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Danube Transnational Programme EDU-LAB

**Collection of the best practices in existing governance models
regarding labour market relevance of higher education
in the Danube Region**

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1. Encouraging the further development of Higher Education Acts

1.1. Existing governance models regarding labour market relevance of higher education: organisations (national/regional governance), infrastructures (law, bylaw, measure, activity ...)

In the selected Danube Region countries, existing governance models regarding labour market relevance of higher education, very much depend on the complexity of country organisation and include various government bodies, laws and bylaws responsible for this area. Also, national legislation in the field of higher education is very influenced by EU policy and regulations. Certain countries have also developed National strategies for higher education which include priorities that should be fulfilled in certain period. More information about specific countries can be found in chapters below.

1.1.1 BULGARIA

The **national legislation and national policy** in the sphere of higher education are strongly influenced by EU legislation and policy. The Bologna process, the Lisbon Strategy, and the Copenhagen Declaration as well as the later Europe 2020 Strategy, set the framework for the Bulgarian national policy in the sphere of higher education and its correspondence to the labour market demands. Bulgaria has defined as a constant priority of its higher education policy the establishment of a closer tie between education and the needs of the economy, respectively of the labour market (national and global). **Applying a competent approach to education, which ensures the formation of practical skills in students, strengthening the connection between business and educational institutions, and assessment of the training provided by various higher schools based on the realisation of their graduates**, are some of the aims fixed in the programme of the Bulgarian Ministry of Education and Science in fulfilment of this priority and as part of the reform in higher education.

1. In order to implement the programme of connecting the quality of higher education to the needs of business and the labour market, in 2013 the Ministry of Education and Science elaborated a **Strategy for Development of Higher Education in the Republic of Bulgaria for the Period 2014 – 2020**, which was approved in 2014 by the Council of Ministers of R. Bulgaria, and in 2015 was unanimously passed by the National Assembly, together with the Action Plan that accompanies it. It is based on this Strategy that reforms in higher education and **amendments in the Higher Education Act** are made.

The strategy puts exceptionally strong emphasis on the building of a sustainable and effective connection between higher schools and the labour market, achievement of a dynamic match between supply and demand of specialists with higher education, and measuring the quality of education according to the practical realisation of students. The strategy estimates that the basic weakness of the current system of higher education in Bulgaria is the lack of an effective mechanism for connection between, on the one hand, higher schools as a place for training and a recruitment source of qualified specialists, and on the other hand, business and public institutions as users of highly-educated staff that can adapt to the structural and qualification changes in the system of employment. The strategy also notes the serious mismatch between the structure and profile of higher education graduates and the dynamics of the labour market in Bulgaria and the EU. It also points out the **basic challenges** to the link between education and labour market needs.

Some concrete measures envisaged by the strategy to overcome the listed challenges are as follows:

- Use of prognosis concerning the supply and demand of labour force in Bulgaria, to be prepared by the Ministry of Labour and Social Policy when determining the demand for specialists with higher education and planning enrolment in higher schools;
 - Creating a competency profile for each specialty;
 - To stimulate dialogue between higher schools and business regarding the contents of training;
 - Targeted funding of academic areas that are of strategic importance for the country: priority professional areas and specialties identified according to adopted criteria;
 - Financial incentives for building, in partnerships with business, a scientific infrastructure regarding the specialists in demand;
 - Funding student internships and practices in the course of education through the web system of the Ministry of Education and Science (MES) <http://praktiki.mon.bg/sp> and creating additional incentives for employers to provide conditions for practical training and internship after completion of education;
 - Building a working, effective mechanism for assessment of the professional realisation of graduates;
 - Creating a common information network for career centres, associations of graduates, etc.
2. Together with the adoption and start of implementation of the new Strategy for Development of Higher Education in R. Bulgaria for the period 2014 – 2020, MES also prepared, in 2015, a draft amendment to the Higher Education Act, which was passed by the Parliament and published in 2016. **The new amendments to the Higher Education Act** related to the connection between higher education and the labour market envisage the following:

The funding of state higher schools is fundamentally changed: they will no longer be subsidised according to the number of students they teach, and a growingly large percentage of the state subsidy will go to specialties whose graduates have a good realisation on the labour market. For instance, in 2017, 40 % of the state subsidy will go to such specialties, and the percentage is expected to rise in 2018 to 50 %, and in 2020 to 60 %. It is expected thereby that a decrease will be made of the large disproportion between the labour market needs and the specialties that are actually being chosen by many students in Bulgaria (one of the negative effects of giving funding according to numbers of students);

The amendments envisage defining priority professional areas (for which there is predicted to be a need for highly qualified specialists on the part of the economy and society) and protected specialties (i.e., specialties that are important for the social-economic development of society, yet are not particularly attractive for candidate students). At present, such defined priority areas are engineering sciences, natural sciences and mathematics, informatics, pedagogy, and agrarian science. Falling under the protected specialties are nuclear science specialties, exotic foreign languages, etc.

3. Along with working on normative documents, MES also undertakes **concrete practical activities**, aimed at increasing the degree of correspondence between higher education and the demands of the labour market. With the help of financing through the European Social Fund in the framework of Operational Programme Human Resources Development, MES announced in 2012 a procedure for competitive selection of projects under Priority Axis ‘**Improving the Quality of Education and Training in Accordance with the Labour Market Needs to Build a Knowledge-based Economy**’, through a **grant scheme**. The aim of the project is to create a direct link between higher educational schools on the one hand and employers’ organizations, large companies, and key experts on the other hand; so that all these will work together to update study programmes and achieve a better match between higher education and the labour market. Under this competition, the projects of 36 higher educational institutions out of a total of 51 in Bulgaria won and implemented joint activities with employers and representatives of state and local government

institutions. The projects were implemented from 2013 until 2015, and the total amount of funding from MES was 11,795,807. 65 BGN. In 31 of the higher schools with winning projects, new study programmes have already been introduced, elaborated with the participation of businesspersons; the programmes take into account the changes and demands of the labour market.

1.1.2 BOSNIA AND HERZEGOVINA

Bosnia and Herzegovina (BiH) has very complex higher education systems with 14 institutions involved in defining and coordinating policies. BiH is constituted of two entities, Federation of Bosnia and Herzegovina and Republic of Srpska, and Brčko District. According to the Constitution, responsibilities for education policies are delegated to entities and Brčko District. The Federation of Bosnia and Herzegovina is constituted of ten cantons. Responsibilities for education policies are delegated to cantonal ministries of education which are coordinated by the Federal Ministry of Education and Science. In the Republic of Srpska, higher education policy is the responsibility of the Ministry of education and culture, and in Brčko District higher education is the responsibility of the Department of education. At the state level, the Ministry of Civil Affairs is responsible for coordination of education policies at lower levels, and education policies adjustment at the international level, as well as promotion between Bosnia and Herzegovina and foreign higher institutions. Governance arrangements regarding the participation of stakeholders in quality assurance processes may play important role. The quality assurance process in Bosnia and Herzegovina is also divided among several institutions, depending on the governance level. Students are not involved in quality assurance procedures in Bosnia and Herzegovina, but they may be involved in external review teams on a discretionary basis¹. Also, there is mandatory involvement of students in decision-making processes for external reviews. However, student involvement in quality assurance systems usually has little impact. Employer involvement is also a feature of quality assurance systems. There is compulsory involvement of employers in external review teams in Bosnia and Herzegovina.

Bosnia and Herzegovina has introduced higher education laws and strategies to institutionalise the adoption of the Bologna principles. It started in 2007, and since then various strategic documents have been issued, several of which aim to align HE policy with the **EU Education and Training 2020 strategy**. Some of them are **Strategic framework for education development in BiH 2015 – 2025, Priorities of Higher Education for the Period 2016-2026, Strategic directions for the development of higher education in the Federation of Bosnia and Herzegovina 2012 – 2022 – Synergy and Partnership, Strategy for education development in the Republic of Srpska 2016 –2020, Youth Policy of Republic of Srpska for 2016-2020, Economic reform programme 2017-2019**.

The document *Priorities of Higher Education for the Period 2016-2026* was adopted by the Council of Ministers. Some of the priorities include the harmonisation of laws on HE with the Framework Law, strengthening research and innovation and strengthening the connection between higher education and the labour market. Regarding strategic and legislative framework this document prioritises following goals (which are in a alignment with the EDU-LAB project): 1. Through active and creative dialogue identify and agree on priority areas and plan the necessary actions, their sequence and stakeholders (including the academic community and students, and provide proper consultations with social partners, employers and the general public) to be included in Higher Education through joint activity, 2. Clearly describe realistic objectives and determine the resources required for their implementation and clearly define goals that HEIs should realise, as well as the indicators of achievement and stakeholders for the next 10 years, 3. Improve and establish clear connections between policies and higher education objectives on all government levels in Bosnia and Herzegovina,

¹ Eurydice (2015) *The European Higher Education Area in 2015: Bologna Process Implementation Report*, Luxembourg: Publications Office of the European Union

authorities and institutions, with each other and with the objectives of the Bologna process. Improve and enhance the trust between universities and ministries (Education, Finance, and other ministries). Also, in this document, it is stressed the need to ensure that each study programme should be designed with two outputs (two possibilities for further career development after graduation): for the labour market and for continuation of education.

This document point out a need to continue to explore the impact of existing legislation (legal provisions) in the implementation of strategies, policies, reports, and the Law on Higher Education in BiH, conducted by higher education institutions in Bosnia and Herzegovina and the corresponding bodies at all levels.

The document encourages the connection between labour market and higher education via a modernisation and an increase the number of existing study programmes for qualifications that are in demand in the labour market; developing consultations on careers and providing public information as a way to stimulate the enrolment for qualifications in demand; providing scholarships for deficit curricula; limiting the number of students in programmes where there is overproduction of staff; clearly defining goals that HEIs should realise in relation to the labour market, as well as indicators of achievement; Establishing consultative consortia at all HEIs (employers, employment bureaus, chambers of commerce, etc.) to coordinate strategic objectives.

According to the state *Economic reform programme 2017-2019* adopted in January 2017, higher education, science, research and technological development in BiH, as a common set of activities, must become a national priority, with the ultimate goal of achieving the standards applicable in the EU. A reform priority is improving links between education and labour market at all state levels. According to this reform programme, the re-establishment of effective research and technological development systems in BiH entails full support from all actors, particularly decision-makers at all levels of government because only then it will be possible to successfully develop the "triangle" of a country's successful future: education – science – economy, with positive participation of the government (politics) as a catalyst. Also the strategy stresses enhancement of cross-sectoral cooperation (sector of labour and employment, education, private sector, social partners, etc.), as well as capacity-building in institutions and services. The reform programme envisages the improvement of chances of young people for inclusion in the labour market, first and foremost necessity to harmonise enrolment policies in secondary vocational and higher education, and then to develop career counselling. The strategy further points out: "It is necessary to improve the conditions for the education process, establish partnerships of schools, institutions of higher education and employers, motivate all participants of these processes to take part in trainings and enhance professional training of teachers. Further development of the Lifelong Learning Qualification Framework in BiH would enhance and facilitate more direct networking of the sectors of education, labour and employment. It is well-known that qualification frameworks encompass the development of knowledge, skills and competences based on learning outcomes and represent an answer to the demands of the labour market."

From the European Commission documents, BiH educational laws and strategies at all state levels presented in this chapter it is evident that key problems on relationship higher education provision and labour market needs are identified and an effective measures are suggested. In fact, nine out of ten EDU-LAB commitments to develop chances for young people leading to the *Danubian Charter for Young Talents* are provided in BiH strategies at all state levels. But, what is needed is implementation of these strategies².

1.1.3 GERMANY

² European Commission (2015) *Western balkans platform on education and training*, Progress report, nov 2015

University Policy

Due to the federal system in Germany, **responsibility for education**, including higher education, **lies entirely with the 16 individual federal states**. The states are responsible for the basic funding and organisation of HEIs. Each state has its own laws governing higher education. Therefore, the actual structure and organisation of the various systems of higher education may differ from state to state. The management structures of HEIs vary, as do the regulations governing the accreditation of new degree programmes. However, in order to ensure the same conditions of study and to guarantee mobility within Germany certain basic principles have been agreed on by the federal state ministers for science within the framework of the Standing Conference of the Ministers of Education and Cultural Affairs. State governments must take these into account when formulating their laws and regulations.

Key actors on national level:

- The Standing Conference of the Ministers of Education and Cultural Affairs

The Standing Conference of the Ministers of Education and Cultural Affairs is the oldest conference of ministers in Germany and plays a significant role as an instrument for the coordination and development of education in the country. It is a consortium of ministers responsible for education and schooling, institutes of higher education and research and cultural affairs, and in this capacity formulates the joint interests and objectives of all 16 federal states.

<https://www.kmk.org/kmk/information-in-english.html>

The Education System in the Federal Republic of Germany 2013/2014

A description of the responsibilities, structures and developments in education policy for the exchange of information in Europe:

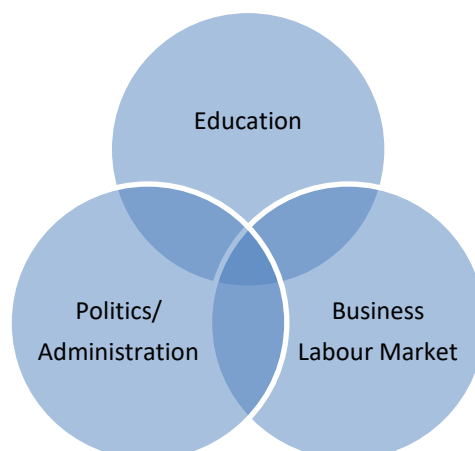
<https://www.kmk.org/fileadmin/Dateien/pdf/Eurydice/Bildungswesen-engl-pdfs/tertiary.pdf>

- The German Rectors' Conference (HRK)

The German Rectors' Conference (HRK) is the voluntary association of public and government-recognised universities and other higher education institutions in Germany. The HRK deals with all issues relating to the role and tasks of higher education institutions in academia and society, especially teaching and studying, research, innovation and transfer, scientific further training, internationalisation, and university self-administration and governance.

<https://www.hrk.de/home/>

In order to strengthen the labour market relevance of higher education, the cooperation of relevant stakeholders is of major importance:



1.1.4 HUNGARY

Higher education in Hungary governed by the **Higher Education Act** (CCIV. Law, 2011; https://net.jogtar.hu/jr/gen/hjegy_doc.cgi?docid=A1100204.TV). It declares the higher educational institutes, their operation, structure etc. All the higher institutes should be accredited regularly. This is carried out by the **Hungarian Accreditation Committee** which was established with the country's first higher education law in 1993. It is, according to the 2011 National Higher Education Act, a national body of experts facilitating the control, assurance and evaluation of the scientific quality of education, scientific research and artistic activity at higher education institutions (http://www.mab.hu/web/index.php?option=com_content&view=article&id=224&Itemid=733&lang=en).

Daily life is governed by the **Ministry of Human Capacities** through the **State Secretary for Education** (<http://www.kormany.hu/en/ministry-of-human-resources>).

All the higher educational institutes are governed by a **rector** and a **chancellor**. The rector is responsible for the education and research, while the chancellor operates the institute.

The **Hungarian Rectors' Conference** is an independent public corporation entitled to represent higher education institutions and to protect their interests. HRC is an independent, consultative organisation with legal personality, which participates in state projects. (<http://www.mrk.hu/en/about/>)

In order to strengthen the labour market relevance of higher education, the cooperation of relevant stakeholders is of major importance. This usually carried out by institutional level, however there are some cooperation in national level. The partner is the **Hungarian Chamber of Commerce and Industry**. There are regional cooperation with different chambers and stakeholders.

1.1.5 ROMANIA

In Romania, the educational system is governed by four types of laws:

- the Constitution of Romania;
- the organic law of education ;
- common specialized laws (regarding the accreditation of higher education institutions and the recognition of university diplomas and the Act regarding the Statute of the Teaching Staff);
- Orders of the Minister of Education.

The **Romanian Ministry of Education** is the national institution to which all higher education institutions look for guidance and report to (www.edu.ro).

Romania has a central government office that authorizes and approves educational institutions. Accreditation and diploma certification is in the hands of the National Center for Diploma Certification and Equivalency (<http://www.cnred.edu.ro/>) and the **Romanian Agency for Quality Assurance in Higher Education** (ARACIS-<http://www.aracis.ro/>), both coordinated by the Ministry of Education.

In Romania, higher education is provided by universities, institutes, study academies, schools of higher education, and other similar establishments, collectively referred to as higher education institutions (HEIs) or universities. HEIs can be state-owned or private; they are non-profit, apolitical in nature and focused on the public interest.

Starting with 2011 and the implementation of the new **Education Act**, universities were divided into three tiers: *Universities focusing on education (which offer only Bachelor degrees); Universities focusing on education and scientific research and universities focusing on education and art (offering Bachelor's and Master's programs); Universities with an advanced research and education focus (which offer Bachelor's, Master's, as well as PhD degrees).*

In the wake of the Bologna Agreement most Bachelor's programs take 3 years to complete. However,

some programs take longer to complete, for example those in some technical fields, medicine, and architecture. Master's programs take 2 years beyond the Bachelor's degree. Master's programs are a prerequisite for admission to PhD programs. PhD programs usually take 3 years to complete. Under special circumstances, the duration of study may be extended by 1 or 2 years.

There are two basic ways to include labour market relevance in quality assurance: requiring higher education institutions to submit employability-related information to quality assurance agencies before programme accreditation or for the continuing evaluation of institutions and/or programmes, and to ensure employer involvement in the governance, design and implementation of those activities.

For Romania, the first way is the most problematic in the sense that the process of using the collected information is difficult and it can take up to three years to change a curricula (ARACIS procedures do not make it easy) in order for it to respond to the market requirements. In spite of that, Romania has been making a lot of progress in the last few years regarding the efforts of involving employers in the educational process, especially in the higher education, as it can be seen in the best practice examples in the next section.

1.1.6 SERBIA

Serbian **Law on Higher Education**, introduced in 2005, and with amendments in 2008, 2010 and 2012, provides a legal basis for full implementation of the Bologna Declaration and the Lisbon Convention.

There is ongoing process of public debate on the Draft of Law on Higher Education. The draft of the Law on Higher Education includes many changes and one of the most important is that it foresees that the faculties will be able to hire experts from industry and economy as teachers. These experts should have completed master studies and have the necessary knowledge and experience which will be crucial for students in gaining practical skills. Other important changes that are on the public debate at the moment are: introducing professional management of higher education institutions (by employing professional manager in each HE institution), unique information system which based on creating database with included all students from all universities in the country, establishment of the National Body for Accreditation and Quality in Higher Education, new criteria for employing retired University professors, etc.

In March 2004, Serbian National Assembly ratified The Lisbon Convention.

Serbian National Strategy for the development of education, approved in October 2012, provided a great number of important innovations at all levels of education in Serbia. As far as higher education is concerned, the strategy sets up 2 important goals to be achieved by 2020:

- At least 40% of students who finish the 4 year vocational high schools and 95% of those who finish grammar school should enter the 3rd cycle of studies
- At least 50% of students who finish Bachelor studies should enrol in a Master degree programme and at least 10% of Master students should get into a Ph.D programme
[* Source: EACEA and National Tempus Office Serbia]

http://eacea.ec.europa.eu/tempus/participating_countries/overview/Serbia.pdf

Strategy for Development of Education in Serbia by 2020

Comprised of five problem parts, the first part of the Strategy sets a precise context, concept and objectives of the project, its contents, approach to project planning and the foundations on which it was based.

The second part of the Strategy refers to pre-university education (preschool, primary, secondary general and arts education and general education in secondary vocational education, and secondary vocational education) and contains the description of the present condition as well as vision of development of each of the said levels from the aspect of coverage, quality, efficiency and relevance.

The third part of the Strategy reflects to the irreplaceable role that persons with higher education have in modern economic and general development.

The fourth part of the Strategy with the common title “All-embracing strategies of education system development”, focuses on the problem of adult education, funding of education, and a particularly delicate issue of education of individual categories of students.

The fifth part of the strategy covers the education development strategy as its main priority in order to maintain and promote Serbia’s education system.

<http://erasmusplus.rs/wp-content/uploads/2015/03/Strategy-for-Education-Development-in-Serbia-2020.pdf>

1.1.7 SLOVAKIA

The Slovak Law defines the institutions of higher education as legal entities, providing education and research in the Slovak Republic . According the character and amount of activities they can be divided into university type institutions, providing education up to the PhD. study, and non-university type institutions, providing education up to the Bachelor’s level.

The Accreditation Commission as the advisory body of the Slovak Government observes and evaluates the education and scientific or artistic activities of Slovak universities or faculties concerning degrees, levels of study, establishment of a public institution of higher education, its faculties, the approval for establishing a private institution of higher education, on changes in study disciplines and fields of study at these institutions, etc.

There are the three types of institutions of higher education in the Slovak Republic :

Public Institution of Higher Education established according the **Act on Higher Education**. The bodies of the academic autonomy of the institutions are the Academic Senate, the Rector, The Scientific Council and the Disciplinary Commission. They decide on the organization, activities and administration of the institution.

State Institution of Higher Education, established through the Ministries of the Slovak government. The respective Ministry sets the rules for the types of study, administering the financial means, regulating the number of students, the employees etc. supervised by respective Ministry as:

- Police institutions of higher education (established and supervised by the Ministry of Interior)
- Military institutions for higher education (established and supervised by the Ministry of Defense)
- Health care institutions of higher education (established and supervised by the Ministry of Health).

Private Institution of Higher Education, established by non-government institutions or founders, but the providing of education and research must be approved by the Ministry of Education. The approval is based on the approval of the Accreditation Commission or the administration and operation of the institution would harm the laws or regulations of the country.

In 2004, it was mainly the decentralisation of school administration introduced by the passed Act No. 596/2003 Coll. on State Administration in Education and School Self-Governing Bodies. The given act defines the jurisdiction, organisation and role of state administration bodies in education, of municipalities, self-governing regions and school self-governing bodies and stipulates their jurisdiction

in the area of state administration in education and school selfgovernance. It also defines financing of non-state primary art schools, language schools, kindergartens and school facilities.

At the same time, the Act No. 597/2003 Coll. on Financing of Primary Schools, Secondary Schools and School Facilities defining financing of schools (primary schools and secondary schools, including special schools) of all founders and special kindergartens, school facilities, as well as school facilities under the founding jurisdiction of regional school authorities.

The Act No. 245/2008 Coll. on Education (the school act) came into force as of 1 September 2008, which is a piece of legislation long awaited, and which brought a key change in education by introducing a two-level model of curricula consisting of national curricula and school curricula.

In connection with the passing of the Act No. 245/2008 Coll., further pieces of legislation were also approved. **The Act No. 184/2009 Coll. on Vocational Education and Training defines**, until the time of its approval, non-existing mechanisms ensuring participation of employers in vocational education and training and at the same time sets the conditions for improving vocational education and training by establishing advisory bodies for vocational education and training. It has also established a support mechanism for coordination of vocational education and training with the labour market.

The Act No. 317/2009 Coll. on Educational and professional Staff complexly governs the issue of status and performance of educational and professional employees, defines their rights and duties, sets preconditions for carrying out educational and professional activity and introduces professional development, career levels, career positions, attestations of educational and professional employees and a system of continuous education. In relation to the above-mentioned acts, governmental regulations and further executive standards (decrees) were passed concerning education in individual types of schools.

1.1.8 SLOVENIA

The Act on higher education enables two types of study programmes at **the undergraduate level** (first cycle), which are called the **academic and professional study programmes**, leading to the academic and professional bachelor's degree, respectively. Within the professional study programmes the **internship** within a working environment is **obligatory** and in the academic study programmes it can be included, but it is not obligatory. Graduates of both types of the undergraduate study programmes can enrol to study programmes at the master level (second cycle). An obligatory part of these study programs are **projects in the working environment or/and work within a basic or applicative research**.

Each study year is divided into two semesters, each should contain 15 weeks of organised study. This requirement **disables flexibility**, which would be required to improve the labour market relevance of the higher education.

All the enrolled students benefit from the **additional social transfers** if they are not employed (reduced fees for student dormitories, travel expenses, subsidized student meals, special benefits within student work). This is regulated through the national acts, which are in the domain of the Ministry for work, family, social affairs and equal opportunities. As soon as a student employs or loses the student status, these benefits are revoked. A **new arrangement is required** if one would want to combine/interchange the studies and employment (as, for example, in a dual study system).

1.2. Examples of best practice (law, bylaw, measure, activity)

Presented activities of selected countries prove that labour market relevance of higher education has been recognised as very important in developing higher education acts, as well as in other activities such as projects, programs, establishing centres for career development, including companies in developing educational curricula, etc. When it comes to financial resources used for these purposes, European funds and national resources are used. It is also visible from the chapters below that only Germany and Hungary have distinction between Universities and Universities of applied sciences where the latter ones are based on practice-oriented education.

1.2.1. BULGARIA

One example of a good practice that has proven successful and given results is the above-mentioned MES grant programme for higher schools is '**Updating School Programmes in Higher Education in Accordance with Labour Market Requirements**', implemented with financial assistance from the European Social Fund in the period 2013 – 2015. In the framework of these programmes, 36 higher schools in Bulgaria have received financial support to improve the quality of education and training in accordance with the needs of the labour market. In 31 of the higher schools with projects under this programme, new study programmes were introduced, designed with the participation of business, taking account of the demands of the labour market; in five other schools the introduction of study programmes is forthcoming.

Along with this, the various higher schools working on these winning projects are introducing practices aimed at consolidating the connection between education and business. We may point out the following **good practices** that these higher schools have introduced and put to the test in the course of training students – practices aimed at improving the quality of training in accordance with labour market demands:

- Established sustainable ties between higher schools, business and the local regional and municipal government for effective functioning of the 'knowledge triangle' higher school-research-business (labour market).
- The creation of work groups of teachers in higher schools, employers, key experts from business, cooperating to design curricula in order to enhance the practical applicability of the knowledge taught at universities.
- Engaging, on a long-term basis, key experts from business and leading specialists from the practical sphere as teachers and lecturers in education.
- Participation of business in elaborating practical tasks to be included in the training of students. This practice is applied in Varna Free University, Varna;
- Active partnership with business for providing the most adequate environment for practical training of students: organising and conducting practical exercises in a real working environment, conducting seminar exercises for students with the participation of representatives of the sphere of practice, designing projects by students working with employers.
- Participation of business in internship programmes in higher schools.
- Established effective cooperation between higher schools and employers for updating the existing curricula and designing new curricula for priority specialties in accordance with the specific needs of business at regional level, taking into account the needs of business in identifying priority specialties.
- Established effective cooperation with business for professional realisation of graduates at regional level: business representatives and employers are introduced to future candidates for jobs, agreements are concluded on providing jobs for graduate students.

Implementing good practices in higher schools in order to improve the quality of education in accordance with labour market needs is only one aspect of consolidating the connection between

education and business. Strengthening the connection between the educational system and business may also have a shaping influence on the labour market itself. The following are some good practices in this direction:

- Participation of the teaching staff and students through established forms of cooperation with business in the designing of regional policies and strategies for development and solution of local problems of economic development and the labour market.
- Established cooperation between higher schools and business for training of workers without absence from production.
- Familiarising businesspersons with the latest theoretical achievements that have resulted from cooperation with higher schools; providing possibilities for subsequent application of these achievements in practice.

1.2.2. BOSNIA AND HERZEGOVINA

Centre for Student Career Development at School of Economics and Business University of Sarajevo (<http://www.efsa.unsa.ba/career/>). The Career centre at School of Economics and Business was founded in 2004. The goal of the Centre is to help students with all uncertainties and difficulties they may encounter in the course of studying as well as their first employment. The Career Centre offers service to students, as well as education on technical matters that they are in a need in their career. Students participate in all activities and workshops of Career Centre during the three years of first cycle of studies. By the end of their studies, they remain in active and regular contact with Career Centre and they become some kind of an alumni network, providing opportunities for new generations of students, aware of the important role that Career Centre had in their career development. Beside organisation of educative workshops, the Centre helps companies to find volunteers for work, students to find a company for their students practice which is obligatory in sixth semester of the undergraduate study, and announces vacancies for jobs and internship programmes. A number of Career Start-up with labour market event and seminars with topics like Employment market, Team work, The first job interview, Idea hunt etc. have been organised by the Centre.

Apprenticeship programme for university graduates in Republic of Srpska and Canton Sarajevo. In 2007, Republic of Srpska introduced an apprenticeship programme for university graduates without any work experience that has continued in subsequent years³. The programme subsidises 70% of HE graduates' salaries up to 600 KM per month (in 2011) and 80% of the social contributions. The criteria for award of an apprenticeship subsidy included whether the graduate was employed in agriculture, processing or a service industry, the length of time spent in unemployment, location in an underdeveloped region, and disability. In 2011, 1,000 HE graduates were enrolled in the programme. A major deficiency of the programme has been its focus on apprenticeship in the public sector (mainly municipal administrations), with only one quarter of graduates hired as apprentices by private sector employers. Most of the graduates hired under the programme have had a degree in Economics or Law, rather than science or engineering. The programme has also been criticised for its lack of transparency in the allocation of subsidised apprenticeships⁷.

The same apprenticeship programme for university graduates without any work experience have applied in Sarajevo Canton for a number of years.

Using scholarships to influence enrolment by field of study . The Republic of Srpska spends about €1 million each year to finance student scholarships. In 2015, it introduced a reform of the scholarship system for HE graduates designed to incentivise more graduates to enrol in the Science, Technology,

³ Djukić, J., Milak, V. and Kremenović, B. (2012) Active labour market policies in Republic of Srpska: good but is it good enough? Example of the apprentices employment project, Published in: *New Challenges in Changing Labour Markets*, J. Zubović and I. Domazet (Eds), Belgrade: Institute of Economic Sciences

Engineering & Mathematics studies. The aim of the policy is to increase the number of students enrolled in natural sciences, engineering and technology departments, expertise which “can constitute a driving force of economic and social development of the Republic of Srpska”.

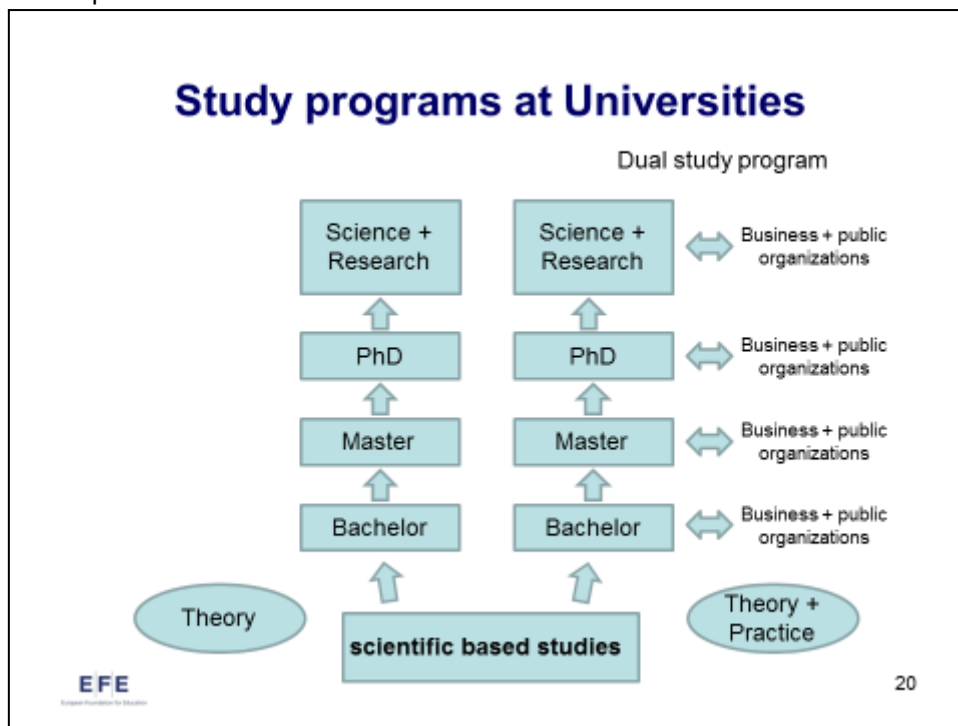
1.2.3. GERMANY

There are currently 387 universities in Germany with a combined student population of approximately 2.4 million. Of these, 110 are universities or similar institutions, 221 are universities of applied sciences (in German ‘Fachhochschulen’) and 56 are colleges of art or music.

There are **three types of higher education institutions** in Germany:

- **Universities**

Universities offer strong theoretical and academically-oriented degree programmes and a broad range of disciplines.



- **Universities of applied sciences**

Instruction at universities of applied sciences is **strongly practice-oriented**. The course work provides the theoretical background and prepares students for the real-world requirements of professional life. Internships and practical semesters form an integral part of the degree programmes.

Colleges of art, film and music

Colleges of art, film and music offer instruction in artistic subjects, such as Fine Arts, Acting, Dance, Industrial and Fashion Design, Graphic Art, Instrumental Music and Singing. Students enrolled at colleges for modern media are trained to become directors, camera operators, screenwriters and film and television professionals.

https://www.study-in.de/en/plan-your-studies/types-of-universities_26607.php

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

<https://www.hochschulkompass.de/en/degree-programmes/choosing-a-programme/types-of-higher-education-institutions.html>

- **Universities of cooperative education**

Universities of cooperative education (UCE) are state-approved educational institutions which have a special position next to the normal universities. The courses take three years, in which theoretical and practical learning alternate. That means that a period of university is followed by a period of practical education in a company which is the educational partner of the UCE.

The degree you receive at a UCE used to be a UCE diploma. But in the meantime several UCEs offer the opportunity of dual studies with the bachelor's degree.

There are state UCEs in the provinces Baden Württemberg, Sachsen, Berlin and Thüringen; in Hessen, Niedersachsen, Hamburg, Schleswig-Holstein and Saarland they are financed by private investors.

<https://studieren.de/university-cooperative-education.0.html>

1.2.4. HUNGARY

There are **three types of higher education institutions** in Hungary:

1. University
2. University of applied sciences
3. High school

Universities:

Universities offer strong theoretical and academically-oriented degree programs and wide range of disciplines. There are 22 state universities and 7 non-state universities.

Universities of applied sciences:

These type of institutes are strongly practice-oriented. The course work provides the theoretical background and prepares students for the real life requirements. Students usually spend some time even a semester in a stakeholder. There are 5 state and 2 non-state universities of applied sciences.

High Schools:

Education in high schools is very similar to the university of applied sciences, but the field of education is more narrow. In Hungary there are 2 state high schools and 28 non-state high schools.

Education in Hungary fits to the European education namely it is a linear education. As a general the BSc/BA level takes 7 semesters, the MSc/MA takes 4 semesters. There is so called undivided education i.e. medical, pedagogical etc.

In the last two years dual type higher education was introduced. This type of education is based on a German model (DHBW) with some modification. The time frame fits to the normal education, but the examination period and the holiday is spent in the stakeholders.

1.2.5. ROMANIA

Best practice regarding law:

Order no. 3.262 of the Ministry of Education from February 16, 2017 regarding the organization and functioning of student entrepreneurial societies in the higher education system in Romania. This order regulates the organization and operation of entrepreneurial students structure, referred to as SAS,

established in higher education institutions (accredited public or private) in Romania. SAS provides a mechanism for supporting development and encouraging entrepreneurship in academia, especially among students and university graduates in order to increase competitiveness of universities and to enable the employability of students. SAS addresses: a) students in higher education institution, in every program of study; b) graduates in their first three years of graduation.

A SAS has the following main responsibilities: development of information and guidance materials for students; organizing mentoring for students who want to establish a start-up; encourage cooperation mentor - student in order to strengthen and develop entrepreneurial skills; organizing projects related to start-up business ideas, etc., in order to select proposals to be submitted to the executive board for review and feedback; organize contests to attract funding to the best projects; coordinating the activities of all business incubators, and other business simulated entities within the higher education institution.

Order no. 94/2014 of the Ministry of Education regarding dual education in Romania. The Ministry of Education has regulated dual education and its organization after consulting employers and at their request, in order to create a strong vocational education system tailored to the needs of the economy and labor market requirements.

In this respect, the Ministry of Education held a dialogue with representatives of employers on the best possible organization of the vocational training system in Romania. Under the new regulations, dual organization of education is at the request of economic agents.

Moreover, organization, duration, content of training programs and certification training modalities are established in consultation with economic operators. Therefore, this form of vocational education is complementary to those operating today and GEO 94/2014 provides the legal framework for its organization, businesses alike can get directly involved in all components of labor training they need.

Best practice regarding employers involvement:

The Advisory Board of the Lucian Blaga University of Sibiu. In order to adapt the university's curriculum to the economic and social environment requirements, since 2008, LBUS took the initiative to establish the Advisory Board of LBUS. The Advisory Board is a representative structure of the economic and business environment operating under a partnership with the LBUS management team that works to improve the quality of the graduates.

The LBUS Advisory Board identified material resources and ideas to increase the quality of the entire education and scientific research process, and the active participation of the university in the community life for the benefit of all community members and society in general. The Advisory Board has the following prerogatives:

- Performs a continuous exchange of ideas and actions on the continuous improvement of the educational service by updating the curricula of the university programs as indicated by the business partners.
- Proposes solutions to improve university management, using efficient and effective use of human and material resources.
- Develops programs that enable internship programs for its students, in partnership with the business environment.
- Attracts resources through actions of sponsorship, donations, etc..
- Provides students practice opportunities and training for the development of practical skills;
- Supports joint activities (university and businesses) with scientific, cultural and sportive implications.
- Supports academic, scientific and professional proposals that serve in any way the effort of perfectly correlating the university curricula to the market needs.

1.2.6. SERBIA

After Serbia signed the Bologna Declaration in 2003, a new **Law on Higher Education** was adopted in 2005 distinguishing between academic and vocational studies. The main types of HEIs are **universities**, **colleges of academic studies** and **colleges of vocational studies**. There are also faculties and art academies within a university. Faculties within public universities are independent legal entities. They have substantial autonomy in taking decisions regarding professional, managerial and financial matters. Universities have a dual governance structure consisting of an administrative body, the Council, and an academic body, the Senate.

Serbia is one of the few countries in the region to have a substantial post-secondary vocational system provided by **a large number of specialised colleges**, which provide degree-level qualifications. The largest HEI is the University of Belgrade, a public university with 31 faculties and more than 82,000 registered students in the 2014-2015 academic year (over a third of the total in all HEIs). Some private HEIs have been established in response to increased demand for higher education. The relative number of private HEIs is below the average in the region in relation to population size.

All universities have a **Center for development of carrier** in order to connect academic and business community as well as to provide personal counselling and advice to students on an individual or group basis.

1.2.7. SLOVAKIA

Modernising higher education

Slovakia is one of the few EU countries where the tertiary education attainment rate – that had risen rapidly over the last decade - did not increase in 2014 compared to 2013, remaining at 26.9%, compared to the EU average of 37.9%. The rate is among the lowest and the Europe 2020 national target of 40% is at risk of not being met. Slovakia is one of the countries with the strongest correlation between tertiary education attainment and the educational attainment of parents: less than 5% of 20-34 year-olds in tertiary education have parents with a level of educational attainment below the upper secondary level (OECD 2014a). The employment rate of recent tertiary education graduates³ remained at 76.7% in 2014, i.e. lower than the EU average of 80.5%. Slovakia remains among the few countries that do not have a quality assurance agency operating independently of the Ministry of Education and where neither completion nor drop-out rates are calculated and monitored systematically. **The Accreditation Committee**, which carries out quality evaluation, is not a member of the European Association for Quality Assurance in Higher Education (ENQA). Supporting its membership could possibly contribute to improving the work of the Committee. Slovakia lacks professionally-oriented bachelor's programmes: the vast majority of students continue on to master's programmes (European Commission 2015 and Figure 3). Between 2010 and 2013, Slovakia was the EU Member State with the highest increase in the number of people with a tertiary degree working in a job below their level of qualification (European Commission 2015). This state of affairs is not helping to achieve a higher attainment rate or to use resources in the most efficient manner. Higher education institutions are also under pressure because of the demographic decline, which is lowering the number of young people entering higher education and forcing institutions to fight to fill their courses. Employers - particularly employers in the automotive sector - point out that graduates do not have the right kinds of qualifications: too many at the master's level, too many from the social sciences and not enough from science, technology, engineering and mathematics (STEM). This may be partly linked to the fact that the largely per capita funding system does not favour technical universities, whereas the labour market needs more graduates precisely from the technical fields. Various sources (the Academic Ranking and Rating Agency, Eurostat, Eurydice, the National Reform Programme) point to a severe

brain drain affecting students, teachers and researchers. Many students prefer to study in the Czech Republic rather than in Slovakia.

Work on a new Higher Education Act has been postponed until after the next general elections in 2016. Nowadays there is expected a small amendment, which incorporates principles of operation of the new accreditation agency for universities. The new Act was supposed to simplify the accreditation process and encourage cooperation with employers, something currently being explored through an ongoing EU-funded project. One of the project's results is a recently-launched portal which helps future students to choose where to study by providing employment rates and wages for graduates from individual universities and programmes. By the end of 2015, the ongoing complex (re)accreditation round following the entry into force of stricter rules for quality assurance in 2013 will come to an end, hopefully bringing qualitative improvements. Funds from the 2014-2020 European Structural and Investment Funds will support the creation of profession-oriented bachelor's programmes. The Ministry of Education has also launched grants to encourage Slovak graduates of prestigious universities to come back to Slovakia and work in public administration.

1.2.8. SLOVENIA

All the public universities in Slovenia have established **Career Centres**, financed by the Ministry of Science, Higher Education and Sports (MIZŠ) through the European Social Fund (ESF) system.

Another activity within the ESF is performed through the Slovene Human Resources Development and Scholarships Fund, which releases calls for the research/professional **projects called "On a creative way to knowledge" (PKP projects)**. The goal of these projects is to connect the HE sector with environment (business, institutions..., i.e. potential employers).

The Slovenian Research Agency (ARRS) considers **collaboration with companies** in research work as **an important indicator when approving the research grants**.

In the past, the Ministry of Economic Development and Technology, financed a collaboration between HE and companies at the research level through the system of "young researchers from business". These PhD students were enrolled to the university PhD study programs and worked in the field of applicative research that a company wanted to develop. They had a supervisor, both at the university and in the company (only companies that had a registered research department were eligible). Unfortunately, this mechanism was cancelled.

2. Fostering the creation of more professionally-oriented study programmes

2.1. Institutional setting-up: Specialised organisations; Dedicated study programmes: Specialised e-learning courses, etc.)

Creating professionally-oriented curricula in higher education has the aim to establish direct link between university graduates and labour market needs which will result in providing well trained staff and competitive advantage on macro level. Selected Danube Region countries have various attempts to give contribution in this field. Germany and Hungary already have universities of applied sciences, while other countries are having various activities in order to improve the situation. Some of those activities are: creating national agencies responsible for professional education and training, including lifelong learning principles, obligatory internships for university students, various programs of career development centers, etc.

2.2.1 BULGARIA

In implementing the measures defined in the **Strategy for Development of Higher Education in the Republic of Bulgaria for the Period 2014 – 2020**, in 2012 the MES of Bulgaria launched a project scheme for funding student practices and apprenticeships in private firms. The **Student Practices** scheme was financed under Operational Programme Human Resources Development to the amount of 90 million BGN and was implemented from January 18, 2012 to October 31, 2014, in partnership with all 51 higher schools in Bulgaria, where a total of 61,100 students participated in practical training. Practical training was conducted in a real work environment for 240 hours for each student. After the conclusion of the practice, the student was paid a stipend of 480 BGN by the respective higher school. The host companies appointed mentors to guide the youths, and the partner universities appointed academic tutors in various professional areas to supervise the practice. The project budget provided funds for remuneration of the academic tutors from the higher schools and the mentors working for employers. Employers taking part in the project were from industrial and non-industrial organisations, state and municipal administrations, state institutions, commercial associations, teaching organisations, employers' organisations and other legal entities. The practical training undergone by students in the programme scheme corresponded to the specialty or professional area of the student's own studies; training was conducted in a real work environment and consisted in fulfilling tasks assigned by the training organisation in accordance with a preliminary programme. The practical training conducted under this project is different from the regular practice envisaged in the curricula for the respective specialty and academic qualification degree. Practical training is conducted with individuals or groups with the help, and with the assistance of an official of the respective mentor organisation or, in the case of academic tutorship, a teacher from the higher school. The aim of this programme scheme is to strengthen the link between education and practice; through practice in a real work environment, education is more closely tied to the labour market.

The success of this project scheme, and the great interest it provoked, encouraged MES to announce a new project scheme in 2016, **Student Practices – Phase 1**, funded under the new Operational Programme Science and Education for Intelligent Growth 2014-2020, with the support of European structures and investment funds, and to be implemented from September 2016 to December 2017. The goal of the new project scheme is to enhance the practical orientation of higher education and the flexibility of higher school graduates in relation to labour market dynamics, by strengthening the link

between education and practice. The project is funded to the amount of 37 million BGN and covers 48 higher schools; it envisages that 40,020 students will complete practices. An indicator of the successful start of the project, and a guarantee of its successful achievement, is the fact that already by the end of 2016, approximately 33,560 students had registered in the project site; 2,900 employers' organisations declared their desire to train students in a real work environment, having announced 4,289 employment positions for students; 5,568 mentors have expressed willingness to share their experience and competence with youths who want to apply in practice the knowledge gained in university; and 3,900 academic tutors and 600 experts from higher schools have declared willingness to take part in the practical training of students.

As concerns the fostering of more professionally oriented curricula for higher schools, it is important to note Bulgarian legal regulation of the conditions for carrying out **continuing professional training** after completion of higher education. In the course of time, a growing number of enterprises are ensuring continuing professional training for their employees. This trend is determined by the deficit of suitable staff, the rapid development of technologies, and the entry of foreign investors. **Continuing professional training in Bulgaria is regulated by several normative acts**, which concern various aspects of this area. The **Labour Code** is the fundamental normative act; it stipulates that continuing professional training may be carried out upon mutual agreement between the worker and the employer. The **Employment Promotion Act** has stimulated employers to increase the qualification of the employed and improve their skills. Under this act, and through a **National Action Plan for Employment**, each year the state allots funds from the state budget under various programmes for continuing professional training. The programmes are run by the Ministry of Labour and Social Policy, the Employment Agency, etc. The **Higher Education Act** regulates continuing professional training in the sphere of higher education, the so-called '**post-diploma training**' or '**post-diploma qualification**'. This type of training is organised by independent units at the higher schools according to procedure and conditions defined by the higher school statutes. Qualification programmes are divided into long-term training, for more than one semester, and short-term, for up to one semester. According to the length of programmes, they result in obtainment of two kinds of documents: a Certificate of Professional Qualification after long-term training, and a Certification of Professional Qualification after short-term training.

2.1.1. BOSNIA AND HERZEGOVINA

The document **Priorities of Higher Education for the Period 2016-2026** which was adopted by the Council of Ministers in priorities concerning connection between the labour market and higher education directed towards significantly increase the level of practice and application of acquired knowledge, especially in programmes related to the profession and industry, using the experience of industry experts as lecturers and building programmes for lifelong learning at all HEIs, which also include professional training. This is in the favour of a creation of more professionally-oriented study programs. In accordance of this document, it is worth to mention a draft of the new Law of higher education in Canton Sarajevo in which is suggested (imposed) introducing one semester student practise.

In a favour of fostering more professionally-oriented study programs, the Institute of adult education in the Republic Srpska could be a good example. The Institute supports development of flexible education system which follows the labour market needs, fosters lifelong learning principles and takes the best practice from EU countries. Institute creates the preconditions for the systematic introduction of Lifelong Learning in the entire educational system of the Republic of Srpska, as well as meets needs of individuals to acquire special knowledge and competence in accordance with their capabilities, requirements and affinities. It develops a system for insurance of quality and the procedure of accreditation for facilities that deal with education of adults and rises the public awareness regarding

the importance of continuous education. The Institute have implemented many internationale project like *Centre for LLL, Education to employment in local community, Strengthening Adult Education Resources in Technical and Vocational Schools in Bosnia and Herzegovina – STARS, Vocational Education in the Republic of Srpska.*

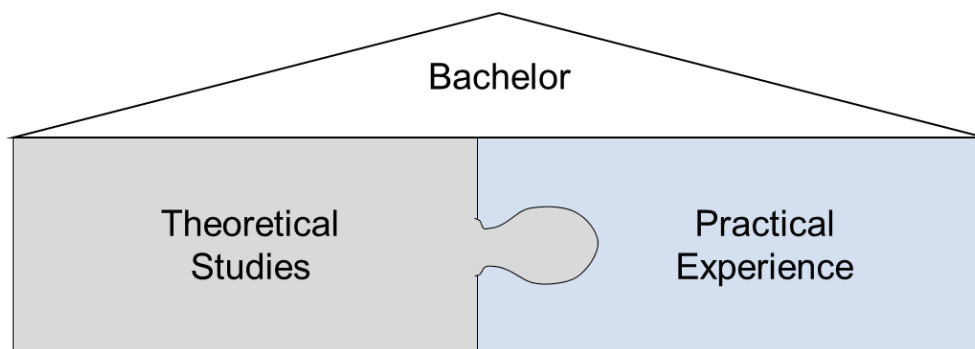
The another good example is the project *Support for Adult Education* implemented by German Society for International Cooperation (GIZ) and co-financed the Swiss Agency for Development and Cooperation (SDC). The project, started in 2011 and finished in 2016, consisted of six working lines: 1. *Training and development* aimed to reinforce the offer in the field of non-formal adult education through the creation of new training, 2. *Certification of informally acquired competences* aimed at establishing a model for the definition and recognition of informally acquired competences, 3. *Professionalism of adult education* developed and implemented the concept of educational training of teachers as well as staff in institutions that are directly or indirectly involved in adult education, 4. *Career and educational counselling* provided support to the competent institutions that would be able to identify the needs of companies and persons seeking employment, and to recognize the need to implement in the educational and career counselling, 5. *Raising awareness about the need for adult education*, and 6. *After the acquisition of primary education* aimed to strengthen the competencies of teaching staff. The project took place in different regions of Bosnia and Herzegovina and one of the result is also the educational manual *Subsequent acquisition of basic education*, the development of the instrument, *Passport competencies*, and the websites *obuke.ba* was established.

Faculty of Science and Education University of Mostar incorporated entrepreneurial learning outcomes into three existing courses⁴. The faculty organised a variety of activities for their teaching training students including guest lectures, workshops and study visits. The guest lectures featured presentations by an academic expert on entrepreneurial learning and by a representative of the federal Ministry of development, Entrepreneurship and Crafts. Three study visits were organised to a local technological park (iNTErA Mostar), a local Chamber of Commerce and a business fair. finally, a workshop was organised on how to develop and evaluate entrepreneurial ideas.

2.1.2. GERMANY

Professionally-oriented study programmes in Germany are offered by:

- **Universities of applied sciences**
- **Universities of cooperative education**



⁴ T. Farnell, E. Heder, M. Ljubić (2016) *Towards Entrepreneurial Higher Educations in South East Europe and Turkey*, South East Centre for Entrepreneurial Learning, Zagreb

Baden-Wuerttemberg Cooperative State University (DHBW)

Baden-Wuerttemberg Cooperative State University (Duale Hochschule Baden-Württemberg / DHBW) is the first higher education institution in Germany which combines on-the-job training and academic studies and, therefore, achieves a close integration of theory and practice, both being components of cooperative education. With around 34,000 enrolled students, over 9,000 partner companies and more than 145,000 graduates, DHBW counts as one of the largest higher education institutions in the German Federal State of Baden-Wuerttemberg.

The university's official seat is in Stuttgart. Based on the US State University System, the organizational structure of DHBW is unique in Germany for it comprises both the central (DHBW headquarters) and the local level (DHBW locations and campuses). Throughout its nine locations and three campuses, the university offers a broad range of undergraduate study programmes in the field of business, engineering, and social work. All degree programmes are both nationally and internationally accredited, count as intensive study programmes and are worth 210 ECTS credits. In addition, DHBW offers postgraduate degree programmes with integrated on-the-job training.

<http://www.dhbw.de/english/dhbw/about-us.html>

Cooperative Education at DHBW

The key feature of cooperative (work-integrated) education is the unique combination of theory and practice. The university's curriculum combines higher education and on-the-job training at numerous partner companies, aiming to provide both academic skills and work-related expertise. In that regard, the academic content conveyed in classroom is complemented with workplace experience, so that real-life situations immediately test the effectiveness of classroom theory and vice versa.

With this strategy, DHBW provides a route to sought-after academic qualifications while enabling students to gain extensive practical experience. This allows DHBW graduates to take on challenging tasks early in their professional pathways, helping them to launch their successful careers. DHBW welcomes partner companies and social institutions as equal partners to the university. All partners work together to continuously develop and improve the 'dual study concept' and to achieve mutual goals.

Baden-Wuerttemberg Cooperative State University is the first higher education institution in Germany which offers hands-on training integrated into the curriculum. Organized according to the US State University System, DHBW cooperates with numerous universities and enterprises worldwide. This gives our students the opportunity to spend part of their studies (either theoretical or practical) abroad. By adding more internationally oriented degree programmes, DHBW has responded to the increasing demand for internationalization. No matter in which sector one works, internationally-trained employees are in great demand.

2.1.3. HUNGARY

Professionally-oriented study programmes in Hungary are offered by:

- **Universities of applied sciences**
- **High Schools**

Curriculum of the institute defines the ration between the practical and theoretical part of the education. BSc level usually contains more than 50% practical, but it does not exceed 60%. The practical

education means laboratory practises and industrial practice. The latter normally lasts 6 weeks. Most of the thesis work is prepared in the industry or in other stakeholders.

The dual type higher education gives more practical. As general, the dual type education means 26 weeks/year normal academic education (including practicals) and 22 weeks/year of so called industrial practice in the stakeholder. Nowadays, not all the higher institutions take part in the dual type education. It is voluntary and depend on the field of education and the relationships with the different stakeholders. Before entering into the dual type education, the stakeholder should prepare a curriculum based on the curriculum of the higher educational institute. This curriculum of the education at the partner stakeholder is accredited by the Ministry of Human Resources.

There are different special courses organised by the higher schools. These courses do not give degree, but gives diploma on s special field. These courses can be distant learning or even e-learning types.

2.1.4. ROMANIA

The National Authority for Qualifications - ANC has established in 2015 an **Advisory Council** that consists of 33 persons - representatives of educational institutions and university, students, professional associations, public administration central employers' organizations, trade unions and representatives of sectoral committees. This structure is intended to establish an effective link between the labor market employers / unions, students and institutions involved in continuous training adults participating in lifelong learning throughout life. At the same time, the Advisory Council supports ANC in developing national strategies and action plans for qualifications and continuous training, exercises a consultative role and endorsement of draft legislation and methodologies related to implementation of the National Qualifications Framework.

The national education strategy until 2020 states that Romania will channel all its powers so that education and training will meet labor market and skills needs.

The Education and Training Strategy proposes to develop an accessible system, attractive and competitive, in order to provide quality education and training relevant and quick to respond to the needs of people and the economy by managing resource efficient.

The strategic vision on education and training in Romania is to provide high-level skills relevant to labor market and society to everyone, so the development of more professionally-oriented study programs is one of the main focuses for most higher education institutions in Romania.

This is the reason why, in the last few years, there have been developed more and more MBA programs. These are usually joint programs with universities in Canada, the U.S., and Europe or different foundations and the chambers of commerce from different countries.

Dedicated study programs are another concern because one of the biggest challenges that universities are facing today is that they are unable to provide practical knowledge to their students, while on the job market companies are looking for experienced workforce.

The cooperation between higher education institutions and companies can be mutually beneficial, yielding valuable benefits. LBUS has experience in this regard, in the last years having developed joint education programs and curricula at the demand of certain companies like Continental Automotive in the Faculty of Engineering and Keep Calling for the Faculty of Economic Sciences, more particularly sponsoring the whole marketing graduate program.

2.1.5. SERBIA

In accordance with the Strategy of scientific/technological development of Serbia which emphasizes participation of students in research and development, several universities, together with their student's parliaments, have established **Centers for student's participation in research and development**. Centers for career guidance are introduced and established at a number of universities. The aim of these centers is students counselling, emphasizing skills necessary for concrete jobs. Communication with employers represents also an important aspect of student centred learning. Contacts with the Economic Chambers of Serbia are established at the level of the NCHE, HERE team and SKONUS in order to develop more fruitful contacts between the academic community and possible employers. One should also have in mind that the Students Conference of Universities and the Students Conference of Academies of Professional Career Studies are established to pursue the common interests of students as partners in the process of higher education (www.skonus.org and www.skass.rs). Their initiatives in the sense of promoting student centred learning are coordinated with the corresponding actions of higher education institutions.

Also, representatives designated by the **Student Conferences** are members of the National Council of Higher Education, of the Conference of Universities, of the Conference of Academies of Professional Career Studies. In discussing and/or deciding on the issues related to quality assurance, the reform of study programmes, analysis of study effectiveness and the determination of the number of ECTS credits, representatives of students can vote in the above professional bodies, taking care of the above aspects.

* National Report regarding the Bologna Process implementation 2009-2012

http://media.ehea.info/file/Serbia/97/7/National_Report_Serbia_2012_571977.pdf

2.1.6. SLOVAKIA

The State Institute of Vocational Education

The Slovak Centre of Scientific and Technical Information

Employers at Slovakia are dissatisfied with VET graduates' competences: this is a result of VET being underfinanced and funding mechanisms based on number of learners not the quality of learning outcomes. Changing young people's education preferences and broken links between the worlds of work and education also play a role. In 2015, a new VET Act (61/2015) was adopted. It was initiated by employer representatives, particularly from the automotive industry. The act supports closer school-company partnerships and encourages the shift to labour market demand-driven VET.

In the new approach, companies take responsibility for training provision. They find learners and sign individual training contracts that must be complemented by an institutional contract between the company and a VET school. This contract describes the partners' roles and responsibilities. Companies are not obliged to offer future employment to contracted learners. In contrast to traditional apprentices, learners in dual VET in Slovakia are students and not employees of a company that provides training. Companies can even partly (up to 40%) delegate the training back to schools. It is now in the companies' interest to attract learners to VET and to deliver job-relevant training.

Dual VET in Slovakia differs from dual systems in other countries. It takes time to implement and organising the learning process may create tension. Curricula for company-based training are being developed predominantly by public authorities as the business community lacks expertise. There is a need to strengthen capacity of 'sectoral assignees' to assist companies, particularly small and medium-sized enterprises interested in providing training. Direct cooperation between VET schools and

companies may need to be strengthened, as there are no fiscal incentives for schools implementing dual VET.

2.1.7. SLOVENIA

As described under 1.1, the Slovenian Act on higher education enables two types of undergraduate studies. The **professional study programmes** include obligatory internship within a working environment. Internship is desirable but not obligatory in the academic undergraduate study programmes. A huge problem that we are facing is **a low level of knowledge of the majority of students enrolled to the professional study programmes**, because most of them come from vocational schools in which the level of knowledge in some general subjects, such as Mathematics and Physics, does not exceed much the level of the elementary school.

As described under 1.2, all the public universities in Slovenia have established the **Career Centres**, which prepare workshops for students on how to plan their professional career, connects them with potential employers, help in finding internships, collect inquiries of employers and publish them on a web-page, help in connection between employers and study programs, relevant for the employer needs, etc.

Within the **projects “On the creative way to knowledge”**, students from different study fields work together on specific problems of companies/institutions under the supervision of tutors from the companies and teaching staff at HE.

2.2. Examples of best practice: study programme, e-learning course, etc.

The range of best practice measures applied in selected countries with the aim to create more professionally-oriented study programmes is very broad: funding student practices and internships in companies and various organisations, e-learning programs for English teachers, team work of students on real business problems, MBA programs, Cisco Networking Academy program, etc. More details on implementation of all these measures can be found in lines below.

2.2.1. BULGARIA

The grant initiative of MES for funding student practices and internships in private companies, state and municipal institutions, non-profit organisations, etc., can be listed as a good practice that has proven its adequacy for Bulgarian conditions in view of the fact that MES has conducted it twice, with great interest shown by higher schools, employers, and students alike. In the framework of this initiative, we may point out some good practices aimed at enhancing the practical applicability of higher education, which have been well established in the course of cooperation between higher schools and employers:

- Student practices and internships are organised so that the practical training a student gets in a real work environment will match the specialty and professional area he/she is studying in and will deepen and build upon his/her professional specialisation; the internship involves accumulating additional knowledge and skills in the professional field and facilitating students on the labour market;

- Practical training during the student internship is done in a real work environment according to practice hours in curricula for the respective specialty and academic qualification degree; this enables students to expand and deepen their practical formation;
- Student practices and internships are paid, which stimulates students to take part in this additional practical training; thus, they are able to deepen their professional skills and prove their knowledge in a real work environment, while receiving pay for their labour;
- The transition from education to work is facilitated, and sustainable mechanisms are established for employers to recruit students who have proven their skills in a real work environment, and for students to directly enter the labour market;
- Effective cooperation is established between professional mentors and academic tutors from the higher schools in order to achieve maximum effectiveness of practical training;
- The professional aid of mentors and academic tutors is also remunerated; which stimulates their active participation;
- Conditions are provided for mentors and academic tutors to form groups of 15 students each, to be trained as groups; this enables the mentors and tutors to increase their per hour teaching fees up to 15 times and increases their interest in conducting practical training of students in a real work environment;
- MES has created a site <http://praktiki.mon.bg/sp>, in which higher schools, employers, and students can register if they wish to take part in organising and conducting student practices; this site facilitates all those involved to find an appropriate partner and creates conditions for establishing long-term partnerships between employers and higher schools; this in turn increases the percentage of students who are hired directly after graduating.

Among the universities that, in the course of their students' studies, apply these practices for training in a real work environment, we may point out: The American University in Blagoevgrad; The Tourism College, Blagoevgrad; Southwest University Neofit Rilski, Blagoevgrad; International Business School, Botevgrad; Burgas Free University; Professor Dr. Asen Zlatarov University, Burgas; Varna Free University Chernorizets Hrabar; Higher Military Naval School Nikola Yonkov Vaptsarov, Varna; Higher School of Management, Varna; Varna University of Economic; Medical University Professor Dr. Paraskev Stoyanov, Varna; Technical University, Varna; Veliko Tarnovo University Saints Cyril and Methodius; Technical University, Gabrovo; European Polytechnic University, Pernik; Medical University, Pleven; Agricultural University, Plovdiv; Academy of Music, Dance and Art, Plovdiv; Higher School for Agribusiness and Regional Development, Plovdiv; Higher School of Security and Economics, Plovdiv; European Higher School of Economics and Management, Plovdiv; Medical University, Plovdiv; Plovdiv University Paisiy Hilendarski; University of Food Technology, Plovdiv; Ruse University Angel Kanchev; Economic Academy "Dimitar Apostolov Tsenov", Svishtov; Higher School of Construction Lyuben Karavelov, Sofia; Todor Kableshkov Higher School of Transport, Sofia; Higher School of Insurance and Finance, Sofia; Higher State College of Telecommunications and Posts, Sofia; Military Academy Georgi Stoykov Rakovski, Sofia; College of Management, Commerce and Marketing, Sofia; University of Forestry, Sofia; Medical University, Sofia; University of Mining and Geology, St. Ivan Rilski, Sofia; National Art Academy, Sofia; National Academy for Theatre and Film Arts Krastyo Sarafov, Sofia; National Musical Academy Professor Pancho Vladigerov, Sofia; National Sport Academy Vasil Levski, Sofia; New Bulgarian University, Sofia; Sofia University St. Kliment Ohridski; Technical University, Sofia; University of National and World Economy, Sofia; University of Architecture, Civil Engineering and Geodesy, Sofia; University of Library Studies and Information Technologies, Sofia; University of Chemical Technology and Metallurgy, Sofia; Thracian University, Stara Zagora; Shumen University Bishop Konstantin Preslavski.

2.2.2. BOSNIA AND HERZEGOVINA

A Good 'helix' example

As a good a 'helix' example regarding education may serve innovative cases of vocational secondary education for adults where a recognition and validation is being promoted in collaboration with private enterprises⁵:

- The Tešanj vocational school in the Zenica-Doboj Canton provides vocational courses based on modular curricula and learning outcomes-based approaches. Social partners (employers and employee associations) have established an advisory council to collaborate with enterprises. They deliver services to employed workers, and recognize and certify skills and learning outcomes from vocational secondary adult education that are relevant to the needs of local enterprises.
- The Banja Luka Agricultural School is a member of the Chambers of Commerce and Industry of the Republic of Srpska. It cooperates with employers associations to organise courses and classes in accordance with the needs of the labour market.
- The Sarajevo Tourism and Catering Secondary school recognizes and certifies the learning outcomes from courses related to occupations in the Register containing the Classification of Occupations. The vocational secondary school has established good links with local companies in order to provide practical training to students and adults. The school also offers adult training that may not lead to a formal qualification, but local companies recognise the value of the certificate of attendance issued by the school.

E-Teacher Programme

The American English E-Teacher Program, also promoted by US Embassy in BiH, offers foreign English teaching professionals the opportunity to take innovative, online university-level classes and online professional development programming for teachers. These courses introduce and explore current methodological concepts and issues in the English as a Foreign Language field, provide an innovative distance-learning experience that uses the latest technology, and Connect participants with U.S. English language teaching experts and creates a professional network of international colleagues. The course helps participants apply technology in record keeping, feedback, and assessment, and use technology to improve communication, collaboration, and efficiency by participating in online discussion and presentation.

2.2.3. GERMANY

In Germany, there are **103 Universities of applied sciences and higher education institutions** that do not award doctorates and are state-controlled.

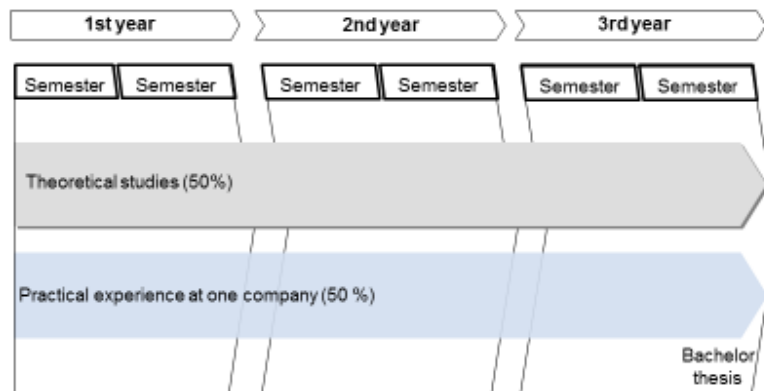
<https://www.hochschulkompass.de/en/degree-programmes/search.html>

There are many study programmes where labour market relevance is of major importance:

- **Dual work-study programmes**
- **Studying part-time while employed**

⁵<http://www.uil.unesco.org/lifelong-learning/recognition-validation-and-accreditation/bosnia-and-herzegovina-rva-case-study>)

Course structure (Example)



The Baden-Wuerttemberg Cooperative State University (DHBW), offers a broad range of dual study programmes:

- Accounting, Taxation and Business Law
- Applied Health Sciences
- Applied Nursing Science
- Business Administration
- Business Information Systems
- International Business Management Trinational
- Entrepreneurship
- Media
- Physiotherapy

Dual study programs in Germany

Universities work together with companies

Students gain first job experiences parallel to their studies

Graduates are already an integral part of the company's network

2.2.4. HUNGARY

As an example, curriculum of our mechanical engineering program is given.

The study program consists of four different class of subjects:

1. Natural sciences (mathematics, physics, chemistry etc.)
2. Economic and human knowledge (economics, management, logistics etc.)
3. Core subjects (machine parts, material processing, metal forming etc.)
4. Special subject (some specialised subject on different area of mechanical engineering)

This type of classification of the subjects is general in Hungary. The educational materials (textbook, lecture notes etc.) are available in written or electronic form. Some institutes prepared or nowadays prepares distance learning or e-learning courses.

Dual type higher education starts with the preparation of curriculum of the stakeholder. The basic of their curriculum is the curriculum of the Pallasz Athéné University. The stakeholder chooses the subjects which will be expanded during the education at the stakeholder. Usually the first two industrial practices deal with the company profile and structure. In this period some soft skill is practised. Later the education focuses in the subjects connected to field of interest of the company. The prepared curriculum is checked by different level. The first step is the university followed by the Board of Dual Training. Acceptance of the curriculum is essential to become partner of PAE.

2.2.5. ROMANIA

The Entrepreneurship Academy means an environment where teams of students study business and create real business operations, assisted by a Team Coach.

The Entrepreneurship Academy is managed by EntrepreNation Foundation, created by the three founding organizations. The Foundation's mission is to develop entrepreneurship in Romania and to prepare the young student for the highest standards of the business environment.

ASEBUSS- American Executive MBA Program

The Institute for Business Administration in Bucharest (ASEBUSS) was founded in 1993 through a program financed by USAID - The United States Agency of International Development.

Since 1993, The Romanian-American School of Business, part of the Institute, has been organizing the Executive MBA Program (Executive MBA) - the only American Executive MBA on the Romanian market - in partnership with prestigious US universities. Between 1993-2003 the Executive MBA program was offered in cooperation with University of Washington, Seattle. Beginning with 1995, IBAB is self-financed through the Romanian-American Postgraduate School of Business Foundation- ASEBUSS.

Starting from 2003, ASEBUSS has developed a new international partnership with Kennesaw State University (KSU), Atlanta -Georgia. Kennesaw State University is recognized internationally, being ranked as one of the leading Executive MBA programs in the United States by Business Week, Success Magazine, and U.S. News & World Report. KSU has the AACSB international accreditation and has recently obtained the European accreditation, EFMD- Equis. Currently, ASEBUSS is an independent institution, authorized and accredited by the Ministry of Education, Research, Youth and Sports to organize academic programs according to the school's mission. The Institute for Business Administration in Bucharest was set up by law as a fully accredited private institution of public utility, part of our national system of education (Law 252/June 30/2009, MO 462/July 3, 2009) in order to comply with the Bologna agreement.

- Romanian-American Executive MBA program, - a two-year accredited program, recognized nationally and internationally.
- Center for International Business Education and Research - CIBER represents a platform for collaboration and communication among ASEBUSS school of business and the business environment, through a series of activities and programs with an international focus addressed to students, alumni and faculty, business representatives from multinationals, Romanian companies, NGOs, entrepreneurs, student associations, etc. Throughout the year, CIBER organizes various events, conferences, seminars, workshops, study trips, exchange programs for students and faculty and will coordinate consultancy and research projects.

2.2.6. SERBIA

Cisco Networking Academy Serbia - F_Email Project Builds Confidence and ICT Careers

The idea for the F_Email project came from a Cisco Networking Academy instructor at the University of Belgrade, School of Electrical Engineering. At the university, many women pursue degrees in areas where no jobs exist or under-represent their skills and talents due to a lack of confidence. In 2006, university partnered with Cisco to launch the F_Email Project: a competitive IT training program for a carefully selected group of women who face significant obstacles to employment. By combining the technical skills taught in Cisco Networking Academy courses with soft skills training in a small group setting, he hoped to help the women bring their strengths and talents to the developing ICT sector in Serbia. Cisco provides the Networking Academy curriculum, online assessments, and lab simulations while the university leads workshops on how to write a CV, interview, and communicate professionally. The women work together in the hands-on lab to develop their skills. More than 150 women compete each year for 16 spaces in the intensive 8-month program. Selection is based on a mix of criteria, including how long they have been looking for work or have been unemployed. The result is a mix of career starters with technical skills and career changers with backgrounds as diverse as IT analyst, mother, artist, language professor, and architect. Beyond technical expertise, the program emphasizes career development through soft skills training. Participants learn to position themselves for a career, not just a job.

2.2.7. SLOVAKIA

The Global educational initiative – Cisco Networking Academy program – NetAcad.

The program is deployed in Slovakia since august 1999. The majority of the program participating institutions in Slovakia come from EDU sector (61 secondary schools and vocational training centers, 5 universities, www.netacad.sk, www.netacad.com).

During recent 17 years the Networking Academy has achieved significant position in the area of education of IT professionals in Slovakia and has become the most significant model of education for IT professionals. There is a trend for NetAcad to become one of integrating and valuable components of the governmental program in process of building of knowledge-based economy in Slovakia. Based on currently achieved results and experiences it is possible to declare that the NetAcad program contributes vitally to the preparation of experts in the field of networking technologies in Slovakia. Before launch of the program there was no such an aimed and systemic education for networking experts.

Program has been implemented in SR since august 1999 and according to positive reactions of academic sphere a Memorandum of Understanding (MoU) between Ministry of Education and Cisco

has been signed in January 2001 (renewed in 2006). This MoU was based on innovative non-profit public-private partnership, on the principles of mutual advantage. The MoU is considered as outline for the mutual cooperation and its implementation is continuously elaborated into agreements between the ME, Cisco and the educational institutions, which introduce the NetAcad into the praxis.

Program in Slovakia has been approached by number of commercial organizations which declared interest to cooperate with the program. These activities resulted in the most important strategic public-private partnership between the Ministry of Education, Cisco and the Slovenska sporitelna a.s. (SLS) – the largest financial institution in the country. All program graduates do not find any obstacles to be successful in finding a job within their field of specialization. The Program in Slovakia is in general represented as the most successful e-learning oriented educational program in the academic sphere and Slovakia is among the most successful countries which have implemented the program.

The Program has achieved significant position in the area of education of IT professionals. Achieved results were recognized many times, also on the international level. It is obvious that Slovakia thanks to these results appears as an attractive country for investment activities which require top-class educated networking experts. Activities of significant IT companies (i.e. HP, IBM AT&T in Bratislava, or NESS, AT&T, T-Systems) verify this fact and assume that the SR will have sufficient number of highly qualified networking and IT experts. There is information that currently more other foreign investors analyze possibilities for establishing similar companies in Slovakia which would provide outsourcing for remote IT services. It is just a sufficiency of well-prepared networking graduates which is one of the most influencing criteria for investment decision

The first Networking Academy in Slovakia was established in 1999 at Technical University of Kosice. During recent 17 years the Program has achieved significant position in the area of education of IT professionals in Slovakia and has become the most significant model of education for IT professionals based on Internet environment. Apparently, implementation of the Networking Academy in secondary schools and universities is considered to be an efficient and prospective step in use of e-learning technologies. The program has opened for Slovak schools access to new globally recognized Internet-based educational technologies. New study programs and specializations were introduced based on the program. Institutions involved in program are internationally recognized as training centers for professionals in the field of implementation of communication technology and solutions. All program graduates do not find any obstacle to be successful in finding a job within their field of specialization. The Program in Slovakia is in general represented as the most successful e-learning oriented educational program in academic sphere and Slovakia belongs to the most successful countries with the Program implementation at all.

With 5 300+ active students currently participating in the program at all levels of study (The highest ratio NetAcad students/students in the world), the Networking Academy has become the largest e-learning community in Slovakia.

2.2.8. SLOVENIA

We give examples of good practice from the University of Maribor (UM), which is the second largest public university in Slovenia. In 2016 the “**programme councils**” were established at all study programmes. They include members from HE and companies, which require the profile of graduates of a given study programme. Ways to improve the study programmes are discussed and implemented. **The system of changing the study programs is very flexible** in Slovenia, which enables a quick response to the needs of different stakeholders.

University promotes **theses at all levels to be a result of a collaboration with companies/institutions**. For that purpose it is possible to have a co-supervisor from companies, who does not have a university habilitation, i.e. habilitation required to teach at HE.

Next to the **PKP projects** described above, students at UM work also on **DEMOLA projects**. Within DEMOLA projects it is all about an idea and how to present it, while in the PKP projects students actually work on a problem and come to the solution, which requires time and knowledge, so PKP projects are more popular. Another reason for them being more popular is also the fact that students get payed for the work done on the project.

Another very common collaboration between the HE and employers are **special study courses within specific study programmes**. Groups of students all work on a given problem of a company. The best solution is rewarded, not only by some money, payed for the solution, but often by an offer of a job position.

3. Enhancing professional training (train the trainers) in companies

3.1. Institutional setting-up: Triple-Helix system: Trainings and Courses provided by HE institutions to companies (networks of HE organisations, companies, etc.)

Triple helix model assumes that all academia, policy makers and businesses are dynamically interconnected and interdependent and actively participate in innovation and knowledge creation and that all three stakeholders benefit from this cooperation. This is one of the most challenging tasks of the developing countries and trainings provided by HE institutions to companies are integral part of this process. Danube region countries have different approaches in this respect.

3.1.1. BULGARIA

- **Enhancing professional training in companies with regard to research, development and innovations**

In 2015, the Bulgarian Chamber of Commerce and Industry (BCCI) conducted a survey among branch organisations regarding the role of innovations in business and the cooperation with universities⁶. The survey results show that the connection and mutual trust between business and education is not growing; to the contrary, it has decreased considerably in the last two years. In 2015, there was registered a considerable decrease of the number of business organisations relying on partnership with Bulgarian research institutes and universities for implementation of innovations (while the percentage was 37 % in 2013, in 2015 it was 10 % for Bulgarian scientific research institutes and 0.00 % for universities)⁷.

Due to Bulgaria's observed lag in the development of science and innovations, the country falls in the lowest ranking group, 'modest innovators'⁸, and it is thus necessary to rethink the national policy in this field. In this connection, in recent years **several strategic documents were adopted** for stimulating scientific research in general, and specifically in higher schools. Thus, for instance, the **Strategy for Development of Higher Education in the Republic of Bulgaria (HES) for the period 2014-2020** highlights the 'insufficient commercialisation of scientific results'. Another strategic document, the **National Strategy for Development of Scientific Research 2020**, sets as its first task 'Enhancing the dynamics, results and effectiveness of scientific research and development activities for the benefit of the economy and society', and as its second, 'Building a sustainable link education-science-business as a foundation of the development of the knowledge-based economy'. In order to strengthen the social dimensions of science, the Strategy recommends **creating specialised 'science shops' attached to various public organisations**. 'Science shops' are structures that maintain a link between the needs of society and the scientific research that is being conducted. In 2010, a **National Roadmap for the Scientific Infrastructure of Bulgaria** was adopted, which was updated in 2014. The roadmap determines the European and national infrastructures that will be developed to achieve a competitive and innovative economy. The scientific infrastructure is an inseparable part of building a 'knowledge triangle' – education, science, innovations – and is an effective way to concentrate scientific potential

⁶ More information is available at <http://www.bcci.bg/news/9588>

⁷ Ebd.

⁸ More information at <http://www.opic.bg/uploads/2017/04/otsenka-na-op-11.pdf>

and resources. The **Innovation Strategy for Intelligent Specialisation of the Republic of Bulgaria 2014-2020** also sets the strategic aim to stimulate the system of scientific research in accordance with the needs of industry. In its analytic part, the Strategy finds that ‘an institutional tie between research activity and training is missing, which has very negative effects. The leading institutes of BAS, as well as the leading universities in Sofia, continue to emphasise fundamental research. The others fail to produce a scientific product having international significance and thus have limited access to competitive funding’.

‘Corporate universities’, as well as the ‘technological parks’, have the possibility of acquiring knowledge and skills generated not by them but by the other participants in innovation networks⁹. These side effects of ‘knowledge extension’ are favourable to the accumulation of knowledge and skills in technological parks, but so far we have not found concrete examples of added value accruing from the activity of these two types of institutions built, organised, and advertised in Bulgaria.

- **Enhancing professional training in companies in using new forms of teaching and learning: the e-Learning Initiative**

The same tendencies are visible in Bulgaria with regard to the development and dissemination of new forms of training as in other countries: foremost is the **mass scale of electronic training**. In accordance with the firmly established trends in e-education (e-Learning Initiative), projects are being implemented for developing the infrastructure of electronic education. In Bulgaria, there has been a 13-year old tradition of studying good practices, since the **Decree for State Requirements for the Organisation and Conducting of Distance Training by Higher Schools** came out in 2003. The present state may be assessed as satisfactory: more than 90 % of Bulgarian universities are successfully conducting the two main forms of electronic training – distance and attended training. Attended electronic training in class is applied in the full-time form of training. The conducting of distance training is done in both variants, with attendance in class and without attendance, with the inclusion of electronic training in both forms.

The used platforms for conducting electronic training are divided in three categories: 1. Platforms with open code: Moodle, 2. Platforms borrowed from leading world universities, 3. Platforms the universities develop by themselves.

Equipping seminar halls with computer technology, building intranet structures, quick access to Internet, provision of applied software with thematic orientation for lecture courses and according to the training profile in Bulgarian universities, are of priority importance for the success of activities; this includes centralised design of electronic content by teachers of disciplines in the Bachelor’s and Master’s degree programmes. Not last is the **systematically conducted training of all participants in the education process**, ranging from students and teachers to the administration, so that a closed cycle of electronic training may be produced.

Distance education in our country should be applied increasingly in the sphere of state and municipal administration, where a system of continuing education needs to be organised and maintained. This would significantly decrease the current expenditures (courses for qualification and requalification of the state administration are held, as a rule, in expensive hotels and, when possible, far from the place of work). However, experience shows that this has been done only in a few ministries and is applied mainly when conducting **online courses in the sphere of information technologies**.

For companies as well, distance education helps solve problems related to qualification of employees; this is important in cases when raising qualification involves considerable costs. The importance of distance education is likewise greater in cases when a company has separate offices located at a distance, in which case holding traditional training would be expensive and technically complicated. It

⁹ International scientific conference on Economic progress thought knowledge sharing, November 9-10, 2016.

is equally important for the companies to maintain a certain level of competitive capacity: in fact, the ability to learn faster than the competitors is the only source of educational advantage over them. However, all this is as yet only a wish in most Bulgarian companies. They lack even rudimentary forms of such training of employees. For them, increasing knowledge or acquiring new knowledge usually happens in the course of work, which leads to overload and costly mistakes.

3.1.2. BOSNIA AND HERZEGOVINA

During the transition period, state owned companies which had significant investments in research and innovations, and in-house research institutes/departments disappeared from the market, while most of new emerged private small and medium businesses still do not invest enough or at all resources in research and innovation. This is due to lack of resources, capacities and also lack of vision and awareness. Due to limited resources, governments made major cut in financing research and innovation projects, so universities were left primarily with educational role.

Traditional linear model assumes that innovations and knowledge are created at the universities and research organizations. Since businesses have knowledge about market demand, they would take over certain innovation and knowledge from academia to produce new and innovative goods and services. Disadvantage of this model is low transmission rate of innovation and knowledge from academia to businesses. Many researches and innovations with commercial potentials were never treated as business opportunity and are left forgotten.

Triple helix model assumes that all three main stakeholders, academia, policy makers and businesses are dynamically interconnected and interdependent and actively participate in innovation and knowledge creation and that all three stakeholders benefit from this cooperation. Economy based on knowledge assumes synergy between these three stakeholders.

Thus, triple helix model is a model of dynamic partnership of academia, businesses and government, where their roles can overlap. Triple helix relations can be developed from the bottom-up (when process starts at the level of individuals and organizations) and from the top-down (when process starts from the policy maker)¹⁰.

Bosnia and Herzegovina used to have model where government dominated over academia and business, or so called statist model. During transition period this model is overnight replaced by a model where all stakeholders are independent with limited role of government, or so called laissez-faire model, with significant limitation of funds for research and innovations of both public sector and businesses. Although with limited resources, there is a space to build up triple helix relations. Businesses can contribute having market knowledge, academia can contribute through its existing knowledge for research and innovations as well international cooperation networks, and government can contribute through adequate policy issues that will promote research and innovation. OECD made a survey on innovation behavior in the agricultural sector and the report showed that such triple helix is limited, but did exist.

OECD developed bottom-up Triple Helix Partnership model. Developed model assumes eight steps¹⁰:

1. Set the project objectives;
2. Defining the project scope;
3. Understanding the business innovation behaviour;
4. Identifying and motivating the stakeholders;

¹⁰ Organization for Economic Cooperation and Development (OECD), Private Sector Development Policy Handbook, Triple Helix Partnerships for Innovation in Bosnia and Herzegovina, May 2013.

5. Transferring good practice;
6. Set up of an efficient process to generate high quality proposals;
7. Assistance in implementation; and
8. Share learning.

3.1.3. GERMANY

In Germany, the **Federal Institute for Vocational Education and Training (BIBB)** developed guidelines for trainers to support skilled workers providing training to make their training tasks easier and better. The guidelines suggest ideas for coping with difficult situations. The guidelines were developed based on input from heads of training, trainers, skilled workers with experience of providing training, lecturers and training experts

According to legislation, the responsible trainers should have necessary vocational qualifications and educational qualifications according to the Ordinance (regulation) on trainer aptitude (AEVO), which is acquired through an examination. AEVO is a minimum requirement and is supported by enterprises too. Since 2009, there are two new qualifications for trainers (apart from AEVO), which are not mandatory but provide a possibility to upgrade their qualifications: the certified vocational pedagogue for initial and continuing training (Geprüfter Aus- und Weiterbildungspädagoge, AWP) and the certified vocational pedagogue (Geprüfter Berufspädagoge/Geprüfte Berufspädagogin, BP), an advanced training qualification, including professional skills in education and management.

German Ordinance on Trainer Aptitude (AEVO):

https://www.bibb.de/dokumente/pdf/25-0509_EN_Aus_und_weiterbildungspaedagoge.pdf

The occupational profiles of a certified pedagogue in IVET and CVET and a certified vocational education pedagogue include, among others:

1. design of individual and group learning processes and training programmes, ☐
2. online tutoring,
3. development of teaching materials,
4. ability to identify skills of trainees,
5. ability to plan vocational training activities,
6. be aware of nationally-recognised qualifications,
7. organise a network for collaborative learning,
8. leadership skills.

In Germany, receiving certification from the BDVT, trainers (working mainly in CVET) adhere to constant updating of competences (though it is not required by any regulation).

3.1.4. HUNGARY

The train the trainer system has no real historical background in Hungary. There were some work in this field, but only in the past few year was the real beginning. Hungarian higher educational institutions have very good contacts with the companies. There are common research and development works, and there are some kind of education, too. This type of “education” previously purely professional was. A few years ago a program connected to the dual type higher education was started to educate the colleagues in the companies. It has to be emphasised that this program has not

finished and the curriculum of these courses are not finalised. The main features of these courses are the followings:

1. The course should be short, as there are time limits at the factories.
2. The course should be focused on to a given company.
3. Number of participants should not be large, as the interaction improves the effectivity of the course.
4. Cooperation of the higher educational institutes are welcome in the program.

The main topics of the short courses are the pedagogy and the methodology. One of the most important aspect is the “handling” of the student in different situations. In the future cooperation of the companies should be improved in this field.

3.1.5. ROMANIA

In Romania there are a vast variety of choices when it comes to training opportunities for companies and their employees. There opportunities are provided on one hand by universities or university employees or, more often, by specialized training companies.

The **Association of Romanian Training Institutes** is one of entities that offers a vast curricula of trainings. It was founded in 2002, based on the belief that learning is a journey for life and that it should continue lifelong.

3.1.6. SERBIA

Academic Network of Serbia-AMRES, which is primarily scientific research and education computer network providing modern information and communication services and Internet connection for its members. In the early nineties, AMRES is created by linking several major colleges, and since then it's became the latest computer network in Serbia, with over 150 related scientific research and educational institutions. AMRES has over 200,000 active users. AMRES in 2007 launched a project for the introduction of e-education in many colleges. It was decided to apply over open source platform for distance learning Moodle. A large number of educational institutions embarked on this project with the aim of increasing the quality of both the teaching and successful study. Some faculties in Serbia use free software tools that can be found on the Internet, and some have begun the development of its software to support e-learning.

According to the law on education, in Serbia is not allowed to take exams via the Internet, so, the virtual possibilities begin and end with online textbooks, lectures and consultations.

TEMPUS project DELIFS - Development of Lifelong Learning Framework in Serbia

The main goal of this project is the development of lifelong learning framework in Serbia. It is important to emphasize that the project is in line with the national priorities: development of lifelong learning in the context of the reform of higher education in Serbia, the training of non-university teachers, development of partnerships with enterprises and employers, reduction of the unemployment and definition of qualification framework.

In order to achieve the general objective of the project, development of national strategy for lifelong learning in Serbia ensuring a successful transition to knowledge-based economy and society, it is vital

to create the institutional framework, develop institutional mechanisms and define the infrastructure for the realization of lifelong learning concept.

In broader context, it will enhance the quality and efficacy of human resources, form the sound basis for dynamic knowledge-based economy and contribute to greater social cohesion.

* <http://projects.tempus.ac.rs/en/project/771>

3.1.7. SLOVAKIA

Dual based – vocational trainings and courses are widespread especially on the high school level during the last years. Fully dual study programmes on university level are just in consideration, any accreditation of such programmes so far. There exists only closer co-operation between universities and industries with diverse level of vocational elements. Such model is mostly unique and bilateral agreed. Actually some initiatives, think tanks, professional association work together with industry on more professional oriented studies in different formats.

The existing formats are as follows:

- Company internships during studies (duration approx. 1 - 2 semesters)
 - External distance HE study programmes (besides employment)
 - Other than internal full study programmes, realised only on weekend-days or Friday+Saturday once a month / 2-weeks basis
 - Bachelor and diploma thesis executed with and within agreed company on topics from their business field
 - Company specialised educational academies
 - Professional oriented MBA programmes
 - Research and development centres linking industries and university needs (rather rare)
 - Mentor network programme (professional mentors supporting students to get an effective link to business world)
 - Train the trainer (training for HE teachers)
 - National and local job fairs
- <http://www.education.sk/firmy/s-295/centrum-dalsieho-vzdelavania-univerzity-komenskeho>

3.1.8. SLOVENIA

At the study program level, faculties have **databases of companies**, which can provide internship as an obligatory part of all the professional study programmes. Because students can also find a suitable company on their own, these databases are alive and growing. There are, in general, no courses for the supervisors/tutors in the companies that would be given at the university level. However, some companies, especially the ones with the highest interest in attracting students, have their own **database of employees that are top experts in their fields**. They present the possible supervisors/tutors to both the students and other employees. Often, they are required to have an **additional training in andragogy**, i.e. in methods and principles used in adult education.

A strategic goal of all the public universities in Slovenia is to provide **Life-Long-Learning (LLL) programmes** for former graduates in order to provide them with new knowledge in the field of their study. Such LLL programs are available in several fields of technology, economy, law and the primary and secondary school teacher education.

Within the implementation of the S4-Smart Specialization Strategy (given in more detail in the next section) University of Maribor has established a **wide network with most of the municipalities** in the eastern half of Slovenia. Through the web portal *Vzhodna.si* University of Maribor has initiated formation of **research development partnerships**, which provide a flow of knowledge that companies require in research projects as well as a support in acquiring European funding within the East cohesion region.

3.2. Examples of best practice: HE organisations, trainings, courses by companies, place, name, date, etc.

Unlike Germany in which cooperation between HE institutions and companies has long tradition and is built in institutions and legislation, other selected countries have various initiatives in this field. Some of the initiatives are: e-learning courses and distance learning, cooperation with individual companies and clusters, creating joint master programs, summer schools, student competitions, etc.

3.2.1. BULGARIA

Distance education is most widely applied in our country in the sphere of higher education. In fact, most of the higher schools are not only offering but also constantly developing distance forms of training.

These are the University of National and World Economy, New Bulgarian University, The Economic University of Varna, The University in Botevgrad, The University of Shumen, and Tsenov Academy of Economy in Svishtov. Most of these universities offer distance education for their Master's programmes and seldom for their Bachelor's. However, Eurostat 2016 data show that only about 30% of all Bulgarians in the age group 30 to 34 years have completed higher education, compared to 40 and 50 %, for the developed EU member states. Distance learning might be a good opportunity for slightly older people to study.

The University of Ruse has developed thematic networks with companies and universities – Bulgarian as well as foreign. The most important and successful example is the Master's programme in 'Software engineering', which has been designed in cooperation with a software company.

3.2.2. BOSNIA AND HERZEGOVINA

OECD wrote about good practice triple helix model from the region. Partnership between Faculty of Agriculture of the University of Zagreb (Croatia), large agro-industry company from Croatia and a R&D department of a producer of animal feed from Slovenia was established to produce omega-3 animal nutrition and to explore possible production of poultry and leaner pork meat with a higher percentage of unsaturated fatty acids and lower percentage of saturated fatty acids. Such meat would be of benefit to humans. Each partner had very clear field of research in this project that complemented well. Governments of Croatia and Slovenia financed this project under EUREKA with its focus on business and market oriented research and innovation project, and not on scientific breakthrough research. Project started in 2003 and finished in 2006. Cooperation within triple helix produced benefits for each stakeholder.

OECD Handbook introduced good practice triple helix model in Bosnia and Herzegovina in the project to produce dairy and poultry enriched with omega 3 fatty acids and with a lower amount of omega 6

fatty acids. Partners in this project were Biotechnical Faculty of the University of Bihać, Teleoptic, large dairy and poultry producer from Velika Kladuša, "Posavina koka" from Orašje and one expert from Emona research institute from Slovenia with experience in this field of research. Market research was done for markets of Bosnia and Herzegovina and Croatia. Pilot project was chosen to be production of omega 3 enriched eggs. Government as the third stakeholder in triple helix model was supposed in essence to financially support this project. Because of limited financial resources, this role of the third stakeholder was replaced by a donor. In May 2012 omega 3 enriched eggs were available in supermarkets in Bosnia and Herzegovina.

3.2.3. GERMANY

Training the Trainer in VET – best practices

Regulations regarding the training of the trainers focus on training structures within VET rather than the tertiary system.

In Germany, a tutor should be professionally and personally qualified. Trainers in companies should be registered by the company with the competent body as a trainer responsible for training. Responsible trainers can also be company owners and master craftsmen. One of the elements in the master craftsman ('Meister') exam assesses the ability of the "Meister" to conduct training. At national level the Skilled Crafts Act stipulates that if the entrepreneur does not possess the respective skills to organise and conduct training in his/her company, he/she needs to ensure trainers who can deliver training for the staff. Trainers' pedagogical competences are proven by the AEVO exam (the Ordinance on the Trainers Aptitude).

In Germany, regional chambers (Industrie- und Handelskammer - IHKs) offer training programmes to help candidates to prepare for the trainer's aptitude exam and two advanced trainer qualifications available at national level: certified pedagogue in initial and continuing VET and certified vocational pedagogue (Cedefop, 2013). These programmes are based on outcome-oriented curricula developed by the German Association of Chambers in accordance with the national regulation. Programmes can be full-time or part-time and last from six to 30 months and are not mandatory. Chambers or professional associations provide courses to trainers in SMEs.

Regional chambers create databases of certified trainers. Being listed in such databases (usually, on websites) is considered a seal of quality by potential clients.

Informal knowledge-sharing and support in training-related skills (for example, how to prepare and implement project work): In **Germany**, trainers attend industry events, fairs, informal meetings with colleagues in the industry to update their knowledge of new developments and technology.

In **Germany**, companies form **training structures** (*Ausbildungsverbände*) with four traditional models:

- 'lead enterprise with partner enterprise' (*Leitbetrieb mit Partnerbetrieben*): the lead enterprise bears overall responsibility for training, but parts of the training are conducted in various partner enterprises,
- 'training consortium' (*Ausbildungskonsortium*): several small and medium sized enterprises (KMU) work together and take on trainees. If one enterprise cannot obtain a specific content the trainee goes into the other enterprise (rotation principle). The enterprises also sign a cooperation agreement; they work together equally and train their own trainees independently.

- 'training to order' (Auftragsausbildung): some periods of training take place outside the regular enterprise, perhaps in a nearby large enterprise with a training workshop, on the basis of an order and against reimbursement of costs.
- 'training association' (Ausbildungsverein): the individual enterprises establish an organisation for the purpose of the training, which takes over the organisational tasks (like contracts etc.), while the master enterprises offer the training. The organs of the association are the general meeting and the honorary committee. A statute regulates rights and obligations of the members.

Inter-company vocational training centres (*überbetriebliche Berufsbildungsstätten, ÜBS*) support companies by providing complementary training to the in-company one, keeping training in line with the technological, environmental, economic and societal developments, ensuring quality of IVET through employing qualified trainers and cooperation between the learning venues. The centres also conduct training for business owners, managers, women entrepreneurs. The centres are supported with long-term public funding. Up to now, more than 1,000 training centres and 27 competence centres have been created.

Reforms related to training programmes for trainers

The Federation has launched a new initiative on workplace-oriented research and development in the area of literacy and basic education for the period from 2012 to 2015. The funding priority had a budget of about Euro 20 million and is divided into three spheres of activity:

- Concepts and measures for workplace-oriented literacy and basic education
- Counselling and training for players in the working world and in the daily life of those concerned
- **Continuing training programmes for trainers and lecturers in education programmes**
<http://www.bmbf.de/en/426.php>
<http://www.kmk.org/bildung-schule/allgemeine-weiterbildung/bund-laender>

3.2.4. HUNGARY

There were several conferences on dual type higher education. A few of them:

<https://www.nyiregyhaza.hu/konferencia-a-dualis-kepzesrol-a-nyiregyhazi-foiskolan-2015-09-28>

I. DUÁLIS FELSŐOKTATÁSI KONFERENCIA, Kecskemét, 2013. 09. 19.

II. DUÁLIS FELSŐOKTATÁSI KONFERENCIA – A „KECSKEMÉTI DUÁLIS MODELL” 3 ÉVE 2015. OKTÓBER 15.

The content of the short courses, especially at the companies are not public.

3.2.5. ROMANIA

The **master program Train the Trainers** was launched in 2008, is accredited by ARACIS, and it is included in the European register WIFO Gateway.

The mission of this program is to train at the highest standards of quality, professional trainers, to public and private areas, which contribute to improving the quality of training and human resource development in organizations.

NTT DATA Romania & Babes-Bolyai University of Cluj-Napoca. Service provider and software solutions NTT DATA Romania, a division of Japanese NTT DATA, in partnership with Babes-Bolyai University of Cluj-Napoca started a postgraduate program of training in computer science. The program, accredited by the Ministry of Education and Research, is an opportunity for people with a university degree who want a retraining (university graduates with any profile) to the IT & Software industry.

Courses are held by university teachers and employees of NTT DATA Romania for a duration of two years with a structure of four semesters. After the completion of the study program the graduates will be offered the opportunity to work in a company in the software and IT field.

3.2.6. SERBIA

ICT Cluster Academy, co-founded by USAID in Nis developed and offers two six-month training modules, tailored to the Nis region ICT sector needs. Module 1 for Software Developers and Module 2 for Embedded Specialists consisting of five courses each (including two compulsory courses, same for both modules) that were developed to teach a specific skill relevant to NiCAT ICT members and included 4-month internship in one of the companies from the cluster or other companies.

Results:

- Established ICT Cluster Academy Nis and developed a six-month vocational education program,
- Compiled ICT Cluster Academy Program Manual with the curriculum for each module,
- Standard procedure that describes knowledge, skills, methods and quality of the training program, step-by-step methodology of organizing and delivering trainings,
- Minimum twenty (20) young unemployed persons completed ICT Academy program,
- Minimum ten (10) academy participants get a job 6 months after completing the academy,
- Documents with lessons learned and best practices.

* <http://ni-cat.org/index.php/en/projects/247-ict-klaster-akademija-2>

IT chance for all – ICT cluster academy 2016/2017

Project „IT – chance for all" is ICT Cluster Academy which is course of hi-tech education and internships based on recruitment needs of businesses with aim to employ or increase employability of unemployed in Nis region. Project is implemented by Nis Cluster of Advanced Technologies with GIZ ACCESS and Development Agency Serbia financial support.

Expected Results:

- innovative program with proven concepts that address the gap between the state-provided education and the needs and expectations of today's businesses
- Established efficient internship model as a channel to employability of young people
- 10 companies with growth potential strengthened by provision of adequately skilled workforce and/or acquired efficient internship model
- 18 young people successfully completed the ICT Cluster Academy
- 10 out of 20 candidates get job offers in local companies three months after finish of project
- 10 companies cooperated and collaborated in selection of participants, lecturers, creation of program
- 10 companies exchanged experience regarding internships
- 30 cluster members informed about challenges faced lessons learned and model developed
- 20,000 people reached through social networks with the information regarding the possibilities in entrepreneurship in hi tech
- 100 young people informed about possibilities in hi tech during testing process

- Student organizations informed about possibilities in hi tech
 - Accelerated growth of high tech industries and entrepreneurship initiatives empowered in the City of Nis and SE region
 - Established communication channel between private sector employers and the pool of employees
 - Suggestions to educational and other institutions made
 - Encouraged women to participate
- <http://ni-cat.org/index.php/en/projects/552-it-chance-for-all-ict-cluster-academy-2016-2017>

3.2.7. SLOVAKIA

There are several types of co-operation between HE institutions and companies from diverse industry fields. Herewith some examples as follows:

Volkswagen Slovakia, Bratislava:

1. Webplatform www.unitag.sk for university students offering possibilities in frame of IngA-Programme = Engineer in automotive industry in co-operation with following universities:
 - Slovak University of Technology (STU), Bratislava
 - Technical University (TUKE), Košice
 - University of Žilina, Žilina
 - University of Economics, Bratislava
2. Forms of co-operation:
 - Vocational internship
 - Bachelor's / diploma thesis
 - VW-Day at University - info-lecture at universities
 - Unitag – interactive oneday-workshop in VW- premises for students
3. Trainee programme for alumnis (yearly for approx 14 alumnis with technical or management educational background. Duration 1 year, starting september)
4. Unitag – interactive oneday-workshop for students

SLOVNAFT, Bratislava

1. online international competition for mainly technical and petrochemical students FRESHHH www.freshhh.net/about_freshhh
2. Business Education Program for fresh graduates, duration 1 year, <https://slovnaft.sk/sk/kariera/programy-pre-absolventov/growww-program-pre-absolventov>
3. PIMS Academy - <https://slovnaft.sk/sk/kariera/programy-pre-absolventov/pims-academy> Faculty of Information Technology, University of Pannonia in co-operation with MOL Plc. launched the Postgraduate Specialization Program, intended for specialist of supply chain optimization in petroleum industry

Short-term projects as diploma thesis and vocational internship in the following companies offered:

1. Branson Ultrasonics, a.s., Nové Mesto nad Váhom with Slovak University of Technology (STU), Bratislava
2. CISCO networking academy with Slovak University of Technology (STU), Bratislava <http://cisco.fiit.stuba.sk/new/> for IT students
3. Anasoft – R/D-laboratory ANALAB – IT-students working on innovative market-oriented projects with Anasoft-specialists
4. PosAm – Java Academy - <http://podnikanieainovacie.euin.org/node/88>
An intensive 5-month programmer IT-course for students, accredited and certified as Java Certified Programmer.

Project SPICE by ZAP: www.zapsr.sk/spice/

SPICE is a student's programme of integrated company education covered by ZAP with the aim to interconnect industry with students from technical universities through a 3-month internship at least and to elaborate final thesis. In SPICE are connected 6 Slovak universities and faculties.

Webplatform for students regarding lectures, workshops, seminars with professionals

www.azu.sk

Professional education by CEIT (Central European Institute of Technology)

<https://www.edu4industry.eu/> by CEIT

Educational programmes in line with concept Industry 4.0 based on specific innovative projects with industries and designed for focused needs of companies in the fields of i.e. process management, logistics, quality, HR.

MBA programme for automotive industry <http://automotive.stuba.sk/>

In frame of continuing education a 4-semester distance learning programme in co-operation of STU and Technival University Vienna, including e-learning and excursions to local automotive producers

Professional re-qualification

To ensure a high-quality alumni from dual education and diverse university projects with companies, during the transition period also a professional re-qualification system from the relevant state institution designed based on real market and industry needs and priorities would be a big asset.

T-Systems <https://www.itlearning.sk/vzdelavanie/firemne-vzdelavanie/>

3.2.8. SLOVENIA

As already mentioned, all the study programmes have formed the **Study programme Councils** that address different issues as how to find the most suitable staff for the companies, how to find a company to start a career, how to improve the existing system of practical education, examples of best practice are discussed. These Councils discuss also the competencies required by the graduates, suggest changes in the study programmes and give ideas for further development of professional education. Some study programmes require a supervisor from the company that has andragogical qualifications. As an example, company Gorenje requires such qualifications for all the top experts in order to become a member of the Gorenje research unit. To improve the quality of practical education several study programmes are connecting the practical work with the thesis.

An interesting example of best practice is given by Comtrade, a company that solves the problem with, in their opinion, too little practical work within study programmes, by organizing **summer schools (EDIT)** and is planning a **student competition** "Students' challenge" to be launched next year.

Faculties can perform their own **courses (not within the accredited study programmes)** for students, employees and companies. An example is the CISCO Academy, where the attendees obtain a certificate after completing the course. Such courses exist also on programming CNC machines, hydraulics and pneumatics, on sustainable building, comparative law, teaching of foreign languages in the first triade (children from 6 to 9 years old), etc...

4. Strengthening the regional economic development

4.1. Institutional setting-up: S3-Smart Specialisation Strategy of the region/country - HE related programmes initiated for specific regional economic development goals/needs (educational programs, measures resulted with visible-measurable economic effects)

Transnational cooperation supported by the concept of the Smart Specialization contributes to improvements of global competitiveness and creation of economy based on knowledge. Smart Specialization assumes developing a vision and strategy including competitive advantages to help boost development of excellence and region's potentials based on knowledge and create conditions to use regional diversity as advantage. S3 means identifying region's potentials and strengths as basis for competitive advantage (smart), further develop the strengths and potentials through research and innovation (specialization) and prioritise investments in research and innovations (strategic). Bosnia and Herzegovina as non-EU countries still did not developed S3 strategy on a national level, while other selected countries have national S3 strategies and the level of including of HE in this is different.

4.1.1. BULGARIA

Several European programmes are devoted to developing ties between educational institutions, business, and the local governments. They include sector programmes like Komenski, Leonardo da Vinci, Erasmus, Grundwig, and Study Visits (which built the Lifelong Learning programme), as well as programmes focused on horizontal strategic goals, such as the EU Programme for Education, Training, Youth and Sports Erasmus+, information and communication technology in education (eTwinning), recognition and validation of skills (Europass and ECVET), academic recognition and quality in the sphere of higher education (the Bologna process), development of national systems of career guidance (Euroguidance), analyses of education and training systems (Eurydice and ReferNet), studying foreign languages (the European Language Certificate). A centre of human resources development in Bulgaria is the National Agency for administration of the Erasmus+ Programme for the period 2014-2020.

These programmes envisage financial support for the building of Strategic Partnerships. They support a wide and flexible set of activities for applying innovative practices, promoting the development and modernisation of organisations, and supporting the development of policies at European, national and regional level.

Depending on the project goals, the extent of engagement of participant organisations, the expected impact, and other elements, the Strategic Partnerships may differ in range and may respectively adapt their activities. In other words, the partnership enables the participant organisations to acquire experience from international cooperation and to increase their capacity, as well as to create innovative products of high quality.

The activities carried out in the framework of Strategic Partnership projects may include:

- Activities related to teaching, training and learning
- Intensive study programmes (from 5 days to 2 months)
- Mixed mobility for students, interns, adult learners, young people (from 5 days to 2 months of physical mobility)
- Joint project work of school groups of students (from 5 days to 2 months) Long-term study mobility for high school students (from 2 to 12 months)

- Joint events for staff training (from 5 days to 2 months)
- Mobility for the purpose of teaching or learning (from 2 to 12 months)
- Mobility for people working in the sphere of youth (from 2 to 12 months)
- International youth initiatives.

4.1.2. BOSNIA AND HERZEGOVINA

Transnational cooperation supported by the concept of the Smart Specialization contributes to improvements of global competitiveness and creation of economy based on knowledge. It contributes to integrated approach of regional strategy such as EUSDR – EU Strategy for Danube Region. Smart Specialization includes support to research and innovation and will be part of future Cohesion Policy. Smart Specialization assumes developing a vision and strategy including competitive advantages to help boost development of excellence and region’s potentials based on knowledge and create conditions to use regional diversity as advantage. S3 means identifying region’s potentials and strengths as basis for competitive advantage (smart), further develop the strengths and potentials through research and innovation (specialization) and prioritise investments in research and innovations (strategic). European Commission developed tool to help countries to develop and implement Research and Innovation Strategies for Smart Specialisation (RIS3). Also, European Commission created Smart Specialization Platform to help developing, implementing and reviewing their RIS3. All EU member countries of Danube region: Austria, Bulgaria, Croatia, Czech Republic, Germany (Baden-Wurttemberg and Bayern regions) joined S3 Platform and developed S3. From non-EU member countries (accession countries) Bosnia and Herzegovina, Serbia and Montenegro, and from neighbouring states Moldova and regions of Ukraine, only Serbia and Moldova are registered for S3 platform, but both accession countries and neighbouring countries as non-EU countries haven’t developed S3 so far¹¹. The aim is to develop RIS3 in all Danube region countries (or their regions) by 2020. In general, over 150 EU regions and 15 EU-member states have already joined the Platform. In recent years across the EU mostly on regional level more than 100 Research and Innovation Strategies for Smart Specialization (RIS3) were developed.

Bosnia and Herzegovina hasn’t yet joined S3 platform nor developed Strategy for Smart Specialization¹². S3 platform web site <http://s3platform.jrc.ec.europa.eu/regions/ba/tags/ba>, provides S3 priorities as Encoded in the eye@RIS3 tool for Bosnia and Herzegovina.

4.1.3. GERMANY

Germany has the largest Research and Innovation (R&I) system in Europe. Gross R&D expenditures (GERD) have reached €79.1b in 2012 which implies that Germany accounts for 29.3% of all R&D expenditures in EU-28. The German R&I system showed a strong performance in 2014. The EU Innovation Union Scoreboard 2014 classifies Germany as an, innovation leader member state together with Sweden, Denmark and Finland. Research and innovation are among the top priorities at all levels of decision making, for the federal government, state governments (so called ‘Laender’) and the business sector. All of these actors have increased their investments in R&I significantly over the last years. Accordingly, R&D investments in Germany have reached 2.85% of GDP in 2013 which puts Germany within reach of its 3% goal. Two thirds of these investments are made by the business sector.

¹¹ <http://s3platform.jrc.ec.europa.eu/s3-platform-registered-regions>.

¹² <http://s3platform.jrc.ec.europa.eu>, Ministry of Civil Affairs of Bosnia and Herzegovina, Ministry of Foreign Trade and Economic relations of Bosnia and Herzegovina.

Policy makers are responsive to current challenges which roots are complex and often times interrelated. For example the renewed High Tech Strategy, Digital Agenda 2014-2017 or a newly introduced instrument for incentivising venture capital investment ('INVEST – Zuschuss Wagniskapital') demonstrate that policies are being developed and refined to turn the challenges into opportunities.

Detailed country report:

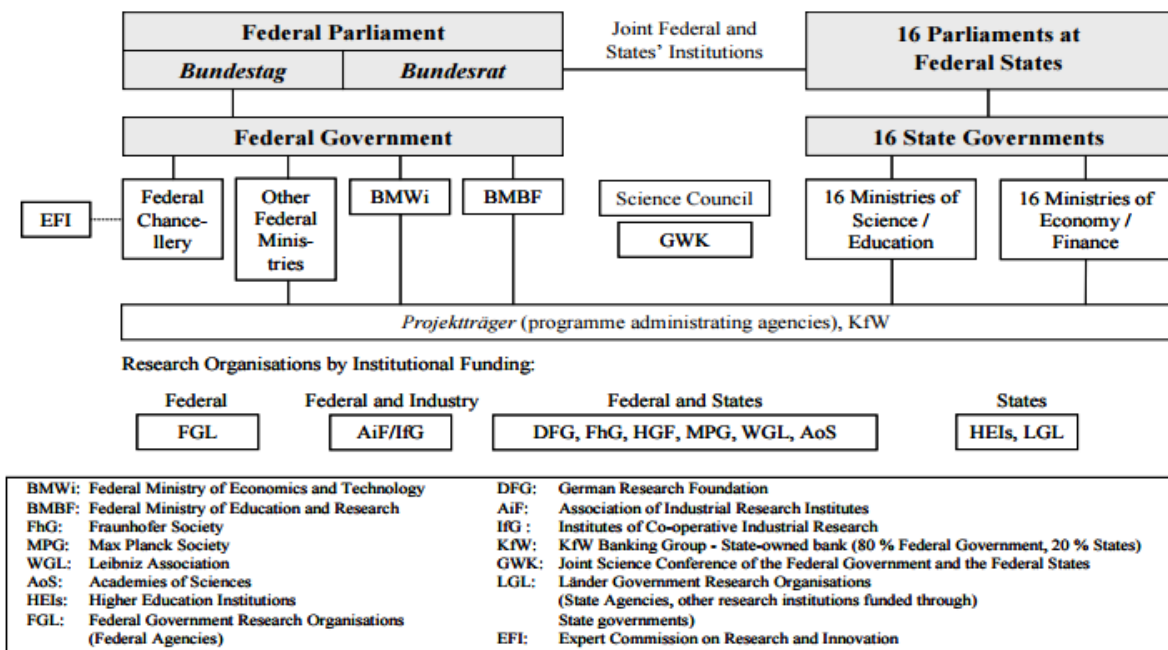
https://rio.jrc.ec.europa.eu/sites/default/files/riowatch_country_report/RIO%20Country%20Report%202014_Germany_0.pdf

S3 related National Websites:

http://ec.europa.eu/regional_policy/index.cfm/en/atlas/germany

<https://rio.jrc.ec.europa.eu/en/country-analysis/Germany>

Germany's RDI governance system



A major legislative achievement of the new federal government is the change of the constitution in December 2014. Article 91b of the German constitution had previously put important limitations on the role of the federal government for funding education and research in universities. The latter was so far the prerogative of the Laender. With the change in the constitutional law, the federal government will have a permanent and strategic role in financing universities.

Experts had called for this change for several years but the necessary majorities in both chambers of parliament (with the 'Bundesrat' representing the Laender) appeared difficult to mobilize. In this regard, the current federal government has the advantage that it is formed by parties of which at least one is also part of every Laender government.

The change in the constitution shows a broader consensus between federal and Laender governments for continued emphasis on R&I in Germany. Federal and Laender governments had previously collaborated on three central policy packages (often times referred to as "pacts") which were all due to expire in the current legislation period. Against the backdrop of the change in the constitution, federal and Laender governments have agreed to continue the Pact for Research and Innovation ('Pakt für Forschung und Innovation,' directed at research organizations) as well as the Higher Education Pact

(‘Hochschulpakt,’ directed at funding education and research at universities) until 2020. Both parties have also signalled their intention to extend the Initiative for Excellence (‘Exzellenzinitiative,’ directed at promoting excellent research in Germany) beyond 2017.

These are important decisions because signals for excellent research in German universities, such as record number of starting grants from the European Research Council (ERC) for researchers in Germany in 2014, begin to emerge.

Policy changes:

Challenge	Policy measures / actions addressing the challenge	Assessment in terms of appropriateness, efficiency and effectiveness
Coordination of federal and Laender governments in the funding of universities and non-university research organizations	Change in constitution for allowing permanent role of federal government in university funding Extension of pacts	Strong political momentum with many new opportunities for the collaboration between federal and Laender governments. Requires planning and management expertise to achieve excellence for the system as a whole.
Effective evaluation and improvement of innovation policies	Establishment of promising pilot projects: BMWi (‘Aufbaukreis Foerdercontrolling/Evaluation’) Establishment of effective data infrastructure to evaluate university research and teaching through combined institutes	Positive developments with potential for further improvement and broader application.
Mix of academic and professional skills for R&I	Removal of barriers for skilled workers to enter universities	Difficult challenge which will require more government attention.
Business opportunities from the knowledge society	Digital Agenda 2014-2017 Industry 4.0 ZIM, EXIST, etc.	Strong political support for appropriate measures.
Internationalization of R&I	ERA strategy of federal government Action plan international collaboration Internationalization of leading edge clusters DAAD, Humboldt society, etc.	Active political strategy. Success remains to be seen in highly competitive, international environment.

Challenges related to EDU-LAB project:

Shift in the career choices of secondary school students. Germany has traditionally benefited from a mix of academically educated students and individuals with professional qualifications based on apprenticeships and on the job learning (‘Facharbeiter’). The latter career path becomes increasingly less attractive to secondary school students. Academic training will hardly be able to replace the professional and often times tacit experience acquired in day to day interaction with processes, procedures and clients.

Smart Specialisation (S3) Strategy for the Danube Region:

<http://s3platform.jrc.ec.europa.eu/danube-macroregion-activities>

<https://ec.europa.eu/jrc/sites/jrcsh/files/jrc-smart-specialisation-danbe-region.pdf>

4.1.4. HUNGARY

There are several programmes under construction to improve and strengthen the regional economic development. “Modern Városok Program” (**Modern Cities Program**), TOP, GINOP etc. are the main programs dealing with regional development. Some of the programs are large (MVP) taking several years or even decades. Others (i.e GINOP) aim companies and focus on improving productivity, quality etc. Most of these programs prefer the cooperation between the partners especially if one of them is university.

4.1.5. ROMANIA

Education programs based on identifiable needs in a region are crucial for the future development of an area. In some regions, more that in others, it is vital that the education system provides the proper specialized programs in order for a certain industry to continue to grow. Such programs should target desired skills, in accordance with the resources that a certain area provides.

In Romania there are several cases where it has been important that the education system, especially the higher one, adjusted to the needs of the main industry in the region as it can be observed in the table from the next section.

4.1.6. SERBIA

Smart specialisation is an economic transformation agenda based on research and innovation (R&I). An ongoing pilot project together with the Joint Research Centre of the European Commission supports the design of innovation strategies for smart specialisation (RIS3) in Serbia. Together with international experts, an analytical mapping and stakeholder dialogue will help to determine the most import domains and clusters in country. Helping stakeholders to organise within these clusters and connecting them to macro-regional and European value chains can make an important contribution to economic growth. Building local competences and capacities for developing clusters through continuous stakeholder involvement and peer learning between Serbia and countries in the Danube Region is expected to be a central result of the project. The EUSDR Priority Area 7(Knowledge Society) agreed to promote the development of RIS3 in all Danube countries by 2020.

Public authorities in Serbia consider smart specialisation as a useful framework to address their development needs. In Serbia, the government created a dedicated inter-ministerial working group with the goal to develop a RIS3 strategy in the next two years. This plan is a formal part of the already adopted Governmental Action Plan. Serbia is developing a national innovation strategy for prioritisation. Quantitative as well qualitative analysis, mapping and stakeholder dialogue will be organised at the subnational level (NUTS2). In Serbia, the process of RIS3 development is considered to be a major driver of the restructuring of the R&I system into national innovation system. In particular, the stakeholder dialogue / entrepreneurial discovery process will be established as a primary instrument for better linking the research and innovation system with the broader economy and society. Throughout this project, attention will be paid to designing appropriate and effective mechanisms for monitoring and evaluation of cluster developments in prioritised domains. Existing statistical and other necessary and available information will be analysed. The entrepreneurial discovery process will be introduced as driver for organising cluster development. Special attention will be paid to the studies of the inclusion of the producers from Serbia to the international value chains and possibilities of further development of international co-operation for local companies.

In addition, Autonomy Province of Vojvodina presented the current work on Research and Innovation Strategy for Smart Specialization in the Peer Review Workshop organized by the S3 Platform and the

Information Centre for Business Standardization and Certification in the year 2014. The presentation was followed by peer discussions, which have provided the basis for this report

*[http://s3platform.jrc.ec.europa.eu/documents/20182/92282/Feedback_report APV June-2014.pdf/58b4079a-dd6a-451a-986b-47ce31badeb9](http://s3platform.jrc.ec.europa.eu/documents/20182/92282/Feedback_report_APV_June-2014.pdf/58b4079a-dd6a-451a-986b-47ce31badeb9)

4.1.7. SLOVAKIA

The Slovak Republic intensively develops a strategy for smart industry with connection to Smart technology. The strategic objectives can include:

- Support the establishment and development of human resources capacity in education, training and retaining and attracting skilled workers in research and development and in practice.
- Define study programs in lifelong learning; design changes in education, especially at university technical direction, support the creation of new interdisciplinary programs.
- Increase technical and IT "literacy" in view of the structure of the school system and the structure of graduates.
- Create flexibility and security in the labor market, security for workers, who the market will need, opportunities for professional development and the creation of new skills.
- Requirements for employment and ways of dealing with the transformation of the classic profession into new requirements of the labor market.

These goals ensure increased awareness of the population, increase the educational level of the graduates, better and professionally-oriented graduates for the labor market needs and create the potential for economic development of regions.

S3 Priorities for Slovakia: <http://s3platform.jrc.ec.europa.eu/regions/SK/tags/SK>

Description	Capabilities	Target Markets	EU Priorities
Automotive & mechanical engineering industries	1. Manufacturing & industry 2. Motor vehicles & other transport equipments	1. Manufacturing & industry 2. Motor vehicles & other transport equipments	1. KETs 2. Advanced manufacturing systems
Production and processing of iron and steel.	1. Manufacturing & industry 2. Other manufacturing	1. Construction 2. Specialised construction activities	1. Sustainable innovation 2. Resource efficiency
ICT and Services.	1. Information & communication technologies (ICT) 2. Computer programming, consultancy & related activities	1. Information & communication technologies (ICT) 2. Computer programming, consultancy & related activities	1. Digital Agenda 2. E-Commerce & SMEs online
Consumer electronics and electrical equipment.	1. Manufacturing & industry 2. Computer, electronic & optical products	1. Manufacturing & industry 2. Electrical equipment	1. Digital Agenda 2. Intelligent inter-modal & sustainable urban areas (e.g. smart cities)

4.1.8. SLOVENIA

The common denominator of the Slovenian S4 Smart specialisation are **sustainable technologies and services** for a healthy life on the basis of which Slovenia will become a green, active, healthy and digital region with top-level conditions to foster creativity and innovation, focused on the development of medium- and high-level technological solutions in the niche areas. The priority areas within the S4 are **Healthy leaving and working environment** (smart cities and communities, smart buildings and homes, including wood chain), **Natural and traditional resources for the future** (networks for the transition to circular economy, sustainable food production, sustainable tourism) and **(S)Industry 4.0** (factories of the future, health – medicine, mobility, development of materials as end products).

In the period 2016-2018, S4 will serve as a basis for investing in development. Support will be given predominantly to RDI in value chains and networks, investments, research infrastructure, research potential of researchers and international mobility, employee knowledge and competences, creativity of young people, and optimization of the supporting environment for entrepreneurship and innovation.

The manner of implementation is by **establishing strategic partnerships**, which will facilitate a joint approach and long-term cooperation of stakeholders within various priority areas, such as the economy, research and education institutions, and other relevant partners in respective priority areas. As mentioned above, University of Maribor, as the largest and leading research-educational institution in the East cohesion region of Slovenia, undertook the leading role in promoting cooperation between stakeholders. It also acts as a partner and link to the state in terms of managing the development policy, devised in a manner that ensures each priority area a chance to voice their needs and opportunities.

4.2. Example of best practices: Specific educational programs on the ISCED levels 5,6,7 and 8; Knowledge related measures resulted with visible-measurable economic effects)

Creating educational programs in accordance with the needs of specific economy sectors and in cooperation with various stakeholders is present in all selected countries. However, the sustainability of these programs is different and mainly is depending on the strength of the economy.

4.2.1. BULGARIA

In order to achieve better cooperation with local governments and organisations in the region, the Academy of Economics in Svishtov is conducting SWOT analysis and designing a concrete plan for realising better cooperation and tracing better perspectives for scientific research and innovations in the Academy:

- Institutionalisation of innovative and project activity, which includes creating a council, committee, or other organ that will have the priority task of strategic management of innovations and project activity;
- Creating an electronic innovation store and/or science shop, to serve as a mediating link between organisations that offer and seek innovations and scientific findings in the field of economy, administration, and governance;
- Initiating the creation of a regional innovation alliance (science cluster or innovation hub) as a uniting structure between the Academy, the de-concentrated and decentralised state structures, scientific institutes, business incubators, agencies for regional development, non-

governmental organisations, representatives of leading firms and innovative enterprises on the territory of the North-central region;

- Stimulating the creation of joint enterprises or consortiums with private spin-off firms for work on various scientific and applied science projects;
- Adopting regulations that provide the possibility for part of the lectures at the Academy (for instance, 20 %) to be assigned to proven specialists from the sphere of practice who lack academic degrees and positions; for this purpose, agreements should be reached with the municipal leaderships on implementing joint projects and supplying the support of experts to the municipalities for the designing of sector policies;
- Active lobbying for the inclusion of the Academy of Economics in some of the scientific infrastructures figuring in the National Roadmap for Science Infrastructure;
- Creating scientific schools for various topical areas of economic and management science and practice;
- Efforts for valorisation of scientific studies;
- A+B Programme (Academy plus Business), jointly with representatives of business;
- Creating close partner relations with the Regional Council for Development of the North-central Planning Region, and with the district development councils in the region.

Examples of strategic partnerships

- Promoting flexible educational paths
- Integrated local/regional development
- Creativity and innovation
- Quality of education
- Enhancing achievements in education
- Innovation
- Language skills
- Information and communication technologies
- Cooperation between regions
- Equality and inclusion
- Open educational resources (OER)
- Active participation of young people in society
- Horizontal skills/basic skills
- Recognition and validation of learning results
- Professional development and professionalisation of working with youths

Conclusion: It should be noted that, despite the declaring of priorities in the strategic documents adopted by the Bulgarian state, in fact all examples of good practices (in general, and including those given in this report) have been fulfilled **only** in the framework of projects with financing provided by EU structures and/or other funds and programmes. The state is not supplying financing, administrative capacity or a legal basis, for the practices related to the declared goals and priorities. That is why the examples given in the report refer only to fulfilled projects. There is no visible or traceable sustainability of, and/or building on, these initiatives after the completion of the respective project. In the field of higher education in Bulgaria, establishing the connection between education and employment, between theory and practical training, is a goal financed by European programmes and implemented under projects. Of all the enumerated projects, only that of student internships has been financed a second time.

It is not clear what the idea and logic of state funding in the field of higher education is, specifically as regards providing a stronger and more effective tie between education and employment. The strategic documents are very good at identifying the problems and tracing the priorities. **It remains unclear how the priority goals will be achieved, and by what mechanisms they will be realised in practice.** We are left with the impression that the state wants to satisfy EU requirements in view of EU pressure for decreasing youth unemployment, rather than to solve the very real structural problem of the existence

of long-term unemployed youths up to the age of 29, and 160,000 demotivated youths who neither study nor work.

4.2.2. BOSNIA AND HERZEGOVINA

USAID mission in Bosnia and Herzegovina recognized need for western style business education in Bosnia and Herzegovina and to create new business leaders needed for the market oriented economy and with necessary knowledge and skills to succeed in a competitive and globally integrated market economy. In 2004 USAID mission in Bosnia and Herzegovina launched Graduate Business Education Project (GBEP). It is important to emphasize that the funds for the project came from the economic department of USAID mission, rather than its educational department, with a view that the project will directly help businesses and economic development of Bosnia and Herzegovina¹³. USAID dedicated \$10 millions for the project. Duration of the project was four years. Partners in the project were University of Delaware and University of Sarajevo – Faculty of Economics while FLAG International served in implementation, administration and management roles. Resulting entity of this partnership was Sarajevo Graduate School of Business (SGSB). Sarajevo Graduate School of Business offered two-year program with dual MBA degrees from both the University of Delaware and the University of Sarajevo. University of Delaware provided its AACSB accredited MBA degree¹⁴. In January 2005 SGSB launched an Executive Education Program that lasted from one day to nine months. After four years, as planned, project was formally closed. After closer of the project SGSB partnered until July 2012 with Henderson State University and Texas A&M University-Commerce and two private universities from Bosnia and Herzegovina: International University of Sarajevo and Burch International University. SGSB achievements were: graduation of 7 MBA cohorts with total 143 graduates and 1.400 students completed Executive Education Program. All graduates are employed and have successful careers and thus contributing development of businesses and economic development of Bosnia and Herzegovina¹⁵.

4.2.3. GERMANY

ISCED levels 5,6,7 and 8 levels in Germany

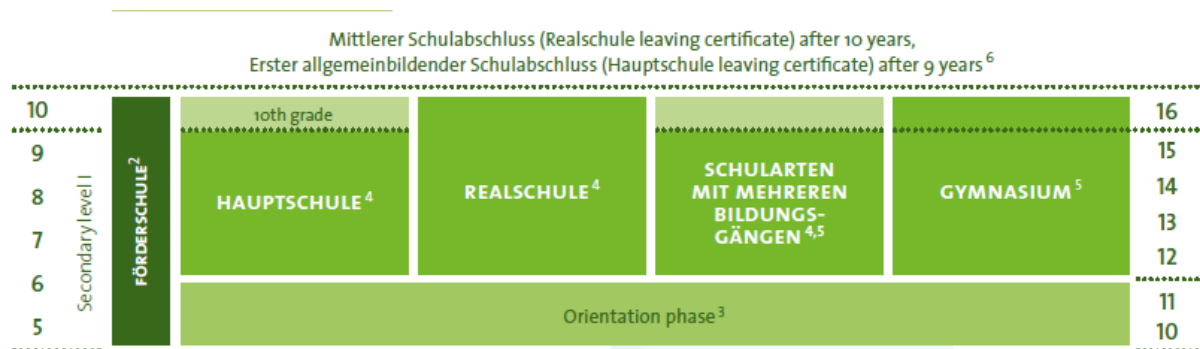
Due to the federal system in Germany, **responsibility for education**, including higher education, **lies entirely with the 16 individual federal states**.

After compulsory education, upper secondary education ensues. Here the choice of educational career or type of school is based on parents' wishes, pupils' interests, their school performance and the entitlements obtained at the end of lower secondary education. Pupils may continue either in full-time general education or in full-time vocational schools; or they enter the dual system (apprenticeship training in companies and vocational schools) for vocational education and training (VET).

¹³ Small Business Association for International Companies – <http://www.sbaic.org/sarajevo-graduate-school-business-sgsb/>

¹⁴ University of Delaware - <http://www1.udel.edu/PR/Messenger/04/01/UDsarajevo.html> and <http://www1.udel.edu/PR/Messenger/04/03/BEUD.html>

¹⁵ Lejla Polimac Čizmo, Sarajevo Graduate School of Business, presentation, Vienna, April 24-25, 2013. http://siteresources.worldbank.org/.../sarajevo_graduate_school_of_business.pdf



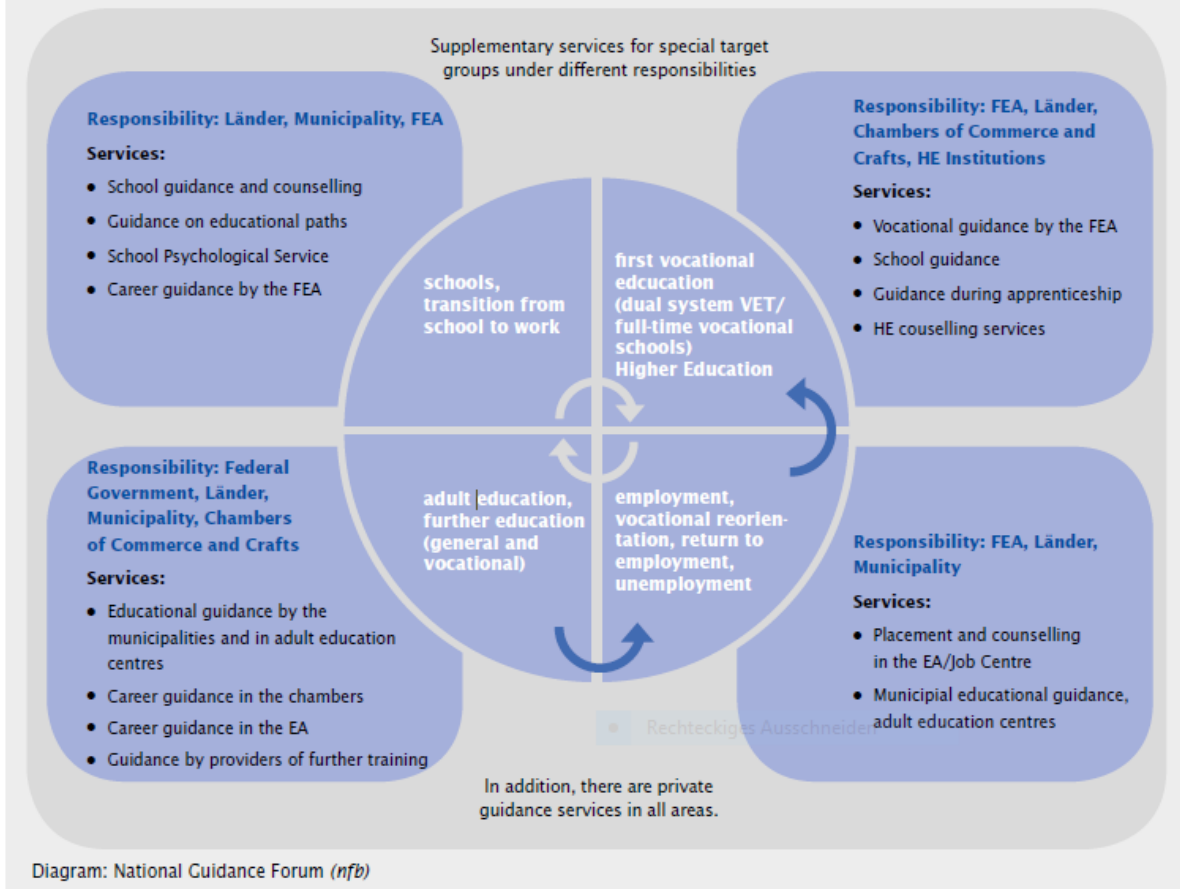
Hauptschule and **Realschule** only exist in any appreciable numbers in six Länder (Baden-Württemberg, Bayern, Hessen, Niedersachsen, Nordrhein-Westfalen, Schleswig-Holstein). In Bayern, the type of school comparable to a Hauptschule is called a Mittelschule. The Hauptschule and Realschule courses of education are also offered at schools with two courses of education, for which the names differ from one Land to another. The following types of school bring the courses of education of Hauptschule and Realschule under one educational and organisational umbrella: Mittelschule (Sachsen), Regelschule (Thüringen), Sekundarschule (Bremen, Sachsen-Anhalt), Erweiterte Realschule (Saarland), Verbundene Haupt- und Realschule (Hessen), Regionale Schule (Mecklenburg-Vorpommern), Realschule plus (Rheinland-Pfalz), Regionalschule (Schleswig-Holstein), Oberschule (Brandenburg), Mittelstufenschule (Hessen).

The **Gymnasium** course of education is also offered at schools with three courses of education. The three courses of education of Hauptschule, Realschule and Gymnasium are also offered at the following types of school: Integrierte Gesamtschule, Kooperative Gesamtschule, Integrierte Sekundarschule (Berlin), Oberschule (Bremen, Niedersachsen), Stadtteilschule (Hamburg), to some extent Regionale Schule (Mecklenburg-Vorpommern), Gemeinschaftsschule (Baden-Württemberg, Saarland, Sachsen-Anhalt, Schleswig-Holstein, Thüringen), Sekundarschule (Nordrhein-Westfalen).

Career education and vocational orientation

Career education or vocational orientation (Berufswahlunterricht, Berufsorientierung) is an integral part of the school curriculum in all Länder and a common guidance activity of most secondary schools. It aims at preparing pupils for the world of work by improving their career management skills and their abilities to seek and use information and make decisions. In some Länder, preparation for working life is a subject in its own right, which may be named differently e.g. Arbeitslehre (lessons in working life), Arbeit-Wirtschaft-Technik (Work-Economy- Technology). But career education is also more and more part of other subjects, such as economics, social sciences and law. It is frequently complemented by extra-curricular activities, often in co-operation with companies. The career education curriculum also involves internships and visits to enterprises as well as to the local Career Information Centre (Berufsinformationszentrum BIZ), which exists in every local EA. Two or three weeks of work experience in businesses, administration or private companies give pupils a vivid impression of the requirements in the world of work. The use of a career choice passport (portfolio approach) enables students to report their careerrelated experiences. In addition, links with the world of work and industry as well as school-business partnerships are organised by a well-established national network (Arbeitskreise Schule- Wirtschaft) operating across the country. This supports not only work experience programmes for teachers and students but also further training for teachers. It assists pupils in learning how to run a company (Schülerfirmen) and encourages twinning arrangements between schools and particular companies in order to give students practical experiences.

Guidance in Education, Career and Employment in Germany – Structures and Services



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More information:

German Education Server (Deutscher Bildungsserver) <http://www.bildungsserver.de>

Education Server Baden-Württemberg: <http://www.schule-bw.de/aktuelles/>

4.2.4. HUNGARY

There will be a conference this year at Pallasz Athéné University, Kecskemét. One of the topic of the conference will be the quality and efficiency of dual type education.

4.2.5. ROMANIA

Area and industry needs	Higher education Program/ Institution
Petroșani region, recognized as a mining area, here being based the Hunedoara Energy Complex, which comprises several mining sites.	University of Petroșani is specialized in offering a vast curricula in regards with the mining industry.
Prahova county is a strong industrial center, focused especially on the oil production and refining industry.	<p>Petroleum & Gas University of Ploiești (UPG) is a public university in Ploiesti was founded in 1948 under the name of Institute of Petroleum and Gas, in response to the increasing industrialization in Romania and the lack of high level education in the petroleum and gas fields.</p> <p>At the moment, the UPG's academical structure includes 5 faculties: Faculty of Petroleum and Gas Engineering, Faculty of Mechanical and Electrical Engineering, Faculty of Petroleum Technology and Petrochemistry, Faculty of Economic Sciences and Faculty of Letters and Sciences.</p>
Mediaș, Sibiu county- Mediaș is known best for its role in production of methane gas. The area where Mediaș is located is the site of the largest natural gas field in Romania. The headquarters of Romgaz - the national gas exploitation enterprise - and of Transgaz - the natural gas carrier - are in Mediaș.	LBUS provides studies in Mines, Oil and Gases and especially the transport, storage and distribution of hydrocarbons (TDDH).

4.2.6. SERBIA

NORBAS project: Norwegian, Bosnian and Serbian cooperation platform for university and industry in ICT R&D

Building a platform for cooperation and development of higher education institutions in Bosnia and Serbia (BAS) with Norway (NOR) in joint research, education and collaboration with enterprises in ICT sector (in Information Technologies, Telecommunications and Signal Processing), in order to strengthen their role in contributing to economic growth and social development in both countries.

<http://norbas.elfak.ni.ac.rs>

ADRIAHUB project:

This trans-national association aims to promote and facilitate the contact among Educational and Business galaxies, creating “new channels and methods of communication”. Considering that public institutions, private consortia inside the partnership will act in the name and for the interests of their public and business associates, it is evaluated that Adria-HUB impacts directly over more than 120 protagonists of social and economic life in the Adriatic region. Moreover, large business associations (like Chambers of Commerce and Public/Private Associations) are going to widely spread methods and outcomes generated in the partnership.

4.2.7. SLOVAKIA

In Slovakia there are no such specific educational programs. There is just cooperation with practice of universities in the area of Master (Mgr.) and PhD. study and visible are just PhD. study programmes in cooperation of university and Slovak Academy of Science.

4.2.8. SLOVENIA

As an example of best practice, especially interesting for the goal of the EDU-LAB project, we point out the **expansion of the University of Maribor to other towns in Slovenia**. This **enables young people to study close to their home**, which is especially important from the financial point, especially in the underdeveloped regions. The recently established faculties and corresponding study programmes are in Brežice (sustainable tourism), Krško (energy technology), Rakičan (agri-business and rural development). In Maribor there are several study programmes that are directly addressed by the S4, e.g. environmental engineering, organic farming, ecology with nature conservation, sustainable building. Primarily, however, the priority areas within S4 are implemented through the changes of the existing study programmes by changing both the obligatory and elective courses.