

NEW FORMS OF ACADEMIA-BUSINESS COOPERATION FROM ERASMUS+ CBHE PROJECTS

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Summary: *The presumption of any modernization of study programs in higher education is to understand the needs of the community and conduct intensive consultations with community stakeholders, representatives of the businesses, public administration, professional associations and citizens. The success of any study program in the community is therefore largely related to the level of networking, i.e. the achieved cooperation and understanding with the stakeholder representatives. European Union Erasmus+ Capacity Building in the field of Higher Education (CBHE) projects support the modernisation, accessibility and internationalisation of higher education in partner countries. In addition to the main goal, CBHE projects are focused on ensuring the sustainability of new educational content and forms in teaching at academic institutions in partner states. Sustainability assurance is linked to the networking of academic institutions in partner countries with business, public administration and professional association subjects and their inclusion in educational processes at these institutions. Participating in the implementation of several CBHE projects, whether as leaders (BESTSID and GEOBIZ) or partners (SEED4NA and UN4DRR), we have paid special attention to the issue of cooperation between academic institutions and business and public administration subjects, finding new forms of cooperation that will result in a more successful modernization of study programs and ultimately qualifying academic experts who will be better prepared for inclusion in the businesses and public administration by contributing to overall development and prosperity. Conducted research and surveys, elaboration, testing and implementation of new or modified forms of cooperation, as well as new levels of communication were applied in these projects. The intention of this paper is to present activities and solutions aimed at achieving new levels of cooperation and understanding of academia with representatives of the businesses and public administration, as well as to point out obstacles in the realization of this cooperation.*

Keywords: *modernisation of study programmes, business-academia cooperation, Erasmus+ CBHE projects*

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1. INTRODUCTION

Modernization of study programs has always been a challenge for academic institutions, both in the design of new content and in their implementation. Today, the challenge of modernization of study programs is even more pronounced because the speed of change either at the technological or sociological level has accelerated to such an extent that the contents of the subject individually need to be constantly modernized, and the entire study programs modernized in shorter periods of time. The STEM area, which is strongly influenced by the changes caused by the fourth technological (digital) revolution, including geodesy, geoinformatics, construction and geography, is particularly emphasized. In addition to the speed and quantity of changes, a significant proportion of academic institutions do not have their own capacities sufficient to implement these changes so that the gap in the introduction of new technologies and related knowledge and skills between the economy and the academy is widening. That is why academia and the wider community pay special attention to this problem, because the unquestionable fact that adequate education that will meet the needs of the economy is a prerequisite for the progress and prosperity of a particular community, i.e. the state. In addition to investing in science and higher education, an important role in the education of students, i.e. their acquisition of knowledge and skills, is played by the business-academy cooperation. The success of the education system is therefore measured today through investments of the economy in scientific research of academic institutions, i.e. through the level of participation of businesses in the educational process itself.

This is a challenge faced by all countries regardless of the level of development. In Finland has been published a report commissioned by the Finnish Research Impact Foundation on the current state of business-academia cooperation in Finland [1] highlighting the continuing decline in funding from business and industry for research, development and innovation (RDI) activities in the university sector since 2010. The consequence of slowdown of cooperation between academia and industry was clearly highlighted by Riikka Heikinheimo, Director of the Confederation of Finnish Industries who pointed out that "if we can't find the time to build up interaction and trust, then we also won't find the time to align the true needs of business development with the agenda of academic research. This will frustrate both sides and cause them to drift apart" [2]. In less developed countries, such a level of awareness of the importance of business-academy cooperation has not been developed so that the challenges of modernization of study programs and establishment of business-academy cooperation are even more pronounced.

2. ERASMUS+ CBHE PROJECTS

Erasmus+ is the European Union's (EU) programme to support education, training, youth and sport. The Programme is made up of three so-called "Key Actions" (Mobility, Cooperation and Policy) two additional actions (Jean Monnet and Sport). They are managed partly at the national level by National Agencies and partly at the European level by the EACEA. The importance attached by the EU to the Erasmus+ programme is

best seen in the number of participants and funding earmarked for the programme. Thus, in the financial period 2014-2017, the EU planned the participation of 4 million participants in all forms of Erasmus+ activities, allocating 14.7 bil. € for this purpose [3], while 12 million participants are planned to participate for the 2021-2027 financial period, for which 24.7 bil. € has been secured [4]. In the frame of Key Action 2: Cooperation for Innovation and Exchange of Good Practices Cooperation activities focused on addressing capacity building, modernization of education and business-academia cooperation are Sector Skills Aliances (SSA) and Capacity Building in the field of Higher Education (CBHE) projects. While SSA aim inside EU to tackling skills gaps with regard to one or more occupational profiles in a specific sector, the CBHE projects aim to encourage cooperation between the EU and Partner Countries and support eligible Partner Countries in addressing challenges in the management and governance of their higher education institutions. This includes improving the quality of higher education, developing new and innovative education programmes, modernising higher education systems through reform policies as well as fostering cooperation across different regions of the world through joint initiatives [5]. CBHE projects were initially designed as a platform for knowledge transfer and modernization of study programmes in Partner Countries between EU and Partner Countries academic institutions. However, recognizing that there is no successful implementation of modernized study programs without establishing cooperation with the business sector, CBHE projects further emphasized the need for business-academy cooperation and from year 2020, beside academic institutions also companies are enabled to be partners on this projects, giving them a new dimension.

Faculty of Geodesy University of Zagreb is since 2017 involved in four Erasmus+ CBHE projects either as project coordinator or as a partner institution. Those projects are covering modernization of study programs in field Spatial Data Infrastructure (SDI), GIS, Earth Observation (EO), Disaster Risk Reduction (DRR) and technologically driven courses in field of geodesy, geoinformatics, geography and agriculture. The overview Faculty of Geodesy CBHE projects is given in table 1.

Table 1. Faculty of Geodesy CBHE projects

Project	Region	Field of modernization	Time frame
Western Balkans academic education evolution and professional's sustainable training for spatial data infrastructures (BESTSDI)	Western Balkan	SDI	2016-2019
Business driven problem-based learning for academic excellence in geoinformatics (GEOBIZ)	Western Balkan & Moldova	Technologically driven courses (EO, GNSS, Laser, GIS)	2019-2022
SDI & EO Education and Training for North Africa (SEED4NA)	North Africa	SDI and EO	2020-2023
University Network for Disaster Risk Reduction and Management in Indian Ocean Rim (UN4DRR)	Indian Ocean Rim	EO and GIS for DRR	2020-2023

3. GOVERNMENT-ACADEMIA COOPERATION

From the perspective of these professions, as well as many others, there are three main groups of stakeholders that contribute to the development of the profession, thereby higher education, the business, the state and public, and academic sector. For academia, more broadly, both stakeholder groups, the business and the state and public sectors represent business partners. Therefore, depending on the field of modernization of study programs, the focus is on the development of business-academia cooperation of individual projects on a different group of stakeholders. As part of the BESTSDI project, which aimed to introduce SDI into partner university study programmes, a comprehensive analysis of stakeholder needs was initially carried out, which showed that in the establishment of SDI, the dominant partners are representatives of the state and public sector who are also the holders of its establishment, while the academic and business community are in the partner countries relatively passive participants [6]. That is why the project paid particular attention to raising awareness among all stakeholder groups of their role in building national, regional and local SDI's, as well as the need for all stakeholders to actively take their role in the process and contribute to the SDI establishment. Of course, the special focus was on partner universities and profiling their role.

Therefore, activity to inform SDI stakeholders, raise their awareness about SDI stakeholders at national levels and establish cooperation has been designed and implemented. This activity included affirmative informing of stakeholders using online newsletter what took place during whole project lifetime and even beyond it. Newsletters were used to promote SDI, role of stakeholder groups and animate them to join the cooperation in introducing SDI courses in higher education in partner countries. Second activity was preparation and dissemination of annual national SDI reports for Albania, Bosnia and Herzegovina, Kosovo, Montenegro and Serbia. Three annual reports have been prepared, a total of 14 of them, and they provided, for the first time, view of academic institutions on SDI establishment in their countries. Those reports aimed to establish and strengthen cooperation among the stakeholder groups. The achieved effect was better understanding between academic and governmental sector representatives and resulting in several cooperation agreements between academic institutions and governmental organizations. Also, new type of SDI events has been introduced, like Joint IMPULSE – BESTSDI projects workshop “SDI education for stakeholder’s benefit” organized in Banja Luka on April 16th – 17th, 2018 or 1st SDI Day in Federation of Bosnia and Herzegovina organized in Mostar on September 6th, 2018. The results of mentioned project efforts were investigated in a survey on business-academia survey on needs and cooperation in field of SDI, which took place at the end of the project lifetime [7]. The survey has indicated positive effects of conducted activities and growing interest for SDI in Partner Countries.

Rather similar, but not identical, approach is under development in frame of two new projects, SEED4NA and UN4DRR. In SEED4NA the SDI and EO courses introduction and modernization in the project focus. Therefore, in SEED4NA a combined cooperation approach, towards governmental and public stakeholders for SDI component, and towards business stakeholders for EO component is under development. Unlike the SEED4NA project, the UN4DRR project focuses on cooperation with state and public

stakeholders involved in disaster protection and rescue systems as well as NGO's active on such occasions. Both projects will therefore, using also BESTSDI and other projects experience, develop a model of cooperation that best matches the issue covered by the project and the specifics of each of the countries covered by the projects.

4. BUSINESS-ACADEMIA COOPERATION

GEOBIZ project deals with rapid technological changes and the related challenge of their up-to-date introduction into the study program in geodesy, geoinformatics, civil engineering, agriculture and others. Since universities are independently unable to modernize classes at the required speed, business-academia sector cooperation is logically imposed as a solution to this situation. In order to find innovative solutions that will be developed through business-academia cooperation within the framework of the project, two studies have been produced. Business and Users Needs Survey Analysis [8] in Partner Countries and Business-Academia Cooperation Best Practices Study [9], which pooled best practices from programme (EU) countries. The idea behind the approach is to involve business partners in development of problem based business driven cases which will be introduced in practical part of technologically driven courses covering applications related to GIS, GNSS, EO, Laser scanning and sensor integration which will after introduction be further upgradable by students supported by teachers and in cooperation with businesses. Since business-academia cooperation is one of the objectives of the project, beside 15 academic institutions also 3 companies from Albania, Bosnia and Hrzegovina and Serbia are project partners. The task of partner companies on the project is to contribute to the development of cooperation and innovative solutions from a business perspective, as well as to contribute to the development of cases that will be business driven.

The first step in preparing the cooperation was to identify and develop innovative business driven problem based cases [10] as the result of need assesment analysis [8], which were then systematized and shaped into 24 units covering all identified cases. The next step is a detailed elaboration of defined cases into practical tasks that will be implemented in modernized courses at partner universities. In parallel, based on collected best practices of business-academia cooperation the GEOBIZ business-academia cooperation platform is under development. Since the project goal is to include as many economic entities as necessary in this cooperation intensive communication with identified companies is ongoing and ultimately business-academia workshops will be held during second year of the project lifetime at which cooperation, based on mentioned platform, with interested companies should be formalized and launched. Strong interaction and workflow of mentioned activities together with implementation of developed cases in the partner universities study programmes and their execution in the third year of the project lifetime is shown in Figure 1.

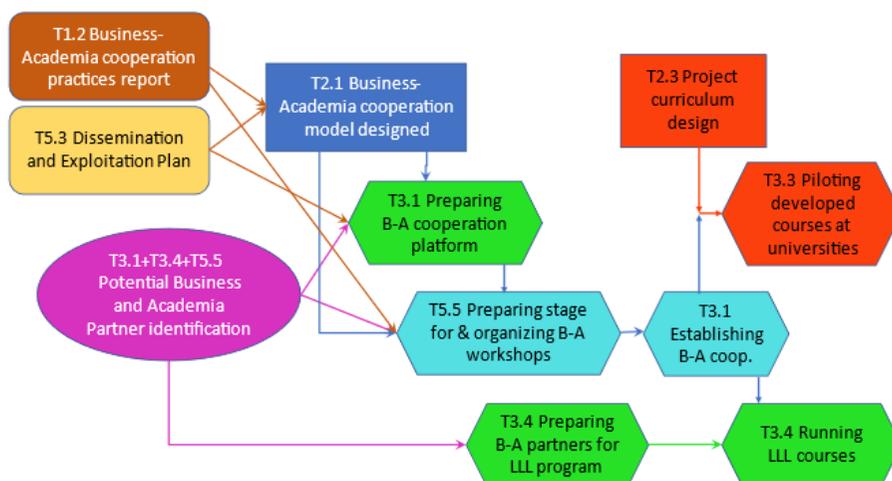


Figure 1. Business-academia cooperation activities workflow

Foreseen final project result of all listed activities should be introduction of modernized technology driven courses at partner universities and set of Long-life learning (LLL) courses delivered to the stakeholders. Also, developed cases and courses will be loaded in the project repository enabling continuous upgrade of cases and courses. Repository should also enable access to interested stakeholders and use of developed content.

5. CONCLUSION

Importance of business-academia cooperation for modernization of technology driven courses in several fields of STEM area has been elaborated and shown how Erasmus+ program Key action 2 CBHE projects can be used to establish or strengthen this cooperation. The content and form of cooperation depend primarily on the field of modernization of study programs and which group of stakeholders can optimally contribute to the development of curricula and its implementation in universities. Attention should always be paid to local specificities, such as the organization of higher education systems, the relationship between the public and private sectors and the potential of each stakeholder group. However, establishing business-academic cooperation through Erasmus+ CBHE projects is a demanding and complex task that must consider a number of factors and be realized in a relatively short time, which is evident in the examples presented. Nevertheless, well-conceived and implemented activities of establishing business-academic cooperation enable the realization of modern and advanced study content, which ultimately results in better educated professionals who will be able to better contribute to the development of the business sector and the well-being of the community.

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NOVI OBLICI SURADNJE AKADEMSKE I POSLOVNE ZAJEDNICE IZ ERASMUS+ CBHE PROJEKATA

***Rezime:** Pretpostavka svake modernizacija studijskih programa u visokom obrazovanju je razumijevanje potreba zajednice i provedba intenzivnih konzultacija sa subjektima u zajednici, predstavnicima gospodarstva, javne uprave, profesionalnih udruženja i samih građana. Uspjeh bilo kojeg studijskog programa u zajednici povezan je zato velikim dijelom s razinom umrežavanja, odnosno postignute suradnje i razumijevanja s predstavnicima subjekata. Erasmus+ projekti Europske unije izgradnje kapaciteta u području visokog obrazovanja (CBHE) podržavaju modernizaciju, dostupnost i internacionalizaciju visokog obrazovanja u partnerskim državama. Pored glavnog cilja, CBHE projekti su fokusirani na osiguranje održivosti novih obrazovnih sadržaja i oblika u nastavu na akademskim institucijama u partnerskim državama. Osiguranje održivosti povezano je s umrežavanjem akademskih institucija u partnerskim državama sa subjektima gospodarstva, javne uprave i profesionalnih udruženja te njihovog uključivanja u obrazovne procese na tim institucijama. Sudjelujući u provedbi više CBHE projekata, bilo kao voditelji (BESTSID I GEOBIZ) ili partneri (SEED4NA i UN4DRR),*

pitanju suradnje akademskih institucija sa subjektima iz gospodarstva i javne uprave posvetili smo posebnu pažnju, iznalazeći nove oblike suradnje koji će rezultirati uspješnijom modernizacijom studijskih programa i u konačnici osposobljavanjem akademskih stručnjaka koji će biti bolje pripremljeni za uključivanje u gospodarstvo i javnu upravu doprinoseći svekolikom razvoju i blagostanju. Provedene istraživanja i ankete, razrada, testiranje i implementacija novih ili modificiranih oblika suradnje, kao i nove razine komunikacije primijenjene su u navedenim projektima. Namjera je ovog rada predstaviti aktivnosti i rješenja usmjerena postizanju novih razina suradnje i razumijevanja akademske zajednice s predstavnicima gospodarstva i javne uprave, kao i ukazati na prepreke u realizaciji te suradnje.

Кључне ријечи: *modernizacija studijskih programa, gospodarsko-akademska suradnja, Erasmus+ CBHE projekti*