

Approaches to Assessing the Effectiveness of the Export of Educational Services by Universities in the Cities – University Centers of Russia



**Tatyana F.
KREYDENKO**
RUDN University
Moscow, Russian Federation
e-mail: kreydenko-tf@rudn.ru
ORCID: 0000-0002-1664-9395; ResearcherID: GLS-6352-2022



**Mariya F.
MIZINTSEVA**
Central Economic Mathematical Institute, Russian Academy of Sciences
Moscow, Russian Federation
e-mail: mfmizintseva@cemi.rssi.ru
ORCID: 0000-0002-1276-2753; ResearcherID: V-6059-2018



**Veronika N.
KHOLINA**
RUDN University
Moscow, Russian Federation
e-mail: kholina-vn@rudn.ru
ORCID: 0000-0003-2565-6244; ResearcherID: V-9500-2017

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Abstract. The export of education in Russia was officially proclaimed as a priority area of governmental policy in 2017. The subsequently adopted documents such as the project “Development of the export potential of the Russian education system”, the program “Priority 2030”, and the national project “Science and universities” confirm that the export of education remains an important governmental strategy, despite the changed geopolitical context. The export of education is considered in the works of scientists from Russia and other countries: they study in detail the economics of education export in various countries, adaptation of foreign students, methodological approaches, legal and visa systems of educational migration, etc. The aim of our work is to develop a methodology for evaluating the effectiveness of the export of education by universities in the cities – university centers of Russia and test it on the materials of the Siberian Federal District. Despite a wide range of relevant publications that we arranged in six main groups, these aspects have not been the subject of scientific analysis. We have developed our own system of indicators and indices (a comprehensive indicator of the effectiveness of the export activities of universities in the cities – university centers, calculated on the basis of indices of the educational and research potential of universities’ export activity). The methodology has been tested on the indicators for 115 universities and 30 cities – university centers of the Siberian Federal District. We have revealed that the data are scattered: out of 29 cities where foreign students study, only Tomsk is in the group of cities with high potential for educational and research export activities. The majority of the cities – university centers (22) belong to group 3 – with low potential for educational and research export activities. Our research makes it possible to comprehensively assess the effectiveness of the export of educational services by universities and cities – university centers in each group and set out the priorities for the development of universities; and also identify cities that best meet the needs of the country to implement the export of education.

Key words: internationalization of education, cities – university centers, export of education, complex indices, assessment methodology.

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Introduction

The international education market is an important and dynamically growing service industry. According to the report “Global Education Market 2023”, the growth rate of the world market of higher education by 2027 will be 7%, and its volume – 4.47 trillion U.S. dollars, including about 200 billion U.S. dollars (3%) will account for the market of online education¹. According to the definition

of the Organization for Economic Cooperation and Development, the export of educational services is the provision of educational services to foreign students in person or through modern communication technologies (online learning), in some countries the export of education includes income from scientific grants, contracts and cooperation; licensing of intellectual property abroad, etc.²

¹ Educational Services Market Analysis, Size and Trends Global Forecast to 2022–2030. Available at: <https://www.thebusinessresearchcompany.com/report/educational-services-global-market-report>.

² Education at a Glance 2022. DOI: <https://doi.org/10.1787/3197152b-en>

Many countries have adopted national strategies to encourage international student mobility (Erasmus program in the European Union; government programs in China, Brazil, Saudi Arabia and other countries aimed at training highly skilled specialists for the needs of the country in foreign universities).

Due to the special significance of the export of education as a tool of “soft power” and a highly multiplicative source of additional revenues of higher education institutions, scientists of various fields and specialties – from economics and sociology to pedagogy and psychology study it. At present, several theoretical and practical directions have been formed, within the framework of which various aspects of higher education export are studied. The first group is the works studying general issues of internationalization of education³ (De Wit, 2018; Bykovskaya, Rybina, 2023; Nikitenko, 2023). Researchers pay much attention to the impact of the knowledge economy and the exports of education on the structural transformation of the world’s economies. For instance, V.M. Kuzmina (Kuzmina, 2021), A.R. Manukyan (Manukyan, 2023) rightly emphasize that knowledge is becoming an important of economic growth factor, and investments in human capital allow not only increasing the GDP growth rate, forming a post-industrial structure of the knowledge-based economy, but also attracting talents from abroad. The Chinese researcher Wu (Wu, 2022), who points out the differences in approaches to its analysis by “Western” countries and new players in the market, conduct a detailed analysis of the role of the exports of education in the process of formation of the global market of educational services.

³ Aidrus I.A., Filippov V.M. (2008). *World Market of Educational Services: Study Aid*. Moscow: RUDN.

The second group of works are more in-depth studies of the influence of individual factors on the possibilities of realizing the export potential of education (for example, the impact of geopolitical and global – pandemic COVID-19 – changes) (Zolochevskaya, Sivakova, 2022; Lebedev, Ridiger, 2022, etc.). Another direction of research has been the study of national features of educational services export development, for example, a system analysis of the factors promoting internationalization of Russian education (Krasnova, 2021; Rybakova, 2023).

In a separate (third) block we can single out numerous works devoted to the ways of effective realization of Russian education exports (Rybakova, 2023), the development of specific mechanisms for attracting foreign students (Rostovskaya, Skorobogatova, 2019), including the results of sociological research (Bondarenko et al., 2022), and methodological aspects of working with foreign students (Marinenko, 2019; Selivanova et al., 2020).

Analytical reports of international organizations – UNESCO⁴ and OECD⁵, in Russia – reports of the Research Institute for Education Development of the Plekhanov Russian University of Economics⁶ (the fourth group of works) are devoted to the study of the functioning of the world market of educational services.

⁴ Global flow of tertiary-level students. Available at: <http://uis.unesco.org/en/uis-student-flow>

⁵ Education at a Glance 2022: OECD Indicators. DOI: <https://doi.org/10.1787/3197152b-en>

⁶ Trends in the development of higher education in the world and in Russia: Analytical digest report. Moscow: FGBOU VO “REU im. G.V. Plekhanova”, 2021. Available at: https://www.rea.ru/ru/org/managements/Nauchno-issledovatel'skij-institut-razvitija-obrazovanija/Pages/analiticheskie_materialy.aspx (accessed: July 11, 2023); Economics of higher education: development trends in the world and Russia: analytical digest report. Moscow: FGBOU VO “REU im. G.V. Plekhanova”, 2021. Available at: https://www.rea.ru/ru/org/managements/Nauchno-issledovatel'skij-institut-razvitija-obrazovanija/Pages/analiticheskie_materialy.aspx (accessed: July 11, 2023).

A separate (fifth) group includes works, which study the experience of countries in the formation of strategies of the export of education. Taking into account the world experience in the formation of the export of education strategy in Russia is extremely important. Statistics show that in economically developed countries the share of mobile students in bachelor's degree programs is 5%, master's degree programs – 14%, postgraduate and doctoral studies – 35%⁷. The Russian system of higher education should follow this trend. It is necessary to promote those programs that allow getting a greater return.

Of particular interest for Russian practice is the study of strategies for realizing the export potential of education in countries which traditionally supplied students to the international market of educational services (importers of education). The works (Kuznetsova, Mashkina, 2020; Zakharov et al., 2023; Lou, Li, 2022) analyze the growth of China's influence in the global education market. Until recently, the country was the leader only in terms of the number of students sent to study abroad, but in recent years China has become a prominent player in education exports by providing government scholarships to students from developing regions. According to S. Bouchaib (Bouchaib, 2023), African countries (the region of traditional interests of exports of the Russian education) occupy a special place in promoting the export of the Chinese education. The work of H. Lee and B. Edwards (Lee, Edwards, 2023) is devoted to analyzing the effectiveness of the implementation of Singapore's strategy of the export of education.

The study of the potential of national education in the global market in countries which traditionally supplied international students to Russia and

economically developed countries of Europe and North America is becoming very relevant: the export potential of universities in Vietnam (Pham et al., 2022), Malaysia (Khodakarami et al., 2022), Uzbekistan (Troitskiy, Yun, 2021), Belarus (Lijun et al., 2020), etc. is considered. Projects to promote Finnish education in developing regions of the world through university-specific interactions are the focus of a group of researchers from Finland and Indonesia (Delahunty et al., 2018). The analysis of these studies shows how important the export of education is in the strategies of states of different socio-economic types.

The sixth group of scientific research is the works devoted to the impact of education export on the university and the region as a whole (Kazantseva, 2022; Yang et al., 2020). V.K. Nikolaev points out that the export of higher education becomes an additional source of income for both universities and regions, the inflow of students is followed by investments in the regional system of higher education, consumption grows, which gives an additional incentive for the development of territories (Nikolaev, 2022). But most often such works concern the analysis of export strategies of specific universities and their impact on the socio-economic development of separate regions.

The review of publications on the subject of the export of education has shown that no specific studies on the methodology for assessing the export potential of cities, where higher education institutions are compactly located, and assessing the effectiveness of its realization have been conducted so far.

Russia in the global market of educational services

The global higher education market is characterized by constant growth (regardless of extreme circumstances, such as the COVID-19 pandemic and geopolitical instability) and high “country”

⁷ Home. Available at: <https://www.oecd-ilibrary.org/sites/573e058e-en/index.html?itemId=/content/component/573e058e-en>

concentration. According to A.B. Ruchkin, the countries' positions in the global market of educational services reflect the competition of national education systems (Ruchkin, 2019).

Since the beginning of the 21st century, the number of students has increased 2.4 times and amounted to 236 million people by 2020 (40% of young people in the group aged 20–24), by 2040 their number is expected to grow to 400 million people. At the same time, the number of mobile students amounted to 6.4 million, about 3% of the total number of students in the world, increasing by 1/3 since 2015⁸. In 2020, almost 40% of all international students (i.e. international students abroad) were from four countries: the United States (960,000), the United Kingdom (550,000), Australia and Canada⁹.

The highest growth rates in the number of foreign students over the previous five years have been noted in countries which implement well-thought-out strategies of education development and position themselves as regional leaders – UAE (almost 2 times), Turkey (1.5 times).

Asian countries remain the main “suppliers” of students to the world market: China (1.1 million people), India (460 thousand), Vietnam (132 thousand), and it is for these students that the main competition in the world market is unfolding.

Thus, the global market of higher education is an extremely competitive market, where the countries that have a strategy for the development of this industry, offering students state scholarships, innovative educational products, comfortable accommodation, leisure and security of living win. Besides country competition, researchers

consider the development of distance education – mass open online courses, active use of mobile devices as additional factors (Rodygina et al., 2022). Marketing research predicts the development of distance education and growing income from it¹⁰.

The number of foreign students in Russia in 2020 amounted to 315 thousand people (2022 – 395 thousand), with expected growth to 435 thousand people by 2030. The Russian Federation ranks 5th–6th in the rating of leading countries; there is a stable growth in the number of foreign students, but the country's share in the global market is declining. Citizens of Central Asian states (Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan, Kyrgyzstan) account for almost half of foreign students in the RF, important partners are non-CIS countries – China (about 30 thousand), India (17 thousand), Egypt (12 thousand), as well as Belarus (10.2 thousand students). Despite the fact that the number of state scholarships has doubled over the previous three years (from 15 to 30 thousand), the main part of students – more than 90% – studies for a fee¹¹.

Almost all the countries in the top ten leaders in the exports of education have adopted ambitious programs which aim to increase the number of foreign students and education revenues (Nagornova, 2020). Similar programs were adopted in the Russian Federation: in 2017 – the priority project “Development of the export

⁸ UIS Statistics. Available at: <http://data.uis.unesco.org/> (accessed: July 20, 2023).

⁹ International student mobility – Key numbers. Available at: <https://timeassociation.org/2022/11/28/international-student-mobility-key-numbers-2022/> (accessed: July 20, 2023).

¹⁰ E-Learning Market size surpassed USD 250 billion in 2020 and is anticipated to grow at an exponential CAGR of over 21% between 2021 and 2027. Available at: <https://www.gminsights.com/industry-analysis/elearning-market-size> (accessed: November 15, 2021).

¹¹ According to the forecast of the Russian Ministry of Education and Science, the number of foreign students in Russian universities will grow to 435 thousand people by 2030. Available at: <https://rsr-online.ru/news/2023/6/8/po-prognozu-minobrnauki-chislo-inostrannyh-studentov-v-vuzah-rf-vyrastet-do-435-tys-k-2030-godu/> (accessed: July 20, 2023).

potential of the Russian education system”¹², in 2018 – the federal project “Export of Education” of the national project “Education”¹³. The main indicator of the effectiveness of the latter project was supposed to be an increase in the number of foreign citizens studying in Russian organizations engaged in educational activities under higher education programs by 2025 by almost 1.8 times due to the development of infrastructure, implementation of state support for the development of export of Russian education, increasing the demand for and competitiveness of Russian education. But in 2020 the program “Export of Education” was excluded from the National Project “Education” of the Ministry of Education of the Russian Federation, as the results of its implementation fall under the competence of the Ministry of Education. A new national project “Science and Universities” was created, within the framework of which it is already planned to achieve qualitative indicators: for example, the creation of 25 campuses of international level integrated into the urban environment in the cities – key university centers by 2030¹⁴. Thus, in strategic planning documents there is a gradual transition from quantitative assessment of universities’ activities to an attempt

to include more significant qualitative indicators in the efficiency analysis. But, unfortunately, two problems arise in the already existing approaches. On the one hand, the approach of quantitative assessment of educational institutions’ activity, which continues dominating, is rather superficial (for example, export activity of universities is assessed at the official level only by comparing the specific weight of the number of foreign students studying under bachelor’s, specialist’s and master’s degree programs in the total number of students). Qualitative assessment does not yet have a well-developed methodology, and in terms of the set of indicators assessing the performance of educational institutions, the analysis of urban areas where universities operate (including features of geographical location, logistical accessibility, etc.) is ignored. The inclusion of “university cities” in the economy of the country is related both to the characteristics of the territory where the university functions and to the processes of interaction between complex, hierarchically organized spatial systems of urban settlement and higher education in the socio-economic space of a modern city¹⁵.

The problems of assessing the role of universities in urban development are particularly relevant at the stage of urban transformation. But the analysis of qualitative indicators should be based on a comprehensive assessment of quantitative indicators. In this regard, the aim of our study is to develop a methodology for the integrated assessment of the exports of education by universities in cities – university centers, taking into account all types of activities of modern universities of different models on the basis of indicators of the Monitoring of the

¹² Passport of the priority project “Development of export potential of the Russian education system” was approved by the Presidium of the Presidential Council for Strategic Development and Priority Projects (Minutes 6, dated May 30, 2017). Available at: <http://static.government.ru/media/files/DkOXerfvAnLv0vFKJ59ZeqTC7ycla5HV.pdf> (accessed: July 20, 2023).

¹³ Passport of the national project “Education”. Government of Russia. Available at: <http://static.government.ru/media/files/UuG1ErcOWtjfOFCsqdLsLx C8oPFDkmBB.pdf> (accessed: May 14, 2023).

¹⁴ National project of the RF. Science and Universities. Available at: <https://xn--80aapampemcchfmo7a3c9ehj.xn--p1ai/projects/nauka-i-universitety> (accessed: July 20, 2023); Acceptance of applications for world-class campuses extended until August. Available at: <https://minobrnauki.gov.ru/press-center/news/novosti-ministerstva/48447/> (accessed: July 20, 2023).

¹⁵ Turgel I.D., Bugrov K.D., Oyker A.D. Russian universities cities: Expectations vs. reality. *Higher Education in Russia*, 5. Available at: <https://cyberleninka.ru/article/n/universitetskie-goroda-rossii-ozhidaniya-vs-realnost> (accessed: November 27, 2023).

effectiveness of higher education institutions 2022¹⁶. In the course of the research, we solved the following tasks: we substantiated, developed and tested the methodology for assessing the effectiveness of the exports of higher education at the level of cities – university centers through the assessment of export activities of higher education institutions; we identified four types of cities – university centers by the potential of educational and research export activities by comparing the values of the proposed indices; we proposed further research directions.

Methodological and methodical foundations of the research, sources of statistical data

The methodological basis of the research is the index approach, which allows comparing indicators with different units of measurement and directions of impact on the analyzed process. The calculation of the complex index facilitates the assessment of the final result, allows for interregional comparisons and systematizes the features of the organization and provision of export services in the cities where higher education institutions are located.

The term “university city” is most often used in the research literature to refer to an urban locality specialized in the provision of higher education, where the educational system has a disproportionate weight in the economic, social and cultural landscape.

At the same time, there is no practice of assessing such a contribution. For example, some classifications of the most effective American university cities include the indicator “number of students at least 10% of the city’s population”, but it has not yet been generally recognized. It is impossible to compare the role of universities

implementing different types of models (University 1.0, where the emphasis is placed only on educational programs, University 2.0 model, in which the most important element of development along with educational activities is scientific research; University 3.0, when there is a deep integration of the interests of science, business and education) in the socio-economic development of the city. In this case, one university can take on a city-forming function.

The essential attributes of university centers are the nature and depth of the relationship between higher education institutions and the urban environment, not always defined by quantitative parameters, so in relation to university centers we can consider the stages of development, the highest of which is the “university city” (“college town”).

In view of the above, we proposed to analyze the effectiveness of the implementation of export of educational services by universities in all cities where universities operate.

To date, there is no developed methodology for assessing the effectiveness of export of educational services at the level of higher education institutions, much less cities as centers of higher education. In the Decree of the Ministry of Science and Higher Education of the Russian Federation 92, dated February 1, 2022 “On approval of performance indicators of federal budgetary and autonomous educational institutions of higher education, subordinate to the Ministry of Science and Higher Education of the Russian Federation, and the work of their managers, based on the results of achievement of which are established incentive payments to the heads of such institutions” as the only indicator of export of educational services for the university is pointed out “share of foreign students studying under bachelor’s, specialist’s and master’s degree programs in the total number of students (reduced contingent)”. The Ministry

¹⁶ Information and analytical materials on the results of monitoring the activities of educational organizations of higher education. Official site of the Main Information and Computing Center of the Federal Agency for Education of the Russian Federation (GIVC Rosobrazovanie) on the basis of the Moscow State University of Instrument Engineering and Informatics. Available at: <https://miccedu.ru/>

of Science and Higher Education has defined the threshold value of efficiency assessment for this indicator as 3% (below this value the university is assigned 0 points, at 9% and more – 10 points).

But a modern university is not just an educational organization that forms professional competencies in certain areas of training, but also a center of research and, in some cases, entrepreneurial activity (universities 3.0). These qualities of universities should also be assessed through the system of indicators, as they have a direct impact on the efficiency of the export of education and the formation of competitive university centers.

Currently, there is actually no methodology for assessing the effectiveness of the exports of higher education at the level of cities – university centers. Taking into account the need to take into account in the results of export activity not only the educational process in the university, but also research and entrepreneurial activity, we have developed and tested a comprehensive indicator of the efficiency of export activity of higher education institutions of university centers as the arithmetic mean of indices of individual potentials of export activity of universities (educational, research and entrepreneurial).

$$EA = \frac{IEdPEA + IRDPEA + IEPEA}{3},$$

where EA – complex indicator of the effectiveness of export activities of universities in cities – university centers;

IEdPEA – index of educational potential of export activity of higher education institutions of cities – university centers;

IRDPEA – index of research and development potential of export activities of universities of cities – university centers;

IEPEA – index of entrepreneurial potential of export activity of higher education institutions in the cities – university centers.

Each index represents the arithmetic mean of the values of normalized indicators characterizing each of the three types of activity potential of a modern university:

$$IPEA = \frac{1}{n} \times \sum_{i=1}^n I_n,$$

where IPEA – comprehensive indicator of individual types of export potential of higher education institutions of cities – university centers;

I_n – normalized indicators included in the index;

n – number of indices included in the indicator;

i – index number.

We used the following indicators to calculate the index of educational potential of export activities:

– share of foreign students in the total number of university students;

– university's income from educational activities from foreign sources per one foreign student;

– share of students from non-CIS countries in the total number of university students.

Inclusion in the calculation index of both the share of foreign students and the share of students from non-CIS countries is due to the need to take into account the real contribution of foreign students to the city's economy (significant share of students – citizens of non-CIS countries choose part-time or distance learning, so their inclusion in the urban environment will be minimal).

The index of R&D potential of export activities includes the following indicators:

– number of articles prepared jointly with foreign organizations per one university faculty member;

– share of funds received by the educational organization from foreign citizens and foreign legal entities at the expense of research and development (R&D) from the total amount of funds received from R&D.

Due to the fact that it is impossible to collect indicators of the efficiency of entrepreneurial potential of export activities of universities in the cities – university centers (due to both the closedness of information and extremely low values of indicators characterizing the efficiency of entrepreneurial activities of universities), at the final stage of the methodology development it was decided not to take into account in the calculations the index of entrepreneurial potential of export activities of universities (due to its insignificant contribution to the efficiency of export activities of universities).

Thus, we calculated the complex indicator of the effectiveness of export activity implementation by universities of cities – university centers as the arithmetic mean of indices of only educational and research potential of export activity of universities.

$$EA = \frac{IEdPEA + IRDPEA}{2}.$$

We propose to consider the contribution of each index in the study as equivalent due to the equivalence of educational and research activities in the implementation of the University 2.0 and University 3.0 models by higher education institutions.

The assessment of the efficiency of educational services export implementation in the cities – Russia's university centers is based on the analysis of statistical indicators of the Monitoring of the effectiveness of higher education institutions in 2022 (data for 2021 for 1208 universities located in 306 cities of 84 Russia's constituent entities, hereinafter – Monitoring).

We carried out approbation of the proposed methodology on the example of cities in the Siberian Federal District (SFD). Cities – university centers of the SFD in the analysis of the comprehensive index of educational potential of

university centers are represented in all types of cities (Kreidenko et al., 2023). The sample can be considered representative, as international students are at universities in 29 (out of 30, i.e. 96.7%) university centers of the SFD. In this regard, we believe that the cities – university centers of the Siberian Federal District can be considered as model cities within the framework of our research.

Interpretation of the findings of the study

In the course of the research, we tested the methodology on the statistical data of the Monitoring of the Ministry of Science and Higher Education of the Russian Federation on universities of the Siberian Federal District.

The study of the effectiveness of implementing the export educational activity potential in the cities – university centers was based on the analysis of the indicators of individual universities, which allowed, on the one hand, identifying the most successful universities in the market of export of educational services, on the other hand, considering the geography of the cities – university centers. We carried out the analysis both by individual components of the potential (educational and research) and by the value of the complex index.

Educational potential of export activities. There are 115 universities in 30 cities of the Siberian Federal District. Foreign students study in 104 universities in 29 cities. At the same time, only 65 universities received income from educational activities from foreign sources in 2021: only 11 universities, 6 of which are medical universities, were able to receive more than 100 thousand rubles per one foreign student. The highest indicator – almost 252 thousand rubles per one foreign student – was earned by Novosibirsk National Research State University, while in 18 universities such income amounted to less than 10 thousand rubles.

Only in two universities, the share of students from non-CIS countries exceeds 10% (Altai State Medical University – 11.5% and Glinka Novosibirsk State Conservatoire – 15%). In 18 universities their share is from 1 to 10%, and in 45 universities of the district there are only students from CIS countries. The education of students from CIS countries is financed from the state budget of the Russian Federation (including through Rossotrudnichestvo); applicants from a number of countries can participate in the general competition, along with Russian applicants, there are also students studying under contract. In a number of cases, tuition fees for foreign students are paid by Russian organizations providing intermediary services in the organization of education: as a result, the host university cannot demonstrate in its reporting the income from educational activities from foreign sources.

In 2021, 12 universities from 7 cities of the Siberian Federal District became leaders in educational potential of export activity (index value more than 0.25): three of the most effective universities are located in Novosibirsk and Tomsk, two in Kemerovo, one each in Barnaul, Irkutsk, Omsk, and Krasnoyarsk (*Tab. 1*).

Thus, the educational potential of export activities of individual universities is most effectively realized in two cities – Novosibirsk and Tomsk (leading research centers of not only Russian but also world level). Omsk Humanitarian Academy (a private university) occupies the seventh place in the rating, which is determined by a significant share of foreign students (more than 70%). However, out of 5.5 thousand students, only 300 are full-time students. It is quite difficult to confirm the high efficiency of export of educational services by this university: the multiplier effect for the city is minimal.

The research potential of export activities of universities is realized only by 54 universities of the district, of which only 8 show significant results. Employees of 51 universities in Siberian cities have joint publications with foreign colleagues. The highest publication activity is noted in the Novosibirsk State University (more than two articles per faculty member). In other universities this indicator is significantly lower: in three universities – from 0.84 to 0.5 articles, and in 27 universities – less than 0.1.

Table 1. Universities of the Siberian Federal District – leaders in the rating of educational potential of export activities of universities of cities – university centers (IEdPEA), 2021

No	City	University	Value of IEdPEA
1	Barnaul	Altai Medical State University	0.603
2	Novosibirsk	Novosibirsk State University	0.470
3	Irkutsk	Irkutsk State Medical University	0.456
4	Novosibirsk	Glinka Novosibirsk Conservatoire	0.452
5	Kemerovo	Kemerovo State Medical University	0.390
6	Kemerovo	Kemerovo State University of Culture and Arts	0.372
7	Omsk	Omsk Humanitarian Academy	0.360
8	Novosibirsk	Novosibirsk State Medical University	0.357
9	Tomsk	National Research Tomsk State University	0.298
10	Tomsk	Tomsk State University Architecture and Building	0.294
11	Krasnoyarsk	Krasnoyarsk State Medical University	0.290
12	Tomsk	Tomsk Polytechnic University	0.252

Source: own compilation.

Only 20 universities (about 20%) receive funds for R&D from foreign citizens and foreign legal entities. At the same time, the share of foreign sources in the total amount of research funding of most universities is insignificant: Omsk State Medical University – more than 25%, Tuvan State University – more than 13%, Krasnoyarsk State Medical University – 6.6%, Tomsk Polytechnic University – 5.4%. For another five institutions (two medical, two classical state universities, one agrarian) this share is from 1 to 5%. And for 11 higher education institutions – less than 1%. As a result, only 8 universities have significant indicators of realization of export potential of research activities (Tab. 2).

In terms of research potential, the leading cities were those with either medical (3 out of 8) or national research (3 out of 8) universities. In general, according to this index, no city had more than two successful universities, which gives grounds to assert the difficulty of implementing the research potential of export activities by universities in the cities – university centers of the SFD.

The Novosibirsk State University (QS 2023 – 421st place, 9th place among Russian universities) – a recognized world center of education and research activity – showed the highest results of the *complex indicator of educational services export efficiency* (Tab. 3).

Table 2. Universities of the Siberian Federal District – leaders in the rating of research potential of export activities of universities of cities – university centers (IRDPEA), 2021

No	City	University	Value of IRDPEA
1	Omsk	Omsk State Medical University	0.501
2	Novosibirsk	Novosibirsk State University	0.500
3	Tomsk	Tomsk Polytechnic University	0.283
4	Kyzyl	Tuvan State University	0.266
5	Tomsk	National Research Tomsk State University	0.226
6	Barnaul	Altai Medical State University	0.187
7	Krasnoyarsk	Krasnoyarsk State Medical University	0.152
8	Kemerovo	Kemerovo State Medical University	0.101

Source: own compilation.

Table 3. Universities of the Siberian Federal District of the RF – leaders in the rating of the efficiency of export activities of universities of cities – university centers, 2021

City	University	Rating position	IEdPEA	IRDPEA	EA
Novosibirsk	Novosibirsk State University	1	0.470	0.500	0.485
	Glinka Novosibirsk Conservatoire	8	0.452	0.000	0.226
Barnaul	Altai Medical State University	3	0.603	0.072	0.337
	Altai State University	10	0.213	0.187	0.200
Tomsk	Tomsk Polytechnic University	4	0.252	0.283	0.268
	National Research State University	5	0.298	0.226	0.262
Omsk	Omsk State Medical University	2	0.243	0.501	0.372
Kemerovo	Kemerovo State Medical University	6	0.390	0.101	0.245
Irkutsk	Irkutsk State Medical University	7	0.456	0.019	0.237
Krasnoyarsk	Krasnoyarsk State Medical University	9	0.291	0.152	0.221
Barnaul	Altai State University	10	0.213	0.187	0.200

Source: own compilation.

The leaders of the rating are located in eight cities – the leading educational centers of the RF, which are also actively involved in the implementation of the national project “Science and Universities”, and in Tomsk, in addition to the two universities – leaders of the rating by a comprehensive indicator of export performance, three more universities are involved.

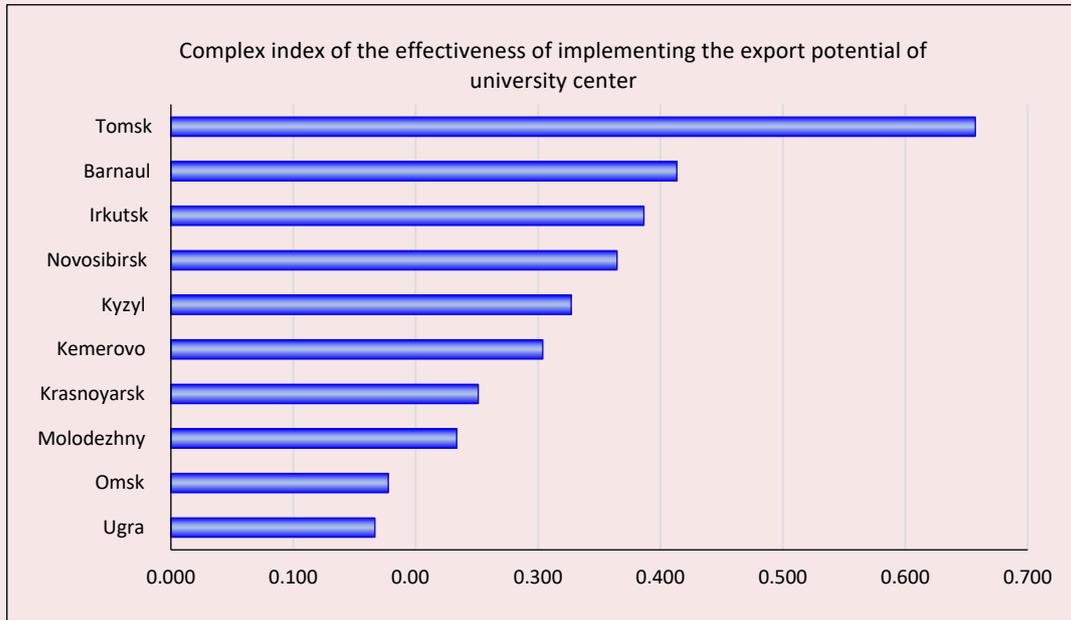
The rating of cities – university centers of the Siberian Federal District on the efficiency of export activities of universities reflects the reputation of the centers in the world market of educational services, as well as the specificity and intensity of educational and research activities, including international cooperation with foreign countries in the implementation of educational programs, joint research, etc. (Tab. 4).

Table 4. Rating of cities – university centers of the Siberian Federal District on the efficiency of implementation of export of educational services, 2021

Rating position	City	Number of universities	IEdPEA	IRDPEA	EA
1	Tomsk	9	0.593	0.721	0.657
2	Barnaul	10	0.226	0.601	0.413
3	Irkutsk	12	0.148	0.625	0.386
4	Novosibirsk	19	0.241	0.488	0.364
5	Kyzyl	2	0.518	0.136	0.327
6	Kemerovo	5	0.094	0.513	0.304
7	Krasnoyarsk	10	0.148	0.354	0.251
8	Molodezhny	1	0.029	0.438	0.233
9	Omsk	15	0.028	0.327	0.178
10	Yurga	1	0.000	0.333	0.167
11	Ust-Ilimsk	1	0.000	0.296	0.148
12	Prokopyevsk	1	0.000	0.261	0.130
13	Ob	1	0.000	0.196	0.098
14	Rubtsovsk	2	0.000	0.185	0.092
15	Achinsk	1	0.049	0.116	0.083
16	Tara	2	0.000	0.150	0.075
17	Novokuznetsk	4	0.049	0.092	0.070
18	Bratsk	2	0.074	0.029	0.051
19	Gorno-Altaysk	1	0.057	0.042	0.050
20	Seversk	1	0.086	0.000	0.043
21	Biysk	3	0.029	0.056	0.042
22	Belovo	2	0.000	0.084	0.042
23	Abakan	2	0.026	0.011	0.019
24	Lesosibirsk	2	0.000	0.022	0.011
25	Angarsk	1	0.000	0.022	0.011
26	Belokurikha	1	0.000	0.016	0.008
27	Norilsk	1	0.000	0.014	0.007
28	Kuibyshev	1	0.000	0.013	0.007
29	Sayanogorsk	1	0.000	0.010	0.005
30	Mezhdurechensk	1	0.000	0.003	0.001

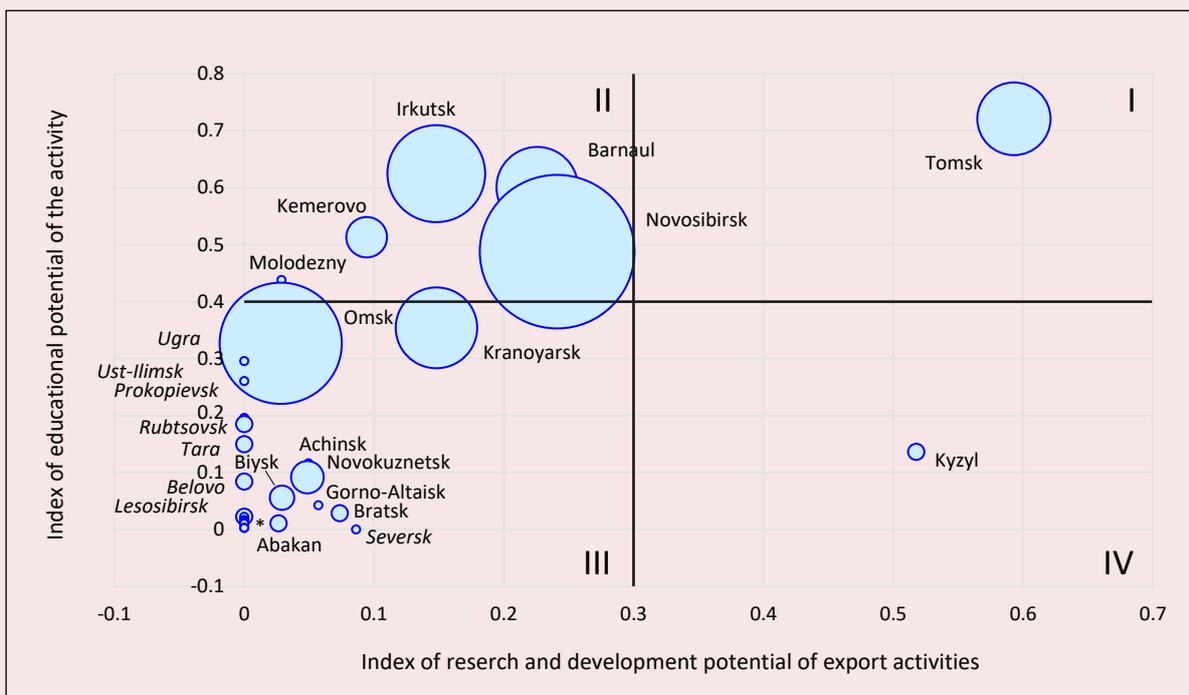
Source: own compilation.

Figure 1. Cities of the Siberian Federal District – leaders in terms of the value of a complex indicator of the effectiveness of the implementation of export potential by universities of cities – university centers, 2021



Source: own compilation.

Figure 2. Ratio of educational and research potential of export activities in university centers of the Siberian Federal District, 2021



Source: own compilation.

Tomsk became the absolute leader in the rating by the value of the *complex indicator of the efficiency of the export potential* of university centers of the Siberian Federal District (Fig. 1). Tomsk universities offer the world market a significant list of educational services not only in traditional areas of study, but also promptly update it in accordance with the most demanded competencies in the labor market (for example, the launch of international educational programs, including nuclear medicine). In addition, the status of the student capital (every eighth resident of the city is either a student or a teacher of one of the universities) and the recognition of the research complex as a city-forming one give the opportunity to receive education with the involvement of specialists and using the equipment of several universities at once.

At the final stage of the study, we compared the values of indices of educational and research potential of export activities of universities, which allowed identifying four types of cities – university centers (Fig. 2).

The diameter of the punxons of the diagram is proportional to the number of universities in a city.

Types of cities – university centers by potential of educational and research export activities

Group 1. Cities with high potential of educational and research export activities. This group includes only one city – Tomsk. It is the oldest university center of Siberia (Imperial Tomsk University was founded in 1878) with a long history and established traditions in international university cooperation. Currently, there are 9 universities in the city, 6 of which are actively involved in the training of foreign students from near and far abroad. A significant share of students are full-time students, which creates additional advantages both for the city economy and for the promotion of Tomsk in the global education market.

Group 2. Cities with high educational and research potential for export activities. It includes 4 cities and Molodezhny settlement (Irkutsk urban agglomeration), where Irkutsk Agrarian University is located. The features of training at universities that train specialists for the agro-industrial complex (for example, the presence of experimental fields, which requires significant space) require the removal of educational buildings outside the boundaries of large urban agglomerations, but at the same time within transport accessibility. Although Irkutsk itself provides the real realization of the export potential of educational services.

Group 3. Cities with low educational and research potential of educational activities. It is the most numerous (22 cities) and the most heterogeneous group. More than half of the cities do not realize the export potential of R&D activities (13 cities) or educational activities (Seversk). On the one hand, it includes small cities - district centers or cities of regional subordination, where branches of regional universities most often function (Lesosibirsk, Belovo, Rubtsovsk, Ob, Prokopyevsk, Ust-Ilimsk, etc.); the number of foreign students is extremely small, and the indicators of the effectiveness of educational potential are low. On the other hand, cities - administrative centers of the Siberian Federal District subjects, including Gorno-Altai, Abakan, Omsk and Krasnoyarsk, were in this group. The presence of Gorno-Altai and Abakan in this group is explained by the relatively low positions of their universities in the ratings of higher education institutions (in the Interfax national rating of universities Gorno-Altai State University ranks 250–253 place, Katanov Khakassia State University – 240–243 place). Katanov Khakassia State University ranks 240–243). The weak positions of Omsk and Krasnoyarsk are associated with a significant differentiation

of university performance indicators. Both Omsk and Krasnoyarsk have a significant number of universities (15 and 10 respectively), but their performance is different. Of the 15 universities in Omsk, only seven universities have students from CIS countries (a significant part of which are part-time students); the income per foreign student varies from 4.27 to 144.39 thousand rubles. Only five universities conduct joint scientific research. In fact, only three universities realize the scientific and educational potential of export activities: Omsk State Technical University; Dostoevsky Omsk State University and Siberian State Automobile and Highway University. The situation is similar with the universities of Krasnoyarsk: only Krasnoyarsk State Agrarian University and Krasnoyarsk State Medical University are the leaders in the export of educational services.

Group 4. Cities with low educational potential and high research potential of educational activity. Only the capital of the Tyva Republic – Kyzyl – can be referred to this group according to the results of the university activity. Tuvan State University was established in 1995 on the basis of the merger of Kyzyl Pedagogical Institute (year of foundation 1952) and branches of Krasnoyarsk Polytechnic Institute and Krasnoyarsk State Agrarian University. At present, the university is actively developing international cooperation in the field of research and educational activities related to ethno-cultural direction. A significant factor hindering the realization of Kyzyl's export potential is poor transport accessibility (no railroad, limited number of direct flights).

Thus, out of 30 cities – university centers of the Siberian Federal District, 76.7% belong to the group with low educational and research potential. There are more centers in the group with high educational and low R&D potential (5 cities; 16.7%) than in the

group with low educational and high R&D potential (1 city; 3.3%): it is easier to realize the educational potential of export activity than that of R&D. The current disproportion is quite objective: export of educational services can be effectively implemented only in university centers with the presence of rated universities located in multifunctional cities (with developed economic, transport, logistics and administrative functions) with a developed adapted urban environment for foreign students.

Universities of cities – university centers of different types can adjust their development strategies taking into account the assessment of their potential: the presence of at least one strong (in terms of export activity implementation) university gives growth incentives to other universities. Cooperation between universities in a city (through inclusion in joint educational programs, joint research projects, etc.), taking into account the most promising areas of export of educational services, can become the basis for improving the quality of training specialists for both external and domestic markets. For such centers, it is rather important to transform the strategies of urban environment development in terms of increasing comfort for the student audience, including foreign students.

In the group with low efficiency of educational services export implementation (except for Omsk and Krasnoyarsk, for which the position in this group is associated with a significant differentiation in the efficiency of universities with a significant number of them), all cities can be considered university centers only formally, since almost all universities operating in them are branches of large regional or federal universities and provide training of specialists for their region. In some cases, their remoteness from major economic and transport-logistic centers (Norilsk) complicates the situation. For such centers of higher education, the analysis

of the experience of other centers and trends in the development of export of educational services in them can also become the basis for adjusting their educational programs in terms of not only improving the level of training of specialists for their regions and regions of the RF, but also attracting foreign students.

Only an integrated approach, consisting of both quantitative (number of foreign students) and qualitative indicators (international scientific cooperation, expansion of the range of demanded specialties, adjustment of educational programs), will significantly improve the efficiency of universities' implementation of strategies for exporting educational services, as well as educational and research activities in the domestic market.

Thus, further development of the export potential of Russian education can be associated not only with the provision of higher education services, but also with deeper inclusion in the work of international professional associations in terms of identifying the most relevant in the global market and competencies demanded by employers.

Conclusion

The export of education, despite the changed geopolitical conditions, continues to be an important state strategy and task of Russian education. Assessment of the efficiency of the export of education implementation by individual universities and cities – university centers is an important research and practical task, the solution of which will help to adjust the development strategies of both universities and their host cities.

The research reveals problems in the existing methods of assessing the effectiveness of export activities of universities in the cities – university centers of the Russian Federation. The approach used in the Rosobrnadzor Monitoring – the

assessment of the share of foreign students in the total number of students – does not reflect the diversity of activities of modern universities: the most important element of competitiveness is scientific research, opportunities for commercialization of new knowledge and inclusion in international scientific collaborations; integration of science, business and education. We propose and test a methodology for the development of indices for assessing the effectiveness of the implementation of educational potential of cities – university centers on the basis of multivariate statistical analysis on the materials of the Siberian Federal District. The clustering makes it possible to differentiate university centers by the degree of efficiency of export potential realization, to specify the goals of strategic development of universities and their host cities.

We test the methodology on the materials of 30 cities of the Siberian Federal District, and identify four groups of cities – university centers: 1) with high educational and research potential of education export – Tomsk; 2) with high educational and low research potential of education export – 5 cities; 3) with low educational and research potential of education export – 22 cities; 4) with low educational and high research potential of education export – Kyzyl. For each group, we propose strategies of higher education development in the context of its export realization.

Further scientific and practical research of conceptual and practical approaches in terms of methods for assessing the export potential of university centers, deeper factor analysis of its implementation will significantly improve the effectiveness of strategic planning at the municipal and regional levels, synchronizing the strategies of university development and urban environment development directions, as well as mechanisms and

tools for the formation of urban agglomerations in Russian regions. For a more complete and in-depth analysis of implementing the export of educational services by universities, taking into account the different contributions of individual indicators to the comprehensive index assessment, it is necessary to further compare the indicators of different types of university activities with the nature of their impact on the effectiveness of the implementation of individual models of university development.

References

- Bondarenko V.V., Polutin S.V., Yudina V.A., Tanina M.A., Leskina O.N. (2022). Attractiveness of Russian universities among foreign students in conditions of competitive global markets of educational services. *Integratsiya obrazovaniya=Integration of Education*, 26(1), 72–92. DOI: <https://doi.org/10.15507/1991-9468.106.026.202201.072-092> (in Russian).
- Bouchaib C. (2023). The Sino-African higher education exchange: Toward building a literature. *Asian Education and Development Studies*, 12(1), 1–14. DOI: 10.1108/AEDS-01-2021-0019
- Bykovskaya E.N., Rybina M.N. (2023). Educational services export: Competition in new geopolitical conditions. *Vestnik universiteta*, 1, 68–75. DOI: 10.26425/1816-4277-2023-1-68-75 (in Russian)
- De Wit H. (2019). Evolving concepts, trends, and challenges in the internationalization of higher education in the world. *Voprosy obrazovaniya=Educational Studies Moscow*, 2, 8–34. DOI: 10.17323/1814-9545-2019-2-8-34 (in Russian).
- Delahunty D., Phusavat K., Kess P. et al. (2018). Globalisation and education: Case demonstration and lessons learned from Finland’s education export. *International Journal of Management in Education*, 12(1), 25–42. DOI: 10.1504/IJMIE.2018.088370
- Kazantseva N.A. (2022). Problems and prospects of higher education export in a cross-border region (by the case of the Transbaikal State University). *Vestnik Zabaikal’skogo gosudarstvennogo universiteta=Bulletin of ZabGU*, 28(8), 35–44. DOI: 10.21209/2227-9245-2022-28-8-35-44 (in Russian).
- Khodakarami P., Zakaria Z., Jamil R. et al. (2022). The effect of business technology strategy on inward export performance in the Malaysian higher education industry. *Sustainability*, 14, 9307. DOI:10.3390/su14159307
- Krasnova G.A. (2021). *Osnovy eksportnoi deyatel’nosti v sfere obrazovaniya* [Fundamentals of Export Activities in the Sphere of Education]. Moscow: Prospekt.
- Kreidenko T.F., Petrovich M.D., Kholina V.N. (2023). Educational potential of cities – Russian university centers as a factor of increasing their competitiveness. *Vysshee obrazovanie v Rossii=Higher Education in Russia*, 32(10), 34–56. DOI: 10.31992/0869-3617-2023-32-10-34-56 (in Russian).
- Kuz’mina V.M. (2021). Problems of export of educational services of the Russian Federation. *Kollektsiya gumanitarnykh issledovaniy=The Collection of Humanitarian Studies*, 1(26), 50–59. DOI: 10.21626/j-chr/2020-3(24)/7 (in Russian).
- Kuznetsova V.V., Mashkina O.A. (2020). Globalization of Chinese higher education as a factor of geopolitical influence. *Sravnitel’naya politika=Comparative Politics Russia*, 11(2), 139–150. DOI: 10.24411/2221-3279-2020-10025 (in Russian).
- Le H., Edwards D.B. Jr. (2023). Singapore’s educational export strategies: “Branding” and “selling” education in a favourable global policy marketplace. *Comparative Education*, 59(1), 38–58. DOI: 10.1080/03050068.2022.2133847
- Lebedev A.A., Ridiger A.V. (2022). About Russian university export programs under sanctions. *Informatsiya i innovatsii=Information and Innovations*, 17(3), 49–58. DOI: 10.31432/1994-2443-2022-17-3-49-58 (in Russian).

- Lijun Guo, Pogorelskaya A.M., Yun S.M. (2020). Higher education internationalization priorities in the Republic of Belarus and the export of Belarusian education. *Vestnik Tomskogo gosudarstvennogo universiteta*, 460, 138–148. DOI: 10.17223/15617793/460/17 (in Russian).
- Lou J., Li J. (2022). Export expansion and intergenerational education mobility: Evidence from China. *China Economic Review*, 73, 101797. DOI: 10.1016/j.chieco.2022.101797
- Manukyan A.R. (2023). Export of education as a factor of the county's economic growth. *Sotsial'no-gumanitarnye znaniya*, 2, 106–110 (in Russian).
- Marinenko O.P. (2019). The role of university teachers in the assistance to international students. *Vysshee obrazovanie v Rossii=Higher Education in Russia*, 4, 124–133. DOI: 10.31992/0869-3617-2019-28-4-124-133 (in Russian).
- Nagornova M.G. (2020). International practice of export of higher education. *Ekonomika i sotsium*, 7(74), 610–613 (in Russian).
- Nikitenko E.V. (2023). Internationalization of higher education in Russia: In search for development. *Vysshee obrazovanie v Rossii=Higher Education in Russia*, 5, 125–137. DOI: 10.31992/0869-3617-2023-32-5-125-137 (in Russian).
- Nikolaev V.K. (2022). Exporting Russian higher education in the conditions of a new reality. *Vysshee obrazovanie v Rossii=Higher Education in Russia*, 31(2), 149–166. DOI: 10.31992/0869-3617-2022-31-2-149-166 (in Russian).
- Pham H.-H., Hoang A.-D., Lai S.-L. et al. (2022). International education as an export sector: An investigation of 49 Vietnamese universities and colleges using Bayesian analysis. *Globalisation, Societies and Education*, 1–19. DOI: 10.1080/14767724.2022.2081536
- Rodygina N.Yu., Musikhin V.I., Azarova O.A., Logina M.V. (2022). Economic analysis of the world export of educational services. *Mezhdunarodnaya ekonomika*, 1. DOI: 10.33920/vne-04-2201-04 (in Russian).
- Rostovskaya T.K., Skorobogatova V.I. (2019). The Russian migration laws: For or against academic mobility? *Migratsionnoe pravo*, 3, 18–25 (in Russian).
- Ruchkin A.B. (2019). Export of Russian education to African countries: Challenges and resources of development. *Znanie. Ponimanie. Umenie*, 2, 21–33. DOI: 10.17805/zpu.2019.2.2 (in Russian).
- Rybakova E.V. (2023). Ways to ensure the effective implementation of the Russian education export strategy. *Pedagogika. Voprosy teorii i praktiki=Pedagogy. Theory & Practice*, 8(6), 573–582. DOI: 10.30853/ped20230098 (in Russian).
- Selivanova I.A., Markovina I.Yu., Il'yasov I.R., Zhevlakova A.K., Terekhov R.P. (2020). Test items validation in the context of education export. *Vysshee obrazovanie v Rossii=Higher Education in Russia*, 29(6), 136–143. DOI: 10.31992/0869-3617-2020-6-136-143 (in Russian)
- Troitskiy E.F., Yun S.M. (2021). Uzbekistan: New milestones of higher education internationalization. *Vysshee obrazovanie v Rossii=Higher Education in Russia*, 10, 157–168. DOI: 10.31992/0869-3617-2021-30-10-157-168 (in Russian).
- Wu W. (2022). The political economy of international education: A critical discussion. *Critical Education*, 13(3), 1–17.
- Yang Y., Fabuš M., Bae K.-H., Zhang M. (2020). A diamond model based analysis for improving the sustainable competitiveness in educational exports by Chinese colleges and universities. *Entrepreneurship and Sustainability Issues*, 7(3), 1858–1871. DOI: 10.9770/jesi.2020.7.3(28)
- Zakharov M.Yu., Starovoitova I.E., Shishkova A.V. (2023). Managing academic mobility as a tool of “soft power” in contemporary China. *Vestnik universiteta*, 2, 166–173. DOI: 10.26425/1816-4277-2023-2-166-173-173 (in Russian).
- Zolochesvskaya E.Yu., Sivakova Ya.E. (2022). Improvement of the mechanism of education export development in the Russian Federation. *Gosudarstvennoe i munitsipal'noe upravlenie. Uchenye zapiski=State Municipal Management. Scholar Notes*, 1, 39–42. DOI: 10.22394/2079-1690-2022-1-1-39-42 (in Russian).

Information about the Authors

Tatyana F. Kreydenko – Candidate of Sciences (Geography), associate professor of department, RUDN University (6, Miklukho-Maklay Street, Moscow, 117198, Russian Federation; e-mail: kreydenko-tf@rudn.ru)

Mariya F. Mizintseva – Doctor of Sciences (Economics), Professor, Chief Researcher, Central Economic Mathematical Institute, Russian Academy of Sciences (47, Nakhimovsky Avenue, Moscow, 117418, Russian Federation; e-mail: mfmizintseva@cemi.rssi.ru)

Veronika N. Kholina – Candidate of Sciences (Geography), Associate Professor, head of department, RUDN University (6, Miklukho-Maklay Street, Moscow, 117198, Russian Federation; e-mail: kholina-vn@rudn.ru)

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