COMPARATIVE ANALYSIS OF UNIVERSITIES - BUSINESS INTERACTION MODELS IN THE ARCTIC ZONE AND EUROPEAN COUNTRIES

Svetlana Sigova, Alexandra Kekkonen

Petrozavodsk State University (RUSSIAN FEDERATION)

Abstract

Activation of mutually beneficial cooperation between universities and business is an important area of regional development in a fast growing economy and globalization processes, where one of the development drivers is the technology and the results of scientific and technological progress. This issue becomes especially important in the Arctic zone considered as a promising region within the global economy and needed of additional incentives and resources for the development of the fullest possible use of existing capacity.

The article presents the results of a study based on surveys conducted in European countries (Bulgaria, Hungary, Poland, Slovenia, Spain and other), including Arctic countries. Another active participant in the survey was Russia - its northern regions.

The main method of study was in-depth interviews with leading employers from different countries. The aim of the study was to identify and summarize best practices of university business partnerships, identify barriers and drivers of such cooperation, understanding the benefits of bilateral cooperation, the study of the situation "from within" - trying to understand the employers' opinion about the prospects of cooperation with universities.

The study allowed generalizing the experience of universities - businesses interaction in Europe, highlighting features of interaction in the Arctic zone. The most interesting examples of the interaction were observed in Finland (for example, the University of Turku), Sweden, by the example of the Baltic University, as well as in Denmark (Aalborg University).

Keywords: University-business cooperation, Arctic zone, interaction models.

1 INTRODUCTION

In a fast growing economy and globalization processes, where one of the drivers are the development of technology and the results of scientific and technological progress, an important area of regional development is the activation of mutually beneficial cooperation between universities and business. Especially important this issue becomes in the Arctic zone, considered as a promising region within the global economy and the need of additional incentives and development resources to fully utilize the existing potential.

Currently, there are a number of studies that describe the most effective ways of collaboration between universities, business and government. The role and status of the university, as subjects responsible for the development of new knowledge, their new features and increased interaction with industry and government is more fully described in the framework of a triple helix. The thesis of the "triple helix" states that the university can play a more active role in the field of innovation especially in the framework of the formation of the knowledge economy. In addition, researchers set a number of classifications to describe interaction models of universities and business, among which are the groups of activities in accordance with the geographical factor, the volume of links, the type of commercial relations, according to the method of production of new knowledge. At the same time, copying of best practices and attempts of its practical implementation faces with various organizational obstacles, legal and even psychological in nature, which differ among countries, and in certain regions within the same country.

The article is based on practical research of interaction of education and business that has been carried out in the course of the survey, conducted in countries EMCOSU (Bulgaria, Hungary, Poland, Slovenia, Spain) and in other European countries (non EMCOSU) with the participation of Russia in 2014. The research allows to compare data in the groups of countries: EU countries, Arctic zone countries and Russia North regions.

2 INTERACTION OF UNIVERSITIES AND BUSINESS: THE THEORETICAL POSITION

Currently, there are a number of studies that describe the most effective ways of collaboration between universities, business and government.

Interaction of universities and business is not a one-way process, where the main role is played by the university as knowledge generator. Interaction with business entities providing higher education institutions have more opportunities for development, opening up before them the problems and demands of practice, allowing you to get feedback on their own work and the ability to implement existing development within the production cycle. Businesses, in turn, gains access to relevant research materials, scientific and technical potential of universities, the opportunity to reduce their own costs of research and development and maintenance of internal research centres due to the transfer of their functions to universities [1].

Initially, from a theoretical point of view, cooperation of universities and the business seemed like the transfer of knowledge and technology, and has been described in terms of "market demand" or "technological breakthrough". At present, this understanding does not explain the existing order of things. Norms and rules have changed and need to develop new strategies to respond to market demand and to promote technology through new institutional mechanisms.

Presentation of the role and status of universities as actors responsible for the creation of new knowledge, their new features and increased interaction with industry and government more fully set forth in the framework of a triple helix, developed by the authors H. Etzkowitz and L. Leydesdorff [2]. "Triple Helix" as an analytical model brings new meaning to the description of the various institutional mechanisms and political models, explaining their dynamics.

The thesis of the "triple helix" states that the university can play a more active role in the field of innovation, especially in the framework of the formation of the knowledge economy. Historically, when the role of the military has declined, and the role of scientific communities increased in the institutional structure of modern society, a network of relationships between institutions, industry and the government has also been transformed. Since science and technology have become important elements of economic development, their impact can be analysed in terms of market relations. Not surprisingly, that the consequences of these changes are the subject of international debate about the appropriate role of the University in the transfer of technology and knowledge.

As noted earlier, in the EU, as well as in other countries, there is no single approach for real interaction between universities and enterprises [3]. The existing monitoring and research in this area shows that there are the following main points of interaction [4]:

- Through the hiring of graduates (as a labour provider);
- As a "customer" for lifelong learning (LLL) / continuous training;
- As a provider of research and development (R & D);
- As a player in various economic networks and partnerships related to the development are usually publicly funded (UK government, the EU, etc.).

3 MODEL AND EXPERIENCE OF COOPERATION IN THE ARCTIC ZONE COUNTRIES

3.1 Denmark

Consider the experience of AALBORG UNIVERSITY Denmark.

Aalborg region has historically adopted a regional development approach to growth: for the university, there is little help from the national government for third stream activities. AAU has played a significant role in Aalborg's regional development by becoming embedded in the region as a driver of change. This entails collaboration with regional and Danish educational institutions as well as the creation of consortia and collaboration networks with national and international universities. It is AAU's aim to become the central institution for constructive collaboration with local institutions and business partners to enhance competence and business development.

AAU has three missions: problem-based learning, interdisciplinary, and innovation. AAU's definitions of all three missions mention the importance of an external approach.

University Business Cooperation is embedded in the missions of the university. UBC is approached as a long-term goal. An innovative teaching and learning method, 'Problem and Project Based Learning' (PBL) fosters innovation and cooperation with industry. Several Danish evaluations show that Aalborg University, compared with other Danish institutions, has the highest retention rates and one of the highest percentages of students finalising their studies on time. A study by The Confederation of Danish Industry in 2008 revealed Aalborg University as the Danish corporate world's preferred business partner in research and development projects. The network model and regional development approach generates interaction between the business community and researchers through various institutions at AAU such as the Network Centre. There are about 30 networks with approximately 3000 members.

Aalborg has historically adopted a regional development approach to growth. The number of innovative companies, the number of innovations, private sector research, and educational level are all below the national average. The industrial structure is dominated by small and medium enterprises, 97 per cent of the business community in Northern Jutland. A high technology environment is burgeoning around the university in the following sectors: information and communication technology, electronics, health science technology, biotechnology, nanotechnology and materials technology. The IT sector in particular forms the third largest industrial concentration in Denmark.

The university's approach is best described as a regional development approach. A network model generates interaction between the business community and researchers through various institutions at AAU such as the Network Centre. There are about 30 networks with approximately 3000 members. According to the university, collaborating with businesses creates positive internal competition. In order to compensate for the lack of national third stream funding the university provides internal incentives for such activities. The university establishes trust with local businesses in order to network with them. According to interview participants, the recession has not actually hurt the university business collaboration. When times were good, businesses stated that they are too busy too cooperate. When times are bad, they state they don't have enough money. AAU takes the approach that generating trust is the best means of consistently engaging with industry, and for this reason employs a longterm perspective and approach to university business cooperation.

3.2 Finland

Consider as an example the interaction experience of the University of Turku.

The University of Turku, established in 1920 in South-western Finland, is the second largest university in the country as measured by student numbers: there are approximately 21,000 students out of whom 16,000 are degree students, 2,500 post-graduate students and 2,500 visiting students. The University awards 1,000-1,500 Master's and Bachelor's diplomas and 140 doctoral degrees annually. The largest faculties are the Faculty of Humanities and the Faculty of Mathematics and Natural Sciences.

In the recent reorganisation of higher education in Finland, the University of Turku merged with Turku School of Economics (TSE). The majority of the university's graduates do not enter industry, but are employed by municipal agencies and institutions and by central government.

Project and Innovation Services is part of the central administration of the University, under the direction of the Rector. It has a staff of nine in full-time equivalent out of which the wage of a colleague is funded by the Foundation of Finnish Inventions. The unit provides back-offices services to the University's research and other externally funded activities. They provide advice, help with the project application procedures, and support during the execution of the projects. Furthermore, the unit promotes the exploitation and utilisation of the research results generated at the University. There are many funding sources available nationally supporting the exploitation of research results, which is considered a key challenge area in Finland:

- TULI Programme funding by Tekes, which targets researchers, research groups and students by offering funding for the exploration of potential business ideas of three different development phases
- Funding by the Foundation of Finnish Inventions that supports the generation of new start-up companies
- Funding provided by the Government Office supporting the establishment of new start-ups

- The Protomo project which is jointly funded by SITRA, the TE-Centres, the participating cities and organisations is a multidisciplinary project that aims to create business opportunities and jobs based on new innovations or service concepts

The innovation related activities of the unit also cover patenting and licensing, regulated by the University Inventions Act (1st January 2007) and since the University Act entered into force the establishment of spin-off companies. A network of contact persons located at the various departments across the University supports the Project and Innovation Services Unit.

A regional development project (Korkeakoulut seutukunnissa) coordinated by the Centre for Extension Studies of the University of Turku supports regional development and strengthens SMEs' competitiveness through improving availability of higher education, research and development services of the seven higher education institutions located in Turku. The project looks for structural and operational models to enhance regional engagement of the HEIs.

The region's economy is dominated by food, maritime, pharmaceutical, and metal and information technology industries together with biotechnological development. The sub-regions of the Southwest Finland region have different economic profiles. While the Turku sub-region has a strong focus on biotechnologies and half of Finland's medical development and diagnostics companies are located in Turku sub-region; the Salo subregion builds on the traditionally strong ICT sector, with Nokia's main mobile phone manufacturing sites located in the city of Salo. The Vakka-Suomi sub-region is home to the only car factory in Finland and the archipelago, Åboland sub-region relies on tourism exploiting its natural endowments.

A prime example of cooperation between universities and business in Finland has become a Technopolis project. It began as a project for the development of Finnish municipalities. Municipal taxes in Finland comprise the bulk of the tax burden. Among the priorities are the creations of new jobs, to attract large anchor companies, the development of small technology businesses.

3.3 Sweden

Swedish experience concerns a program of combined effort between more than 200 HEIs from 14 countries focused on the maintenance and growth of environmental, rather than economic capital in the Baltic Sea region.

The network is led by the Baltic University Program Secretariat, which is part of Uppsala Centre for Sustainable Development at Uppsala University in Sweden. The BUP is also largely financed by the Swedish Ministry of Education, the Swedish Institute, the Swedish International Development Agency, and Uppsala University. Other important sources of funding are the Nordic Council of Ministers, Baltic Sea Region Program, Interreg IIIB, the Finnish Ministry of Education, as well as the universities in the network.

A typical approach of the BUP network is to taking into account student development and regional conditions in order to come up with concrete solutions and feed back into teaching and development.

The types of cooperation partner are very symptomatic of the nature of the activity. Very often there is more than one BUP university involved, and in addition projects involve government agencies – on a local or regional level, and NGOs, for example the WWF. Private businesses are also involved; they may take on the role of experts, share their experiences with teachers and students and are also interested in the results of various undergraduate projects that have taken place, which may be something they can use in their operations.

There are several types of key drivers. These could be viewed to be independent strategies pursued by the BUP partners, but they may also be interlinked to a certain extent.

Experience of the Arctic zone countries shows that there are some common features of interaction between business and universities: focus on the interaction with the business is registered in universities mission, joint projects of universities and business are encouraged, there is an order for skilled personnel and research by business.

4 MODEL AND EXPERIENCE OF COOPERATION IN RUSSIA

In Russia, the interaction between universities and businesses in many ways is similar to the areas that are presented above. At the same time the processes of cooperation between universities and

companies in Russia are at a formative stage. Russia largely borrows foreign experience and models, however, are institutional constraints, due to country-specific.

In Russia at the present time considerable attention is focused on the development of the regions of the Arctic zone. In this connection, as an important instrument of regional development is seen an increase in collaboration between universities and business. The state of development in this area more detail will be presented in the comparison with European countries.

The country's leadership understands the importance of well-functioning processes of collaboration between universities and business, for which the necessary steps are taken. In particular, it has adopted a number of legislative acts to optimize the processes of interaction between universities and business.

Consider the features of the organization of interaction of universities and business in Russia at the moment. Commercialization of universities available and established in the framework of independent schools of results of intellectual activities, expressed in the form of any intellectual property, it is possible within the framework of two complementary lines of action: the creation of new business entities focused on university intellectual property commercialization (transmitted in company under license) or the transfer of rights to the intellectual property of the university on the basis of licensing agreements with the counterparty. Both directions currently received widespread acceptance, although the first one spread out to a greater extent than the second.

The task of forming environment that encourages innovative small and medium enterprises, based on the commercialization of the individual authors and research groups of the university, was solved in 2009 the adoption of the Federal Law of August 2, 2009 № 217-FZ "On Amendments to Certain Legislative Acts of the Russian Federation on the establishment budget scientific and educational institutions, business entities with a view to practical application (implementation) results of intellectual activity. " The law gave universities the right to act in the role of the co-founders of companies and has defined a mechanism for creating spin-off and spin-out companies, operating on the basis of the intellectual property of the University (transferred to the company under license). Prior to the entry into force of the Federal Law 217-state universities and research organizations have been denied the right to act as co-founders of the business enterprise; since the granting of this right amount produced within 217-FZ of small innovative enterprises (SIE), grew rapidly, which, however, is not always due to objective reasons.

In 2010 the Russian Federation Government Resolution dated April 9, 2010 № 219 "On state support of innovation infrastructure in the federal educational institutions of higher education", which has become another tool to support small innovative enterprises at higher educational institutions, carried out in this case, due to the formation of the university innovative infrastructure.

Recently in Russia the level of involvement of large domestic enterprises in such initiatives is greatly increased, which is a direct consequence of the emergence of infrastructure tools to support collaboration of universities and business. They appeared thanks to the Decree of the Russian Federation from 09.04.2010, № 218 "On measures of state support of development of cooperation of Russian higher education institutions and organizations implementing integrated projects for high-tech production."

An attractive business to cooperate in the framework of the University of Contractual Relations is also providing expert consulting services, including in the form of the creation of analytical products. In this case, the university acts as a contractor who provides outsourcing services and enterprise - in the role of the customer (payer). It should be noted that the university is often the only regional operator, able to provide advice or that enterprise, primarily because of the natural concentration within the University a significant number of highly qualified specialists in various fields.

Due to the increasing importance of regions of the Arctic zone at the moment, the survey results were selected for the analysis and comparison the situation in the countries of the Arctic zone, and Russia, as well as other EU countries. The survey involved a significant number of representatives of companies from the Northern regions of Russia, so the data will be presented specifically for the Russian Arctic regions.

5 COMPARATIVE CHARACTERISTICS OF MODELS IN RUSSIA AND EUROPEAN COUNTRIES: LESSONS FOR RUSSIA

Extensive practical research topics of interaction of education and business have been carried out in the course of the survey, conducted in EU countries [5]. The project depth interviews with leading employers from different EU countries have been carried out in order to generalize the best practices of university business partnerships, as well as employers to receive an opinion on the prospects and problems of cooperation with universities. Industry of the selected companies from manufacturing sector, the services sector and the IT sector are presented.

The purpose of the surveys was to identify existing forms of cooperation between education and business, and to identify factors that contribute to the development of interaction between education and business and barriers to this process. In addition, they were studied aspects related with the expectations of universities and enterprises to cooperate.

Regions of the study included the following countries: EU countries (Continental unit: Austria, Belgium, France, Germany, Luxembourg, Netherland, Bosnia and Herzegovina, Macedonia, Serbia); Arctic countries: Denmark, Finland, Sweden; Russia (Arctic regions).

The main objective of the study was to answer the following three questions:

a) What are the most important forms of cooperation between universities and enterprises that exist, and why?

b) What are the current characteristics of the models of cooperation and the need for the development of future cooperation?

c) What are the key factors for development and what are the motives for cooperation on the part of universities and enterprises?

The main directions of activity of the enterprises, emitted in the study were the following:

a) Organizational profile and recruitment practices;

b) Assessment of acquired competences of the graduates;

c) The model of cooperation between universities and companies;

g) Ratio of cooperation between universities and companies;

d) An opinion on the future developments in higher education;

e) Practices and examples of cooperation between universities and companies;

g) Drivers and barriers to cooperation between universities and companies;

h) The results of the cooperation between universities and companies;

and) a description of the interaction of specific cases.

Consider the overall results of the study.

To sum up national responses to the first question, "What are the most important forms of cooperation between universities and enterprises that exist", the results are the following. For the majority of countries participating in the survey, it is characterized by medium or high degree of interaction between universities and companies (see Figure 1).

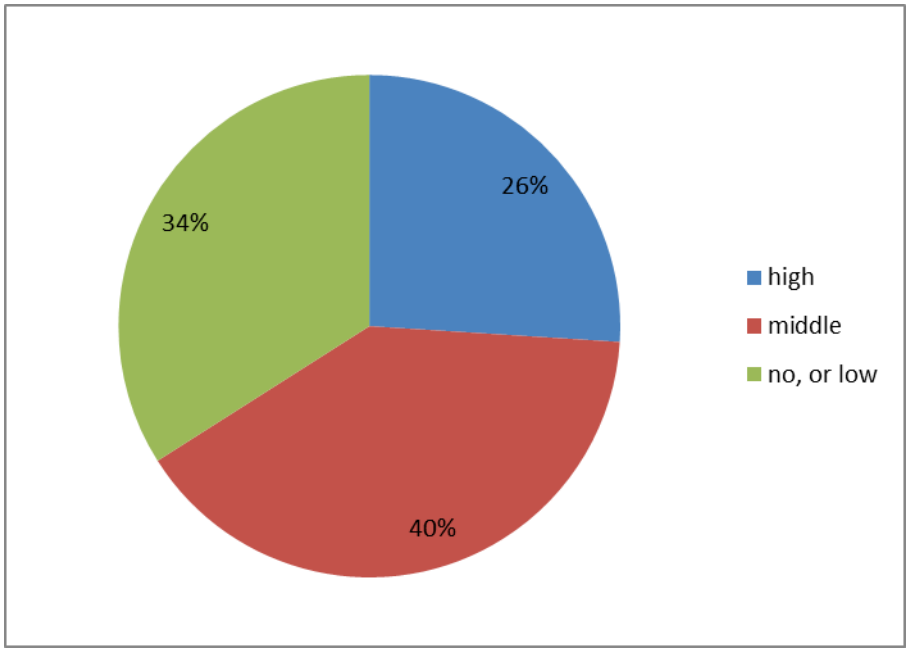

Figure 1. Distribution of answers to companies with established partnership with universities EMCOSU countries.

Most employers cooperate with universities in the field of student mobility that is usually done in the form of practical training and training (Figure 2). This model of cooperation has been ranked in the majority of countries included in the large-scale survey, with the exceptions of the Czech Republic and Slovakia and the Nordic countries, where it ranks third, and Bulgaria and the countries of the former Yugoslavia, the most common method of cooperation is adult education, training and short courses. Student mobility is accompanied by research activities, development of education and training of adults.

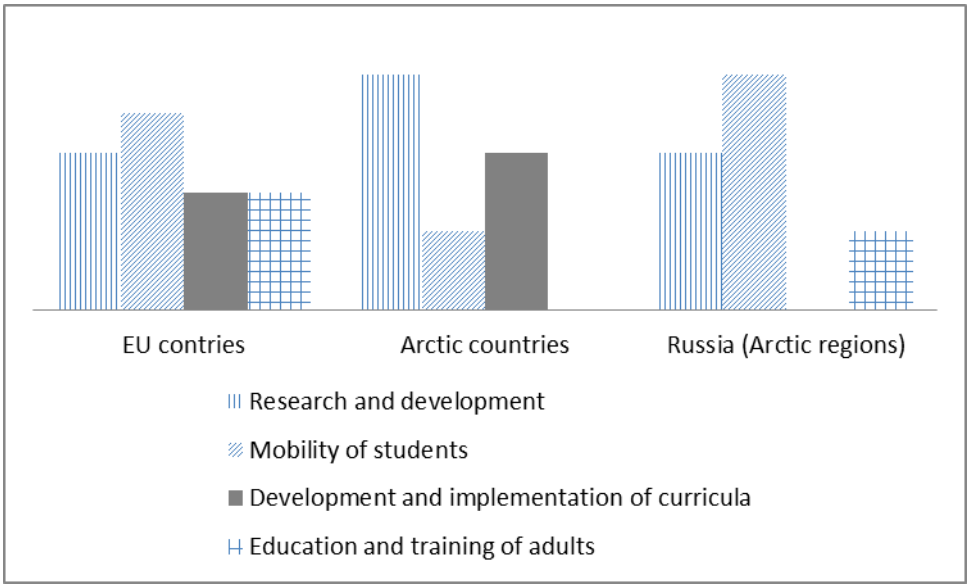

Figure 2: Ranking of the most common ways of cooperation between companies and universities.

Research and development are the most common kind of co-operation in the Arctic countries, but is not used to a great extent in other EU countries. The company's participation in the activities of curriculum development is most commonly used in the Czech Republic and Slovakia, as well as quite often in Bulgaria, Croatia, Arctic countries, Spain, Italy and continental countries and countries of the former Yugoslavia, but not less frequently in Russia. The least common activities of cooperation

between universities and business in all countries and regions, with the exception of Italy is the mobility of scientists.

The second important aspect that characterizes the “current model of cooperation and the need for the development of future cooperation” is the presence of obstacles to their cooperation with universities. In total, the main obstacle in all countries and regions is a bureaucracy within or outside schools, with the exception of the Arctic countries. But, as emphasized by the Slovak employer, as companies are faced with bureaucratic processes within their own companies.

The second most relevant obstacle to cooperation with universities are different time horizons, so that in a dynamic business environment increases the need for flexible and react quickly. Very often, industry or business comes up with a specific problem and requires solutions in a very short time, but the university is not always ready to do it this way. Universities need some time to understand the problem, to solve the problem, and they cannot at the same time and to devote himself to solving these problems of the industry and meet the requirements to meet in time.

Bureaucratic obstacles to cooperation between universities and business, and a variety of time horizons are due to follow different motivations and values, but at the same time, the overall theme is one of the main factors in the cooperation of the University and business.

In Hungary, the Czech Republic and Slovakia, Italy, the countries of the continental block, Scandinavian and Russian employers also noted that among the most important barriers to co-operation between businesses and universities are different ways of communication and language between actors. Employers in Bulgaria, Hungary, Croatia, the Czech Republic and Slovakia, the countries of former Yugoslavia and Russia indicated that they have difficulty in finding the persons in university for cooperation purposes, but it is less than the actual barrier in Scandinavia. On the contrary, the least relevant obstacle for university business cooperation in general, this is the current financial crisis, as well as the tendency of universities to publish confidential findings.

The third major aspect of the survey is answering the question "What factors are key to development and what are the motives for cooperation on the part of universities and businesses". Employers of EMCOSU countries and the countries and regions outside the project consortium included in a large-scale survey reported that there is an urgent need for development that universities should focus on the future, to ensure that the strategic partnership with the business and there are no large differences across countries except the Czech Republic and Slovakia where no strategic cooperation among the three development needs. The second direction of development, which should be implemented in the system of higher education is to increase the practical orientation of teaching, the third direction is to increase the number of training and practice.

Italian employers indicated that universities should be directed to the support of the international orientation of its institutions; enhanced internationalization, which also highlighted a large extent in Slovenia, the Czech Republic and Slovakia, countries of the former Yugoslavia and the Scandinavian countries. The Croatian and Italian employers reported a high need for further development of cooperation with universities, and to ensure that increasing the value of applied research. Employers of Poland and the continental block, the countries of the former Yugoslavia and Scandinavian regions see one of the main requirements for the development of long-term development of competences.

As for the drivers, cooperation between universities and businesses, we can conclude that it is extremely important that companies and universities have sought for the same goals and are reliable, trustworthy partner in this process.

It is interesting to note that in all countries and regions, employers see the biggest benefits of cooperation between universities and business in the development of professional competencies of students needed for the labor market. The only exceptions are Italy and Russia, where this trend is second in the overall ranking. In these two countries are the main advantages of innovative enterprises manufacturing facilities in Italy, and the development of regional clusters and coordination in Russia.

As the results of the survey, at present, many countries are actively developing cooperation mechanisms of the education system and business, there is also room for improvement in terms of more effective communication, legal support, and better integration of the various stakeholders. In some sectors, such as information and communication technology, already have a long tradition of cooperation with universities, other industries are lagging behind is still due to the national and disciplinary constraints.

Analysis of the results of a survey conducted among representatives of different companies from the EU shows that the cooperation with universities is conducted mainly in the following areas: mobility of students, research and development, participation in the learning process, the mobility of scientists and other models that are related to specific companies (Figure 3).

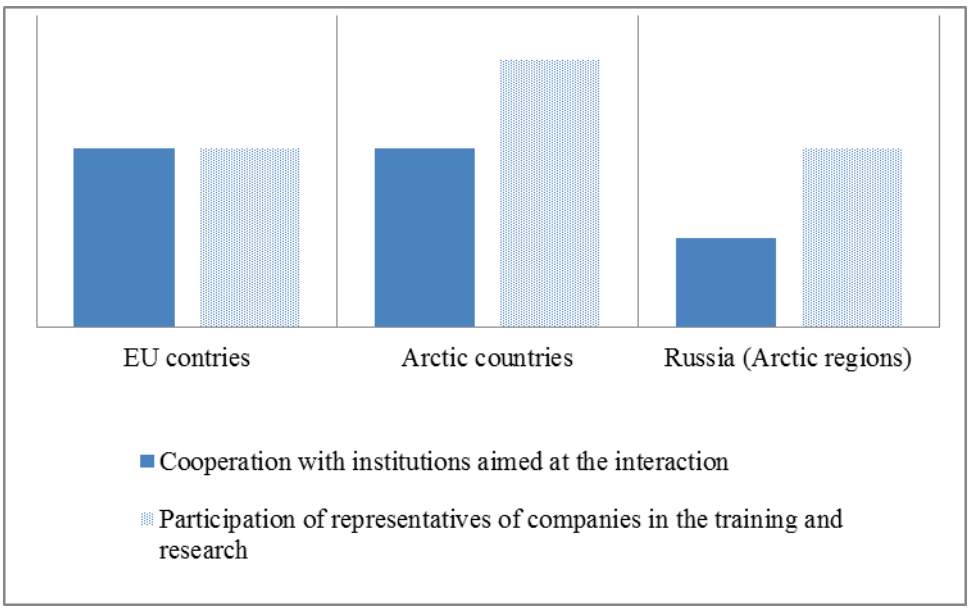

Figure 3. The most common ways of participation in university activities.

In total, the company most involved in research activities, teaching and the work of career guidance and employment departments. Also, company representatives are often invited to participate in the educational process as lecturers and researchers. With regard to cooperation with the departments of vocational guidance and placement, companies often participate in job fairs and other events related to employment.

6 CONCLUSION

The study allowed generalizing the experience of interaction between universities and businesses in Europe highlight features of interaction in the Arctic zone. The most interesting examples of the interaction observed in Finland (for example, the University of Turku), Sweden, by the example of the Baltic University, as well as in Denmark (Aalborg University).

An important finding was the fact that Russia, as a country with a developing economy, also pays great attention to the issues of mutually beneficial cooperation between universities and businesses: creating his own practice and using foreign experience. It should be noted that the state is actively supporting the development of this direction in the framework of legislative initiatives to support business innovation.

A feature of collaboration between universities and businesses in European countries and the Arctic zone countries is the support of joint research and development and student mobility. These trends are also typical for cooperation in the Arctic regions of Russia area. At the same time, despite the efforts of the Government to focus Russian universities the interaction with the business is not as high as in European countries. In addition, the Russian Arctic regions should be given more attention to the organization of training for the economy needs of skilled personnel and actively involvement in the research of companies' representatives.

* The article was prepared with the implementation of the project within the state task of Russian Ministry of Education and Science No.30.207.2016/HM and the Strategic Development Program of the Petrozavodsk State University

REFERENCES

[1] Wilson T. (2012) A review of business-university collaboration. February 2012 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32383/12-610-wilson-review-business-university-collaboration.pdf

[2] Henry Etzkowitz, Loet Leydesdorff (2000)The dynamics of innovation: from National Systems and ‘‘Mode 2’’ to a Triple Helix of university–industry–government relations. Research Policy 29, pp.- 109–123 http://www.uni-klu.ac.at/wiho/downloads/Etzk.pdf

[3] University Business Cooperation. 15 Institutional Case Studies on the Links Between Higher Education Institutions and Businesses/ Technopolis, October 2011. – 181 p.

[4] Employer and University Engagement in the Use and Development of Graduate Level Skills. IFF Research 2007

[5] Melnik M., Palvin S. (2014) Emerging Models of Cooperation between Private Enterprises and Universities – Insights of European Enterprises and Employers Organizations/ University of Lubljana, October 2014, 110 pp.