

TRANSARCTIC COOPERATION POTENTIAL EVALUATION OF NORTHERN UNIVERSITIES: RESEARCH PERFORMANCE OF ARCTIC UNIVERSITIES' EDUCATION INDICATORS

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Abstract

The article deals with international cooperation potential evaluation of large Arctic universities. A study was based on both collection and analysis of 10 quantitative indicators characterizing the internationalization level of large Arctic universities with a minimum contingent of 3,500 students. Totally, 15 large Arctic universities were selected - 10 universities are located in the European, Canadian, and American Arctic; 5 universities are located in the Russian Arctic.

Having applied 10 indicators collected from the open information sources, it became possible to create a Barometer for international cooperation potential evaluation in the Arctic - an infographic tool of international cooperation monitoring in a macro-regional context. Thanks to that, it became obvious which Arctic macroregions are interested in international cooperation and projects to a greater extent, and which are to a lesser. The study once again has proved that Arctic universities are offering different opportunities for international cooperation. Methods of the research are cluster analysis, cabinet studies, comparative analysis.

In conclusion there were suggested recommendations on international cooperation potential evaluation for the Russian Arctic universities.

Keywords: Arctic, potential evaluation barometer, integration, research-educational cluster, transarctic cooperation, university.

1 INTRODUCTION

The international cooperation potential in the Arctic has been growing recently. At the same time, this macroregion has its own specifics both in terms of its special geographical location and both complicated natural and climatic conditions. Both structuring and formalization of cooperation has been underway in the Arctic zone. The architecture of a brand-new Arctic cooperation is being considered in the paper [1]. There are three organizational clusters to be selected. The first is uniting interaction of both intergovernmental and non-governmental organizations aimed at enhancing Northern Europe states integration. Within its framework, such institutionalized forms of interaction as the Barents Euro-Arctic Council, the Northern Dimension program have been created.

The second cluster unites a certain architecture between multifunctional and different subject-oriented national and international structures that focus (in a whole either partly) their activities on the Arctic zone. Within its framework, the Arctic Council got established which include a number of non-Arctic countries as observers.

A strong feature of all circumpolar countries is that they all have recently adopted the Arctic strategies. At the same time, science and education act as one of the tools to ensure geopolitical interests in the macroregion [2]. In Kiruna Declaration [3] it is highlighted both an increase in infrastructural presence in the Arctic as well as a large-scale growth of a research factor.

Universities become a serious tool that stimulate integration processes in the Arctic zone. Taking these circumstances into account, we will single out third cluster of the Arctic cooperation, mainly broad internationalization of science (and education) and "arctic" universities integration (both in terms of location and research topics).

In this framework, a specific tool was developed to assess international cooperation potential of the Arctic macroregion - *Barometer for international cooperation potential evaluation in the Arctic*,

including both an integrated assessment of international cooperation in the macroregion in general and geographical distribution of cooperation intensity at a regional level.

2 METHODOLOGY

Barometer for international cooperation potential evaluation in the Arctic is a convenient infographic tool that allows to familiarize all interested actors in the field of international cooperation.

Barometer for international cooperation potential evaluation in the Arctic methodology includes a list of 10 quantitative indicators used to analyze international cooperation at Arctic universities:

- 1 number of projects implemented in the Barents Euro-Arctic Council, Nordic Council of Ministers, Arctic Council, UArctic over the past 5 years,
- 2 share of foreign students out of the total amount of students,
- 3 availability of large universities and research centers, performing Arctic research,
- 4 number of teachers, scientists invited to implement educational programs, to hold research,
- 5 share of students sent to study in foreign universities,
- 6 share of foreign students admitted to the university,
- 7 number of educational programs (bachelor and master degree programmes) in English,
- 8 number of courses taught in English,
- 9 number of international partnerships and university memberships,
- 10 total number of PhD programs with foreign universities.

Quantitative data for 10 above-selected indicators was collected out of the following 3 types of sources: accumulated projects database supported by the Barents Euro-Arctic Council, Nordic Council of Ministers, Arctic Council, UArctic for the last 5 years, web-sites of major Arctic universities (5 Russian and 10 foreign Arctic universities with a student contingent of at least 3,600 people); UArctic web-site [4].



Figure 1. International cooperation visualization of Arctic Universities, 2016

As follows from the Figure 1, Russia is lagging behind in terms of the number of contact points, which is indicative of Russia's insufficient and even sluggish international activity in a field of science, education and human capital development.

However, in order to gain a deeper understanding of Arctic universities international activity, we shall consider each of the 10 proposed indicators separately.

3 RESULTS

3.1 Barometer's indicators description

Indicator Nr.1 «Number of implemented projects within the Barents Euro-Arctic Council, Nordic Council of Ministers, Arctic Council for the last 5 years». Data on a number of projects implemented in a framework of international organizations (Barents Euro-Arctic Council, Nordic Council of Ministers, Arctic Council) over the last 5 years was obtained under the previous project implemented for the International Department of the Ministry of Education and Science of Russia (Figure 2).

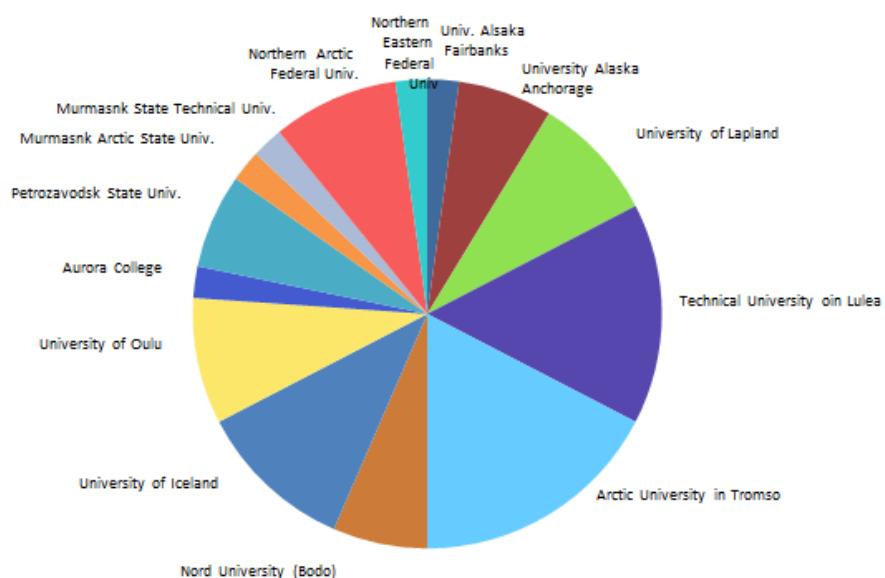


Figure 2. Number of implemented projects within the Barents Euro-Arctic Council, Nordic Council of Ministers, Arctic Council for the last 5 years, 2012-2016

Figure 2 shows that the largest number of projects within international organizations being implemented by the Arctic University in Tromsø, Norway (8 projects) and Technical University in Luleå, Sweden (7 projects). This is also followed by University of Iceland, University of Oulu, University of Lapland and Northern-Arctic Federal University (Russia) with 4 projects respectively.

Indicator Nr.2 «Share of foreign students out of the total amount of students» is presented in a Figure 3. As follows from the Figure 3, the leader in many foreign students to be accepted for study is the Arctic University in Tromsø (Norway) with 10% of such students, second place goes to the University of Iceland - 8.34%, followed by the University of Lapland (Finland) - 6.4 %. Russian Arctic universities are very "slagging" on this indicator, with the exception of Petrozavodsk State University (4.05%) and Northern-Arctic Federal University (4%).

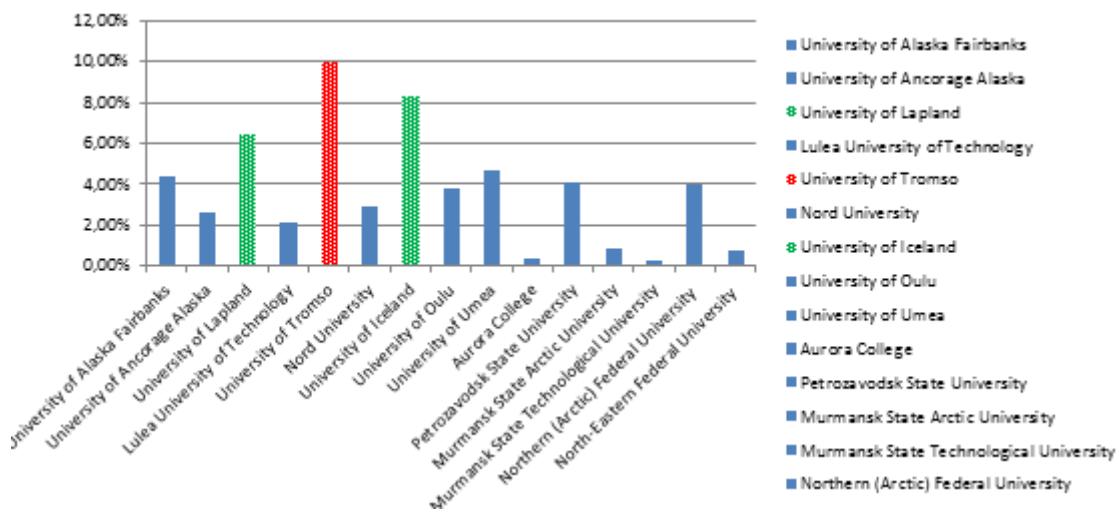


Figure 3. Share of foreign students out of the total amount of students

Indicator Nr.3 «Large universities and research centers performing Arctic research». The study involves 15 Arctic universities, located beyond 66 degrees of northern latitude, i.e. beyond the Arctic Circle ($66^{\circ}33'44''$ (66.5622°) to the north of the equator.

Only large Arctic universities (not University branches) with students' contingent of at least 3600 people are in a study focus. The largest arctic university is Umeå University with a student contingent of 31,500 in 2016. This is followed by the University of Alaska in Anchorage (20,000), Northern-Eastern Federal University (19,970), Northern-Arctic Federal University (17,228) and University of Oulu in Finland (16,000).

An exception is presented with Canada, it has only 2 colleges located beyond 66 degrees - Aurora College and Yukon College. We analyze data for a college-university - Aurora College, since it offers bachelor's degree in social work.

IT-technologies play an important role in the Arctic universities internationalization, including their websites. Most websites of the Arctic universities are designed in English language (Table 2). The exception is presented with Russian universities as well as Technical University in Lulea (Sweden) and Arctic University of Tromsø (Norway).

Deeper understanding of the *indicator Nr.3 «Large universities and research centers performing Arctic research»* might be also scrutinized though a number of references in a news feed linked to cooperation with Russian universities over the last year (Figure 4). Thus, the news feed of 10 foreign Arctic universities was analyzed.

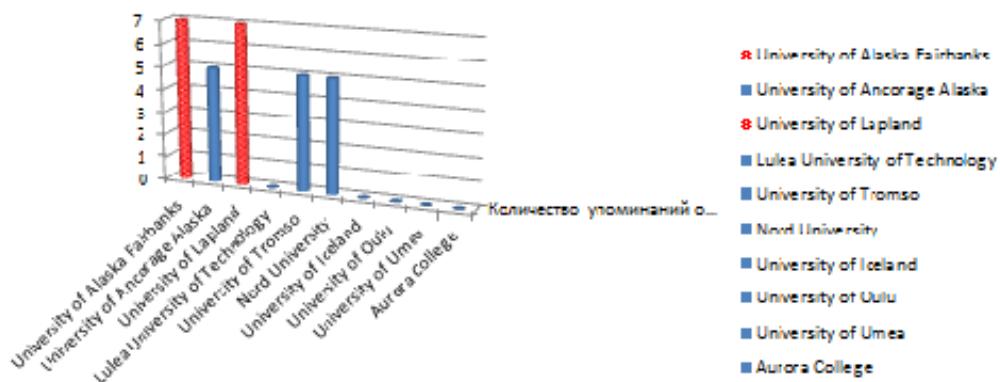


Figure 4. Cooperation reference with Russia in Arctic Universities' newsfeed for the last year, 2016

As it follows from the Figure 4, the leaders in terms of cooperation references with Russia are the University of Alaska in Fairbanks (USA) and the University of Lapland - they have 7 references per year. The second place is shared by the University of Alaska in Anchorage (USA), Arctic University in

Tromsø (Norway) and Northern University of Bodø (Norway) - they have 5 references in 2016. There is a strong interest in Russian studies in the USA and Norway.

The remaining 5 foreign Arctic universities participating in this study have shown that a number of references on Russia over the past year has reduced to zero.

Indicator Nr.4 «Number of teachers, scientists invited to implement educational programs, to hold research».

The undisputed leader in this indicator is the North-Eastern Federal University, which invited 72 foreign scientists in 2016, the second place goes to Petrozavodsk State University (37 scientists), and University of Iceland - 35 scientists (Figure 5).

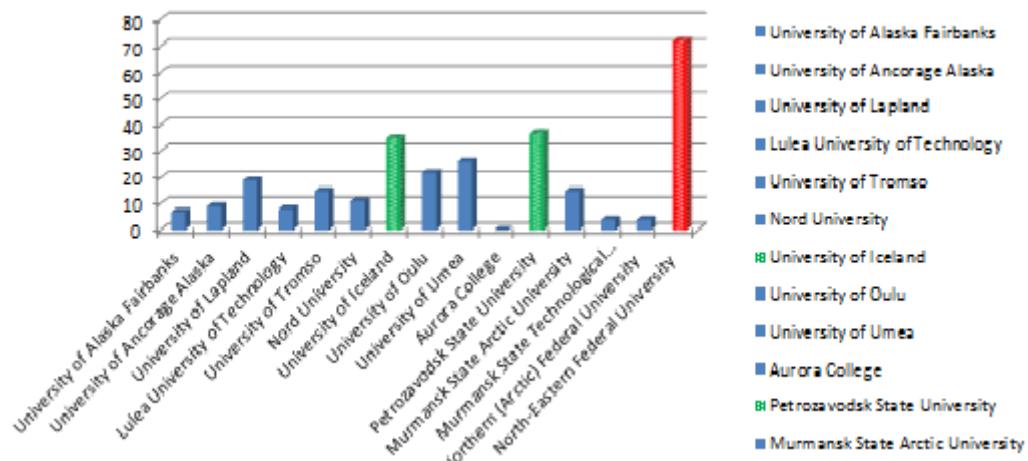


Figure 5. Number of teachers, scientists invited to implement educational programs, to hold research, 2016

Indicator Nr.5 «Share of students sent to study at foreign universities» is presented in the Figure 6. Quantitative data was collected from 5 Russian Arctic higher educational institutions. This data is not located in a public domain. This type of indicators refers to rather "specific" or "with difficult access". Both at websites and reports of foreign Arctic universities, it was not possible to find such indicators.

The obvious leader in students' exchange rate among Russian universities is the Northern-Arctic Federal University which has sent 368 students abroad in 2016.

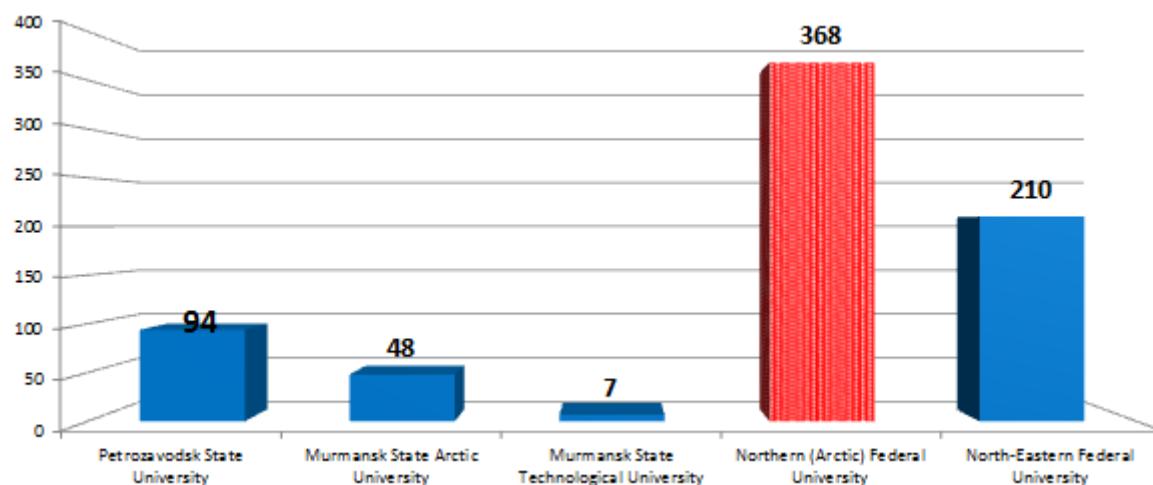


Figure 6. Share of students sent to study abroad at foreign universities, 2016

A broader understanding on students' exchange within the arctic higher education institutions is presented in the Figure 7. The UArctic web site indicates the following significant student exchanges vectors:

- from Norwegian universities into Russian universities,
- from Finnish universities into Canadian universities,
- on students' mutual exchange between the United States and Canada,
- on students' mutual exchange between Canada and Norway.

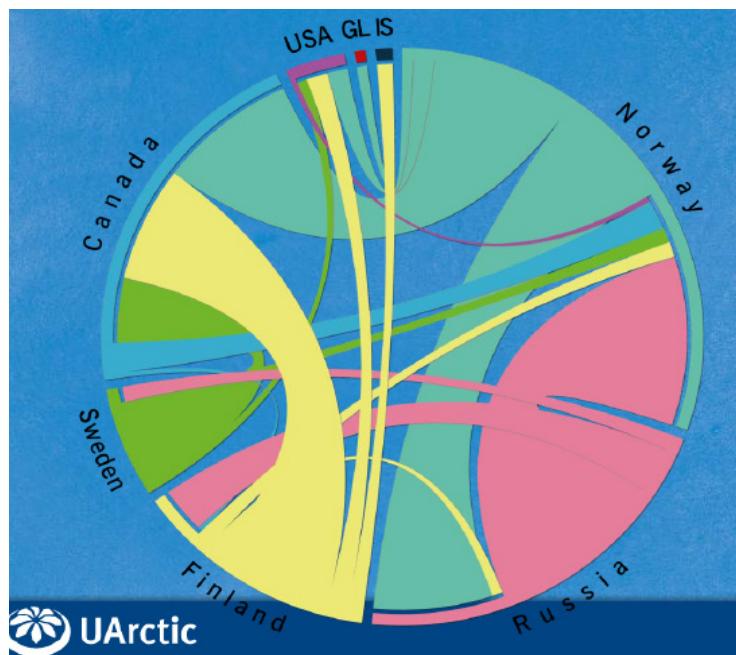


Figure 7. Students exchange vectors in Arctic universities

Quantitative indicator Nr.6 «Number of foreign students admitted to the university» is presented in the Table 1. The largest number of foreign students is accepted by Arctic universities of Northern Europe - Umeå University, Tromsø Arctic University and University of Iceland. Among Russian universities dominates the Northern-Arctic Federal University with 706 students and Petrozavodsk State University with 455 students.

Table 1. Number of foreign students admitted to the Arctic universities in 2016

Arctic university title	Number of foreign students admitted to the university
University of Alaska Fairbanks	428
University of Alaska in Anchorage	524
University of Lapland	300
Technical University in Lulea	270
Arctic University in Tromso	1200
Nord University Bodo	350
University of Iceland	1150
University of Oulu	600
University of Umea	1480
Aurora College	2
Petrozavodsk State University	455
Murmansk Arctic State University	32
Murmansk State Technical University	35
Northern-Arctic Federal University	706
Northern-Eastern Federal University	146

Indicator Nr.7 "Number of educational programs (bachelor and master degree programmes) in English language" is presented in the Figure 8. The obvious leader in a number of programs in English is the University of Iceland - 49 programs, the second place is at Umeå University (Sweden) with 39 programs, and the Arctic University of Tromsø, Norway with 35 programs. Among Russian universities the Northern-Arctic Federal University is leading with 7 degree programmes programs.

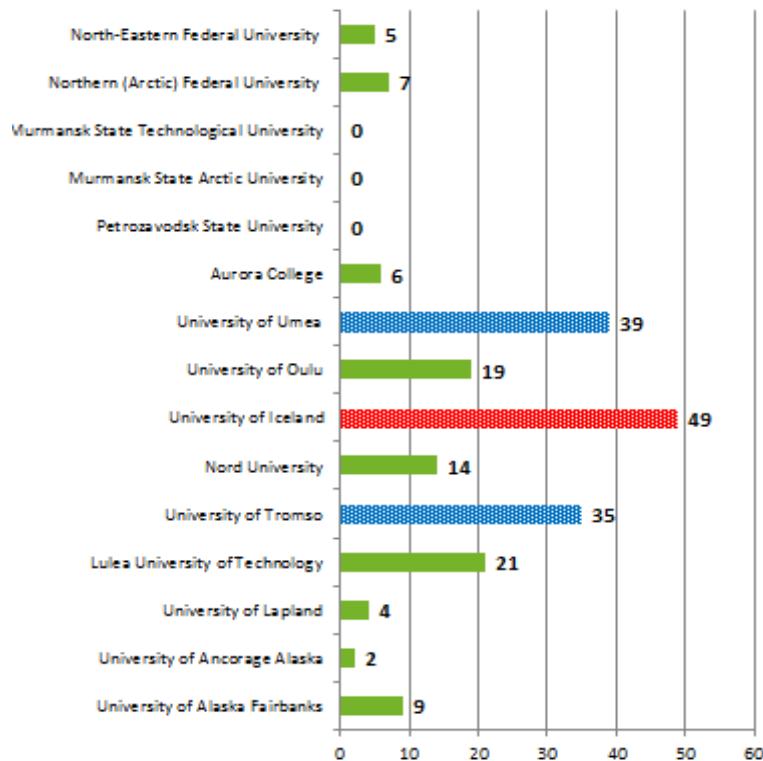


Figure 8. Number of educational programs (bachelor and master degree programmes) in English language

Indicator Nr.8 "Number of courses taught in English" perfectly reflects level of internationalization of a particular university. Thus, the University of Iceland offers 500 courses in English, University of Oulu - 486 courses, and University of Tromsø - 350. The Russian leader is again Northern-Arctic Federal University with 66 courses taught in English (Figure 9).

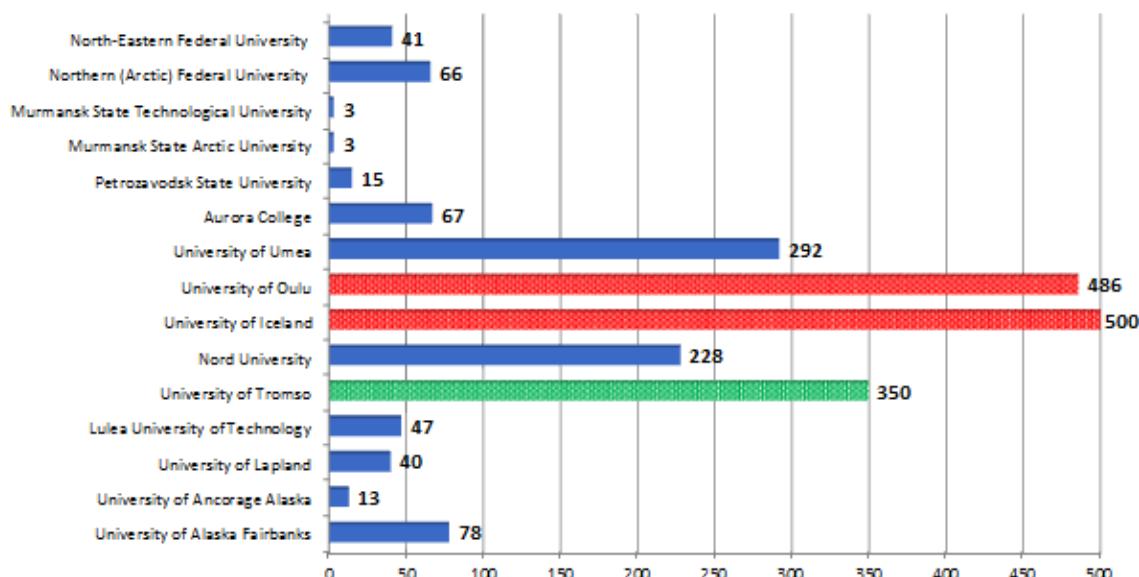


Figure 9. Number of courses taught in English

Indicator Nr.9 "Number of international partnerships and university memberships" is clearly illustrated in the Figure 10. The largest number of partnerships and memberships, as one of the symbols of internationalization, is the University of Umeå (564 agreements), the University of Iceland (400 agreements) and Northern-Arctic Federal University (142 agreements).

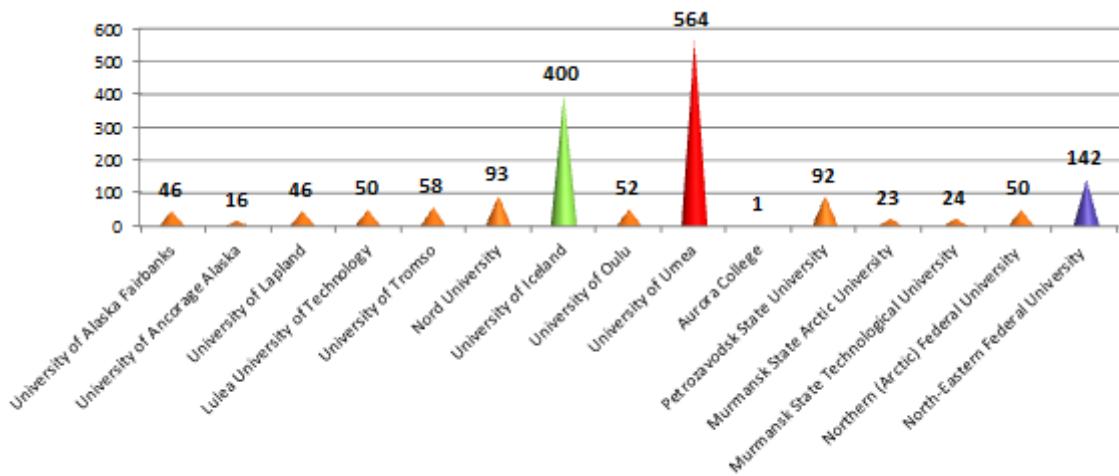


Figure 10. Number of international partnerships and university membership

Indicator 10 "Total number of Ph.D. programs with foreign universities" reflects the highest level of internationalization, since it supports the system of academic degree holders training within Ph.D. degree programs.

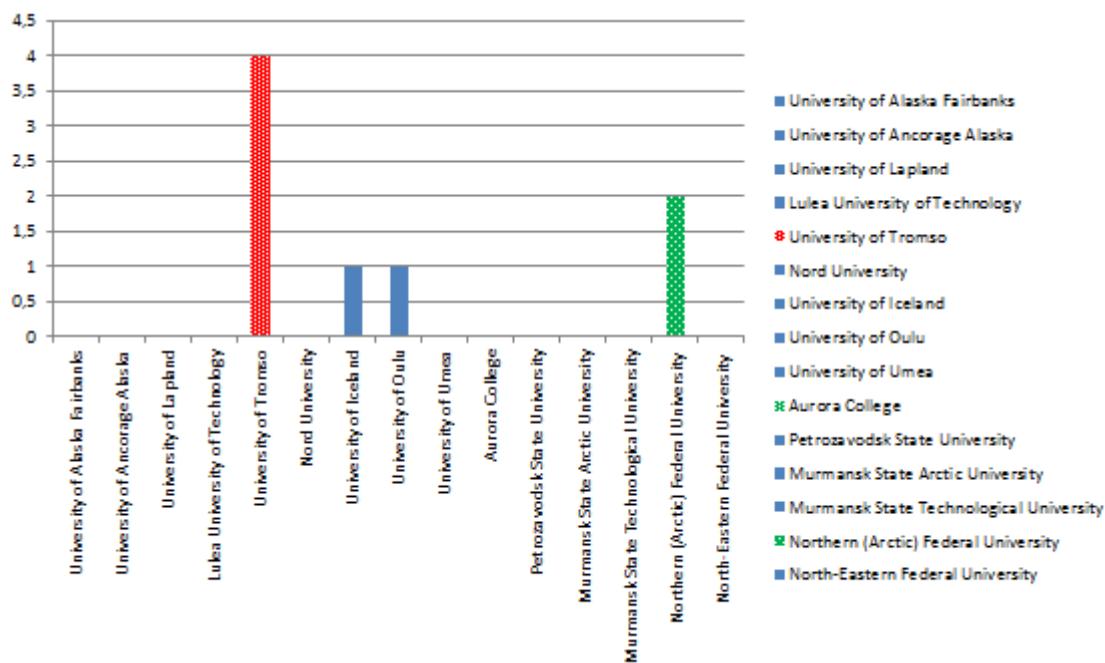


Figure 11. Total number of Ph.D. programs with foreign universities

As follows from the Figure 11, the leader is the Arctic University of Tromsø with 4 Ph.D. programs, followed by Northern-Arctic Federal University with 2 Ph.D. programs, from the University of Iceland and the University of Oulu for 1 Ph.D. program.

Thus, within the framework of the study, a list of 10 indicators was formed, then quantitative indicators were accumulated and analyzed for the selected 10 indicators in terms of 15 large Arctic universities.

3.2 Barometer for international cooperation potential evaluation in the arctic

Arctic macroregions clustering methodology is based on Professor A.Pilyasov research from the Northern Economy and the Arctic Center in Moscow, which distinguishes four Arctic economy models - Canadian, American, European and Russian.

Arctic region's clustering in terms of international cooperation potential evaluation is based at a list of 10 indicators. Quantitative 10 indicators data was ranked using points ranking from 1 to 3, where 1 point would correspond to low potential of international cooperation, 2 points to medium potential, 3 points to high potential. Thanks to the ranking, it was possible to identify low / medium / high potential of international cooperation for various Arctic universities (Table 2).

As a result of the ranking, the Table 2 was generated, demonstrating the low / medium / high potential of international cooperation at various Arctic universities. While ranking, if the university score is less than 15 points - this would indicate a university with a low international potential, from 15-20 points - average potential, over 20 points - high potential.

Table 2. International cooperation potential evaluation in the Arctic

Arctic University name	International cooperation potential
University of Alaska Fairbanks	low
University of Alaska in Anchorage	low
University of Lapland	medium
Technical University in Lulea	medium
Arctic University in Tromso	high
Nord University Bodo	medium
University of Iceland	high
University of Oulu	medium
University of Umea	high
Aurora College	low
Petrozavodsk State University	medium
Murmansk Arctic State University	low
Murmansk State Technical University	low
Northern-Arctic Federal University	medium
Northern-Eastern Federal University	medium

Obviously, American Arctic zone (of the USA and Canada) demonstrates the lowest potential for international cooperation, European Arctic is around of high / medium, and Russian Arctic - medium / low. In general, Arctic's potential for international cooperation can be considered as medium.

In order to visualize better international cooperation potential, an Arctic map is proposed that allows us to understand which Arctic regions are more interested in international cooperation and which are less (Figure 12).

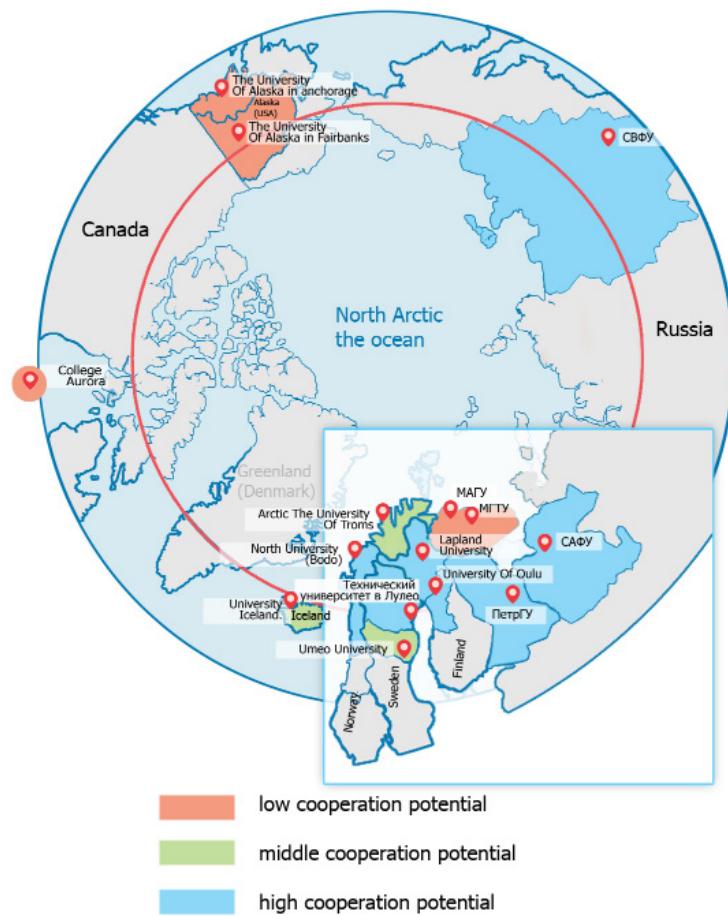


Figure 12. Barometer for international cooperation potential evaluation in the Arctic

4 CONCLUSIONS

A research study of 15 Arctic universities has showed that American Arctic (of the USA and Canada) demonstrates a lower potential for international cooperation rather than European Arctic which is about of high / medium potential while Russian Arctic demonstrates medium / low potential. In general, Arctic's potential for international cooperation can be characterized as the medium one.

It is desirable for Russia to perform a transition from a lower potential to medium for universities located in Murmansk region (Murmansk Arctic State University and Murmansk State Technical University); from medium potential to high - for other 3 Russian Universities (Petrozavodsk State University, Northern-Arctic Federal University, Northern-Eastern Federal University). The recommendations for Russian universities on the transition are:

- 1 to perform university's website principal version in English;
- 2 to conclude agreements with foreign universities;
- 3 to diversify students' exchange and increase student exchange volume;
- 4 to develop (bachelor and master) training programs in English;
- 5 to create a joint training program for Ph.D. fellows (Ph.D. program);
- 6 to invite foreign scientists and researchers;
- 7 to implement more projects within the framework of international organizations (Nordic Council of Ministers, Barents Euro-Arctic Region, Arctic Council);
- 8 to develop a greater number of courses taught in English.

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