University Network Interaction as Strengthening the Competitive Positions in the International Education Market: Synergistic Effect

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Abstract. Today's actively developing Higher Education Institutions (HEIs) strive to strengthen and enhance their competitive position in the international educational market. One of the means to achieve this goal is to develop strategic partnerships with other HEIs, in particular, in the form of networking. Networking allows achieving a synergetic effect by combining complementary competences and partners' resources, accelerating the process of coordinating and making multilateral decisions, increasing the responsiveness to innovations and changes in external environment, organizing a system of information and consulting mutual assistance and creating the basis for long-term trust relationships. Networking cooperation in higher education can be used to improve the coherence and efficiency of HEI at regional and international levels. Russian universities are actively introducing networking forms into their cooperation. Networking of HEIs is one of the promising areas in Russian education, allowing the efficient use of the combined partners' resources and increasing the competitiveness of the higher education system as a whole. The leading Russian HEIs face the challenge of developing strategies to join inter-university networks, which would contribute to the effective use of the partnership mechanism for enhancing the competitiveness of HEIs. In order to join those networks with which cooperation is in the university's interests, it is necessary to have a good understanding of the main characteristics of inter-university networks operating in the Russian and global educational space: the history of their creation and development, types of networks and their features, priority activities, conditions for joining a network, organization of partner interaction, advantages that network participation provides and costs associated with it.

Keywords: education, integration, international educational market, university networks, global educational space, strategic partnerships,

1   Introduction

One of the most important tasks of the educational policy is to organize a comprehensive partnership, including the networking development at different levels of the

education system. The networking problem in education is becoming even more relevant in the context of increasing globalization processes and interdependence, with increasing human mobility, and labour legislation unification of the countries [1, 2]. Networking as a phenomenon of our time has a great potential. As an important mechanism of information exchange, networking allows realizing its synergetic effects in collective scientific and educational activities, makes it possible to use network advantages in increasing the educational institutions efficiency, optimizing costs, improving the educational programs quality and developing academic mobility [3, 4]. Even now, under the conditions of the transforming Russian system of higher professional education, it is necessary to provide students with real opportunities for enhancing flexibility and learning mobility through the network interaction mechanism between local and international higher education institutions (HEIs).

Network interaction is understood as a system of horizontal and vertical links that ensures quality education accessibility for all categories of citizens, education variability, educational organizations openness, teachers' professional competence improvement and use of modern information and computer technologies [5, 6, 7]. The inclusion of universities in networking allows for the transition from discrete international contacts to meaningful scientific and pedagogical cooperation and comprehensive partnership; to a combination of bilateral, multilateral and network projects; to the transformation of subject-oriented projects into interdisciplinary projects, etc.

Networking is now a powerful resource for innovative education based on the following principles. Firstly, networking is an opportunity to promote the products of innovative activities in the market of educational services, thus, obtaining additional funding. Secondly, networking allows strengthening the resource of any innovative institution at the resources expense of other institutions. The network helps to find precedents, to obtain expertise of own developments, to extend the list of educational services for students, inter alia, by implementing educational programmes in a network form. The purpose of HEIs network interaction is to create an effective mechanism for the leading ideas implementation about modern education, corresponding to the demands of the innovation economy [8, 9].

Presidential Decree No. 599 of May 7, 2012 "On Measures to Implement State Policy in Education and Science" [10, 11] states that it is necessary to "ensure <...> that by 2020 at least five Russian universities will be included in the top one hundred world universities according to the world university ranking". The Association was established, in particular, by the winning universities of the Ministry of Education and Science of the Russian Federation. The programme of financial support for the country's leading universities to improve their positions in international rankings is one of the latest initiatives for state support of higher education development. In order to implement the Decree, a competition was organised in 2013 among Russian universities for state financial support for their development [12]. Based on the results of the competition, 15 universities were selected to receive subsidies from the Ministry of Education and Science of the Russian Federation. These are universities of different specialisation from six federal districts of the country [13].

Activities within the framework of network interaction of higher education institutions are regulated by Art. 15 of the Federal Law "On Education in the Russian Federation", No. 273 as of December 29, 2012 (enacted on September 1, 2013). According to this law, "the network form of educational programs implementation provides the possibility for the student to master an educational program using the resources of several organisations carrying out educational activities, including foreign ones, as well as, if necessary, using the resources of other organisations" [14].

In February 2014, the rectors of the 15 HEIs participating in the programme met. In particular, the prospects of networking were discussed, and it was decided to unite into an association, "so that the universities participating in the program could cooperate with the outside world". The partnership will enable the universities to share their experiences, create joint educational programs, exchange best practices and overcome together the existing limitations in order to achieve the main objective [15, 16]. All winning HEIs have envisaged the implementation of partnership programs with foreign universities and university associations in the action plans for enhancing competitiveness for 2013-2020. In particular, Kazan (Volga Region) Federal University is planning "to be included in international networks and consortia, including the formation of institutional partnerships with foreign universities" [17], and Nizhny Novgorod State University named after N.I. Lobachevsky is planning "to be included in international networks and consortia, including the formation of institutional partnerships with foreign universities". N.I. Lobachevsky Nizhny Novgorod State University intends to take "an active part in the formation of regional and international university networks" [17, 18].

2   Methodology

International university networks (IUN) have a century-long history. The first organization of this type, the Association of Commonwealth Universities, was created in 1913. The rapid development of IUN began in the 1990s. These partnerships come under different names: associations, unions, consortia, and networks. All of these organizations bring together three or more higher education institutions from around the world to work together in different fields over the long term [19]. The main characteristics of IUN include the circumstances of establishment, geographical location of partners, type of partner organisations, partner statuses, barriers to entry for new entrants, specialisation of activities, financing, management, and forms of interaction partners (Figure 1).

Management of activities	Forms of engagement of partners	Circumstances for their creation	
Specialisation of activities	CHARACTERISTICS OF INTERNATIONAL UNIVERSITY NETWORKS		Geographical location of partners
Barriers to entry for new partners	Financing activities	Partner statuses	Types of partner organisations

Fig. 1. Features of international university networks

This paper presents the results of a study of the existing International University Networks established in different periods of time (27 existing International University Networks created in different years and comprising 1,119 member organizations from 117 countries).

The participation of leading Russian universities in these International University Networks and other international educational associations is analyzed. The general characteristics of International University Networks, their characteristics, the joining conditions, their objectives, and the organization of partners' interaction are identified.

We have analysed information both posted on their official website and publicly available online, as well as annual reports on the activities of international university networks, their strategic development plans, texts of partnership agreements, and interviews with representatives of network partners and coordinators.

We have identified and described the key features of international university networks as a form of interuniversity partnership: pre-requisites for establishment, geographical location of partners, type of partner organizations, status of partners, entry barriers for new partners, specialisation profiles, financing of activities, management of activities, form of partner cooperation.

We have also analysed the engagement of higher education institutions of different countries in international university networks, particularly the membership of leading Russian universities in such networks and in other international educational associations. It appears that Russian universities are represented insufficiently in the international university networks. Accession is a challenging task that will require universities to apply considerable efforts, both organizational (overcoming entry barriers, negotiating with networks, managers and partners, ensuring a certain level of openness in activities of the university, meeting the network requirements, performing the tasks assigned to network members on time) and financial (entry and annual fees, business traveling) [19]. Collaboration with foreign universities through network interaction will promote internationalisation and quicker innovation of Russian universities, as well as learning of new working techniques and accumulation of resources and knowledge.

2.1 Eligibility Criteria

The selection of International University Networks to participate in the study was based on the following criteria:

- include higher education institutions from two or more countries in the world;
- have signed cooperation agreements;
- official documents indicate the International University Networks;
- established for a long period or indefinitely;
- the management structure of the network is organized;

2.2 Search Strategy

The information base for the research is the materials placed on the official website of the International University Networks and on the Internet:

- annual reports on their activities;
- strategic development plan;
- co-operation agreements between the partners;
- interviews with partners' representatives and network coordinators

2.3 Study Selection

In accordance with these criteria, 27 IUN were selected. Nine of them were established before 1991, eleven between 1991 and 2000, and seven after 2000. Two networks have a small number of members (less than 11), seven networks are very numerous (more than 50 universities), and most networks (18) include between 11 and 50 organizations. Nine networks unite HEIs from a small number of countries (up to 11), 16 networks are medium-sized: they include organizations from 11-30 countries, two networks are very large, with HEIs from 30 countries or more. There are 1,119 member organizations in the surveyed IUS in 7 of the 117 countries. Figure 2 shows that European countries are the leaders in terms of the number of universities participating in IUN. Russia is in 6th place.
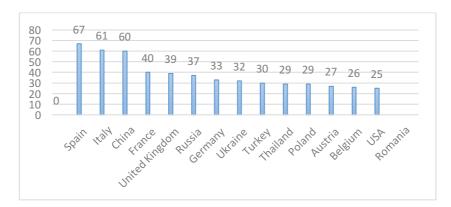
Fig. 2. Presence of organizations in International University Networks from different countries (number of organizations)

11 IUN include 34 Russian organizations: 27 universities in nine cities (three universities are members of two networks each) and seven UNESCO Chairs located in Russia. Thirteen of the 27 universities are located in Moscow and St Petersburg (Figure 3).
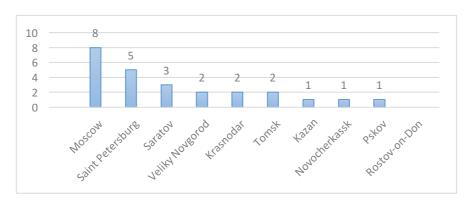

Fig. 3. Geographical distribution of Russian higher education institutions belonging to International University Networks (number of higher education institutions)

Of the 15 HEIs participating in the government's international competitiveness program, only three are included in the IUN examined in the study. Nine of them are included in one or more international associations or networks of HEIs not included in our sample.

International university networks *can be divided into two main groups according to the geographical location of the partners:*

International university networks comprising HEIs from different countries and in which there are no restrictions on the territorial location of candidates to join the network;

International networks of universities formed by HEIs from countries located in certain territories. There are networks comprising universities from the capital cities of Europe (Institutional Network of the Universities from the Capitals of Europe), universities of South-East Asia (ASEAN University Network), and universities of the Baltic Sea Region Universities Network.

In some IUN, there is an "asymmetrical" territorial distribution of participants. For example, the International Strategic Technology Alliance includes 23 universities from China, two from the United Kingdom and one from the United States.

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3   Results.

IUN are created at the initiative of partner higher education institutions, at the initiative of noneducational organisations, or as a result of the consolidation of existing educational networks. In the first case, the creation of an IUN is usually a natural continuation of a long and fruitful cooperation between the universities, as a result of which they come to the conclusion that it is necessary to institutionalize the existing connections. By doing so, they create conditions for more effective interaction with each other and with new partner universities, as well as the opportunity to engage industry and non-profit organisations, to make proposals on behalf of the network, and to engage in fundraising for the implementation of joint projects. Such IUN are often self-organising and dynamic partnerships [20].

Examples of IUN initiated by several partners are the Institutional Network of Universities of the Capitals of Europe, which aims to integrate universities from Central and Eastern Europe into the European Higher Education Area, and the League of European Research Universities, which aims to develop basic research in European universities [21].

Many of the IUN have been created at the initiative or with the participation of public bodies or noneducational organisations:

The Global University Network for Innovation was created by UNESCO, the United Nations University, and the Technical University of Catalonia following the World Conference on Higher Education organized by UNESCO in 1998, to continue and facilitate the implementation of key decisions taken at the conference;

University Network of Excellence in Nuclear Engineering, an initiative of the Canadian government, to ensure that the country's universities train qualified engineers and researchers in nuclear technology;

International Strategic Technology Alliance is created and operated with significant support from the Chinese Ministry of Education. The main goal of the alliance is to strengthen the global competitiveness of China's leading technological universities.

In the IUN under consideration, partnerships are usually between universities. In the three IUN, the partners are, in addition to universities, industrial enterprises, governmental or non-profit organizations, research centres, and other organizations. The integration of different types of organizations into an IUN offers a number of potential advantages to both universities and non-academic partner organizations [22].

For example, closer interaction with real sector organisations enables universities to align educational programmes with labour market needs, which facilitates the employment of graduates and the commercialisation of research and development results. In turn, real sector organisations have an opportunity to influence the training programme of future specialists and promote applied research at universities in areas of interest to businesses. The inclusion of governmental organisations in IUN gives universities a chance to promote higher education reform at the national level. Government bodies, through their involvement in IUN, have a better understanding of the real needs and challenges faced by higher education institutions, which can contribute to the development of more effective government support for higher education in a particular country and globally [23].

3.1   Partners' statues

The most common types are *full partner* and *associate partner*. Five of the IUN we reviewed have partners with different statuses. As a rule, associative partners have the

right to participate in network activities and projects, they have access to network resources and services, and they are mentioned in all publications and materials about the network. However, unlike full partners, they usually have no say in strategic decisions regarding network activities and cannot be initiators and coordinators of joint projects. Associate partners can become full partners after some time.

For example, in the Top Industrial Managers for Europe Association, there are two categories of members: associate members and active members. The associate member category includes universities that have recently joined the network. To become an active member, a university must develop and launch, within two years, a dual degree program implemented jointly with universities from two different countries in the network. In the third year, the program must be operational. If these requirements are not met, the member is excluded from the network [24].

3.2 Limitations for new partners

As a rule, the IUN provides for the possibility of expanding the partners. The IUN management formulates the requirements for the potential candidates and defines the steps that the institute must fulfil to be included in the IUN.

The most common requirements imposed on the characteristics of a higher education institution concern: type (university, academy, business school, etc.); status (public/non-public); specialization (technical, humanities, etc.).

The criteria for the selection of IUN partners can be the results achieved by the HEI: in research activities; in academic activities, e.g., number of students and graduates; successfully functioning partnerships with foreign research activities; educational activities, such as the number of students and graduates; successfully functioning partnerships with foreign research and educational institutions.

When assessing candidates for the IUN, we assess the goals of the HEI's development as reflected in its strategic development plan, e.g., striving for internationalization of scientific and educational activities, the intention to develop partnerships with foreign HEIs [20]. The goals and values of the HEI should not contradict the mission, objectives and values of the network, and preference is given to those candidates whose aspirations coincide with the goals of the network.

When considering a candidate, the IUN leadership takes into account the capacities and resources of the HEI, e.g., whether it can organize the necessary number of disciplines in English, whether it has sufficient capacity to participate in dual-degree programs. There are networks that set certain requirements for the geographical location of the applicant, e.g., only higher education institutions from certain countries or regions of the world can be included in the network.

The International Network of Universities, when deciding whether to admit a new partner to the network, assesses the extent to which the geographical alignment of the network will change with their arrival, and in addition, the network cannot include more than two universities from the same country. There are financial barriers for those wishing to join a particular IUN, such as the initial admission fee, annual membership fees, and other costs that are necessary for full operation within the IUN. Often, there are rules in place in the IUN according to which a higher education institution intending to join a network must be nominated by one of the existing members of the IUN or must be a partner of at least one of the member institutions of the network [22].

The HEI intending to join the network must prepare a work plan for the network, a motivation letter, and documents confirming that the HEI's activities and objectives do not contradict the main provisions of the statutes of the network, that its membership

in the network will contribute to its development and it is ready to take an active part in the network activities. As a rule, the decision to join the IUN is taken by the governing bodies of the network in agreement with the partners. Often, representatives of the network are sent to the candidate higher education institution to study it thoroughly before the decision to include it in the network is taken. Furthermore, representatives of the candidate higher education institutions may be invited to network events to participate in them, to get acquainted with the representatives of the network members, and to present the candidate higher education institutions.

There are both highly specialized networks, where partners collaborate on a limited range of issues, and networks where members collaborate on a wide range of topics and sometimes without any restrictions on what they can do together. As a rule, the stated narrow specialization of a network does not imply a strict limitation of cooperation on issues beyond the scope of specialization.

An example of a highly specialized network is the *European Association of Distance Teaching Universities* promotes open and distance education and e-learning all over the world, supporting the development of this area of activity in universities - members of the network. The mission of the network is to contribute to the development of the European educational area, supporting and promoting educational networks for flexible learning, lifelong learning, the formation of open educational resources, joint educational program, and virtual mobility [23].

3.3 Financing, Governance and Interaction Patterns

The IUN are funded from three main sources: admission and annual fees of network members; sponsorship or charitable contributions; government allocations.

The amount of membership fees may vary depending on the status of the partner. In the reviewed IUN, the amounts of membership fees for an individual member are determined on the basis of different parameters, in particular: depending on the level of socio-economic development of the country the member represents; according to the characteristics of the participants (annual income, human capital development index); by the decision of the governing body of the network. For example, the General Assembly of the Institutional Network of European Metropolitan Universities sets the annual membership fee for each member not exceeding EUR 10,000.

Most IUN are governed by a president and/or a governing/administrative board. The governing board often includes representatives of the partner universities. As a rule, the main task of the network's management is to coordinate, support, and monitor the activities of the partners.

Based on the results of the review of the partners' regular reports on networking activities, the network management can issue a warning about the need to work more actively in the partnership and make recommendations on the actions that the HEI could take to improve its networking performance [24]. There is a wide range of forms of interaction among IUN participants.

The most common are the following: Events involving face-to-face meetings: seminars, conferences, forums, summits, and mutual study visits of representatives of IUN participating universities; Online communication: virtual seminars, videoconferences; Realization of joint projects: educational programs (including distance learning), commercial research projects; Exchange of resources: exchange of teachers, staff, and students, creation of common electronic libraries, a common database of academic disciplines, and educational programs, including those implemented remotely; Creation of

new joint structures: laboratories, research centers, schools; Collaboration with external organizations: foundations industry, universities, research centers, and industry.

4 Discussion

In one of the networks included in this study, the *Consortium Linking Universities of Science and Technology for Education and Research* [25], we look at the organization and performance of IUN. The network was founded in 1990 to improve engineering education in Europe. The network has expanded over the years and today operates in the *"knowledge triangle" that includes education, research, and innovation.* The network is positioned as a platform for creating and supporting projects aimed at training a new generation of engineers with leadership and entrepreneurial skills.

In the long term, the network has the following *objectives*: become the leading technological network of universities responsible for organising research, education, and innovation in Europe; play a key role in the development of knowledge and innovation communities in Europe; become a leading partner of European industry.

The network unites 19 universities: 13 universities from 11 European countries have full membership status and six have associate membership status (universities from the US, Russia [26], Israel, China, Brazil, and Canada). The network is governed by a president, who is the president or rector of one of the member universities. The president of the network is re-elected every two years. His position is personalised. The status of the university whose head has become president of the network does not change. The network has two governing bodies: a general assembly and a steering committee. The General Assembly approves the Network's activities and annual reports on the results of its work. The members of the General Assembly are the heads of the member higher education institutions. The Steering Committee makes proposals for the development and expansion of the activities and organises their implementation. The members of the steering committee are the rectors and presidents of the member higher education institutions or their deputies. Task forces, departments, and working groups are in place to initiate and rapidly implement new ideas.

Task groups in the Consortium of Universities of Science and Technology for Education and Research are established to: organise cooperation between the libraries of the member universities; supporting member institutions in preparing and submitting grant applications to foundations and international organizations to fund research projects; developing Sino-European Engineering Education Platform SINO-EU.

The SINO-EU Educational Platform to promote cooperation between European and Chinese universities in the field of engineering has been operating since 2010. The network's partner universities and 18 leading universities of China participate in its activities.

The main activities of the SINO-EU Educational Platform are talent support and student exchange; faculty professional development and teaching materials development; cooperation in the implementation of research projects.

The working groups develop four research areas: mechanical engineering; sustainable energy systems; industrial engineering; civil engineering.

Working groups are created for specific projects with a limited implementation period, such as the development of technological entrepreneurship and cooperation between universities and companies. In the education area there are dual degrees (18 programs) and joint educational programs supported by the European Union in the Erasmus Mundus project (19 programs).

The research area of the network is currently represented by 17 joint research projects, including *"Development of Energy Systems for Mobile Devices"* and *"Development of an Innovative Biofuel System for Portable Electronics"*. The innovation area includes 11 business projects aimed at solving applied problems and commercialisation of the results of activities. Operational interaction between partners occurs online. Face-to-face meetings in the form of workshops, meetings, and meetings of governing bodies are held on a regular basis. The network is also active with external partners, such as the European Commission and European industry.

5   Conclusions

Network forms the cooperation between HEIs have been actively developing in recent years: the number of interuniversity networks is growing and the existing networks are expanding due to the inclusion of new partner HEIs, scientific and noneducational organisations in them. The new model of higher professional education should take full advantage of the opportunities offered by HEI networking to improve the education quality, its flexibility and students' mobility, and to expand the range of their professional skills and social competences. It should incorporate all the positive features that have been accumulated within the framework of real network interaction between Russian and foreign higher education institutions. The analysis of the existing IUN has shown that Russian HEIs are underrepresented in them. As the leading Russian universities aim to establish partnerships with Western universities and associations of universities, they need to take steps to join the various IUN.

This is not an easy task, which will require significant efforts from the universities - both organizational (*overcoming the entry barriers, negotiations with the management and partners of the network, ensuring a certain openness of the university, adaptation to the requirements of the network, timely performance of the tasks of the network members*) and financial (entrance fees and annual fees, business trips) [26, 27]. Cooperation with foreign HEIs in the framework of networking will contribute to the internationalisation and acceleration of the innovative development of Russian HEIs, mastering new methods of organising joint work in the network, acquiring new resources and knowledge.

ABBREVIATIONS The following abbreviations are used in this manuscript:
HEI - Higher Education Institutions
IUN – International University Networks
SINO-EU - Sino-European Engineering Education

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