

THE BENEFITS OF COOPERATION WITH STAKEHOLDERS IN IMPLEMENTATION OF MASTER PROGRAMME “BUILDING DESIGN FOR SUSTAINABLE DEVELOPMENT”

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Abstract. The article provides an opportunity to learn about the success factors of strategic partnerships between universities and business. It describes the experience of creating a unique interdisciplinary practical-oriented Master Programme "Building Design for Sustainable Development", developed according to the most modern educational standards within the international project "Master Degree in Innovative Technologies in Energy Efficient Buildings for Russian and Armenian Universities and Stakeholders". The Programme was developed in cooperation with the members of the consortium, which includes four Russian, two Armenian and five EU universities, European Civil Engineering Education and Training (EUCEET - Association). Work on the educational programme was conducted in close cooperation with employers - leading enterprises in the field of construction and energy in Russia, Armenia and Italy. The educational process should be modern and effective, taking into account the Bologna Process, which introduced the concept of a practice-oriented approach to the development of educational programmes. In this context, the role of employers is of fundamental importance, since they will establish links with the labor market.

Another effective way to achieve these results are international student olympiads and competitions organized by world business leaders in the production of building materials, construction and architecture. Experience has shown that this is an important step in the interaction of the students of the master's degree programmes and the stakeholders. Motivation of students: the acquisition of practical design skills, taking into account the latest achievements in the field of construction and architecture. Motivation of the organizers of international competitions and competitions: acquaintance of the younger generation of

builders and architects with materials and developments of a specific corporation or manufacturer; attraction of the most talented students and trainees at operating enterprises; intensive coverage in the press, the internet and other media. Summing up, international student olympiads and competitions are an active and mutually beneficial partnership in education and business.

1 INTRODUCTION

The tasks of ensuring innovative development of the economy and the formation of a knowledge-based society require studying the interaction between different institutions in the spheres of education and production. Integrative interaction of such institutions gives a multiplier effect, such as, in particular, the experience of China, Israel and Finland [1]. The level of development of any state is directly determined by the effectiveness of its economic sphere. Every developed economy is formed under the influence of a number of factors: successful business, high level of citizens' education, well-formed and well-functioning educational system. The interaction of the identified factors is also important. So, cooperation (partner interaction) of professional education and business has been and remains one of the main factors of the development of Russia's human resources.

The main driving force for the development of cooperation is the mutual interest of the state, vocational education and business in the training of professional staff whose knowledge, skills and professional competencies meet the requirements of modern innovative economy. Training of qualified employees for such a huge and diverse country like Russia can't be provided by the efforts of only education or only business. Effective and responsible cooperation of all stakeholders from education and business is necessary. The growing openness of the national economy, the growing mobility of financial resources and labor potential are forcing radical measures to be taken to ensure the reproduction of labor resources and their compliance with the requirements of competitive enterprises [2,3].

In conditions of increasing the requirements of the society to the effectiveness of education in terms of the effectiveness of total costs, the need to meet the expectations of students for decent employment, most often the initiator are technical universities with traditions in the field of applied scientific researches and their implementation [4]. One of the most common forms of integration in this case is the development of practice-oriented master programs. Thanks to this form, the synergistic effect is achieved through the use of the capabilities of industrial and laboratory equipment in the educational process, targeted research in master's thesis and the exchange of knowledge between teachers, undergraduates and industrial workers.

2 MASTER'S DEGREE PROGRAM

The Institute of Civil Engineering and Architecture of the Ural Federal University named after the first President of Russia B.N. Yeltsin implements the unique interdisciplinary Master's Degree Programme «Building Design for Sustainable Development». The educational programme is developed according to the most modern educational standards within the framework of the international project ERASMUS + "Master Degree in Innovative Technologies in Energy Efficient Buildings for Russian and Armenian Universities and Stakeholders" (MARUEEB).

The Programme corresponds to the trends and requirements of the 2030 Agenda for Sustainable Development, adopted in September 2015 by the leaders of 170 countries at the UN General Assembly in New York [5,6]. The UN Programme contains 17 integrated, interrelated and indivisible goals of sustainable development, which include a universal, flexible and comprehensive plan of action for the world community.

The concept of sustainable development has emerged in the process of combining the three main points of view: economic, social and environmental. It implies the adoption of measures aimed at the optimal use of limited resources and the use of environmentally-friendly, energy- and material-saving technologies, the preservation of the stability of social and cultural systems, and the integrity of biological and physical systems [7].

Although all 17 Global Sustainable Development Goals are interrelated and important, we distinguish among them two especially important. SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all and SDG 12: Ensure sustainable consumption and production patterns [8].



Currently, the effective use of energy is a worldwide concept. Many countries, even those with large reserves of natural resources such as natural gas, oil and coal, have realized the importance of preserving their resources so that they can be used for a longer period [9,10]. In order to develop and implement steps to improve energy efficiency, special attention should be paid to the education sector, to train a new generation of engineers "equipped" with specific technical knowledge and management skills in the field of energy efficiency.

Current climatic conditions of Russia are characterized by cold winters and hot summers. According to this, an integrated approach is required to solve the problems of reducing energy consumption for heating and air conditioning therefore future specialists should have high-quality modern knowledge related to activities and methods for improving the energy efficiency of buildings and structures. The MARUEEB project aims to develop and implement innovative master's educational programmes to train a new generation of civil engineers and architects with in-depth knowledge of energy efficiency and energy saving. The Programme "Building Design for Sustainable Development" was developed jointly with the members of the consortium (Table 1), which includes four Russian, two Armenian and five European universities, European Civil Engineering Education and Training (EUCEET - Association).

On the other hand, the educational process should be developed in a modern and effective way, taking into account the Bologna Process, which introduced the concept of student-centered approach to the development of educational programmes. In this context, close interaction with business and the labor market is mandatory, because they represent future employers (employers – Stakeholders) of students enrolled in a magistracy [11].

Employers' participation is considered significant when formulating the specific content of educational programmes in order to ensure students' interest in employers' companies and the ability of graduates to find work as close to the profile of training as possible. The student-centered approach requires a change in the consciousness of the faculty staff responsible for developing and implementing curricula, in terms of learning outcomes that must be achieved in accordance with the level of education (for example, bachelor's, master's).

Table 1: Members of the MARUEEB Project Consortium

| Russian and Armenian members | EU members | Employers |
|---|---|---|
| Ural Federal University (Russia) | University of Genoa (Italy) | Engineering Academy of Armenia (Armenia) |
| Peter the Great St. Petersburg State Polytechnic University (Russia) | Second University of Naples (Italy) | Ministry of Education and Science of Armenia (Armenia) |
| Tambov State Technical University (Russia) | Slovak Technical University (Slovakia) | TICASS Consortium (Italy) |
| Voronezh State University of Architecture and Construction (Russia) | Technical University of Iasi (Romania) | European Association for Building Education and Retraining EUCEET (Belgium) |
| National Polytechnic University of Armenia (Armenia) | Kaunas University of Technology (Lithuania) | AE Consulting (Armenia) |
| American University of Armenia (Armenia) | | Non-profit partnership "Atomstroykompleks" (Russia) |
|   Co-funded by the Erasmus+ Programme of the European Union | | Center for Building Expertise of R&D (Russia) |
| | | Full cycle project company "Uralproektdubrava" (Russia) |

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At present, many educational programmes are developed on the basis of traditions, available resources and interests of the teaching staff, therefore they can be considered as "based on the existing base" and "focused on the teaching staff." In other words, they are more focused on the structure than on the students. The transition to a student-centered approach is a process that is currently taking place all over the world, and the goal of this transition is the introduction of an innovative process of developing educational programmes. In particular, the emphasis is on the fact that the results of the training should be in accordance with the objectives of the programme, meet the needs and expectations of students and society, aimed at ensuring their employment after graduation, development of personality and citizenship [11].

All this underscores the importance and necessity of organizing positive cooperation and creating solid relations between higher education institutions and employers, which become central figures in the process of developing educational programs, because they will be the ultimate beneficiaries of the educational process. The importance of the relationship between universities and employers is emphasized in the MARUEEB international project, since the first stage of the project is represented by a survey of about 100 enterprises and organizations in Russia and Armenia in order to perform an analysis of labor market needs and understand what are the demands from business and society in the regions of implementation of the developed educational programmes. The interest of business also lies in the fact that within

the framework of the Master's programme students perform research work on specific orders of the stakeholders.

Thus, the educational Programme "Building Design for Sustainable Development" was formed in an optimal way, based on the needs of the local business community.

3 OLYMPIADS AND COMPETITIONS

An effective way to achieve these results are International Student Olympiads and Competitions organized by world business leaders in the production of building materials, construction and architecture. Experience has shown that this is an important step in the interaction of the students of the master's degree programme and the stakeholders. For example, in 2017, PERI first launched the "Universities" project, within the framework of which it held the PERI Championship among construction universities. During the preparation for the Championship, engineers and project managers read 150 lectures for students across the country [12]. The aim of the Championship is to give students a real opportunity to expand theoretical knowledge, gain invaluable practical experience and make useful acquaintances with professionals in the construction industry. For the Company it is an opportunity from the very beginning to be close and participate in the formation of future specialists. Today, students learn the basics of the profession, and in the future they will become employees of construction and industrial companies. And perhaps they will become part of the PERI team.

Another example is the International Contest "Designing a Multicomfort House", organized by the Saint-Gobain Company. Saint-Gobain is a world leader in creating a comfortable space for living, working and resting. The student competition has been held since 2005 on many countries of the world as part of the implementation of a global strategy to reduce emissions of carbon dioxide into the atmosphere. Russia joined the project in 2011, and over that time, it was attended by more than a thousand students from different regions of the country, each of which had the opportunity to manifest itself in the field of modern architecture [13]. Every year, students develop new projects of modern facilities and infrastructures on the territory of different cities of the world, with contrasting climatic conditions, for example Astana in Kazakhstan or Dubai in the UAE. When designing, they take into account not only the features of climate and territory, but also how to intelligently integrate the object into the concept of a complex of knowledge about the cultural and historical heritage of the city. And there are a lot of such examples.

Participation in Contests and Olympiads forms the following competencies for students:

- stable career growth;
- managerial and leadership skills;
- motivation to actively participate in a difficult and interesting program;
- interpersonal and communication skills;
- a clear vision of own professional development;
- ambitiousness and commitment.

Motivation of students: the acquisition of practical design skills, taking into account the latest achievements in the field of construction and architecture; the possibility of further cooperation in the scientific and research field on the basis of enterprises and design organizations and even employment; international cooperation with young scientists and

students from different countries, etc. An important quality that a student acquires in participating in Contests and Olympiads is the ability to work in a team, which at the present stage is considered as the basic competence of a person, since it affects the quality of the joint work and at the same time determines its results and success [14, 15].

Motivation of the organizers of International Olympiads, Championships and Competitions includes:

- acquaintance of the younger generation of builders and architects with materials and developments of a specific corporation or manufacturer;
- attraction of the most talented students and trainees at operating enterprises;
- intensive coverage in the press, the internet and other media.

Summing up, International Student Olympiads, Championships and Competitions are an active and mutually beneficial partnership in education and business.

Thus, the cooperation between education and business is beneficial to both parties, and this implies the main goal of pedagogy - to determine the methods that help students to see, know, develop and find their place in the future profession.

4 CONCLUSION

The high importance and lack of the interaction between education and business determine the novelty of further development of the proposed forms of cooperation. The main result is an integrated approach to the formation of the relationship between the subjects under consideration. Education and business should function in a constant mutual influence and mutual support, thus setting the pace of development of the economy and the state as a whole. The proposed forms of interaction allow us to reconcile the spheres of social life that are divergent at first glance into a single direction, and also to eliminate the most important labor market problems: supply and demand discrepancy, and unemployment.

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