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BARRIERS AND BENEFITS OF UNIVERSITY-BUSINESS COOPERATION IN UKRAINIAN INNOVATION SECTOR

Summary. The article presents the most popular ways of university-business cooperation (UBC) in innovation technology area of Ukrainian science. The general barriers and key benefits of such a type of cooperation in Ukraine are discovered. To do this, we considered the existing theoretical and practical UBC approaches, and provide the analysis of UBC conditions in Lviv. The representatives of both sides of partnership relations are interviewed. To fulfil the presented work, a comparative analysis between Ukrainian, EU countries, and other developed countries in UBC sector is made. Afterward, the model of the partnership relations with university value estimation, and the general steps for choosing development strategy for the company are proposed in the article.

Keywords: university-business cooperation, partnership relations, innovation, science, education process.

Formulation of the problem. Periodic reports of the European Union (EU) forums pay particular attention to the problem of the UBC in different countries of all over the world. The most popular presentations, speeches, and discussions are presented at University-Business Forums held in Rome on 2-3 October 2014 [1], in Stockholm on 19–20 March 2014 [2], in Warsaw on the 27th November 2013 [3]. But still, the partnership relations between university and business are not totally developed in EU and Ukraine. According to World Economic Forum, the level UBC in Ukraine is no more than 3.5 among 7 [4].

In order to coordinate the UBC development in Ukraine, the special events, forums, and programs were created. The TEMPUS Project “National Education Framework for Enhancing IT Students’ Innovation and Entrepreneurship” and Horizon 2020 united a lot of national and EU universities. The tasks of such programs are: to increase scientific and practical recommendations to the UBC development. At the same time, for the development of UBC in Ukraine it is necessary to define the barriers and to estimate forms of cooperation.

Analysis of recent research and publications. Due to the importance of UBC problems Ukraine, especially in technological sector, there are numerous researches appeared last years. Materials concerning the role of UBC for university renovation, transfer of technologies, successful collaborations between industry and university are presented in scientific works of D. Rudenko [5], G. Edmondson [6], H. Gogl, C. Schedler [7], J. Dankiv, M. Popovych, Yu. Voloshyna [8] and others.

The role of government in university development is shown in works of T. Bogolib [9]. Approaches for international cooperation among universities are shown in papers, written by T. Obolenska [10].

Separation of previously unresolved parts of the common problem. Development of UBC takes place in researches of scientists from different scientific areas. But still, there are a lot of

open questions concerning the methodology of cooperation analysis. Thus, it is reasonably to research status of UBC, its barriers, opportunities in innovation sector.

Purpose of the article is to analyze the status of UBC in Ukrainian environment and compare it with EU countries, to identify key barriers concerning its development, to categories the main forms of UBC in innovation sector and to propose the model of UBC value estimation and general steps for choosing future development strategy for IT companies.

Presentation of the main material of the study. The information and communication technology evolution, globalization processes, education transformation and knowledge-based-economy have led to a powerful growth of partnership relations between industry and university worldwide. The potential of such cooperation is huge: local arrangements can lead the growth of regional economy development. There is an enormous economic literature estimating the impact of UBC on society.

For more than 26 years, many Ukrainian leaders, politicians and academic representatives have high interest in mutual cooperation and common research between their companies and universities. This interest is built on good quality impact on economy and education situation in EU countries [11]: improved teaching methods, increased cross-disciplinary researches, the growth of research activity, high employment of population and stability on the labor market, the growth of innovation activity, development of national industry etc. We should add that The European Commission is working strictly with the regions and member countries to support new forms of cross-border, cross-discipline and cross-sector cooperation that will help modernize education in Europe [1; 2].

As it was mentioned the level of UBC of Ukraine is approximately 3.5 among 7. In some EU countries it is much higher. For comparison, in high developed Belgium it is 5.58; in Finland – 5.97; in Switzerland – 5.79; in Sweden – 5.33; in Norway – 5.02; in Holland – 5.38 [4].

The Ukrainian position is close to eastern EU countries, but in compare with high developed countries the level of UBC is low. That is why it is necessary to pay more attention for the UBC improvement. Such cooperation has an important influence on territory development and society.

Among the key contributions that universities make to economic growth in the knowledge-based economy are the performance of research and the training of highly qualified personnel, both of which are sustained by networks and social interaction; universities act both as a primary source of “knowledge workers”, as well as the key factor of production – knowledge itself [12].

The target groups of university – business cooperation are students, academics, business, universities, society and economy of the country in general (table 1).

Table 1

UBC development benefits

№	Group	Explanation
1.	Students	High level of received education, matching the received knowledge to the needs of employers
2.	Business	Innovation activity, marketing, improved performance of business
3.	Universities	Modernized equipment, high graduate employment, better reputation of Universities
4.	Academics	Modern training programs, financial support for research projects
5.	Society	Labor market stability, improved education level of graduates
6.	Economy	Economics' development, competitiveness on the global market, growth of GDP, industry development

Source: based on [11]

As seen from Table 1, the positive impact of UBC may be realized on territory environment through different, direct and indirect, ways.

Finally, a university is often one of the biggest businesses in a city or region, with a number of different responsibilities to the local community [12].

East European countries, members of EU (Poland, Slovak Republic, Romania, Hungary), have started implementing different steps for improving UBC and lead innovations. The most common of them are: creating the entrepreneurial mindset among students, improving intellectual property rules, support students' and academics' mobility, initiate new academic partnerships with other universities and not only, support different innovation projects, support entrepreneurship among students, implement Erasmus+ and Horizon2020 projects [1; 2; 3].

It should be noted that for the effective UBC development in Ukraine some barriers should be overcome. In order to study key barriers of the partnership between university and business, it is necessary to analyze their separate groups. We identified 4 main groups (Fig. 1):

- institutional and legal barriers (laws, regulations, rules etc.);
- economical (inflation rate, unemployment rate, GDP index);
- education and scientific (spending on education, educational level of graduates, the rate of education institutes, number of research projects in national and international frameworks);
- socio-cultural (the attitude towards education, technology transfer, cultural differences etc.).

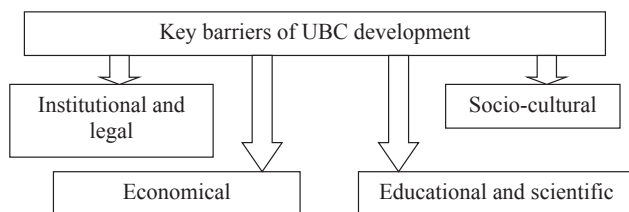


Fig. 1. Main groups of cooperation development barriers between company and university

Source: authors

For the analysis of the generalized barriers, we interviewed representatives from both sides. To assess the major barriers concerning the development of cooperation with universities the method of

expert evaluation on the basis of the existing application was used. One of the most common problems – information and coordination, joint project exposed the negative impact of external bureaucratic procedures.

Representatives identified the next main UBC barriers: 1) lack of government strategy of partnership “enterprise – university”; 2) inadequate regulatory – legal framework, lack of public policies that can support development of cooperation for enterprises and reforms of the law in education; 3) high levels of bureaucracy and lack of universities’ financial independence; amendments to academic programs take a lot of time; 4) different values, product types, speed of adaptation to market conditions, new standards of higher education in IT; 5) financial aspects; the impact of the economic crisis on the state of science, education, distribution of state orders; 6) lack of information about the possibilities of cooperation with universities, poor organization of the Career Centers.

There are eight main types of UBC in EU: collaboration in R&D, academic mobility, student mobility, commercialization of R&D results, curriculum development, lifelong learning, entrepreneurship, and governance [11].

Large firms are often self-supporting with regard to R&D while small (technology-based) firms are often highly dependent on external sources of research. Therefore, as the diffusion of knowledge proliferates, it is usually high-tech and startup firms that tend to cluster around universities [12].

As a result of UBC followed by innovative companies, we observed the different forms of popular partnership relations in Lviv: creation educational laboratories, conducting practicum for students, providing courses, educational lectures in universities, creating collaboration in research field, developing education courses, organizing support for student initiatives, competitions, Olympiads etc. (table 2).

As seen from Table 2, there are some, not very major, differences between chosen forms of UBC. On the basis of the results of separating forms of cooperation, it is possible to conclude that the most popular ways of cooperation are conducting practicum for students and providing courses, educational lectures in universities.

In general, for evaluating the value of partnership relations with universities can be used the special model (Fig. 2).

The creation of this model will provide solutions to many system problems and help to use the partnership with education institution for business development. We consider that the system of indicators should be balanced and optimal. The general steps for choosing future development strategy for company may include next.

- 1) Formation of a working group at the company;
- 2) Determining the goals and objectives of developing partnership relations with universities;
- 3) Gathering information on the state of partnership relations with universities;
- 4) Conducting assessment and calculation of integral indicator of the value of partnership relations with higher educational institutions for the company;
- 5) Determining of the level of the relationship between the company and the university;
- 6) Choosing the strategy;
- 7) Approving and implementing of the chosen strategy.

The creating cooperation with the universities can have some risks for business: problems with coordination, project management, people management and information distribution; time lost on bureaucracy procedures; lost of ownership or incorrect commercialization of the common research results; market risks.

Cooperation between innovative IT companies and universities in Lviv

Forms of cooperation	Innovative IT companies									
	1	2	3	4	5	6	7	8	9	10
Creation educational laboratories	*	-	*	*	-	*	*	-	*	-
Conducting practicum for students	*	*	*	*	*	*	*	-	*	*
Providing courses, educational lectures in universities	*	*	*	*	-	*	-	-	*	-
Creating collaboration in research field	-	-	-	-	-	-	*	*	-	-
Developing education courses	-	-	*	-	*	-	*	-	-	-
Organizing support for student initiatives, competitions, Olympiads	-	*	*	-	-	*	-	-	*	*
Taking active part in education committee "IT of Ukraine"	*	-	*	*	-	-	-	-	-	-
Taking part in Lviv IT Cluster	*	*	*	*	*	*	*	-	*	*

1 – EPAM Systems, 2 – Eleks, 3 – SoftServe, 4 – Global Logic, 5 – Ostware Services, 6 – Sigma Software, 7 – Cypress MicroSystems, 8 – CEA Electronics, 9 – DataArt; 10 – Ciklum.

Source: authors

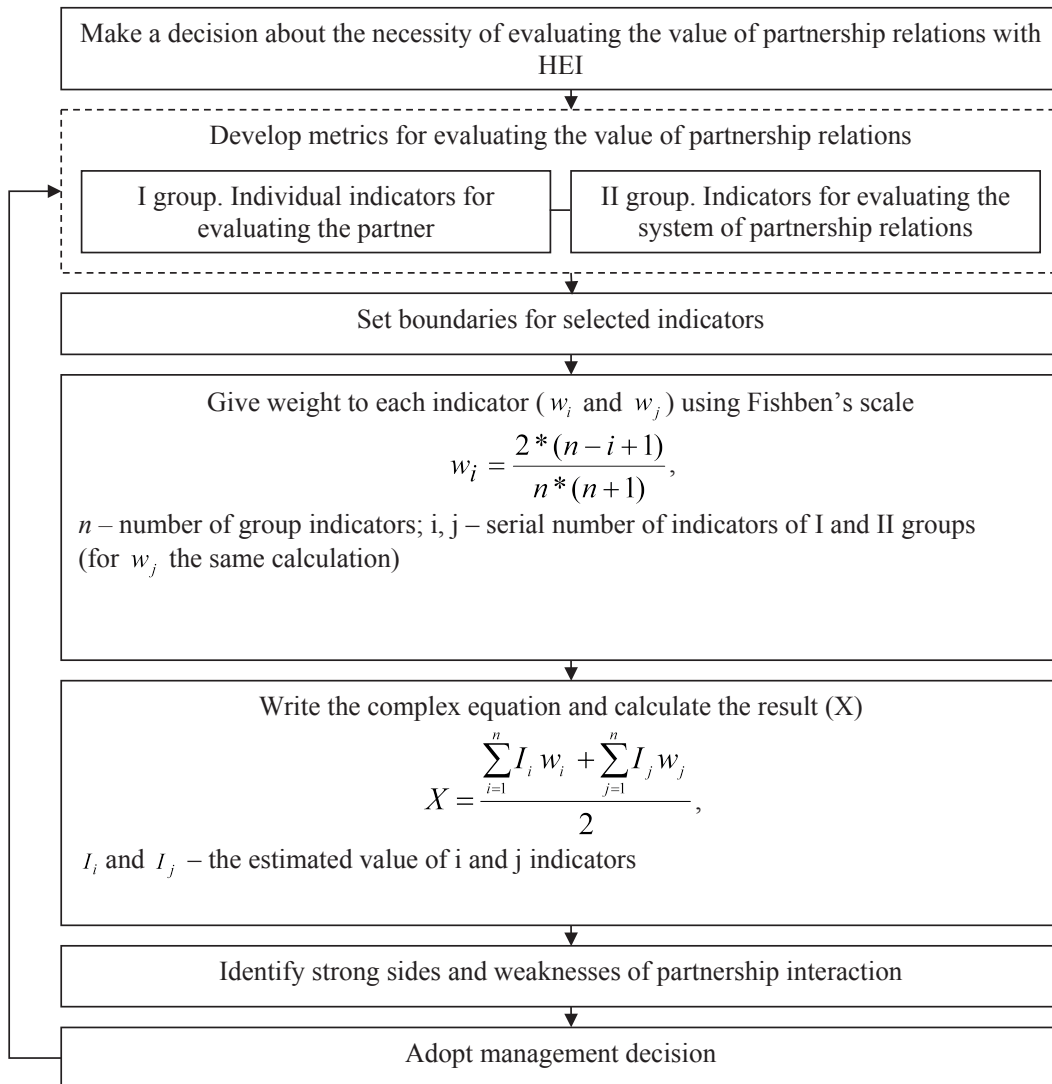


Fig. 2. The model of value of companies' partnership relations with universities estimation

Source: authors

Nowadays universities in Lviv have strong connections with successful business partners in different scientific areas: electronics, information and communication systems, information technology, computerized automatic systems, biotechnology, mechanical engineering, automated control systems, automation and instrumentation engineering, architecture and construction, management and administration and others. Although Ukraine is taking steps for improving UBC, but they are still far from ideal. We continue having in these area understatement mutual expectations of business and science. However, a partnership between university and business is a great challenge that is necessary to accept.

Conclusions. The experience of EU countries shows that the UBC has a powerful impact on different target groups: students, academics, universities, business, society, and economics. Unfortunately, the level of such cooperation in Ukraine is low and needs development and government reforms.

Based on an expert analysis of main barriers we have introduced the key barriers of UBC: high level of bureaucracy and lack of universities' financial independence; the impact of the economic crisis on the state of science and education; lack of government strategy of partnership "enterprise – university".

UBC forms analysis has enabled us to identify the most popular forms of UBC in innovation sector (creation educational laboratories, conducting practicum for students, providing courses, educational lectures in universities).

For evaluating the value of partnership relations of enterprise with universities can be used the special model, that includes next steps: make a decision about the necessity of evaluating the effectiveness of partnership; develop metrics for evaluating the effectiveness of partnerships; set boundaries for selected indicators; give weight to each indicator; write the complex equation and calculate the result; identify weaknesses and threats of partnership interaction; adopt management decision.

The results of this research can be used for the improvement of UBC and for the development government education strategies.

Changes in UBC increase both local and global questions in Ukrainian and worldwide scientific society. Thus, the item of UBC becomes the base of research. In further studies is planned to provide approbation of the methodic of choosing the strategy for UBC development on the enterprise, which will be based on estimation model presented in the article.

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Чухрай Н.І., Щербата Т.С. Бар'єри та переваги співпраці між підприємствами та університетами в інноваційному секторі України

Анотація. У статті відображено найбільш популярні способи взаємодії між бізнесом та університетами в інноваційному секторі України. Проаналізовано основні бар'єри розвитку взаємовідносин та переваги взаємодії для різних дотичних груп. Для реалізації цього аналізу було розглянуто теоретичні підходи та практичні засади співпраці між підприємством та ВНЗ. Також в статті представлено порівняння стану розвитку партнерських відносин між підприємствами та університетами України, Європейського Союзу та інших розвинутих країн світу. Стаття містить модель оцінювання цінності партнерських відносин з ВНЗ для виявлення сильних та слабких сторін та порядок вибору стратегії розвитку партнерських відносин для підприємства.

Ключові слова: співпраця між підприємствами та ВНЗ, партнерські відносини, інновації, наука, навчальний процес.

Чухрай Н.И., Щербатая Т.С. Барьеры и преимущества сотрудничества между предприятиями и университетами в инновационном секторе Украины

Аннотация. В статье представлены наиболее популярные способы взаимодействия между бизнесом и университетами в инновационном секторе Украины. Проанализированы основные барьеры развития взаимоотношений и преимущества взаимодействия для разных соприкасающихся групп. Для реализации данного анализа были рассмотрены теоретические подходы и практические основы сотрудничества между предприятием и вузом. Также в статье представлено сравнение состояние развития партнерских отношений между предприятиями и университетами Украины, Европейского Союза и другими развитых стран мира. Статья содержит модель оценивания ценности партнерских отношений с вузом для определения сильных и слабых сторон и порядок выбора стратегии развития партнерских отношений для предприятия.

Ключевые слова: сотрудничество между предприятиями и вузами, партнерские отношения, инновации, наука, учебный процесс.