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Assessment of cooperation between higher education institutions and employers in Europe

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Executive Summary

The interviews conducted with 59 respondents throughout Europe reveal the common belief that universities and business speak different languages. The gap between the worlds of education and business is explained with the conservativeness of higher education institutions, and the dynamic business environment. Effective cooperation between them is essential and has to be valued for contributing to knowledge and the economy.

Most organisations involved in the interviews consider university-business cooperation (UBC) as a priority. It is mainly implemented on a bilateral level and focused on joint projects and practical initiatives of common interest. Two main areas of UBC can be determined: the improvement of graduates' practical skills, and knowledge transfer/R&D.

Shared successful cases of UBC
The most successful cases of UBC relate to an improvement of the quality and relevance of practical training (internships, graduate placement and scholarship programmes), curriculum development, review and update, and practical training courses in employability and career management skills in which university career centres play a significant role. Other important areas include research and technological development (RTD) with the exchange of know-how and innovation, management- and governance-related collaborations such as the participation of companies on university boards and the establishment of common bodies and new training/ entrepreneurship centres.

The modes of UBC that have developed the most in the last few years in all countries are: internship programmes and graduate placement; permanent routes of dialogue and knowledge transfer from universities to companies and vice versa. Other significant modes of cooperation seeing marked progress are: continuing education and training, joint programmes and curriculum development, research and technological development and joint projects.

The key challenges and areas of UBC to be focused on in the next years
For UBC to be successful, some challenges remain to be tackled in the next few years. First of all, it is important to find those points where common goals, mutual needs and benefits intersect and to then initiate joint initiatives and projects. Communication needs to be improved and some mentality barriers are to be overcome, like a lack of understanding, will, flexibility and the sustainability of cooperation. UBC has to be facilitated through the provision of an appropriate legislative framework and incentives coupled with adequate and efficient funding.

Four Co-factors make up the model of a fruitful and long-lasting partnership:

- **Co**mmon goals – cooperation should be based on mutual benefits, needs and aims;
- **Co**mmitment – a good partnership lies in the hands of the 'right people', starting from the leadership and involving all levels;
- **Co**mmunication – establishing ongoing and open dialogue, having mutual trust and good knowledge of each other – represents a major milestone in UBC. A special role in linking university and companies is played by career centres and specialised departments such as industry liaison offices, technology transfer offices, and scientific/applied research units; and
- **Co**ntext – UBC should be reviewed as a priority and supported with suitable legislation and strategic incentives on the European, national and institutional levels.

The most significant impacts on both higher education institutions and enterprises in the target countries are: a better skills match of graduates with labour market needs, encouraged R&D and the facilitated transfer of know-how and innovation.

The key changes needed to enhance UBC

To enhance UBC, changes should be introduced on several levels. Education needs to be modernised to narrow the gap between theory and practice, and respond to the needs of the labour market. Communication needs to be facilitated and R&D should be stimulated through joint activities, projects and centres. Finally, it is important to provide strategic support and incentives for UBC.

The report presents a brief country review on these topics, presenting both the university and business points of view.

1. Introduction

The main purpose of this report is to summarise some of the most effective practices and challenges for university-business cooperation (UBC) in Europe. The summary report is based on in-depth interviews with representatives of universities, businesses and public institutions in Bulgaria, Hungary, Poland, Slovenia and Spain, as well as in other European countries.

Key activities included:

- a literature review;
- development of the research methodology and questionnaires for interviews;
- piloting and interview summaries (10 interviews per country);
- national summary reports; and
- a summary report produced by the lead partner – BFE.

As an outcome of the interviews, this report will support the development of a meta-framework for cooperation among employers and HE institutions that will be used in the large-scale survey among employers' organisations.

Interview targets in each country included ten in-depth interviews, involving three representatives of HE institutions (for example, rectors, deans, university professors), three employers (for example, enterprise owners, CEOs, human resources manager, line managers), two to three representatives of associations and employer organisations, one key policy expert, and a representative of a governmental unit.

The interviews took place in the period from April to July 2013 and involved 59 respondents – 22 representatives of universities, 29 representatives of companies and associations, and 8 representatives of public institutions. The respondents were selected on the basis of several criteria. First, the decisive factor was the respondent's attitude and competence in the topic. There was also a tendency to ensure a certain level of variety: although the detailed interviews did not intend to ensure the representativeness of the data, the EMCOSU partnership tried to involve various actors – big and small, private and public organisations, institutions involved in policies, figures who are well known for their active UBC, and others who are not as symbolic.

The interviews addressing the three specific target groups were conducted in person, by phone or email or in a hybrid mode, using semi-structured questionnaires. With the aim of allowing an easy comparison of the findings across the three groups, the questionnaires included the same or similar questions. A sample of the questionnaires is attached in Appendix 1.

This report addresses ten main points concerning university-business cooperation:

- cases of UBC with the strongest impact for universities and companies, which describe the ways both sides work together to enhance the connection between both worlds (e.g. internships and placements, training programmes, joint projects and management related collaborations);
- significant outcomes that emerged from the described cases, such as new projects and improvements (in knowledge transfer, internship programmes, R&D etc.);
- the impacts of UBC on organisations, which are most significant in the matching of both worlds (skills match) and in the processes directly related to knowledge (e.g. R&D, knowledge transfer);
- specific policies regarding UBC in universities and enterprises, mostly in the fields of an improvement of graduates' practical skills and knowledge transfer and promotion of R&D;
- a review of the UBC models that have been developed over the last 10 years, where the most established models include internship programmes and graduate placements, permanent routes of dialogue and models of knowledge transfer;

- the key areas of UBC to focus on in the next years, which chiefly derive from the need to improve the quality and relevance of practical training;
- the biggest challenges/impediments for UBC, which describe the difficulties UBC is currently facing;
- the essential factors/drivers of fruitful and long-lasting UBC, which represent a common model of four "Co-factors": Common goals, Commitment, Communication and Context;
- the key changes universities and enterprises have to implement in order to enhance UBC, which are foremost directed at the general modernisation of education that would strive to increase the responsiveness to the needs of the world of work; and
- common rules and lessons learned, which reflect the conclusions and recommendations deriving from our analysis.

Following this introduction, in the second chapter we present the theoretical background of university-business cooperation from the perspective of graduates' early careers and career success. The third chapter introduces the priorities of such cooperation in the selected countries. In the fourth chapter, we present an overview of best practices from this area and further divide it into subchapters that present the UBC models which have developed in the last decade, the most important cases of cooperation modes and their interrelations, their most significant outcomes and their impact. Chapter five is devoted to developing a typology of the most relevant cooperation modes by addressing the key areas to be focused on, the biggest challenges, the central factors and drivers for fruitful and long-lasting cooperation and the main changes that have to be implemented in order to enhance it. In the final, sixth chapter, we summarise the most important common rules and lessons learned from university-business cooperation.

Each section confronts the enterprise-university perspectives so that a comparison can easily be made for each country. In addition, the opinions of strategic policy-makers and representatives of public bodies are presented.

2. Considering university-business cooperation from the perspective of graduates' early careers – theoretical framework (Samo Pavlin)

Current major European policy concerns related to establishing the European Higher Education Area are closely related to supporting graduates' career success, international mobility, cooperation among higher education institutions and among universities and business. The paper focuses on the last mentioned dimension. It looks at how three general questions in the area of university-business cooperation – *i) which are the most relevant modes of cooperation between universities and business; ii) what are the determinants of cooperation modes and their future developmental needs; and iii) which are the key developmental drivers and barriers to cooperation on the side of universities and business?* – are linked to the issue of graduates' transition from education to the labour market. In the context of the general interdisciplinary conceptualisation of knowledge creation processes and the shift from a linear to an interactive knowledge cycle (Nonaka and Takeuchi, 1995; Boisot, 2002; Lundvall, 2001), these questions relate to the functions of professional groups (e.g. Abbott, 1988), the overall goal of interaction between the academic sphere, business and society (e.g. Etzkowitz & Leydesdorff, 2000) and the transition of graduates from education to the labour market (e.g. Allen, Pavlin and Van der Velden, 2011).

The shift from industrial to post-industrial information societies (e.g. Bell, 1973; Habermas, 1979) has been accompanied by growing interest in cooperation between the university and industry (Freeman, 1982). With the area of the 'knowledge-based society' characterised by increasing globalisation processes, the value of services and intangibles, networking organisations and digital technologies, university-business cooperation has been described using distinct concepts such as "national innovation systems" (Nelson, 1993), a "new mode of knowledge production" (Gibbons et al., 1994), "entrepreneurial university" (Clark, 1998) and "the triple helix model" (Etzkowitz & Leydesdorff, 2000; Etzkowitz, 2008).

These concepts have gradually been reflecting the call for the 'third mission' of universities – from teaching and research towards community engagement – via technology transfer, trans-disciplinarity, regional development and living laboratories (e.g. Trencher et al., 2013: 4). The so-called Wilson's review (Wilson, 2012), in the case of the UK, explains well which actions drive university-business and foster students' careers. Examples include *setting enterprises by graduates, the enhancement of study relevant work experience through apprenticeship and qualifications, the recognition of informal learning and recognition, lifelong learning activities, implementation of an innovation voucher scheme, support for graduates' career services and alumni etc*. Moreover, this review indicates that cooperation between universities and industry is supposed to cause paradigmatic shifts (Wilson, 2012: 23-24) like, for example: *"from future-oriented research in advanced technologies, to in-house up skilling of employees", "from university science park developments, to support for entrepreneurial research students finding their way in the business world", "from improving business skills amongst undergraduates, to enabling small companies to recognise the value of employing a first graduate", "from supporting spin-out companies from research teams, to helping government agencies attract major employers to invest…"*.

Related to this, the Organisation for Economic Cooperation and Development and the European Commission (OECD & EC, 2012) have also recently promoted guidelines for how universities can become more "entrepreneurial". The areas they identify relate to leadership and governance, organisational capacities with a strong stress on acquiring new financial sources and cooperation with business, the promotion of entrepreneurial principles and innovation through the curriculum, promoting start-ups, internationalisation and the development of measurement principles. These "recommendations" are accompanied by the latest economic necessity to *"do more with less"* (OECD, 2010). In this context, several authors question this convergence from the traditional towards an entrepreneurial university and do not regard it as a positive development (e.g. Hackett, 2005),

particularly due to the proletarisation, deprofessionalisation and hybridisation of academic roles (Henkel, 2009; Kogan, 2009) as well as the decline of the traditional social function of higher education to give equal opportunities and citizenship (Zgaga, 2009). Moreover, intensified collaboration between industry and the academic sphere is leading to the segmentation and trivialisation of disciplinary areas (Becher, 1989), modified or even polarised relations between research and teaching (Elton, 1986) and the precarisation of academic institutions (Musselin, 2009).

Few studies have tried to explain the principles of university-business cooperation in relation to disciplinary differences. Existing literature (e.g. Kolb, 1981; Neumann, 2009) differentiates between hard-pure (e.g. natural sciences and mathematics), soft-pure (the humanities and the social sciences), hard-applied (e.g. medicine) or soft-applied (e.g. social work) categories and explain what this implies for the vocational focus and professionalisation scope of graduates' careers. Moreover, Pavlin and Svetlik (2008) described the principles of how these different disciplines interact with the world of work, particularly when it comes to the creation of study programmes, (re)accreditation of study programmes and implementation of practicums. The typology that was selected for the empirical work in the DEHEMS project (2013-) is based on six different professional domains.

Table 1: Types of higher education study domains

	Vocational Orientation		**Academic Orientation**
	Unregulated Domain	**Regulated Domain**	
Social Sciences and Humanities	*Business and Economics*	*Education and Teaching Studies*	*Sociology and Political Studies*
Science and Engineering	*Engineering (incl. Civil Engineer)*	*Medicine and Pharmacology*	*Life Science (incl. Mathematics, Computing)*

Source: Schomburg, Janson and Pavlin (2010)

The variety of disciplinary areas importantly determines what applied potential for the world of work a particular higher education institution offers due to the capabilities of its academics and students which are determined by (Teichler, 2011: 403):

- *a professionally geared composition of knowledge within a study programme (e.g. mechanical engineering) versus an academically determined composition of knowledge of a study programme (e.g. philosophy);*
- *an academic versus applied emphasis of teaching and learning, i.e. an emphasis on understanding the logic of the knowledge system versus and emphasis on the transfer of knowledge to practical problem-solving;*
- *academic orientation versus orientation towards practice, i.e. pursuit of knowledge for its own sake versus learning to understand the tensions between theory and practice during the course of study;*
- *preparing students to be able to become scholars versus preparing students to under-stand and utilize the results of academic work in their subsequent professional work outside academia;*
- *prime emphasis on the understanding and the ability to handle conventional wisdom versus prime emphasis on skeptical and critical views as well as on coping with indeterminate work tasks and innovation;*
- *emphasis on conveying foundation of knowledge relevant for professional practice versus preparing students directly to master all the relevant knowledge;*
- *emphasis on general knowledge and competences versus emphasis on specific academic or professional knowledge and competences, and*
- *disciplinary versus interdisciplinary approaches.*

These particularities significantly determine the prevailing orientation of academics towards industry cooperation. Lam (2010), for example, developed a typology that describes the *traditional academic* who believes the academic sector and industry should be separate, the *traditional hybrid* and the *entrepreneurial hybrid* who believe some form of cooperation should exist and the *entrepreneurial type* who believes in the fundamental importance of science and business collaboration. Lam further explored to what extent different factors – *increasing funding and other research resources, application & exploitation of research results, creation of opportunities for knowledge exchange/transfer, building personal and professional networks, enhancing the visibility of research and an increase in personal income* – motivate particular academic types for cooperation with business. These elements also hold important implications for the development of curricula, interdisciplinary development, the integration of learning with research, the organisation of problem-based learning and student practices (Palmer et al., 2010).

On this basis various actors have developed frameworks on university-business cooperation.

Some Concepts, Frameworks and Results

Although several projects have started to develop indicators that measure cooperation such as number of patents, spin-offs and contract value of contracts with external stakeholders (e.g. SIAMPI from 7FP[1]), "…there is still no comparative information as to which universities are among the world's major providers of science-based information and services to the business sector in general, and research-active industry in particular" (Tijssen et al., 2009). It is thus no surprise that there is a wide diversity of university-business cooperation modes that in recent times have been extracted from the best case studies. A report of the Technopolis organisation (2011), for example, presents a review of 15 countries that identified best practices of university-business cooperation, including practice-oriented teaching methods, problem-based learning in interaction with industry, decentralised management in cooperation with SMEs, autonomous management of business cooperation at the university level, compulsory placements with industry, common laboratories etc. Davey et al. (2011a) also conducted a similar survey on 30 European case studies related to entrepreneurial training, international MBA programmes, state-of-the-art R&D with industry, adult education, start-ups, accelerating apprenticeships, empowering science-society linkages or generating living laboratories.

The search for drivers and barriers is another area that has recently been attracting significant attention. While the set of drivers (e.g. better employability of graduates, curriculum improvements, spin-offs and financial measurements) can be classified according to a particular beneficiary (e.g. higher education institutions, academics, students, the community etc.), the set of barriers has *traditionally* been classified as restrictions imposed by a company, problems related to the appropriation of results, communication problems, duration of the research and cultural differences (Mora-Valentin & Ortiz-de-Urbina-Criado, 2009: 396). Based on the results of an Imperial College survey, Wilson (2012: 28) conceptualised major barriers to business university cooperation in the UK and to different degrees the results can be generalised across European countries. In the report, he stressed: "i) the needs of the business do not align with the mission and strategy of the university, ii) time scale and capacity mismatch (a university has already committed its resources and does not have the available capacity to meet the timescale that the business needs, iii) capability mismatch (a university does not have the skill set or the facilities to meet the needs of the business), iv) the cycle of bureaucracy (where external funding is required, the bidding cycle does not meet the timescale the business needs), v) financial constraints (a university is unable to provide the service required for the price the company is willing to pay), vi) sustainability: the investment required by the university to provide the service does not have an acceptable payback period, vii) mismatch in expectations and objectives (expectations of outcomes from collaboration are not mutually recognised), viii) agreement on the future of the intellectual property that may be generated".

[1] Short for "Social Impact Assessment Methods for research and funding instruments through the study of Productive Interactions between science and society", see: http://www.siampi.eu/ .

Some other reports have in recent years presented a general picture of university-business cooperation in Europe. For example, with a large-scale survey among over 4,000 enterprises Davey et al. (2011b) explored how eight EC pillars of business-university collaboration (research and development, mobility of academics, mobility of students, commercialisation of R&D results, curriculum development and delivery, lifelong learning, entrepreneurship and governance) are practised by academics and what determines these cooperation aspects. The authors found there is a high statistical correlation among these types and measurable modes are perceived to be more important than more tacit ones. The study also found the strong effect of influencing factors that were classified as action processes (mechanisms that support university-business cooperation, strategies, structures and approaches, activities and framework conditions), motives, drivers and barriers. Interestingly, the results show that academics believe their institutes, students and employers benefit from cooperation much more than they do. They see the funding system and bureaucracy within higher education institutions as the main barriers to cooperation. This is the reason, according to the report, that almost every second academic is not involved in any way in cooperation with industry.

The HEGESCO project case survey and its further implications

In the course of implementing a qualitative study as part of the HEGESCO project (2013-) (Pavlin et al., 2009), a group of researchers from Lithuania, Poland, Hungary, Slovenia and Turkey has explored the most important modes of university-business cooperation and the differences in how they are perceived. In each country 30 structured interviews were conducted, 15 among higher education institutions (management) and 15 among large employers (in most cases human resource managers). Based on the consortium's agreement a general question framework was provided. When the interviews (150 in total) were complete, a group of experts extracted content aspects from the interviews, generated a standardisation framework and conducted codification in line with the standardisation guidelines. Accordingly, a simple data analysis was provided that allows a broad comparison of similarities and differences in views on university-business cooperation among higher education institutions and businesses (see Table 2).

Table 2: Framework of the forms of collaboration perceived to be most important as reported by higher education institutions and employers

Programme creation and changes	Programme creation (general aspects); common lectures; research projects and informal contacts
Practical training	
Research and development	
Final thesis	
Seminars and conferences	
Creation of common organisations	University bodies, associations, spin-offs
Recruitment	Direct Recruitment; career days; cooperation with career centres
Financial support	

Source: Adjusted to HEGESCO project (Pavlin, 2009; Kovačič, 2009)

Irrespective of the country differences, by far the most important identified mode of cooperation was practical training as highlighted by approximately four out five employers and two out of three higher education institutions. Most interviewees stressed that practical training should be given greater importance as it "…often remains a formality, *lacking a mentor that would assist a student or employers resist from taking students for practices*" (Kovačič, 2009: 47). Other key modes among higher education institutions were programme creation, research projects, involvement in common bodies and other aspects such as the common organisation of competitions, access to technological advancements, international exchange etc. On the employers' side, the two most important modes were practical training and direct recruitment. Overall, the results tentatively indicate large differences in the way employers and higher education institutions perceive practical training, seminar and conferences, involvement in common bodies or recruitment.

The study surprisingly indicates that the cooperation modes between university and business in many ways resemble the perceived future development of higher education (Pavlin & Svetlik, 2009). Among employers and universities, the biggest future developments to be perceived are: *practical orientation (practical work, traineeships and internships), financial system and material issues, curriculum improvements, management system developments, research and autonomy.* As expected, cooperation with employers is listed as one of the most important developmental features. "The largest discrepancies among HE institutions and employers are in their perception of practical work and adaptation to employers' needs, which are significantly more important in the view of employers than HE institutions" (Pavlin & Svetlik, 2009: 66). While almost every second employer sees the practical orientation of study programmes as one of the most obvious developmental trends, this is listed by only one out of ten academics. Employers reported (Pavlin & Svetlik, 2009: 57): "*…The role of practical training in education is enormous and enables students to get familiar with the specific character of work under the constant supervision of a mentor"; "the currently prevailing model favours theoretical over practical knowledge, and it should be the other way round…"; "it is not about the liquidation of theoretical subjects, which are very important for personal development as well as indispensable for students who intend to continue an academic career but to focus on possible applications of theory in practice*" or "most of the lecturers are very far from the practices and only aware of the academic world". Similar views were shared by employers in the case of traineeship, study visits, adaptation to employers' needs and strengthening the vocational focus on the field of study. To a greater extent than employers, representatives of higher education institutions conversely expect changes in financial systems, different types of flexibilisation, management and teachers' training.

Academics have for decades already studied the effect of social background, personality traits and education on graduates' labour market performance (Schultz, 1961; Becker, 1962; Thurow, 1975; Collins, 1979; Abbott, 1988). Some of these approaches contend that higher education institutions are the main drivers of professional expertise, while others see education more as an institution allowing a persisting monopoly and selection over more privileged work. Debates in higher education on massification and a labour market orientation have particularly distinguished between: i) human capital and the manpower approach which place higher education in the position of labour market, employment and "matching" policies in order to stimulate economic growth; and ii) social demand approaches that favour freedom of choice, personal growth and equal opportunities (Teichler & Kehm, 1995: 116-117). Both approaches consider the issues of over-education and study massification (e.g. Freeman, 1976; Chevalier & Lindley, 2009), even though labour market prospects generally still increase with the level of one's educational achievements.

In the last decade, hand in hand with policy recommendations public opinion has expected higher education institutions to become more oriented to the labour market in terms of practical training and the development of better professional and managerial competencies (e.g. team work, working under pressure or asserting authority over others…). Academics' responses to these expectations have varied but the vast majority of higher education institutions in Europe have accepted a two-cycle model accompanied by 'new' (re)accreditation procedures, internal and external evaluations, the promotion of problem-based learning, a competence-based curriculum and institutionalised support for student practices and careers. These processes and bodies are supposed to improve the professional relevance of their graduates and increase the 'quality' and functional dimension of higher education institutions.

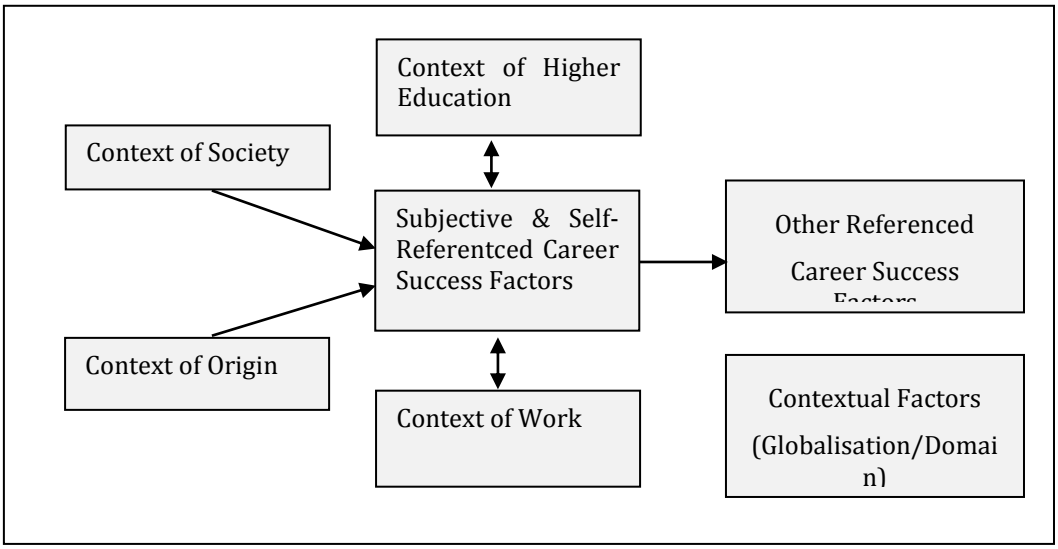
During the period of the Bologna processes, the policy imperative of the professional relevance of higher education has been accompanied by the term graduates' "employability". This concept has predominantly reflected key concerns for the development of human resources (Thijssen et al., 2008: 168-169): resolving problems with school leavers and underprivileged people with political ambitions to attain full employment and cut public losses (the 1970s), restructuring companies with corporations' ambitions to attain efficient human resource management (the 1980s) and the development of successful career opportunities (the 1990s onwards). Hence, the concept is usually related to paradoxes and causalities of: individual capabilities versus actual registered employment, deprivileged youth in

terms of finding a job at all versus the further prosperity of privileged youth (Teichler, 2008: 302), the skill-supply phenomenon versus the skill-demand phenomenon (Allen & Van der Velden, 2001) or individual factors versus personal circumstances (McQuaid & Lindsay, 2005: 209). Most current definitions of employability refer to an individual's ability to obtain a meaningful job, which is not only limited to the issue of a skills and education match in terms of compatibility between individual, educational and professional destinations. It is foremost also related to highly personalised components of work such as identity, values and satisfaction – attributes that on the social level are related to labour market segmentation, mobility, professionalisation, professionalism and civil life.

In reality, most higher education stakeholders chiefly associate the issue of higher education employability with the question of the development of skills and qualifications, and their utilisation in the world of work. With a fairly limited reflection they believe an improvement in graduates' employment is related to internationalisation, internships, problem-based learning and a learning outcomes approach (DEHEMS project, 2013-). Researchers have been questioning these policy recommendations and searching for particularities in relation to countries, disciplinary areas, programmes, institutions and other contextual factors (Pavlin and Judge, 2010; Pavlin, 2012). They seek to ascertain the relative effect of personal characteristics and social backgrounds as well as details of higher education systems such as, for example, how well the acquisition of relevant work experience is monitored, how developed are the incentives for fostering students' motives and talents, how demanding study is, how traditional teaching is combined with newer problem-based learning, what are the characteristics of assessment modes, to what extent have higher education institutions established systems for informing employers and graduates about what to expect from HE graduates and how well have higher education institutions established graduate tracer studies that support the indicated study characteristics (Allen, Pavlin and Van der Velden, 2011).

The concept that in the last few years has been increasingly related to stakeholders' perspective of 'employability' is *career success* – defined as a sequence of roles and positions in the individual's work and free time (Gunz and Peiperl, 2007), or professional success in terms of the transition from education to the labour market, the "appropriateness" of education and job, income, satisfaction etc. (Teichler, 2008: 300). However, in theory these elements are analysed and classified as: i) *subjective and objective;* and ii) *self-referenced and other referenced* dimensions of careers (Heslin, 2003; Judge & Kammeyer-Muller, 2007). These distinctions have inspired the creation of several conceptual frameworks such as those in the DEHEMS project (2013-).

Figure 1: Exemplary conceptual model of professional success from the DEHEMS project



Source: Adjusted from Demeter, Chudzikowski, & Pavlin (2010); Conceptual contribution to the DEHEMS project, draft document

The model presented in the figure distinguishes between subjective and self-referential career success factors and influencing contexts (Mayrhofer et al., 2007): the context of origin refers to a person's cultural, social, class and educational background as well as their work history, the context of higher education, chiefly referring to teaching and learning modes and organisational characteristics, the context of work encompassing issues such as job characteristics, work-related social relationships, labour markets, new forms of working and organising, and the context of society and culture that involves societal and biographical data. On this basis, the final operationalisation of the model of the DEHEMS project included several career success factors *(job satisfaction, a graduate's match between acquired and required competences, career developmental opportunities, job security, work autonomy and work-life balance)* and influencing factors *(previous education experience, type of study, programme characteristics, teaching modes, a graduate's behavioural characteristics during their study period, spatial mobility and work experience during and after graduation, characteristics of the job and employer and country of origin)*. Related data and the measurement instrument that supported this conceptual model were acquired earlier from higher education graduates five years after graduation in the CHEERS (2013-), REFLEX (2013-) and HEGESCO (2013-) projects.

The Flash Eurobarometer Survey (Gallup Organisation, 2010) looked at graduates' careers from the perspective of the world of work. It studied how employers perceive graduates' skills and abilities, study programmes and fields, graduate recruitment modes, educational institutions' reputations, the amount and type of training given to graduates, the recruitment of foreign graduates from abroad and major challenges companies face when hiring graduates.

Another aspect observed in this survey was cooperation with higher education institutions in terms of curriculum design and study programmes, training and recruitment of graduates. In the next section, we present some recent approaches and studies related to business-university cooperation modes and discuss in what ways they are connected with fostering graduates' transition from education to the labour market.

3. Priorities in policy regarding university – business cooperation

Formally or informally, the university-business cooperation is considered by most organizations involved in the interviews as a priority. It is mostly implemented on bilateral level and focused on joint projects and practical initiatives of common interest – i.e. review of the curricula (Bulgaria), specific subjects, such as research (in Poland) or joint initiatives and events (Slovenia).

Two main areas of university-business cooperation can be determined:

- Improvement of graduates' practical skills - through internship programs, graduate placement (Bulgaria, Hungary, Poland, Slovenia) and scholarships (Hungary); practical trainings (Bulgaria, Spain) and involvement of lecturers from the business; support of university programs, in which workforce shortage is visible (Slovenia); financial support (i.e. for equipment of laboratories, etc. – in Poland);
- Knowledge transfer and promotion of research and development, which are accentuated as a priority in Hungary, Spain, EU and Slovenia.

Active communication and dialogue is reviewed as a major milestone of university-business cooperation in Bulgaria, Hungary and EU. A special role in linking university and companies is taken by career centers (Bulgaria, EU, Slovenia) and some specialized departments, such as industry liaison offices, technology transfer offices and scientific/applied research units (EU).

In *Bulgaria* only a few organizations explicitly stressed that they have a written policy specifically addressing university-business cooperation, but it is reviewed by all of them as a non-formally priority for their university or company. It mostly involves: practical trainings, internship programs, graduate placement, active cooperation (for the business – with the career center) and dialogue, as well as joint projects and initiatives (such as review of the curricula). Obviously, the enterprises provide much more specific examples and dimensions of the partnership; however the areas states by the universities are the same.

For the enterprises involved in the survey in *Hungary***,** university-business cooperation is oriented primarily towards knowledge transfer, graduate placement, internships and scholarships. Two of the three universities have such specific policy, which is rather informal and focused on internships and graduate placement and permanent routes of dialogue and one does not.

All six companies and three universities surveyed in *Poland* have policy regarding university-business cooperation. They are mostly focused on bilateral cooperation, focused on specific subject of mutual interest such as research, projects, student internships and placement and financial support (for equipment of laboratories, etc.)

In *Slovenia***,** the universities and companies have special policies regarding university-business cooperation (one of the companies has an informal one). The career centers play a special role in linking university and companies. The transfer of knowledge is a common priority for both parties. Priorities of the interviewed companies comprise training and placement of graduates, joint initiatives and events, support of university programs, in which workforce shortage is visible.

All four of the involved universities in *Spain* have their specific policy on university-business cooperation (one of them informal), focused on promotion of research and development, knowledge transfer and practical training through involvement of lecturers from the industry. Among the interviewed enterprise members three of five have only informal policies, focused on development of students' practical skills.

On *EU* level, all eight universities and two companies included in the detailed interviews have specific policy regarding university-business cooperation. The focal points for cooperation with enterprises at the universities are career centers and industry liaison offices, as well as specialized departments - technology transfer office, scientific / applied research units. Both parties envisage regular communication and contacts as part of their university-business cooperation policy. For some universities, these policies are rather formal and not well implemented.

We can sum up the priorities of university-business cooperation policies as being largely focused on joint projects and practical initiatives of common interest, mostly in the areas of improvement of graduates' practical skills, knowledge transfer and promotion of research and development. Attention is also concentrated with organizational units such as career centers and different offices and departments, that are the main actors in the implementation of university-business cooperation policies.

4. Overview of best practices regarding University–Business Cooperation (UBC) identified

4.1 University–Business Cooperation Models which have Developed in the Last 10 Years

In the following section we present the variety of university-business cooperation models which have developed in the past decade. Across all the countries, the most developed models have been internship programs and graduate placements, permanent routes of dialogue and models of knowledge transfer.

The companies in *Bulgaria* point out as most developed the most specific modes of cooperation, providing immediate effect on business - internship programs on first place, followed by graduate placement and joint projects. An interesting example is the annual survey conducted by the Bulgarian People Management Association about how the business evaluates the newly hired employees and, based on this, the ranking of the best university.

For Bulgarian universities there are many modes of partnership which have intensified and progressed in the recent years – except for the three mentioned above, the dialogue with the business as a whole, the continuing education and training, the knowledge transfer from and to universities.
For both parts, the most important cases of cooperation are internship programs and graduate placement and joint projects. These "top 3" are followed by knowledge transfer and continuing education, joint curriculum development and joint programs (mentioned by both groups as important). The most common spin-off effect for universities from the cooperation are internship programs, participation of business in the university management and joint programs. Also, for the business - these are new joint projects and initiatives and transfer of knowledge.

In *Hungary***,** for universities Research and Development and continuing education and training have developed the most, followed by: permanent routes of dialogue between university and businesses, graduate placement, knowledge transfer from university to businesses and business/entrepreneurship centers.
For enterprises, the area that has developed the most, is knowledge transfer from businesses to university and vice versa; followed by permanent routes of dialogue between university and businesses, student internship programs and joint programs. From the university side, permanent routes of dialogue between university and businesses; student internship programs; sector skills deficit analysis/forecast, joint programs; knowledge transfer from businesses to university; research &development were developed in the last years, and one of the universities also mentioned its virtual job fair.

From the private sector size, enterprises put emphasis on permanent routes of dialogue between university and businesses, and knowledge transfer. They all implemented these modes in the last years. Also exchange of personnel between university and enterprises were developed in one of the private sectors. One other enterprise mentioned student internship programs; graduate placement; and business centres too.

In *Poland*, five out of six companies point out business/entrepreneurship centers as most developed mode of cooperation with the universities the most in the last years. Permanent routes of dialogue, curriculum development, joint programs, as well as continuing education and training have also been significantly facilitated.

For universities there are many areas of cooperation that have progressed in the last ten years – except for the above mentioned by the enterprise members, these are the student internship programs and

graduate placement, joint projects and knowledge transfer from university to business. The most important are the modes of cooperation related to research. It is still relatively small part of University business cooperation, but it is the cooperation which provides companies with ides for the development of innovative product and innovative solutions. This area of cooperation will be developing during next years, as new financial perspective would direct the financial flow of the EU Funds to companies for the joint research project, important for the business development

For enterprises in *Slovenia*, the modes of cooperation that evolved significantly are: joint projects (for all six interviewees) and knowledge transfer from business to university and vice versa (mentioned by five out of six interviewees). Next follow graduate placement and research and development.
Slovenian universities listed much more areas of cooperation that have progresses in the last years – except for the listed above, they also point out: permanent dialogue, internships, joint programs and curriculum development, continuing education and training, business/entrepreneurship centers (as well as support to start-ups) and recognition and validation of competences.
The most important modes of cooperation developed in Slovenia in the last years are governmental incentives in the form of centres of excellence and competence centres; both for universities and companies. Their relation is cooperation/joint development of basic and applied research, knowledge, technologies in the key propulsive sectors in Slovenia.

Universities and enterprises in *Spain* agree that the knowledge transfer from businesses to university is the area which has developed the most, for both sides, during the last ten years. The other areas in which university-business cooperation have developed the most for universities are: permanent routes of dialogue, internship programs and continuing education and training. The key areas of cooperation for companies in the last decade have been: curriculum development and joint programs.

One of the most important modes for university-business cooperation suggested by universities are the internship programs. In connection to that graduate placement was also recommended as important. Employment forum/fairs were also suggested and one interesting point noted for these kinds of forum/fairs was the provision of legal and juridical meeting (offering consultation opportunities for students with employers). In relation that it is important to note the suggestion of the creation of consulting committees in universities, whose members come from industry who can advice about skill shortage and skills needs in industry and providing assistance in curriculum development. In addition to the above shared modes, universities considered permanent routes of dialogue between university and businesses, joint research programs and joint masters programs with well-known companies as important for university-business cooperation.

While combining opinions from the business organizations, it was interesting to note that they considered internship as one of the most important modes for university-business cooperation, as opined by universities. More importantly they considered joint research and development programs and knowledge transfer from university to businesses as important. As normal modes, they selected provision for permanent routes of dialogue between university and businesses, graduate placement, start-ups and sector skills deficit analysis/forecast as important modes.

In addition to the above modes, what is more important for business organizations as new modes for university-business cooperation are, promotion and development of entrepreneurial attitudes among students and basic and theoretical investigation, specialized training and proximity to I+D+I. In order to promote these activities they suggest for local entrepreneurial centers. As business people consider university-business cooperation as important, they suggest more exchange of personnel between university and enterprises and consider participation in events organized by the universities as new ways of cooperation. Since flows of personnel are required for university-business cooperation, they also highlight the need for the recognition and validation of competences of professional from companies.

In *EU*, the enterprises included in the interviews, stated that the modes of university-business cooperation that have developed the most are the permanent routes of dialogue with the universities, as well as the knowledge transfer from the companies to the universities.
For the universities research and development is the leading mode of university-business cooperation which has developed in the last years, followed by student internship programs, graduate placement, and permanent routes of dialogue with the business and knowledge transfer from the university to businesses.

To summarize, there are several modes of university-business cooperation which are emphasized as most developed in the last years in all countries: Internship programs and graduate placement (mentioned by both universities and enterprise representatives), permanent routes of dialogue (pointed out mainly from the universities) and knowledge transfer from the universities to companies and vice versa (for both parts).

There are also other significant modes of cooperation which have marked a progress in the last decade, namely continuing education and training (in Bulgaria, Hungary, Poland, Slovenia and Spain), joint programs (in Hungary, Poland, Slovenia and Spain) and curriculum development (in Poland, Slovenia and Spain), research and technological development (in Hungary, Slovenia and EU), joint projects (in Bulgaria, Poland and Slovenia), business/entrepreneurship centers (in Poland and Slovenia) and recognition and validation of competences (in Slovenia).

4.2 The Most Important Cases of Cooperation Modes and Their Interrelations

In the following paragraphs we present the findings on the variety of ways that universities and companies cooperate in the target countries.

In *Bulgaria*, the most important cases of university-business cooperation for both universities and companies are related to graduate transition to the labour market (internship and placement programs, facilitated by the university career centers and national career days initiative), as well as curriculum development and update and joint programs.

The cooperation in *Hungary* takes place mostly in the form of internships, job placements and scholarship programs. Other important cases represent establishment of joint research centres and career centres, which offer practical trainings in employability skills and guidance services.

In *Poland* there is an overlap between the results for the two groups of interviewees, about the modes of university-business cooperation which have biggest impact on their institutions – these are initiatives related to joint development and review of programs, as well as to graduates' transition to the labour market, as well as internships and placement programs, establishment of common management bodies and centers, knowledge transfer from businesses to the universities and research and development projects.

In *Slovenia* the modes of cooperation with largest impact on both universities and companies are joint projects and researches, knowledge transfer, as well as initiatives related to improvement of graduates' skills and transition to labour market – through curriculum development (for the universities) and practical career support (for companies).

Spanish universities and companies involved in the detailed interviews share exactly the same significant cases of university-business cooperation – internships and graduate placement; curriculum issues and graduate transition to the labour market; knowledge transfer; as well as research and development. Enterprises also add important management and governance related collaborations, such as the establishment of common bodies and new training/ entrepreneurship centers.

On *EU* level the interviewed university representatives share many specific cases of fruitful cooperation, comprising a wide range of practices, such as internship programs, scholarships; dual education (linking theory and practice) integrated in the university curriculum – such as researches/working for the faculty or creating a business plan; post-graduate courses for employees and master classes for students, led by business people; research and development projects; as well as very successful cases of jointly established scientific centers as a result of university-business cooperation. The successful cases presented by the enterprises include also linking theoretical knowledge and practical skills as a joint university-business method of education, as well as mandatory traineeships and scholarships. According to the participating public institutions, universities and companies cooperate most effectively in the form of projects. Students can work on their thesis. Database of research laboratories and researchers with their competence profiles (for companies) are also a model of good cooperation.

The results from all countries show an overlap between the experience of universities and companies in successful cases of cooperation. These are - above all - internships, graduate placements and scholarship programs; cooperation in the direction of curriculum development/review and update; practical trainings in employability and career management skills, in which university career centers play a significant role; joint projects and initiatives (knowledge transfers, research and development); and also management and governance related collaborations, such as participation of companies in the university boards and the establishment of common bodies and new training/entrepreneurship centers.

4.3 Significant Outcomes (Spin-offs, New Initiatives) of the Important Cases of Cooperation between Universities and Business

The overall effect of university-business cooperation reported by the interviewees refers to strengthening and widening of the academy-industry cooperation as a whole and in improved reputation of the institutions. The emerging spin-offs vary from country to country and are described in the following section.

In *Bulgaria*, the most important outcomes from the described cases refer to: development and promotion of the internship programs in the companies and among students; better skills match and awareness of students and graduates about the demands of the business; as well as participation of business in the university management structures.
For the businesses the most significant outcomes from the university-business cooperation are the establishment of university career centers, the national career days held in different towns and on university level. More than thousand career counselors have been trained and a network of 36 university career centers has been established nationally. The case is described in details in our WP3 report.
Another major outcome is the wide promotion of the internship programs. They have been a common practice during the socialist time, however often took place pro-forma, and afterwards - during the changes almost disappeared. In 2005 internships were offered only by some big foreign companies and students did not know a lot about them. Due to the large promotion campaign held among university staff, companies and students, the internships became quite popular and currently most students take part in internships. These are offered on all levels - by small and medium enterprises, public administration and large enterprises.

Impact on both enterprises and universities - improved competitiveness, career opportunities and graduate placement (skills match of graduates to the labour market needs), as well as encouraged research, development & innovation and facilitated transfer of knowhow and innovation.
Impact on universities - the long-term effect is multiple: except for those mentioned above - improved management approach, improved teaching methods, attractiveness of programs.

All three interviewed companies in *Hungary* report significant outcomes from the university-business cooperation (joint institutions, better management and cooperation enhancement), while none of the three universities report such an effect. Universities all mentioned that skills of graduates should match to the labour market needs, and they also marked development and innovation.
Private sectors also said that skills of graduates match to the labour market needs, and that students established a relationship with the economic entities. They also agreed that research and development as well as improved teaching methods are significant outcomes.

In *Poland*, two out of six companies and all the university representatives report significant outcomes from the described cases, related to further research and development projects and exploitation of their outcomes, as well as strengthening and widening of their collaboration. Boosted entrepreneurial spirit and raised competitiveness are the most valuable impact on enterprises, followed by skills match of graduates to the labour market needs, facilitated transfer of knowhow and innovation and the encouraged research and development. For the universities the impact is not focused on a specific, but on multiple directions. Universities are learning how to plan the research project, according to the need of businesses. Private sector has access to research results, viable for companies.

Half of the interviewees from the business and all three university representatives in *Slovenia* report valuable follow-ups from the university-business cooperation – in both settings, mostly related to know-how, innovations and research and in the case of the universities – to support of start-ups. An important effect is the increase of interest of girls in technical professions and better understanding of the needs for technical profession from the parent's side.
These modes of cooperation lead to new partnerships, new knowledge and trust, to the development of new technologies (patents, models ...) and entering new markets for the companies. The also lead to knowledge transfer from these centres to the university students, to supporting new student entrepreneurial ideas and to new employments.

In *Spain***,** the main spin-offs for the universities are related to international cooperation (international research and development initiatives and joint master degrees).
For the interviewed companies the most significant outcomes are new projects, placement and scholarships for specialization of the best interns, as well as contribution to the development of more contemporary study plans in the universities.

One of the significant outcomes due to university-business cooperation for universities are that this cooperation encourages research at all levels and students get opportunities to work in the projects funded by companies. As there are join programs, universities opine that university-business cooperation raises the competitiveness and programs by the universities are attracted by the companies. Another important impact due to university-business cooperation is the increased participation of companies in the joint masters programs, especially to the Erasmus Mundus programs. All these modes help to match skills of graduates to the labor market needs.
For business community university-business cooperation resulted to the higher prestige and attractiveness as an employer, raised competitiveness and facilitated transfer of knowhow and innovation. They opine that university-business cooperation encourage research, development & innovation and contribute to business and fiscal advantages (more specifically an employer noted that short projects in information and communication technologies ends with good results). One important results due university-business cooperation is that scholars gain working experience in Large or SMEs and do collaborative projects and this shows that it helps in the skills match of graduates to the labour market needs. Yet another significant outcome for the companies is that they gain better project management and they improve management approaches with partners.

Four out of the nine interviewed university representatives on *EU* level report significant outcomes or spin-offs from university-business cooperation (improved reputation, teaching and practical training of students, joint events and networks), while none of the two enterprise member share the same experience.

To summarize, we list the variety of recognized outcomes: further development of internship programs (in Bulgaria and Spain) – including promotion of the internships among companies and students in Bulgaria; new projects (in Spain); joint events and networks (in EU); facilitated know-how transfer, innovation, research and development (in Slovenia and Poland); improved international cooperation in form of research and development initiatives and joint master degrees (Spain); support of start-ups (in Slovenia); improved management and new joint structures/centers with the participation of business (in Bulgaria and Hungary); improved study plans in the universities (in Spain); enhanced teaching and practical training of students (in EU) and better skills match and awareness of students and graduates about the demands of the business (in Bulgaria). An important side effect is reported in Slovenia – as a result of a project, the university noted an increase of interest of girls in technical professions and better understanding of the needs for technical profession from the parents.

4.4 Impact on Organizations from University-Business Cooperation

In the following section, we present the effects of university-business cooperation on both higher education institutions and enterprises in the target countries. The most significant impacts can be seen in the matching of both worlds (skills match) and in the processes directly related to knowledge (e.g. research and development, knowledge transfer).

In *Bulgaria*, raised competitiveness and better skill match of graduates to the labour market needs are the two most valuable impacts both for companies and universities from university-business cooperation. Both sides emphasize on the enhanced career development of graduates. For the universities there are also many other positive effects, like improved management approach, teaching methods and attractiveness of programs, encouraged research and development, and facilitated transfer of knowledge and innovation.

The most significant outcomes of the partnership both for the universities and enterprises in *Hungary* are the skills match of graduates to the labour market needs, as well as the encouraged research, development and innovation, followed by the increased attractiveness of programs. Another important impact for the interviewed company members is the improved teaching methods, and the facilitated transfer of knowhow and innovation.

In *Poland***,** the most valuable impact on enterprises are boosted entrepreneurial spirit and raised competitiveness, followed by skills match of graduates to the labour market needs, facilitated transfer of knowhow and innovation and the encouraged research and development. For the universities the impact is not focused on a specific, but on multiple directions.

For the companies in *Slovenia* the facilitated transfer of knowhow and innovations is in the first place, followed by encouraged research, development and innovation and improved management approach.
For Slovenian universities the effect is on various directions - except for the above mentioned – boosted entrepreneurial spirit, improved teaching and graduates' skills match, raised competitiveness and attractiveness of programs, with least impact on the improved management approach (mentioned only by one university out of three).

In *Spain*, the most significant impacts both on companies and universities are improved skills match of graduates to the labour market needs, encouraged research and development, attractiveness of programs. The interviewed representatives of enterprises report also a facilitated transfer of knowhow and innovation.

On *EU* level, skills match of graduates to the labour market needs is the most significant impact on universities and enterprises. Universities also mention raised competitiveness and many other

improvements on their organizations. The other valuable outcomes for companies are facilitated transfer of knowhow and innovation and encouraged research and development.

In general, the most important impacts of university-business cooperation are better skills match of graduates to the labour market needs, encouraged research and development, and facilitated transfer of knowhow and innovation. Besides these, there are also many other positive effects for the universities: raised competitiveness (in Bulgaria, Poland, Slovenia and EU), increased attractiveness of programs (in Bulgaria, Hungary and Spain), improved teaching methods (in Bulgaria and Slovenia), boosted entrepreneurial spirit (in Poland and Slovenia) and, to a lesser extent (reported only in Bulgaria and Slovenia), an impact on the management.

5. Early Attempt to Develop Typology on the Most Relevant Cooperation Modes between Universities and Business

5.1 Key Areas of University–Business Cooperation which have to be Focused on in the Next Years

There are several main areas of university-business cooperation which respondents emphasize as key in the forthcoming years for their organizations:

Improvement of the quality and relevance of practical training is mentioned by practically all respondents. There are various approaches to achieve this: internship programs (in Bulgaria, Spain and EU), including the perspective of globalizing labour market and opportunities to recruit foreign employees (EU); involvement of business people as university lecturers (in Bulgaria in Hungary); supply of skills and competences, corresponding to the needs of the companies through development of centres of excellence and competence centres (in Slovenia); review and adaptation of the academic programs, including development of joint programs (in Bulgaria); modernization of university teaching staff and methods (in Bulgaria); improvement of university management, such as change of leadership, centralization of research centers (in EU); and lastly, increased efficiency of investment in education (in Hungary and Poland).

Routes of institutional cooperation should be more intensive, optimized and become more effective (Bulgaria, Hungary, Poland) – using the career centers (Bulgaria) or specific events and efforts, in order to approach universities and establish contacts (Poland, EU). Small and medium enterprises should be more active in their cooperation with universities and the number o (Poland).

Better job opportunities for graduates - through job fairs and internship programs, employer branding (Hungary) or via the activities of the university career center as a linkage for promoting employability skills and better career development of graduates (Bulgaria).

Encourage research and development and joint initiatives and projects (Bulgaria, Hungary, Slovenia) - through wider participation of students and PhDs in the research and development (Bulgaria), enhancing the practical, applied-science and project activity of the universities (Bulgaria), multidisciplinary cooperation and focus on new knowledge in accordance with the arising new sectors and technologies (Slovenia), boosting the transfer of knowledge and innovation and the entrepreneurship (Slovenia).
The Polish respondents from the business environment put a special accent on the strategic level priorities of university-business cooperation in the next years: support science in defining the new development policy and in building a stronger competitiveness of regional and local economies; support the cities in preparing an innovation strategy; develop strategies to attract and retain "knowledge workers"; support the creation and strengthening of the effectiveness of business incubators, creation of joint ventures managing research results, especially in environmental management.

In *Bulgaria*, there are practically no discrepancies. The key areas for both universities and enterprises are: the review and adaptation of the academic programs, including development of joint programs; improving the quality and relevance of practical training through internship programs, as well as through modernization of university teaching staff and methods and involvement of business people in the education; establishing permanent routes of dialogue between both parties, with an emphasized role of university career center as a linkage for promoting employability skills and better career development of graduates. Also, the area of Research and Development and joint initiatives and

projects should be encouraged - including through wider participation of students and PhDs and enhancing the practical, applied-science and project activity of the universities.

The interviewed representative of the ministry of education also shares the same priorities. Universities and private sector orgnizations share the same three key areas of university-business cooperation, which have to be focused in the next years:
Establishing permanent routes of dialogue between them with the particpation of the university career center as a linkage. Its key role for promoting employability skills and better career development of graduates is emphasized by both parties.
Improving the quality and relevance of practical training - on one side through modernization of university teaching staff and methods; and on the other - through internship programs, involvement of business people in the education process, as well as in the review and adaptation of the academic programs and development of joint programs;
Encouraged research and development and joint initiatives and projects - including through wider participation of students and PhDs in the research and development; enhancing the practical, applied-science and project activity of the universities.

The key changes universities have to make:
"The high schools should respond to the needs of the business with introducing joint training modules and programs. Universities should be more flexible in the elaboration of their academic plans and in the selection of professors. If more business representatives, as people bringing innovative solutions and ideas) are involved in the education process, the students will be more adequately trained in coherence with the labour market needs in the country and abroad.";
"Attracting business representatives in the university management;
Updating the academic curricula, plans, etc. – in order to improve the practical training and career fulfillment of graduates;
Directing the scientific and research and development activities to the needs of the real business; involving students and PhDs in project work."; "The universities should: Introduce flexible structure and more operative regime of their career centers; Guarantee mechanisms for access and participation of business people in the training process". "Joint approach of business and universities for establishing long-standing partnership for their mutual interest".
Update of the academic curricula in the way that the knowledge and competences of the graduates respond to the real needs of the business.

The key changes companies have to make:
Facilitate easier and more open communication;
Improve mutual trust, understanding and continuity of the dialogue;
and ensure the realization of projects which are of mutual benefits for both sides.

The interests of universities and business in *Hungary* match in providing better skills of students (through involvement of business experts as university lecturers, more efficient institutional cooperation and investment in education), better job opportunities for graduates (such as through job fairs and internship programs, employer branding, etc.), as well as in common research and innovation projects. The key areas for universities are scholarship programs, and common research and innovation. For universities, the changes of university-business cooperation are that they need stronger business approach, and private sectors also mentioned this.
Key areas for private sectors are joint programs and knowledge transfer. The changes in private sectors are practice-orientation, well-structured strategy for development, as well as better adaption of company claims and information.

In *Poland,* according to both universities and companies, the routes of cooperation should be more intensive, optimized and become more effective. Universities need to create specialized cells that could administrate the cooperation rules, and draw an effective negotiation model. Small and medium enterprises should be more active in their cooperation with universities.

The representatives of the higher education institutions believe that the number of joint programs should be increased. They are also concerned about the efficiency of the financing and consider attracting more sources for research from the business.
For the interviewees from the business setting there are also several other main strategic areas of university-business cooperation for the next years: support science in defining the new development policy and in building a stronger competitiveness of regional and local economies; support the cities in preparing an innovation strategy; develop strategies to attract and retain "knowledge workers"; support the creation and strengthening of the effectiveness of business incubators, creation of joint ventures managing research results, especially in environmental management. Universities are taking into account the interest of businesses, which was not the case before

The universities in *Slovenia* plan to focus on providing graduate skills and competences, corresponding to the needs of the companies. Other key areas of university-business cooperation are the multidisciplinary cooperation, development of centres of excellence and competence centres, joint projects, focus on new knowledge in accordance with the arising new sectors and technologies, boosting the transfer of knowledge and innovation and the entrepreneurship.

Key areas and changes for the universities, for the near future, are: Adopting the curricula in order to provide graduate skills and competences, corresponding to the needs of the companies - focusing on new knowledge and new coming sectors; multidisciplinary cooperation with universities and companies, project cooperation, boosting entrepreneurial spirit in the universities and facilitating transfer of knowhow and innovation. Key areas and changes for the companies, for the near future, are study programmes, corresponding to companies' needs, efficient management of human resources, strategic planning and knowledge transfer; joint RTD projects with the universities.

In *Spain*, improvement of students' practical skills through internships is a key area for both universities and enterprises.
In order to have better university-business cooperation, universities consider that they need to implement more practically oriented classes. They also consider that they lack professionals with practical experiences. They also mention that companies need to charge their perception of the University for Better Cooperation.
Companies consider that as new ways of university-business cooperation they need to invest in I+D+i and provide training programs for students. One of respondents suggested that there is great need to set up center of excellence for intelligence building which would serve as an instrument for research and development programs and obtain improved results.

Another important area for university-business cooperation is the transfer of technology and know-how. In relation to this, one of the respondents suggested that it is important to develop a map of excellence (transferring entities and licenses) for collaboration.

In relation to skill acquisition, companies suggested that programs needs to be initiated to promote students to acquire more realistic vision of their future professional careers and help students to be prepared to enter to the labour market, beyond the subjects they study. In order to support this they also suggest that professionals from the higher education institutions should acquire new skills and competences to teach as labour market requires different needs to be satisfied.

As university-business cooperation encourages opening new doors, companies suggested that they need to introduce global internship programs as companies are planning to wider their market and start to cooperate in international projects. They also suggested that they need to organize events to share knowledge and ideas to other people, especially to students as part of new cooperation programs.
Changes: one of the important changes companies require for more university-business cooperation is to promote collaborative initiatives beyond established time and invest on trust (social capital) and interest in working together based on a structure similar to what is understood as a community of practice. They also propose new ways to gain better understanding (patience) and know different culture (in terms of individual objectives, constraints and time) in collaborating together. Enterprises

consider that they need to share technologies to universities and research institutions to do real-world projects.

In order to change ways of participation for students, they suggest insisting students on the importance of being in touch with the "real labour world" as soon as possible. Companies suggest to universities to prepare adequate study plans to the necessities of the local enterprises, including the participation of professionals from enterprises in the lectures and they consider that there is a need to provide guidance to universities in structuring educational programs, mentioning the skills and competences that they have develop in the student community. In order to have smooth flow of students and professional to both sides, companies propose that universities need to bring flexibility of the class schedules. They suggest that universities should reward good practices and discourage bad practices, as they practice in companies.

For the interviewed university representatives in the *EU*, the next steps for improving university-business cooperation are in two directions – managerial (change of leadership, centralization of research centers), and oriented to the graduates' practical skills and career fulfillment (internships and placement programs, scholarships).

The respondents from the enterprises also emphasize on internships, but also from the perspective of globalizing labour market and opportunities to recruit foreign employees. They also point out that specific events and efforts are necessary to approach universities and establish contacts.

5.2 Key Challenges for University–Business Cooperation

The interviews conducted in the five countries and EU reveals a common belief, that "universities and business speak different languages" (Bulgaria) or "are two different worlds" (EU). The "gap between the worlds of education and business" (Spain) are explained with their "different and partly contradictious points of view" (Hungary), "conservativeness" (Bulgaria), and "bureaucracy" (Hungary) in the higher education institutions, their "passiveness" in attracting investors (Poland) and "dynamic business environment". Universities need to adjust to the "fast changes in technology and to the changing market needs" (Poland). The demands of companies are focused on a specific issue, and require specific knowledge and results in a short time, while scientists are too focused on basic research and journal publications, not on applicative research. The effective dialogue between them is essential for solving the confrontation and bringing them together. As some of the interviewees say, they are "all in the same boat" (Bulgaria).

- **Various difficulties in cooperation are addressed by most of the interviewed** - lack of sustainability in university-business cooperation when management is changed (Bulgaria) and lack of recognition of the added value of university-business cooperation (Slovenia). The obstacles for the companies come from splitting of teaching and research staff in universities (Spain) and from the insufficient level of information and cooperation and lack of proper offer for business (Poland). In the same time enterprises need to enhance their capacity for cooperation, especially in small and medium enterprises (Hungary); increase their awareness regarding technology transfer procedures and rules (Slovenia) and strengthen the cooperation to facilitate innovation, which is "necessary for the competitiveness of the economy" (Poland). Efficient communication and flexibility in both parties are necessary to solve these issues (EU).

- **Funding** - provision of adequate financial resources is a common issue for all countries. Financial crisis and funding of research and development activities is a key challenge for both universities and enterprises (Spain, Bulgaria). Various measures are suggested by the respondents - the budget allocated by the state for research and development should be increased (Poland); and a better support system or incentives is needed to increase the participation of enterprises and research units in European and national research and development programs (Poland, EU); introducing new funding grants (EU), decent wages for research workers (EU) and change the financing procedures of HE institutions and research and technological developments: from current "programme" financing to institutional financing (Slovenia).

- **Legislation** – the interviewees from Bulgaria, Hungary and Slovenia share a common understanding that the regulation framework should be improved in order to facilitate the cooperation between universities and businesses. In Bulgaria the issue concerns the lack of governmental policy and strategy about university-business cooperation (example was given with the existing model in UK, where a ministry is responsible for the link between the two spheres). Another difficulty comes from the inadequate regulation of volunteering and internships. In Hungary the unpredictable regulatory environment is challenging for long-term business planning and in Slovenia the problem is caused by the inadequate legal framework and procedures for the management of intellectual property and commercialization of research and development.

- **Research and development** is challenged by the loss of many young researchers (Poland); lack of time and high costs for research and development, without clear benefits (Poland); and the lack of time for research and development activities (Spain)
- **Improving the quality of education and practical training** is among the key challenges for university-business cooperation in Bulgaria, Slovenia, Spain and EU. According to the

interviewees, incentives are necessary for modernising training and education (Bulgaria) and change the existing sluggish procedures for amendment of academic curricula (Bulgaria); universities need to boost their entrepreneurial spirit, introduce programs and practical training, corresponding to the needs of the companies (Slovenia, Spain), as well as improve the habilitation rules (Slovenia, EU), allowing academic people to be habilitated if they work in applicative projects.

The perception of the interviewees in *Bulgaria* is that universities and business speak different languages due to the conservativeness of the educational system and the dynamism of the business. Thus, the effective dialogue between them is essential for solving the confrontation and bringing them together. As some of the interviewees say "we are all in the same boat".
Both parties call for external support in the form of governmental policy/ strategy for university-business cooperation (an example is given with a ministry in UK responsible for this link); the legislation about volunteering and internships; and provision of adequate financial resources and incentives for modernising training and education. In the same time, there are also internal barriers stated, such as the sluggish procedures for amendment of academic curricula and the lack of sustainability in university-business cooperation, once a change in the leadership in the company or in the university takes place. The interviewee from the ministry of education and Science also agrees that the main challenges are the legislation and the lack of effective dialogue, incentives and sustainable economic environment.

The Key Challenges of University-Business Cooperation for universities:
"Establishment of mutul dialogue and trust" - Confrontation of the business and the universities, instead of linking them;
"Lack of resources in the budgets of universities and companies for financing of modern education and training and for equipment of a corresponding learning environment";
Conservative education system; "The procedures of amendment of academic curricula and programs take too long. Sometimes the poorly developed legislation in the field of volunteer work and internships are also impediment for the cooperation with the business."

The Key Challenges of University-Business Cooperation for Private Sector Organisations:
"They speak different languages. The educational system is quite conservative and the business – very dynamic one. The lack of government policy with priority to the bringing together the business and the universities (such as a ministry in UK).";
"The conservativeness of the universities and the lack of understanding that they are participants and a part in the labour market.";
"The lack of sustainability for realization of long-lasting programs for partnership – the change of the university rector or of the company manager almost always lead to a new start of the cooperation.";
"The lack of understanding that we are all in the same boat and we have the same goals. The mutual trust and understanding of the other side's goals and interests could be improved. However, there is a big progress in this direction."

According to the *Hungarian* interviewees, the challenges are multiple: on one side there is a lack of enterprise capacity especially in small and medium enterprises due to their size - they are not open and have no established "culture" of cooperation with universities. Impediments for this are also the different and partly contradictious points of view, the lack of financing (for both parties) and bureaucracy in the higher education institutions. Besides, there is the unpredictable regulatory environment which is challenging for long-term business planning.
Universities say that they need to improve their communication, and they also needs to reduce bureaucracy. They also face challenges with the harmonization the needs of both sides.
For private sectors, one of the challenges is the different operation of the institutions (different and partly contradictious points of industrial and scientific views, and because of governmental background; unstable situation for long-term business planning.) Other challenge is the quickly changing business expectations universities should have more flexible attitude.

In *Poland*, the key challenge for universities is the fast changes in technology and the need to adjust to the changing market needs, as "it looks like the financing will come from the businesses." Other impediments are the loss of many young researchers, the lack of time and high costs for research and development, without clear benefits.
The enterprises, on their turn, have to strengthen the cooperation to facilitate innovation, which is "necessary for the competitiveness f the Polish economy".
According to the interviewed public bodies, the main challenges are the passiveness of universities in obtaining investors, the lack of capital and lack of proper offer for business.
According to the respondents from the business, there are several main challenges: insufficient level of information and cooperation; inadequate legal framework and procedures for the management of intellectual property and commercialization of research and development; and funding – the budget allocated by the state for research and development should be increased, introduce better support system or incentives to increase the participation of Polish enterprises and research units in European and national research and development programs.
The key challenge is to find the common language and understanding for the priorities of companies and higher education institutions. Universities have significant problem with understanding, that the companies are working under the time pressure, and they need the results in planned time schedule.

In *Slovenia*, there is an impression that respondents mainly outline challenges which are related not to their setting, but to the other – for example: university representatives share they have to cope with the decrease of RTD funds at companies and to increase their awareness regarding technology transfer procedures and rules. In the same time, enterprise members believe the universities need to boost their entrepreneurial spirit, introduce programs and practical training, corresponding to the needs of the companies, as well as improve their habilitation rules.
Institutions representatives underline as challenges the inappropriate mind set in Slovenia; recognizing the added value of university-business cooperation; understanding the Intellectual Property Rights issues in joint development projects; changing financing procedures of higher education institutions and research and technological developments: from current "programme" financing to institutional financing.
To sum up, the key challenges remain: lack of systematic approach (apprenticeship is an exception), lack of political dedication for implementation of strategic documents; even when strategic approach is accepted by the government, the problem is in (unrealised) implementation of strategies , uninterested RTD/HE staff for collaborating with companies (due to habilitation rules.

In *Spain*, financial crisis and funding of research and development activities is a key challenge for both universities and enterprises. The interviewees from the business see many challenges for university-business cooperation – related to the practical training of students, lack of time for research and development activities, and the gap between the world of education and business. There are also issues such as lack of time for preparation of attractive activities for students during internships, and obstacles to collaboration with universities, due to splitting of teaching and research staff.

According to universities, a key challenge for university-business cooperation is the financial crisis and lack of collaboration reduced practically oriented activities for students which would help them to integrate to the labor market. Respondents from universities consider that old fashioned structures of educational activities are an important challenge for university-business cooperation.

One of the key challenges for university-business cooperation for companies is the lack of time for I+D+i. In relation this, they comment that there is an unequal distribution of financial distribution in projects with Universities in the areas of I+D+I, which becomes a challenge for collaboration. In addition to that there are difficulties in getting funding for research and investigation projects for companies.

Another important challenge of companies for collaboration with universities is the poor knowledge of areas or potential areas of collaboration. Companies also consider that cooperation is difficult because

companies and universities are in different and distinct worlds with few connecting links. In addition to that the split of universities' staff in teaching and research can be an obstacle to collaboration.

Lack of mutual trust between partners and lack capacities to keep abreast of new sources of information, new working methods and new learning opportunities are also challenges for collaboration. Companies suggest that lack of time for the professional in the business community to prepare for collaborative projects is an obstacle for collaboration.

Another important challenge for university-business cooperation is the difficulty for the enterprises/business community to offer internships or placements in the same subjects that students have learned. Companies accept that lack of knowledge regarding foreign universities and cultures becomes problems for collaborations.

In addition to the above mentioned challenges, most of the companies suggest that bureaucracy is an important factor for the lack of university-business cooperation.

The position of most interviewees in *EU* is that "companies and universities are two different worlds" – the demands of companies are quite focused on a specific issue, they require specific knowledge and expect results in a short time, which doesn't allow much time for proper development. In the same time scientists are too focused on basic research and journal publications, not on applicative research. Academic people are currently not habilitatated if they work in applicative projects. They also need to receive decent wages for research work. New funding grants, efficient communication and flexibility in both parties are necessary to solve these issues.

As we can conclude from the interviews, the most frequent challenges and barriers to successful university-business cooperation are connected with insufficient funding, legislative regulation, overall quality of education and training and limited research and development. There are also some other difficulties, addressed by the interviewees, such as lack of sustainability, low recognition of the added value of university-business cooperation, systemic limitations and insufficient information/communication flow in general.

5.3 Key Factors and Drivers for Fruitful and Long-lasting University–Business Cooperation

Based on the experience of the 59 interviewees, the common model of a successful and long-lasting partnership may be represented by four "Co-factors" - Common goals, Commitment, Communication and Context:

- **Common interests/mutual benefits, needs and aims** - such as joint projects, exchange of knowhow and innovation, practical training and placement of graduates).
- **Commitment** - good will or "passion" (as it is referred to in Poland) of both parties, especially on top management level. It is highlighted by many participants in the survey that the good partnership lays in the hands of the "right people"– not only managers, but also devoted leaders, visionaries, people who are open, knowledgeable, treasure the cooperation and are its keen promoters among all other levels – human resource and line managers, researchers and academic staff. The main qualities of those involved in the cooperation are openness and flexibility.
- **Communication** - ongoing and open dialogue, mutual trust and good knowledge of each other; joint planning, regular monitoring and feedback exchange.
- **Context** – the university-business cooperation should be reviewed as a key priority and supported by strategic stakeholders on national and European level, especially in the area of research and innovation (Hungary, Slovenia, Poland) and also implemented and supported by the company leadership and faculty management. According to some interviewees, university-business cooperation has to be "appreciated as a culture - knowledge is virtue, not money!"

(Slovenia). Other suggest that universities and enterprises should be involved in political decision making process, in order to contribute to transparent, computable and unambiguous legal regulation especially in the field of industrial property rights (Hungary).

Among the most powerful drivers of university-business cooperation are: the competition in the market (Poland); the fast developing professional fields and growing demands of the labour market on the work force catalyze the development of education and update of curricula (Bulgaria) and the globalization (Slovenia).

Universities and businesses in *Bulgaria* have a similar view on the key factors and drivers for successful university-business cooperation – good will and commitment; sustainable/on-going dialogue of the strategic leadership, joint planning; partnership based on mutual trust and benefits. Both universities and companies make a point that the developing professional fields and growing demands of the labour market on the work force catalyze the development of education and update of curricula.

In *Hungary*, all parties (universities, enterprises and public bodies) agree that the keys for fruitful and long-lasting cooperation are the permanent dialogue, commitment of management and joint projects and strategies reflecting the common needs, interests and aims.
Beside these factors, according to the public institutions interviewed, universities and enterprises should be involved in political decision making process, in order to contribute to transparent, computable and unambiguous legal regulation especially in the field of industrial property rights. Other drivers are the state support of research and development programs of the universities; support the establishment of the spin-off companies with application opportunities, and reducing bureaucracy and improving flexibility of universities. Most of these considerations are also shared by companies.

In *Poland*, the key factors, mentioned by public bodies, universities and business representatives, are commitment, passion and openness for dialogue and innovation, as well mutual benefit from the cooperation. The competition in the market is a powerful driver for the business. The European and state policy to support innovation in the economy – as well.

In *Slovenia*, the recipe for a fruitful and long standing cooperation between universities and enterprises envisages that it is accepted and implemented as a national strategy; reviewed as a strategic orientation of the faculty management; supported by state incentives and measures; led by open, knowledgeable and devoted leaders, researchers, human resource managers and academic staff; based on trust and long-term relationships; provides students practical experience and skills and is appreciated as a culture ("knowledge is virtue, not money!"). Additionally, university-business cooperation should be open to internationalization.

The main drivers of university-business cooperation in *Spain* are the ongoing communication, knowledge transfer and practical training of graduates. The fruitful and long-lasting cooperation lays on the following steps - identify areas of joint interest for collaboration to meet real needs; clearly set the aims of both parts in this process, and make it know to the other side from the beginning; create capacity for mutual understanding and sustainable cooperation; develop and maintain personal contacts; designate fixed responsible people on both parts; evaluate the process and exchange information and feedback regularly. Mutual trust between partners becomes particularly important. Tangible results of previous collaboration experience are an important factor, as well as flexibility and commitment.
According to the representatives of public institutions: enterprises and above all universities have to see their mutual cooperation as a possibility of money return in the investments and projects, not only as knowledge exchange and focus on projects that have a direct impact and application in the society.

In *EU*, the basis of fruitful and long-lasting cooperation is willingness to cooperate, mutual interests (transfer of knowledge, research and successful graduate placement), trust and good knowledge of each other. There are also important steps of bringing them together which have to be made

simultaneously – universities staff should appreciate more the cooperation with business and be open to change of the study programs according to the labour market needs; in the same time businesses need to keep regular contacts with the high schools and hire people who have academic background.

5.4 Key Changes the Two Parties have to Implement in Order to Enhance University–Business Cooperation

The changes needed to enhance university-business cooperation can be summarized in the following directions:

- **Modernize education to narrow the gap between theory and practice and respond to the needs of the business** - help students obtain the key skills and competences needed on the job (Bulgaria, Hungary, Poland, Spain); facilitate the update/upgrade the academic curricula according the market needs (EU); introduce flexible class schedules and provide opportunity for students and lecturers to gain practical experience in enterprises (Hungary); involve business people in the management and in the training process (Bulgaria, Spain); become familiar with the technologies that the companies are developing, have better understanding of the small and medium enterprises culture and specifics (Spain). Universities have to be more flexible and develop business approach (Hungary, Poland). According to interviewees from EU, the habilitation system has to be changed, and be based not only on publications and teaching, but on projects, researches and other forms of practical cooperation with the business. Another important dimension is to make education more oriented to international collaborations (Spain) and put emphasis on "opening of the economy in the use of the achievements of science in Europe, on the one hand to mobilize a regional academic staff to act, on the other hand to introduce and exploit the tested innovations in other countries directly to the economy" (Poland).

- **Facilitate communication** - easier and more flexible communication approach is needed (Bulgaria); and specially assigned individuals/ teams should be responsible for university-business cooperation (Poland). Higher education institutions can use portfolio to present in a better way their readiness, facilities and capacity for cooperation in front of the enterprises (Poland). Both parties have to be more flexible (EU) and broaden their knowledge about industrial property rights (Hungary, Slovenia). An important point is that above all, it is necessary to change the mentality/culture – on valuing the knowledge, not the money (Slovenia).

- **Stimulate research and development through joint activities, projects and centers** - recommend the respondents from all countries. Universities have to promote collaborative and strategic planning and intensify the research and technology transfer activities of universities (Slovenia), support companies' efforts in research and development, and innovation activities and value tech-transfer activities more (EU). At the same time, enterprises should be closer to universities (Spain, EU) - share more information about their current projects and technological developments, develop an internal culture and understanding of the contribution of young people and researchers to the company and have more active position in the training process of students.

- The suggested strategic measures and changes include: to improve the legislation (Poland) and promote scientific research clusters and centers (Poland, Slovenia); put in practice the research and innovation strategy (Slovenia); provide more efficient and sustainable funding for research and development (Poland, Slovenia).

The key words listed by both higher education and business representatives in *Bulgaria* are "mutual interest and trust" and "the real needs of the business". The specific practical steps which have been listed include: introducing new training modules which will help students obtain the competences needed on the job; involving business people in the management and in the training process; easier and more flexible communication approach; implementation of joint projects.

According to all interviewees in *Hungary,* the higher education institutions are those, who are expected to make more efforts and changes in order to enhance the university-business cooperation. Universities have to develop a business approach, they have to consider the labour market needs and narrow the gap between theory and practice; provide opportunity for students and lecturers to gain practical experience in enterprises; look for the possibility of cooperation and be more flexible.
Public bodies recommend also broadening of knowledge about industrial property rights, or the involvement of a professional experienced staff in this field.

In *Poland*, The ways of linking universities and enterprises are those of open and strengthened dialogue between them. According to companies, higher education institutions are not quite familiar with the needs of the business. In the same time they should also present in a better way their readiness, facilities and capacity for cooperation through portfolio for the companies. They have to introduce business approach in the universities and assign individuals/ teams responsible for university-business cooperation.
Other important measures are to facilitate research and development through joint activities, projects and centers; improve the legislation and promote scientific research clusters and centers. A more efficient funding model is necessary, both parties agree. Some respondents from the universities think more money for research should be obtained from the business, while other believe that money for research cannot ensure the financial independence universities need in order to focus on cooperation, not on fund raising. According to the respondents from the enterprises, the government should increase the budget for research and development and link the amount of subsidy with the amount of commercialized university research. Other important point is that "more emphasis should be placed on the opening of the economy in the use of the achievements of science in Europe, on the one hand to mobilize a regional academic staff to act, on the other hand to introduce and exploit the tested innovations in other countries directly to the economy."

The interviewees in *Slovenia* underline that implementation of Research and Innovation Strategy of Slovenia (RISS) is key issue, together with changing the mentality/culture – on valuing the knowledge, not the money, on collaborative and strategic planning and intensifying the research and technology transfer activities of universities, including the knowledge regarding intellectual property rights (IPR) and its opportunities. Research and development should become a special focus of university projects and be encouraged through new training and research centers. Another important change, according to the public bodies interviewed, concerns the financing procedures of higher education institutions and RTDs: from current "programme" financing to institutional financing.

Spain The business interviewees provide far more detailed answers about the necessary changes – focused on opening enterprises to universities, modernizing education and making it more practical, as well as oriented to international collaborations. Most of the respondents give specific recommendations for the changes universities need to implement in order to provide education which is relative to the business need and realities - become familiar with the technologies that the companies are developing, have better understanding of the small and medium enterprises culture and specifics; introduce flexible class schedules and invite professionals from the industry in the lecture; equip students with key skills (proactiveness, team work) that are vital for enterprises and prepare them how important it is to stay in touch with the "real labour world".

On *EU* level, strengthening the cooperation of universities and business is important for both sides. There are various opinions about the necessary changes they need to make in this respect.
Universities and public institutions' representatives interviewed share the opinion that habilitation system has to be changed, and be based not only on publications and teaching, but on projects,

researches and other forms of practical cooperation with the business. Currently academic people don’t have time for this kind of activity; therefore it should be formally recognized and appreciated as a progress. Another step is to facilitate the access of business representatives as lecturers in the universities and update/upgrade the academic curricula according the market needs. Besides, universities should support companies' efforts in research and development and innovation activities and university management needs to value tech-transfer activities more.
In the same time enterprises should be closer to the universities - share more information about their current projects and technological developments, develop an internal culture and understanding of the contribution of young people and researchers to the company and have more active position in the training process of students. Both sides should be more flexible.

The most important changes that have to be undertaken to answer the current challenges of university-business cooperation are directed towards a general modernization of education that would strive to increase the responsiveness to the needs of the world of work. There is also a need to facilitate communication between both sides and stimulate research and development through joint activities, projects and centers. These changes also imply a need for a certain level of improvement in legislation and funding.

6. Common Rules and Lessons Learned from University-Business Cooperation (Conclusion)

In this chapter, we present the common rules and lessons learned from university-business cooperation, first for each country studied and then in a synthesised form where we summarise and group the findings.

All interviewees in *Bulgaria* – representatives of universities, business and public institutions – underline that effective cooperation is based on the mutual benefits for universities and enterprises, such as internship and placement programmes, practical training and joint projects. The continuity and sustainability of initiatives are very important.
Another key element is the communication and understanding of each other's viewpoints and specifics. One of the associations interviewed comments that the national recognition and workforce competence assessment system will be the best way to achieve this and to foster changes in university curricula.

According to the interviewed representatives of *Hungarian* public institutions, universities and enterprises should be involved in the political decision-making process on research and development – setting transparent and unambiguous legal regulation, mainly in the field of industrial property rights, ensuring state support for the research and development programmes of universities and for the establishment of spin-off companies. Universities and enterprises should focus on joint projects based on common interest. Reducing bureaucracy within universities, making personal contacts and maintaining them after the end of a project is a very essential lesson learned.

Universities and businesses in *Poland* are natural partners and their cooperation benefits both sides. The exchange of ideas and experience is important for solving the current problems of companies. Higher education institutions need to be more proactive and flexible. New joint programmes/ specialisations must be planned in cooperation with business, and the monitoring of graduates should be implemented to provide feedback.

In *Slovenia*, the most important lessons shared are that university-business cooperation is effective when the proper (knowledgeable, willing and open to cooperation) managers and leaders on all levels are involved in proper UBC and receive results of true mutual benefit. Cooperation between industry and academia has to be treasured for contributing to knowledge and the economy, and supported on the national level by the RISS strategy and various incentives. Research and development has to be open to international knowledge centres.

In *Spain*, the enterprise interviewees shared two important lessons:
Both parts, universities and enterprises, must walk together. The proximity of these entities is essential and both of them can take great advantage of it because their aims complement each other in many different ways.
High-tech, knowledge-intensive, innovative small and medium enterprises are the future of economic growth in the EU. Universities and other public research organisations thus have an important role to play in creating start-ups. That is why business creation stemming from academic research (universities and public research organisations) is becoming an ever more important topic across the whole EU.
One rule shared by a university representative is that the main cooperation comes from research funded by industry.
According to a Spanish public body representative, "enterprises and above all universities have to see their mutual cooperation as a possibility of a money return in the investments and projects, not only as knowledge exchange and a focus on projects that have a direct impact on and application in society".

In the *EU*, the public bodies believe that trust and both good knowledge and previous experiences are the common rules for university-business cooperation. There are no common lessons shared by the companies. Universities also believe that each case of cooperation is specific and no common rules can be derived.

The key lessons across the countries are:

The significance of UBC – Universities and businesses are natural partners and their cooperation benefits both sides. The exchange of ideas and experience is important for solving the current problems of companies (Poland). Both sides – universities and enterprises – must walk together. The close proximity of these entities is essential and both can take great advantage of it because their aims complement each other in a host of different ways (Spain). Cooperation between industry and academia has to be treasured for contributing to knowledge and the economy, and supported on the national level by strategies and incentives (Slovenia, Spain).

The grounds for a successful partnership – Universities and enterprises should focus on joint projects based on common interest (Bulgaria, Hungary). The continuity and sustainability of initiatives are very important (Bulgaria). Trust, good knowledge of each other's views and specifics, and positive previous experiences (Bulgaria, the EU) facilitate the cooperation. Enterprises and above all universities have to see the possibility of a money return in the investments and projects, not only knowledge returns, and focus on projects that have a direct impact on and application in society (Spain).

The importance of the right people – making personal contacts and maintaining them after the end of a project is a very important lesson learned (Hungary). University-business cooperation is effective when the appropriate people at all levels are involved in proper university-business cooperation and receive results of genuine mutual benefit (Slovenia). Steps toward each other in the different countries include a national recognition and workforce competence assessment system, which will be the best way to achieve mutual understanding and foster changes in university curricula (Bulgaria). Universities and enterprises should be involved in the political decision-making process on research and development – setting transparent and unambiguous legal regulation, ensuring state support for research and development programmes and the establishment of spin-off companies (Hungary).

High-tech, knowledge-intensive, innovative small and medium enterprises are the future of economic growth in the EU, which calls for support for start-ups and academic research (Spain). New joint programmes/specialisations need to be planned in cooperation with business, and graduates should be monitored to provide feedback (Poland). Higher education institutions need to be more proactive and flexible (Poland), and reduce bureaucracy within universities (Hungary).

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Appendix 1: Country cases

5.1. Bulgaria	
The most important cases of cooperation modes and their interrelations	
Universities:	**Business:**
• The establishment of one of the universities was initiated and supported by the business • Internship programs in all 4 universities; • Annual update of the academic plans in coordination with business; • Joint master program with businesses	• Internships, placement programs, sector skills deficit analysis / forecast (4); • Curricular issues and graduates transition to LM - development of particular skills, recruitment programs and practices, career days, support of career centers (2); • National career days - http://careerdays.bg/ • National network of university career centers - http://careercenters.staj.bg/
Significant outcomes from the described cases	
Universities:	**Business:**
• Internship programs (3), • Development of joint master degrees with prestigious foreign universities (1) • Management and governance - participation of business in the university management structures.	• Development and promotion of internship programs in the companies; More than 25 thousand internship places offered during the National career days; Over 170 thousand participants in the National career days; • Establishment of career centers in almost all universities in Bulgaria; • Better skills match to the demands of the business; the students are much better oriented about the demand of employers in the labour market; • Revisions in the academic curricula and programs; • Use of laboratories and involvement of academic staff in company projects; • Management and governance - participation of business in the university management

Impact on organizations from university – business cooperation

	on Universities:	**on Enterprises:**
Improved management approach	3	1
Skills match of graduates to the labour market needs	3	4
Facilitated transfer of knowhow and innovation	3	2
Boosted entrepreneurial spirit	2	
Improved teaching methods	3	
Encouraged research, development & innovation	3	2
Attractiveness of programs	3	1
Raised competitiveness	4	4
Other (please specify):	Higher percentage of successfully realized graduates / successful	better career fulfilment of graduates

	career development of students (2)	
Priorities in policy regarding university – business cooperation		
Universities:	**Business:**	
• Practical trainings, supply of skills demanded by the business; • Internship programs; • Graduate placement, • Joint projects and initiatives; • Permanent dialogue.	• Active cooperation with the university career centers (2); • Seminars in different universities (2); • Internship programs (2); • Career forums and career guidance initiatives; attracting, training and placement of young graduates • Participation in joint initiatives, projects and events: review of academic curricula and programs (2), accreditation commissions, scientific conferences, use of laboratories and academic staff in projects.	
University – Business Cooperation models which have developed in the last 10 years		
	In Universities:	**In Enterprises:**
Permanent routes of dialogue between university and businesses	4	3
Student internship programs	4	7
Graduate placement	4	5
Sector skills deficit analysis / forecast	2	2
Curriculum development in cooperation with businesses	3	3
Joint programs	3	1
Continuing education and training	4	3
Knowledge transfer from businesses to university	4	2
Knowledge transfer from university to businesses	4	3
Exchange of personnel between university and enterprises	2	1
Research & Development	2	0
Joint projects	4	5
Business / entrepreneurship centers	2	0
Recognition and validation of competences	3	2
Other:		Annual surveys of the business evaluation about the newly hired employees and national contests for best university
Key areas of University – Business Cooperation which have to be focused on in the next years		
For Universities:	**For Business:**	
• Joint development / review of the curricula in different disciplines (3); • Joint programs (2); • Attractiveness of programs; • Internship programs;	• Adaptation of the academic programs; • Internship programs (3); • Practical training (2) including participation of the business in the training; • Modernisation of the university teaching	

• Practical training through involvement of renowned business people (2); • Improved teaching methods (2); • Fostering Quality Management in the university through UBC; • Permanent routes of dialogue between university and businesses; • Better career development of graduates (3) - including through fostering the activity of the university career center; • Establishment of alumni club in the university; • Better skills match of graduates to the labour market needs (2); • Encouraged research, development & innovation (3) - including through wider participation of students and PHDs in the R&D; • Enhancing the practical, applied-science and project activity of the university; • Better promotion of the products and results of the research and development; • Boosted entrepreneurial spirit; • Raised competitiveness; • Facilitated transfer of knowhow and innovation.	staff; • More intensive dialogue and cooperation, using the career centers; • Development of students' employability skills; • Better skills match of graduates to the labour market needs; • Joint projects (2); • Recognition and validation of knowledge; • Overall opening of the educational system to the real life.
Key challenges for University – Business Cooperation	
According to the Universities:	**According to the Business:**
• Establishment of mutual dialogue and trust (2), • Conservative education system; • Confrontation of the business and the universities, instead of linking them; • Lack of resources in the budgets of universities and companies for financing of modern education and training and for equipment of a corresponding learning environment (3); • The procedures of amendment of academic curricula and programs take too long. • Sometimes the poorly developed legislation in the field of volunteer work and internships are also impediment for the cooperation with the business.	• They speak different languages. The educational system is quite conservative and the business – very dynamic one. (2) • The lack of understanding that we are all in the same boat (2) and we have the same goals. The mutual trust and understanding of the other side's goals and interests could be improved. However, there is a big progress in this direction. • The lack of government policy with priority to the bringing together the business and the universities (such as a ministry in UK); • The lack of sustainability for realization of long-lasting programs for partnership – the change of the university rector or of the company manager almost always lead to a new start of the cooperation.
Key factors and drivers for fruitful and long-lasting University – Business Cooperation	
According to the Universities:	**According to the Business:**
• Established sustainable partnership and dialogue, mutual trust and benefits (3); • Establishment of appropriate conditions and forms for partnership in both arenas.	• Good will, on-going communication and dialogue between the management of the company and the university, joint planning (2); • The cooperation is of mutual benefit for both

• People factor – highly qualified leaders, managers and professors both in the universities and in the business; • Motivation and commitment of the leaders and of participants in the cooperation; • Fast developing professional fields and the need to update curricula and training approach.	sides. In order to develop the programs, the cross point of interest should be found. (2); • The high requirements for graduates' skills and for high quality of education are a factor which guarantees the realization of the future specialists. • Monitoring of the joint projects;
Key changes the two parties have to implement in order to enhance University – Business Cooperation	
Universities:	**Business:**
• Respond to the needs of the business with introducing joint training modules and programs; be more flexible in the elaboration and update of academic plans and curricula; • Direct the scientific and R&D activities to the needs of the real business; involve students and PHDs in project work; • Involve business representatives to improve the practical training (3); • Attract business representatives in the university management; • Introduce flexible structure and more operative regime of their career centers; • Joint approach of business and universities for establishing long-standing partnership for their mutual interest.	• Update the academic curricula in the way that the knowledge and competences of the graduates respond to the real needs of the business. • Realize projects which are of mutual benefits for both sides; • Mutual trust, understanding and continuity of the dialogue (2); • Easier and more open communication;
Common rules and lessons learned from university – business cooperation	
For Universities:	**For Business:**
• "The UBC is effective, when managers and leaders on all levels are involved in proper forms and when real results are achieved, in mutual benefit." • "The joint work with the business contributes to mutual trust and in-depth communication and cooperation, which benefits both sides."; • "Education institutions should always take in consideration the opinion of the business and respond adequately to the business conditions and environment in the country."; • "The internship programs and the other forms of cooperation should be regular, held annually and offering continuing and building-upon effect, not episodic initiatives.";	• "The partnership should be of mutual benefit and not only in the form of financial support."; • "Communication is a process. The steps are small but in the right direction. Even if we want everything to happen faster, it is often impossible."; • "Policies and incentives for ensuring better career opportunities for the university graduates through internship programs, practical training, joint projects of companies and universities."; • "National recognition and fostering of the workforce competence assessment system to enhance adaptability and effectiveness, and to achieve a balance of the labour market demand and supply will be the best way for the universities to assess the competences of their students and timely to change the curriculum."

5.2. Hungary

The most important cases of cooperation modes and their interrelations

Universities:	**Business:**
• Internship programs • Mostly the soft skills need to be improved by these cooperations. Students can learn theoretical things in the university lessons but other important skills can be developed in the most effective way by help of enterprises which employ the graduated people in the labour market. For example the services of Career Office: trainings (development of communication skills; job-finding, job-interview, CV and motivation letter writing; self-knowledge theme), different guidances.	• Job placement • Support of scholarship programs • Joint institutions with universities

Impact on organizations from university – business cooperation

	on Universities:	**on Enterprises:**
Improved management approach	1	
Skills match of graduates to the labour market needs	3	3
Facilitated transfer of knowhow and innovation	1	2
Boosted entrepreneurial spirit	1	
Improved teaching methods		3
Encouraged research, development & innovation	3	3
Attractiveness of programs	2	2
Raised competitiveness	1	
Other (please specify):	Services of Career Office: trainings, guidance services	

Priorities in policy regarding university – business cooperation

Universities:	**Business:**
• Internships and graduate placement • Permanent routes of dialogue	• Central aim is the knowledge transfer. Two-way knowledge transfer: ○ industry experts' lectures at university ○ joint projects with university ○ professors practical experience at the enterprise (exchange of personnel) ○ joint development of university's education materials ○ joint R&D and innovation projects • The company has a close relationship with the university; they support the studies of the professional trainees and our employees. They have a special study program • Telecommunications company has a strategy for this. Within the company, a program was launched, which specifically builds on the

	close and mutually good relationship between the higher educational institutions and the company.

University – Business Cooperation models which have developed in the last 10 years

	In Universities:	**In Enterprises:**
Permanent routes of dialogue between university and businesses	2	2
Student internship programs	1	2
Graduate placement	2	1
Sector skills deficit analysis / forecast	1	
Curriculum development in cooperation with businesses	1	1
Joint programs		2
Continuing education and training	3	
Knowledge transfer from businesses to university	1	3
Knowledge transfer from university to businesses	2	3
Exchange of personnel between university and enterprises		1
Research & Development	3	1
Joint projects		1
Business / entrepreneurship centers	2	1
Recognition and validation of competences	1	
Other:		

Key areas of University – Business Cooperation which have to be focused on in the next years

For Universities:	**For Business:**
• Common research and innovation, • Scholarship programs, • Organising job fairs Te institutions' main profile is to keep in touch with students and companies, so they have to work from a wide scale.	Automotive company: • Institutionalized cooperation, which makes joint action efficient. • Participation in university lectures through industry experts' lectures. • Knowledge transfer between university and enterprise (for example R&D projects). Telecommunications company: • Synergies and transparencies; • keeping track of the investments referring higher educational sectors; • Improving the reputation of Magyar Telekom as an employer brand and as a promotional brand. Electronic equipment company: • Joint programs, • Joint project, • Student Internship program.

Key challenges for University – Business Cooperation

According to the Universities:	**According to the Business:**
• Harmonize the need of both sides, improve communication, reduce administrative rules;	Automotive company: • Different operation of the institutions: different and partly contradictious points of

• Focus on the demands of several companies, too much administration makes the financial cooperation difficult	industrial and scientific views. • Governmental background: unstable situation for long-term business planning. • Finance: lack of necessary sources. Telecommunications company: • keeping the company as a popular employer brand in the scope of higher educational students • maintaining knowledge transfer • broadening business approach Electronic equipment company: • Quickly changing projects, changing business expectations • the more flexible attitude of higher education institutions
Key factors and drivers for fruitful and long-lasting University – Business Cooperation	
According to the Universities:	**According to the Business:**
• Permanent communication between partners, to draft common aims and strategies, get to know the needs accurately	Automotive company: • Sources: securing operation. • Stable law background: computability. • University autonomy: freedom and capability in decision making. Telecommunications company: • drawing into projects from both parts • continuous communication and contact keeping • finding future talents and helping them in their career Electronic equipment company: • The commitment of the management, the awareness of universities, and their flexibility towards enterprises
Key changes the two parties have to implement in order to enhance University – Business Cooperation	
Universities:	**Business:**
• Stronger business approach	Automotive company: Business point of view: time, data, facts prioritized. Practice-orientation: gap should be narrowed between practice and theory. Well structured strategy for development of infrastructure: to be able to strive for the industrial need of efficiency. Telecommunications company: • continuous information from the universities • transmitting newest knowledge • drawing into projects Electronic equipment company: Flexibility, business oriented concept, better adaptation of special company claims.
Common rules and lessons learned from university – business cooperation	

For Universities:	For Business:
• It is important to build a good personal contact and keep in touch after the ending of the project.	• Reducing bureaucracy inside universities

5.3. Poland

The most important cases of cooperation modes and their interrelations

Universities:	**Business:**
• Curricular issues and graduates transition to LM - joint development of programs, lifelong learning, mobility of students and professors, development of particular skills, recruitment programmes and practices, career centers development (3) • Internships, placement programs, sector skills deficit analysis / forecast (3) • Management and governance - creation of common bodies, setting new training centers and other institutions (3) • Knowledge transfer from businesses to university, business / entrepreneurship research units, recognition and validation of competences) (3) • Research and Development -projects, spin offs etc. (2) • Career offices for graduates	• Curricular issues and graduates transition to LM - development of programs, lifelong learning, mobility of students and professors, development of particular skills, recruitment programmes and practices, career centers development (6) • Internships, placement programs, sector skills deficit analysis / forecast (4) • Management and governance - creation of common bodies, setting new training centers and other institutions (4) • Knowledge transfer from businesses to university (products, experiences), business / entrepreneurship research units, recognition and validation of competences) (2) • Research and Development projects, spin offs, etc (2)

Significant outcomes from the described cases

Universities:	**Business:**
• Commercialization of the research outputs	• Continuing their collaboration with universities: Internship programs, training courses, seminars for students, support of thesis preparation and research work, modernization of teaching and research laboratories; • Implementation of R&D projects, individual agreements on scientific and technological cooperation with different universities

Impact on organizations from university – business cooperation

	on Universities:	**on Enterprises:**
Improved management approach	3	3
Skills match of graduates to the labour market needs	3	4
Facilitated transfer of knowhow and innovation	2	4
Boosted entrepreneurial spirit	3	6
Improved teaching methods	3	
Encouraged research, development & innovation	2	4
Attractiveness of programs	3	
Raised competitiveness	3	6
Other (please specify):		

Priorities in policy regarding university – business cooperation

Universities:	**Business:**
• The biggest companies and universities	Various models of cooperation exists:

regulate the rules of cooperation on bilateral agreement level; • Job opportunities for graduates; • The UBC is an opportunity to obtain financial support and raise their prestige; • Promote better use of university's intellectual and technical potential, and support all kind of actions devoted to the introduction of academic work results into the industry and commercial market.	• Mostly bilateral agreement focused on strict problem solution (e.g. research). • The biggest companies have universal programs for graduates and young researches in cooperation with universities – mostly practices and internships. • When cooperation standard is rewarding, companies are willing to equip universities laboratories. • Implementation of joint projects • Organization of lectures and speeches on specific business and industry-related topics; • Participation of business representatives in the management board/ program level in the universities.

University – Business Cooperation models which have developed in the last 10 years

	In Universities:	**In Enterprises:**
Permanent routes of dialogue between university and businesses	3	4
Student internship programs	3	1
Graduate placement	3	1
Sector skills deficit analysis / forecast	2	1
Curriculum development in cooperation with businesses	3	4
Joint programs	3	4
Continuing education and training	2	4
Knowledge transfer from businesses to university		1
Knowledge transfer from university to businesses	3	
Exchange of personnel between university and enterprises	1	1
Research & Development	2	1
Joint projects	3	1
Business / entrepreneurship centers	2	5
Recognition and validation of competences		
Other:		It is important that the dialogue with universities has started

Key areas of University – Business Cooperation which have to be focused on in the next years

For Universities:	**For Business:**
• Universities need to create specialized cells that could administrate the cooperation rules, and draw an effective negotiation model. • Increase number of joint business-HE programs. • Main issue is bigger efficiency of financing model. More money for research should be obtained from the business.	• Increase cooperation between SMEs and universities; • Support science in defining the new development policy and in building a stronger competitiveness of regional and local economies. • Develop strategies to attract and retain "knowledge workers", which for the sub-regional economies becomes the most important challenge. The outflow of young

	scientific personnel to the metropolis will cause, if not causes already, the increase in negative effects that reduce the competitiveness of the regions. • Support the cities in preparing an innovation strategy for the whole region and in developing own research agendas as well as engaging in research and development projects, for example the Framework Programmes. • Support the creation and strengthening of the effectiveness of business incubators, creation of joint ventures managing research results, especially in environmental management. Such activities have significant thematic impact regarding public utilities.
Key challenges for University – Business Cooperation	
According to the Universities:	**According to the Business:**
• Adjust to changing market needs - It looks like financing will come from businesses. • Very fast changes in technology and fast outdating of laboratory equipment challenges the proper preparation of students to labour market conditions (in area of private scientific research). • Loss of many well educated young researchers and PHD students • Lack of time. High alternative costs – researcher can spend his/hers time for realization of theoretical project or other activity • Lack of satisfaction and direct benefits (the effects of cooperation are mostly indirect – lack of tangible results)	• **Insufficient level of information and cooperation (underlined by all interviewees)** – no transfer of information between business and science; lack of an effective model of cooperation; lack of leaders; lack of knowledge about partners; poor coordination of business environment institutions who do not have the contacts to promote business and science; too high scientific approach to self-promotion of research workers, and thus little orientation towards the commercialization of scientific solutions. Strengthening of the cooperation to facilitate innovation is necessary for the competitiveness of the Polish economy. • **Inadequate legal framework and institutional procedures, management of intellectual property**; insufficient regulations on instruments to support innovation and the lack of tax incentives, which could provide an additional source of income fully used for the purpose of innovation. Poorly developed structure for commercialization of R&D, • **Funding** – there are no guarantees of achieving satisfactory results and return of investments in R&D; The mutual orientation must be stimulated by the state. Further reforms are needed in the field of science and higher education but also it is necessary to increase the budget allocated by the state for research and development. Despite the existence of EU programs aimed at research and development to increase the participation of Polish enterprises and

	research units in these programs, it is necessary to build a better support system for participants. One of the respondents identifies three main barriers to cooperation between the science and business: • Legal barriers - institutional, still imperfect model and unearned cooperation strategies, • Mentality barriers - both the science and the business side. lack of knowledge about the benefits of cooperation, lack of knowledge of the needs and potential. Low brand research and how its relevance to business. • Co-existing barriers - inhibition, lack of glorification of cooperation between science and business, a lack of development of a prestigious brand and a lack of system of incentives for this type of activity. There are no practices of cooperation. Cooperation between science and business should be not only a good idea.
Key factors and drivers for fruitful and long-lasting University – Business Cooperation	
According to the Universities:	**According to the Business:**
• Passion of entrepreneurs and universities bodies; • Mutual benefits; • Building of both side prestige; • Understanding of both sides needs;	• Common language; • Business model of mutual benefit. • Understanding of the numerous possibilities and commitment of those involved in the projects and cooperation; • Greater openness of the University to promote cooperation, to actively seek partners; • The competition in the market; • Innovation and entrepreneurship spirit - openness of companies for innovation; promotion of entrepreneurial attitudes among scholars and students to encourage innovative thinking. • State policy and the European Union to support innovation in the economy, • Co-financing (public, private / business angels); • Real opportunity for the commercialization of research.
Key changes the two parties have to implement in order to enhance University – Business Cooperation	
Universities:	**Business:**
• Open dialogue with business; • Better tools of cooperation need to be implemented; • Universities must act more like an enterprises – measuring of effects not didactic process;	• Strengthen the dialogue with universities • Universities do not have significant knowledge on business needs. They should designate individuals / teams responsible for the cooperation. • Legislation promoting R&D

• Increase number of joint business-HE programs. • Main issue is bigger efficiency of financing model. More money for research should be obtained from business. • Universities need to have stabile financing system to focus on cooperation, not on obtaining funds (money from research can not ensure financial independence); • Attract more foreign students who are more likely to stay in the country and take part in the R&D or work in Polish companies.	• Joint activities aimed at innovation (2) - promote scientific research clusters and centers; • Increase the budget for R&D • Link the amount of the subsidy with the amount of commercialized university research • More emphasis should be placed on the opening of the economy in the use of the achievements of science in Europe, on the one hand to mobilize a regional academic staff to act, on the other hand to introduce and exploit the tested innovations in other countries directly to the economy.
Common rules and lessons learned from university – business cooperation	
For Universities:	**For Business:**
• The prevailing opinion is that cooperation between business and education helps both sides. • Universities need to be more elastic during planning new specialization. It need to be done in cooperation with entrepreneurs. New specializations need to be a result of previous cooperation with business eg. In joint programs.	• For companies most important is solving the current problems (technical, management etc.) in cooperation with universities; • It is advisable to exchange experiences between universities and business. Many ideas can be implemented in other partnerships. • Universities are natural partners for the business, but currently they cannot be expected to take the initiative for cooperation.

5.4. Slovenia

The most important cases of cooperation modes and their interrelations

Universities:	**Business:**
• Many joint research, training and development projects in all interviewed faculties (3) • Knowledge transfer through Centres of Excellence and Competence centres (3) • Curriculum development - annual update of the academic plans in coordination with business; joint master programs with businesses (3) • Centre of Business Excellence (1)	• Joint research and development initiatives – mostly joint projects (6) • Support to knowledge transfer from universities to companies (2); • Graduates transition to labour market through: career days (1), support of career centres (2); student centre incubator (1); centre of competence /knowledge (1) • Management and governance - Strategic council for technology development and innovation (2)

Significant outcomes from the described cases

Universities:	**Business:**
• Joint research projects (3); • Support to start-ups (3)	• New knowledge (1); • New technologies developed (1); • New innovative solutions (1); • Transfer of marketing know-how to technical innovators (1); • New business solutions for finding financial resources (1); • Increase of interest of girls in technical professions and better understanding of the needs for technical profession from the parent's side.

Impact on organizations from university – business cooperation

	on Universities:	**on Enterprises:**
Improved management approach	1	3
Skills match of graduates to the labour market needs	3	1
Facilitated transfer of knowhow and innovation	3	6
Boosted entrepreneurial spirit	3	1
Improved teaching methods	3	2
Encouraged research, development & innovation	3	4
Attractiveness of programs	3	1
Raised competitiveness	3	
Other (please specify):		

Priorities in policy regarding university – business cooperation

Universities:	**Business:**
• Knowledge transfer. The Technology Transfer Office and University Career Centre are the two drivers of cooperation expansion in the period 2012 – 2020 Competency Centres, Strategic R&D alliances	• Active cooperation with the university career centres (5); • Attracting, training and placement of young graduates (3) • Research collaboration, knowledge transfer (3);

	• Promotion of study programs and professions with workforce shortage (2); • Participation in joint initiatives and events (2),

University – Business Cooperation models which have developed in the last 10 years

	In Universities:	**In Enterprises:**
Permanent routes of dialogue between university and businesses	3	2
Student internship programs	3	
Graduate placement	3	3
Sector skills deficit analysis / forecast	2	1
Curriculum development in cooperation with businesses	3	1
Joint programs	3	
Continuing education and training	3	2
Knowledge transfer from businesses to university	3	5
Knowledge transfer from university to businesses	3	5
Exchange of personnel between university and enterprises		2
Research & Development	3	3
Joint projects	3	6
Business / entrepreneurship centers	3	1
Recognition and validation of competences	3	1
Other:	support to start-up companies (3)	

Key areas of University – Business Cooperation which have to be focused on in the next years

For Universities:	**For Business:**
• Providing graduate skills and competences, corresponding to the needs of the companies (3); • Cooperation with other universities, companies on various technological skills (multidisciplinary cooperation) (3); • Centres of excellence and competence centres need to be continually developed (3); • Joint (multidisciplinary) projects (3); • Focusing on new knowledge and newcoming sectors (2), • Facilitated transfer of knowhow and innovation; • Boosted entrepreneurial spirit;	• No answers

Key challenges for University – Business Cooperation

According to the Universities:	**According to the Business:**
• Coping with decrease of RTD funds at companies - finding new financial resources, new RTD models (3).	• Boosting entrepreneurial spirit in universities (3); • Habilitation rules not supporting UBC (2),

• Enhancing the knowledge regarding technology transfer procedures, rules, especially in the companies (1).	• Autonomous status of public universities (2); • Study programmes, corresponding to companies' needs (1); • More soft skills (marketing, IPR, communication), especially in technical universities (1); • More business case studies presented at university courses (1); • Ineffective legislation (1);
Key factors and drivers for fruitful and long-lasting University – Business Cooperation	
According to the Universities:	**According to the Business:**
• UBC as a strategic orientation of the management of faculties (1); • new incentives for UBC; • highly educated students (1); • competencies (1); • internationalisation (1)	• business skills in all university programmes (3); • practical experiences for students (3); • trust and long-term relationships (3); • win-win collaboration principle (1); • efficient human resource management (1)
Key changes the two parties have to implement in order to enhance University – Business Cooperation	
Universities:	**Business:**
• Demanding the implementation of national strategic documents, related to research, development and UBC (3); • Focus on consultation services to companies (1); • Change of culture - values and goals (1)	• Strategic planning and knowledge transfer (4); • University research in each RTD project (3); • New training and research centres (2); • Efficient human resource management (1);
Common rules and lessons learned from university – business cooperation	
For Universities:	**For Business:**
• The management of the faculty has to support UBC. The extent of UBC is related to individual professors. "The UBC is effective, when managers and leaders on all levels are involved in proper UBC (real results for mutual benefit)	• Trust and mid & long-term cooperation are element of innovation; • Implementation of accepted strategic documents, • Follow-up (evaluation) is crucial.

5.5. Spain

The most important cases of cooperation modes and their interrelations

Universities:	**Business:**
• Internship and placement programs (3); • Curricular issues and graduates transition to LM - development of programs, lifelong learning, mobility of students and professors, development of particular skills, recruitment programmes and practices, career centers development, etc (3); • Knowledge transfer from businesses to university (3); • Research and Development - projects, spin offs, etc (3)	• Internships, placement programs, sector skills deficit analysis / forecast (4); • Curricular issues and graduates transition to LM (4); • Knowledge transfer from businesses to university (4); • Research and Development (3); • Management and governance - creation of common bodies, setting new training centers, etc (4)

Significant outcomes from the described cases

Universities:	**Business:**
• International cooperation: Research – oriented cooperation with international institutions and companies; joint master degrees in cooperation with a global company and an international university	• Short projects focusing on practices with interns; • Scholarships for technological specialization and placement of interns in the company; • Facilitated implantation of hybrid (semi-online) study plans in the universities; • Fiscal advantages for the involved enterprises.

Impact on organizations from university – business cooperation

	on Universities:	**on Enterprises:**
Improved management approach	1	1
Skills match of graduates to the labour market needs	1	2
Facilitated transfer of knowhow and innovation		2
Boosted entrepreneurial spirit		
Improved teaching methods		
Encouraged research, development & innovation	1	2
Attractiveness of programs	1	2
Raised competitiveness		
Other (please specify):		

Priorities in policy regarding university – business cooperation

Universities:	**Business:**
• Promote the research activity of the university, funded by industry; • Involve lecturers from the industry to increase practical training and transfer of knowledge.	• Development of students' practical skills.

University – Business Cooperation models which have developed in the last 10 years

	In Universities:	**In Enterprises:**

Permanent routes of dialogue between university and businesses	3	2
Student internship programs	3	2
Graduate placement	1	1
Sector skills deficit analysis / forecast	1	1
Curriculum development in cooperation with businesses	1	4
Joint programs	1	3
Continuing education and training	3	2
Knowledge transfer from businesses to university	3	3
Knowledge transfer from university to businesses	1	2
Exchange of personnel between university and enterprises	2	
Research & Development	1	2
Joint projects		
Business / entrepreneurship centers	1	
Recognition and validation of competences		
Other:		

Key areas of University – Business Cooperation which have to be focused on in the next years

For Universities:	**For Business:**
• Improve the student experience during their internship	• Improve the student experience during their internship

Key challenges for University – Business Cooperation

According to the Universities:	**According to the Business:**
• Financial crisis	• Financial crisis and distribution of finance between partners. Difficulty in getting funding for research and investigation projects. Unequal distribution of financial distribution in projects with Universities in the areas of R&D. • Little time for research, development and innovation. • Lack of time to think and prepare the appropriated activities. The difficulty of finding enough attractive subjects for the students • More practical activities in the universities and the students should know more about what they are going to find when they start looking for a job. They have to be ready for that moment. • The split of universities' staff in teaching and research can be an obstacle to collaboration. • The lack of knowledge of foreign universities and cultures can be an impediment. • Very different and distant worlds, with few connecting links. Poor knowledge of areas or potential areas of collaboration. We need to

	invest on trust (social capital) and interest in working together based on an structure similar to what it is understood as a community of practice.
Key factors and drivers for fruitful and long-lasting University – Business Cooperation	
According to the Universities:	**According to the Business:**
• Flow of knowledge • Practical training for graduates • Ongoing communication	• Knowledge transfer • Practical training of graduates • Transparency, flexibility, long-term relation, commitment • Identify areas of joint interest for collaboration to meet real needs; clearly set the aims of both parts in this process, and make it know to the other side from the beginning; create capacity for mutual understanding and sustainable cooperation; develop and maintain personal contacts; designate fixed responsible people on both parts; evaluate the process and exchange information and feedback regularly. Mutual trust between partners becomes particularly important. Knowledge transference is a continuous process, so stable channels of communication between the actors are required. • UBS is like a wheel - we educate and train graduates who work for a company, and when there is a need in industry, they come back, fund research that generates knowledge that will be embedded in new graduates, and so on,... • Tangible results of previous collaboration experiences. • Work together for the internationalization
Key changes the two parties have to implement in order to enhance University – Business Cooperation	
Universities:	**Business:**
• Practical training for teachers • Less theory and more practices for students	• Companies need to charge their perception of the university. They have to be closer to the university to guide the programmes, the important skills that should be developed. The enterprises should share more information about real projects and technologies they are using. • Universities have to make education and training more practical and relative to the business need and realities - become familiar with the technologies that the companies are developing. introduce flexible class schedules and invite professionals from the industry in the lecture; equip students with key skills (proactiveness, team work) that

	are vital for enterprises and prepare them how important it is to stay in touch with the "real labour world"; A better understanding (patience) of the SMEs culture (time, constrains, objectives) in collaborating together. • University needs to collaborate more in international projects, with students and foreign universities to allow the internalization of the companies. In the same time, when you are working with worldwide universities, there is a lot of difference related with the educational systems and their homologation.
Common rules and lessons learned from university – business cooperation	
For Universities:	**For Business:**
• The main cooperation comes from research funded by industry.	• It is acknowledged that high-tech, knowledge-intensive, innovative SMEs are the future of economic growth in the EU. Thus universities and other public research organizations have an important role to play in creating start-ups. That is why business creation from the academic research (universities and public research organizations) is becoming a more and more important topic in the whole EU. • Both parts, universities and enterprises, must walk together. The proximity of these entities is essential and both of them can take a great advantage of it, because their aims complement in many different ways.

5.6. European Union	
The most important cases of cooperation modes and their interrelations	
Universities:	**Business:**
• Internship programme; • Knowledge transfer - Post-academic courses for people already working in the companies; The managers of Procter and Gamble company provide courses on managerial, communication and presentation skills to ICTP students; • Curricular issues and graduates transition to LM - PhD students working at the faculty once per week, otherwise are employed by a company - at faculty theoretical part, in company a research; A programme includes creation of business plan - firstly, students get 5-days basic course of the principles of tech-transfer and later they make commercial business plan on the topic they are working on; • Research and Development projects and contracts; • Management and governance - faculty of environment and company LentiKats established the Centre of modern biotechnologies - the centre solved many projects focused on clearning of waste water and outcomes are created on the license agreement basis; establishment of institute of molecural and translational medicine based on cooperation between several universities and institutes an companies; creation of Centre for Drug Development; creation of venture funds together with two financial institutions to invest in university spin-off companies	• Curricular issues and graduates transition to LM - Two students were sent to the university that is specialized in company's technology and they are now working in the company. • The company supports the best students with awards and financial support; mandatory traineeships in private and public organizations within certain study programmes.
Significant outcomes from the described cases	
Universities:	**Business:**
• From shared PhD position (part time at the faculty, part time in a company) they have publications; • Reputation and legitimacy of the institution on the relevance of their researches; • Joint conference organisation; • Deeper involvement of experts in teaching; • Focus on students' projects and their public presentation; • Creation of network of cooperation	• No answers

companies/institutions.		
Impact on organizations from university – business cooperation		
	on Universities:	**on Enterprises:**
Improved management approach	2	
Skills match of graduates to the labour market needs	5	2
Facilitated transfer of knowhow and innovation	1	1
Boosted entrepreneurial spirit	2	
Improved teaching methods	2	
Encouraged research, development & innovation	2	1
Attractiveness of programs	2	
Raised competitiveness	4	
Other (please specify):	higher motivation of students to achieve better study results and level of knowledge; understanding the needs of the industry	Prestige and attractiveness as an employer
Priorities in policy regarding university – business cooperation		
Universities:	**Business:**	
• Policy includes standard guidelines on UBC (but they are not really well implemented and well-known throughout the institute); • Establishment of career and employment office and Industry Liaison Office; • Presentation of scientific goals to enterprises and public; • Collaboration in the framework of scientific and commercial research, • Building joint workplaces for applied research; • The Office of Technology Transfer	• Global Head of University Alliances and dedicated departments and programs (university alliances research, group of the chief scientist, academic research centre etc.); • Annual practices to keep the contact with the university.	
University – Business Cooperation models which have developed in the last 10 years		
	In Universities:	**In Enterprises:**
Permanent routes of dialogue between university and businesses	4	2
Student internship programs	5	1
Graduate placement	4	1
Sector skills deficit analysis / forecast	1	
Curriculum development in cooperation with businesses	3	
Joint programs	2	
Continuing education and training	3	1
Knowledge transfer from businesses to university	3	2
Knowledge transfer from university to businesses	4	
Exchange of personnel between university and enterprises		

Research & Development	7	
Joint projects	2	
Business / entrepreneurship centers	1	
Recognition and validation of competences		
Other:	Soft-skills training courses; promotion of development of innovative companies and founding of spin-offs and start-up companies; sharing of modern technologies	Participation in events organised by the university

Key areas of University – Business Cooperation which have to be focused on in the next years

For Universities:	**For Business:**
• Change of the management; • Centralisation of business development managers from several research centres into one department • Extend cooperation; • Help industry to find the best candidates; • Support of the best students by companies; • Practical placement of students during study and thus enhance the possibility of employment of graduates;	• International students internship due to the opening to the world; • Cooperation programmes between Spanish universities and foreign universities in order to be able to recruit employees in other countries; • Organise events to approach knowledge to the university

Key challenges for University – Business Cooperation

According to the Universities:	**According to the Business:**
• HE should be more entrepreneurial, to follow what is happening in business; • Scientists don't have a sense of giving priority to deliver a problem solution for one organisation, but are focusing on journal publications; • Problem of communication between scientists and employers; Companies don't have a need for scientific research, also not equipped. To establish efficient communication between universities and companies; • Lack of flexibility in both sides; • New grants of starting the cooperaiton; • HR policy needs to adapt to pay researchers decent wages for this work	• The gap between applied and basic research; • A company wants to see results in a short time - this doesn't allow much time for proper development; • The lack of knowledge of foreign universities and cultures can be an impediment.

Key factors and drivers for fruitful and long-lasting University – Business Cooperation

According to the Universities:	**According to the Business:**
• Science should appreciate more cooperation with industry; • University staff must be willing to cooperate with companies; • Universities should pay deeper attention to the LM needs and develop adequate study	• Having someone in the company who has a demonstrable track record in academic research; • To keep in contact, have periodic meetings and information shared

programmes.; • Universities and companies need to realise they need each other; • Mutual interest - transfer of knowledge, research and need of graduates; • The win-win principle; • Long-lasting relationships.	
Key changes the two parties have to implement in order to enhance University – Business Cooperation	
Universities:	**Business:**
• Strengthen relations with industry; • Change of habilitation system (not only publications and teaching); Academics don't have time for UBC (there should be more motivation in a formal recognition of UBC as a mean of title progress); • Constant upgrade of curricula and continuous re-evaluation of programmes adjusting to market needs; • Universities should be more open to accept experts from companies; • Both sides more flexible in defining needs and reactions on demand; • Universities should support companies' efforts in R&D and innovation activities; • University management needs to value tech-transfer activities more; • Clarity and transparency is very important for industry (who can sign what, who is responsible for UBC. etc.) • Foster entrepreneurship at universities.	• Culture and expectations regarding what young people and researchers can bring to a company (they are seen as too theoretical); • The enterprises have to be closer to the universities to guide the programmes and important skills that should be developed. • Enterprises should give more information about real projects and technologies they are using.
Common rules and lessons learned from university – business cooperation	
For Universities:	**For Business:**
• Each cooperation is specific and no common rules can be derived; • Models need to adapt to the complexity of each project.	• No answers

Appendix 2: Questionnaires

QUESTIONNAIRE 1: HIGHER EDUCATION INSTITUTIONS		
I.	**Respondent profile**	
1.	**Name**	
2.	**Position**	
3.	**Contacts**	*Email:* *Telephone:*
4.	**Experience**	*Approx. 800 characters including spaces* • *For how many years have you worked in the current position?* • *What is you other work experience?* *How is your current position and work related to university – business cooperation?*
II.	**University profile**	
5.	**University**	*Full title:* *Town:* *Website:*
6.	**Ownership**	*(200-500 characters, including spaces)*
7.	**Short profile**	(1500 characters including spaces) • *year of establishment* • *number of academic units/ faculties* • *number of staff and students,* • *main programmes* *Please focus to the key academic unit the interviewee is attached to: e.g. rector to university, dean to faculty; if needed further in the interview the interviewee should strees to what level/unit answers can be applied to.* *Please attain info on this in advance!*
III.	**University Business Cooperation (UBC)**	
8.	**Does your university have a specific policy regarding university – enterprise cooperation?**	*What are its key priorities and actions?*

9.	**Which models of university-enterprise cooperation have developed in the last 10 years in your institution?**	*(max. 3000 characters)* *Points for discussion:* • *Permanent routes of dialogue between university and businesses* • *Student internship programs* • *Graduate placement* • *Sector skills deficit analysis / forecast* • *Curriculum development in cooperation with businesses* • *Joint programs* • *Continuing education and training* • *Knowledge transfer from businesses to university* • *Knowledge transfer from university to businesses* • *Exchange of personnel between university and enterprises* • *Research & Development* • *Joint projects* • *Business / entrepreneurship centres* • *Recognition and validation of competences* • *Other (please specify)*
10.	**Can you describe cases of University-Business Cooperation that had the strongest impact to your university?**	***Please consider the following aspects:*** *2-3 cases need to be described – please attach link etc. if relevant);* *(approx. 2000 characters including spaces per case)* *For each case, please identify:* • *Rationale and motives;* • *Description of processes;* • *Main outcomes and impact* • *Which levels /personel have been involved?* ***Some modes for inspiration in discussion:*** • *Internships, placement programs, sector skills deficit analysis / forecast,* • *knowledge transfer from businesses to university (products, experiences), business / entrepreneurship research units, recognition and validation of competences)* • ***Curricular Issues and Graduates Transition to LM** (development of programs, lifelong learning, mobility of students and professors, development of particular skills, recruitment programmes and practices, career centers development, …)* • ***Research and Development** (projects, spin offs, sales, …)* • ***Management and Governance** (creation of common bodies, setting new training centers and other institutions, …)* • ***Other issues** (satisfaction with graduates, entrepreneurship, …)*

11.	**Did any other significant outcomes / new initiatives or modes of university – enterprise cooperation evolve as a result of the cases described above?**	*(approx. 2000 characters including spaces per each outcome)*
12.	**Do you believe any common rule can be drawn based on your experience?**	*(approx. 2000 characters)* *What lessons learned (conclusions and recommendations) would you like to share?*
13.	**What is the impact on your HE institution from university-enterprise cooperation?**	*Guiding points:* • *Improved management approach* • *Skills match of graduates to the labour market needs* • *Facilitated transfer of knowhow and innovation* • *Boosted entrepreneurial spirit* • *Improved teaching methods* • *Encouraged research, development & innovation* • *Attractiveness of programs* • *Raised competitiveness* • *Other (please specify):* *(max. 3000 characters)*
14.	**Which are the key <u>areas</u> of university – enterprise cooperation your institution should focus on in the next years, and why?**	*(max. 3000 characters)*
15.	**Which are the key <u>challenges/ impediments</u> for university – enterprise cooperation, and why?**	*(max. 3000 characters)*
16.	**Which are the key <u>changes</u> universities have to implement in order to enhance the university – enterprise cooperation, and why?**	*(max. 3000 characters)*
17.	**Which are the key <u>factors/ drivers</u> of fruitful and long-lasting university – enterprise, according to you, and why?**	*(max. 3000 characters)*
18.	**Are there any other important aspects / questions that you would like to comment on?**	*(max. 3000 characters)* *Please discuss the incentive procedure for the large scale survey.*

Thank you very much for your time!

QUESTIONNAIRE 2: EMPLOYERS		
I.	**Respondent profile**	
1.	**Name**	
2.	**Position**	
3.	**Contacts**	*Email:* *Telephone:*
4.	**Experience**	*Approx. 800 characters including spaces* • *For how many years have you worked in the current position?* • *What is you other work experience?* *How is your current position and work related to university – business cooperation?*
II.	**Organization profile**	
5.	**Company**	*Full title:* *Town:* *Website:*
6.	**Ownership**	*(200-500 characters, including spaces)*
7.	**Short profile**	*(1500 characters including spaces)* • *year of establishment* • *structure, departments,* • *number of employees,* • *main activities, etc.* *Please focus on the key departments the interviewee is attached to: e.g. president/director, head of HR department etc.; if needed further in the interview the interviewee should stress to what level/unit answers can be applied to. Please consider this in advance!*
III.	**University Business Cooperation (UBC)**	
8.	**Does your company have a specific policy regarding university – enterprise cooperation?**	*What are its key priorities and actions?*

9.	**Which models of university-enterprise cooperation have developed in the last 10 years in your company?**	*(max. 3000 characters)* *Points for discussion:* • *Permanent routes of dialogue between university and businesses* • *Student internship programs* • *Graduate placement* • *Sector skills deficit analysis / forecast* • *Curriculum development in cooperation with businesses* • *Joint programs* • *Continuing education and training* • *Knowledge transfer from businesses to university* • *Knowledge transfer from university to businesses* • *Exchange of personnel between university and enterprises* • *Research & Development* • *Joint projects* • *Business / entrepreneurship centres* • *Recognition and validation of competences* • *Other (please specify):*
10.	**Can you describe cases of University-Business Cooperation that had the strongest impact to your company?**	***Please consider the following aspects:*** *2-3 cases need to be described – please attach link etc. if relevant);* *(approx. 2000 characters including spaces per case)* *For each case, please identify:* • *Rationale and motives;* • *Description of processes;* • *Main outcomes and impact* • *Which levels /personel have been involved?* ***Some modes for inspiration in discussion:*** • *Internships, placement programs, sector skills deficit analysis / forecast,* • *knowledge transfer from businesses to university (products, experiences), business / entrepreneurship research units, recognition and validation of competences)* • ***Curricular Issues and Graduates Transition to LM*** *(development of programs, lifelong learning, mobility of students and professors, development of particular skills, recruitment programmes and practices, career centers development, …)* • ***Research and Development*** *(projects, spin offs, sales, …)* • ***Management and Governance*** *(creation of common bodies, setting new training centers and other institutions, …)* • ***Other issues*** *(satisfaction with graduates, entrepreneurship, …)*

11.	**Did any other significant outcomes / new initiatives or modes of university – enterprise cooperation evolve as a result of the cases described above?**	*(approx. 2000 characters including spaces per each outcome)*
12.	**Do you believe any common rule can be drawn based on your experience?**	*(approx. 2000 characters)* *What lessons learned (conclusions and recommendations) would you like to share?*
13.	**What is the impact on your organization from university-enterprise cooperation?**	*Guiding points:* • *Improved management approach* • *Skills match of graduates to the labour market needs* • *Facilitated transfer of knowhow and innovation* • *Boosted entrepreneurial spirit* • *Improved teaching methods* • *Encouraged research, development & innovation* • *Attractiveness of programs* • *Raised competitiveness* • *Other (please specify):* *(max. 3000 characters)*
14.	**Which are the key <u>areas</u> of university – enterprise cooperation your company should focus on in the next years, and why?**	*(max. 3000 characters)*
15.	**Which are the key <u>challenges/ impediments</u> for university – enterprise cooperation, and why?**	*(max. 3000 characters)*
16.	**Which are the key <u>changes</u> companies have to implement in order to enhance the university – enterprise cooperation, and why?**	*(max. 3000 characters)*
17.	**Which are the key <u>factors/ drivers</u> of fruitful and long-lasting university – enterprise, according to you, and why?**	*(max. 3000 characters)*
18.	**Are there any other important aspects / questions that you would like to comment on?**	*(max. 3000 characters)* *Please discuss the incentive procedure for the large scale survey.*

Thank you very much for your time!

QUESTIONNAIRE 3: PUBLIC BODIES		
I.	**Respondent profile**	
1.	**Name**	
2.	**Position**	
3.	**Contacts**	*Email:* *Telephone:*
4.	**Experience**	*Approx. 800 characters including spaces* • *For how many years have you worked in the current position?* • *What is you other work experience?* *How is your current position and work related to university – business cooperation?*
II.	**Institution profile**	
5.	**Institution**	*Full title:* *Town:* *Website:*
6.	**Short profile of the institution**	*(1500 characters including spaces)* • *year of establishment* • *structure, departments,* • *number of employees,* • *main activities, etc.* *Please focus on the key departments the interviewee is attached to: e.g. director, head of department etc.; if needed further in the interview the interviewee should stress to what level/unit answers can be applied to.* *Please consider this in advance!*
III.	**University Business Cooperation (UBC)**	
7.	**Does your institution have a specific policy regarding university – enterprise cooperation?**	*What are its key priorities and actions?*
8.	**Can you describe successful cases of University-Business Cooperation?**	***Please consider the following aspects:*** *2-3 cases need to be described – please attach link etc. if relevant);* *(approx. 2000 characters including spaces per case)* *For each case, please identify:* • *Rationale and motives;* • *Description of processes;* • *Main outcomes and impact* • *Which levels /personel have been involved?* ***Some modes for inspiration in discussion:*** • *Internships, placement programs, sector skills deficit analysis / forecast,* • *knowledge transfer from businesses to university (products, experiences), business / entrepreneurship research units, recognition and validation of competences)*

		• ***Curricular Issues and Graduates Transition to LM*** *(development of programs, lifelong learning, mobility of students and professors, development of particular skills, recruitment programmes and practices, career centers development, …)* • ***Research and Development*** *(projects, spin offs, sales, …)* • ***Management and Governance*** *(creation of common bodies, setting new training centers and other institutions, …)* ***Other issues*** *(satisfaction with graduates, entrepreneurship, …)*
9.	**Which <u>areas</u> of university – enterprise cooperation should be focused on in the next years, and why?**	*(max. 3000 characters)* *Points for discussion:* • *Permanent routes of dialogue between university and businesses* • *Student internship programs* • *Graduate placement* • *Sector skills deficit analysis / forecast* • *Curriculum development in cooperation with businesses* • *Joint programs* • *Continuing education and training* • *Knowledge transfer from businesses to university* • *Knowledge transfer from university to businesses* • *Exchange of personnel between university and enterprises* • *Research & Development* • *Joint projects* • *Business / entrepreneurship centres* • *Recognition and validation of competences* • *Other (please specify):*
10.	**Which are the key <u>challenges/ impediments</u> for university – enterprise cooperation, and why?**	*(max. 3000 characters)*
11.	**Which are the key <u>changes</u> companies and universities have to implement in order to enhance the university – enterprise cooperation, and why?**	*(max. 3000 characters)*
12.	**Which are the key <u>factors/ drivers</u> of fruitful and long-lasting university – enterprise, according to you, and why?**	*(max. 3000 characters)*
13.	**Are there any other important aspects / questions that you would like to comment on?**	*(max. 3000 characters)* *Please discuss the incentive procedure for the large scale survey.*

Thank you very much for your time