

CONSTRUCTING NATIONAL RANKING METHODOLOGY: DILEMMAS, CHOICES, AND DECISIONS

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Abstract

The Russian universities as well as universities from other countries increasingly compete not only at the national level, but globally. This trend is reflected in growing interest to universities rankings. Despite criticism, rankings outcomes are in demand and influence universities' positioning in the global higher education area. In Russia several rankings have been recently established, striving to satisfy needs of various stakeholders. However, all these approaches are single dimensional rankings that use a composite indicator and weight coefficients. The article presents a rationale and draft methodology of a multidimensional ranking system in Russia. The authors advocate relevancy of the chosen approach as it allows them to reflect complexity and diversity of the Russian Higher Education system. Drawing on the project outcomes, the authors focus on the national multidimensional ranking methodology concept, choice of indicators, the approbation outcomes, dilemmas and decisions.

Key words: rankings, university ranking, higher education institutions, tertiary education institutions.

Introduction

Driven by globalization and growing demands of various stakeholders modern universities become more transparent and intensify their engagement with stakeholders. Enhancing competitiveness and transparency (van Vught & Westerheijden, 2010; Rauhvargers, 2011) strengthening image and reputation at national and international levels (Hazelkorn, 2011) become key goals for universities' development. The growing mobility of international students and researchers worldwide challenge higher education institutions for better quality provision (OECD, 2010).

Universities are striving for better reputation to attract more talented students and researchers and such tools as accreditation, quality assurance and academic rankings play an important role in strengthening their reputation and image.

Despite criticism, rankings are perceived as one of the tools that influence universities' positioning in the global higher education area. However, some experts consider that international academic community and governments are obsessed with rankings (Hazelkorn, 2011). Nevertheless, rankings serve as a useful tool to define universities' status and competitiveness. A growing number of various rankings and their popularity in Europe and the USA are explained by massification, marketisation and globalization of higher education (Shin, & Toutkoushian, 2011). These trends are also relevant for Russia.

To facilitate modernization, enhance higher education quality, strengthen universities capacities, the Russian government established federal universities (Ministry of Education and Science RF, 2012, retrieved 5 November, 2012, from URL: <http://www.mon.gov.ru>) and national research universities (National Research Universities, 2012, retrieved 5 November, 2012, from URL: <http://eng.mon.gov.ru/pro/ved/niu/>). This transformation of the Russian Higher Education System led to increased competition and differentiation among universities (Drantusova & Knyazev, 2011).

Simultaneously with the above-mentioned trends the Russian universities are making concerted efforts to get top positions in global rankings. The Russian government set a goal for the national universities to reach top-positions among global universities by 2020. However, at the moment the results are modest: there are only two Russian universities in the Times Higher Education World University Rankings (THE) (The Times Higher Education, 2012, retrieved 5 November from URL: <http://www.timeshighereducation.co.uk/world-university-rankings/>) and 14 universities in Quacquarelli Symonds World University Rankings (QS Ranking) (QS Rankings, 2012, retrieved 1 November, 2012, from URL: <http://www.topuniversities.com/university-rankings/world-university-rankings>). Therefore, special systematic efforts are required to strengthen the national universities competitiveness in the global higher education area.

Alongside with the increasing popularity of global academic rankings, the number of national ranking systems, monitorings and quality assessments are growing. National policy in higher education is significantly affected by outcomes of the monitorings implemented at the initiative of the Ministry of Education and Science RF (National Training Foundation, 2012, retrieved 5 November, 2012, from URL: <http://ranking.ntf.ru/>).

Problem of Research

Rankings can be developed by media, professional associations, and universities. The quality of a ranking system is responsibility of its developer. There is no single organization that assesses rankings quality. The International Observatory on Academic Ranking and Excellence (IREG) is an independent expert organization that conducts an independent rankings' audit and provides recommendations (IREG, 2012, retrieved 5 November, 2012, from URL: <http://www.ireg-observatory.org/>). In Russia there have been developed more than 30 tools of higher education institutions' external evaluation. They draw close attention of prospective students, universities and academic community. They are also criticized by various stakeholders (Rauhvargers, 2011). None of these ranking systems undertook the IREG audit procedure. This could be explained by the fact that these ranking systems have recently become the focus of attention.

A comparative analysis of 19 international and 30 Russian ranking systems was carried out within the framework of the project "Developing and Approbation of a Template Methodology for National Ranking of Higher Education Institutions" (2011-2013) implemented by National Training Foundation. The ranking systems were assessed against IREG audit criteria (Zavarykina, Lopatina, & Perfilieva, 2012). The analysis revealed the number of limitations of the national ranking systems including:

Inconsistency: some new rankings appear to meet immediate demands and are not repeated by developers due to lack of institutional, managerial, financial and human resources.

Diversity of target audiences and ranking developers: some rankings are developed to meet demands of the national education system and are initiated and implemented by the Ministry of Education and Science RF; other rankings are initiated by media, business community and are aimed at meeting demands of general public;

Institutional focus: existing ranking systems usually assess higher education institutions (HEI) but not education programmes;

Limited assessment: only separate functions of higher education institutions are assessed (usually teaching and research).

A comparative analysis demonstrated that the Russian ranking tools do not fully comply with the audit criteria of the International Observatory on Academic Ranking and Excellence (IREG). Crucial limitations of the Russian ranking systems are:

- Lack of transparency;
- Lack of feedback on rankings outcomes from main stakeholders;
- Quality of the received data.

The limitations drawn from the analysis determine the need to elaborate a new approach to the academic rankings in Russia. The new approach should provide the transparent and reliable information about the national higher education system functioning. The methodology of the new academic ranking must consider the diversity and development trends in national system of higher education as well as to comply with international quality criteria and standards for ranking development. The multidimensional approach is suggested as the most relevant to address all the requirements.

Consider limitations of the existing ranking tools in Russia the correct assessment and comparison of the national higher education institutions are currently challenged, though there is a great demand for the objective and integrated assessments for the evidence-based policy making in Russia. Thus, the research project was designed to identify the key elements of the methodology for the multidimensional academic ranking and to appropriate it for the national higher education system.

Research Focus

The Russian higher education system is highly diversified and presented by a number of following groups and types of HEIs, including:

- leading universities (Moscow State University, Saint Petersburg University, federal universities, national research universities);
- other universities (e.g., Tver State University; Ryazan State University);
- engineering and technical higher education institutions (e.g. Irkutsk Technical University);
- humanitarian and pedagogical higher education institutions (e.g. Russian Humanitarian University);
- higher education institutions with economics and law programmes (e.g. Rostov State Economics University);
- agricultural higher education institutions (e.g. Orlov State Agricultural University);
- medical higher education institutions (e.g. St. Petersburg Medical Academy).

The existing Russian ranking practices solve narrow objectives and do not take into account differentiation and complexity of the Russian Higher Education System as well as do not facilitate integration of the Russian higher education institutions into the global education area. The Russian rankings also do not fully comply with the international criteria of rankings' quality.

An integrated assessment of higher education institutions is required to meet new challenges of international and national higher education systems development. The presented article describes a new approach to assessment of national higher education institutions on the basis of multidimensional ranking that enables to meet objectives of the national higher education system development.

Methodology of Research

General Background of Research

The aforementioned project *goal* is to develop and approbate a template ranking methodology of the Russian higher education institutions on the basis of:

- the methodology of comparative analysis of global, national and specialized rankings, national approaches to evaluation of higher education institutions performance;
- public and expert discussions;
- approbation and evaluation of the outcomes;
- consultations with experts from the International Observatory on Academic Ranking and Excellence.

The methodology is based on a multidimensional ranking.

The selection of a multidimensional approach to ranking higher education institutions responds to the diversity of the national higher education system and necessity to take into account various dimensions of higher education institutions activities. The developed methodology also takes into account the best international practice that was identified through a comparative analysis of foreign and international ranking methodologies and their assessment against IREG audit criteria. (Table. 1)

15 parameters (type of ranking, focus of a ranking, target groups, subject areas, status, frequency, geographical scope, requirements to the participants, education levels, methodology, outcomes, criticism, reputation, position of the Russian universities) have been used for comparative analysis of rankings systems. These parameters enable a common framework for the comparison (Zavarykina, Lopatina, & Perfilieva, 2012).

Table 1. Characteristics of compared foreign and international ranking methodologies.

Type of methodology	Characteristics	Methodologies
Single-dimensional ranking (rankings, league tables)	<p>Displays vertical diversity in terms of performance by using indicators. Most existing higher education rankings take the form of a league table.</p> <p>League table – a single-dimensional list going from “best” to “worst”, assigning ordinal numbers to the entities which relate only to rank and scales of difference.</p>	<p>Academic Rankings of World Universities. (2012). Retrieved 1 November, 2012, from URL: http://www.shanghairanking.com/</p> <p>The Times Higher Education World Universities Rankings. 2012. Retrieved 5 November from URL: http://www.timeshighereducation.co.uk/world-university-rankings/</p> <p>QS World University Rankings. 2012. Retrieved 1 November, 2012, from URL: http://www.topuniversities.com/university-rankings/world-university-rankings</p> <p>US News Worlds Best Universities Ranking. (2012). Retrieved 1 November, 2012, from URL: http://www.usnews.com/education/worlds-best-universities-rankings</p> <p>Guardian Ranking. (2012). Retrieved 1 November, 2012, from URL: http://www.guardian.co.uk/education/universityguide</p>

Multidimensional ranking	Does not try to combine education and research rankings, for example, into single, composite measure and is often user-driven because it enables an interactive display of data.	U-multirank. van Vught, F.A. & Ziegele, F. (2011) Centre for Higher Education (CHE) University Rankings. (2012). Retrieved 1 November, 2012, from URL: http://www.che-ranking.de/cms/?getObject=613&getLang=en
Classification	A system that allocates objects to groups on the basis of their characteristics. It shows horizontal diversity, where differences do not imply ordinary scales of "more", "bigger" or "better". It is aimed at showing diversity of higher education institutions.	European Classification of Higher Education. U-map. (2012). Retrieved 1 November, 2012, from URL: http://www.u-map.eu/ The Carnegie Classification of Institutions of Higher Education. (2012). Retrieved 1 November, 2012, from URL: http://classifications.carnegiefoundation.org/

The comparative analysis includes 3 levels:

1 level: Comparative analysis of methodologies on key selected parameters

2 level: Assessing ranking methodologies against the IREG audit criteria

3 level: Identifying key quantitative indicators and assessing these indicators against criteria of relevance to the Russian education system development objectives, validity and feasibility of data collection.

The assessment of the analysed methodologies against the IREG audit criteria demonstrated that multidimensional rankings such as Multirank, CHE University Ranking have greater compliance with the criteria. However these approaches have their limitations:

- Resource intensity;
- Lack of comparable data on HEIs performance;
- Challenges of ensuring data validity received from surveys;
- Challenges of ensuring data collection procedures validity and quality in case of large volume of data collecting;
- Difficulties associated with processing of large volume of data;
- Challenge of covering all subject areas.

Despite these limitations the multidimensional ranking enables to design a new approach to assessment and ranking of higher education institutions. It considers various functions and types of national higher education institutions and enables to conduct accurate assessment and comparison of higher education institutions. Following the outcomes of the conducted analytical research a multidimensional approach became a basis for assessment and ranking of the national higher education institutions.

Key principles of the template methodology for ranking Russian higher education institutions build on the features which should a new approach to HEIs assessment should conform to:

1. The methodology should provide reliable data on performance of higher education institutions and their position in system of higher education;
2. The methodology should take into account diversity of the Russian higher education institutions, their missions and functions;
3. The methodology should be a useful tool for users of educational services providing friendly and easy-to-use-and-interpret information on diversity of higher education institutions and education programmes;
4. The methodology should take into account diversity of education services users;
5. The methodology should facilitate quality improvement and competitiveness of higher education institutions;

6. The methodology should facilitate integration of the Russian higher education institutions into global education and research environment as their position in rankings is perceived as a “signal” of universities competitiveness;
7. The methodology should be a source of valid data for global and regional rankings.

Five functions of higher education institutions have been identified and included in the ranking methodology: research, teaching and learning, internationalization, knowledge transfer, engagement with regional stakeholders. The methodology for ranking Russian higher education institutions takes into account information needs of the following several target users groups:

1. Prospective students and their parents;
2. Government (central and local);
3. Employers and labour market;
4. Academic community (researchers, lecturers);
5. Business organisations.

A multidimensional approach, used in the methodology, is aimed at achieving maximum relevance in HEIs assessment and correctness in their comparison. Under a multidimensional approach an aggregated score is not used to assess and/or compare HEIs.

Multidimensionality of the methodology is based on confluencing several evaluation areas (figure 1):

- Five identified HEIs functions: teaching, research, knowledge transfer, engagement with regional stakeholders, internationalization.
- HEIs’ groups identified according to their missions: leading universities (Moscow State University, Saint Petersburg University, federal and national research universities), other classical universities, engineering and technical HEIs, humanitarian and pedagogical HEIs, HEIs with economics and law programmes, agricultural and medical universities.
- Groups of users identified according to their information needs: prospective students, academic community, government, business organisations.

		HE Is groups	Users groups
HEIs functions	Research		
	Teaching/learning		
	Internationalization		
	Knowledge transfer		
	Engagement with regional stakeholders		

Figure 1: Multidimensionality of a new academic ranking methodology.

As outlined in the key methodology principles the *mission* of the template methodology is to provide reliable and objective information on HEIs performance to satisfy information

needs of various groups of education services users with account of the Russian higher education system diversity.

The main goals of the template methodology are, as follows:

- Assessment of higher education institutions against 5 identified functions.
- Developing a database of the Russian higher education system (current state and development trends) taking into account its diversity, with possibility of creating HEIs rankings and ratings on specific indicators.
- Developing a transparent tool for external assessment of the Russian higher education institutions.
- Contributing to the Russian higher education system development through creating an information and analytical basis for benchmarking (best practices identification) and facilitating demand for higher education services in the country.

The multidimensional approach complies with the methodological standards for rankings development:

- standards for empirical research;
- rankings quality criteria developed by the international expert group on Academic Ranking and Excellence (IREG) and Berlin principles on ranking higher education institutions;
- practices on developing global, national and specialist rankings.

The developing approach does not use qualitative data received from surveys of students, academic staff and employers. This is explained by the lack of specialized national sociological research. However, inclusion of qualitative data into the multidimensional ranking methodology is perceived as one of the directions of the Russian higher education system development.

All elements of the multidimensional ranking methodology (in the first instance, quantitative indicators) have been discussed and evaluated by experts.

Experts' inputs have been used for:

- indicators identification for each of 5 functional areas of assessment with account of international and Russian practice;
- assessing indicators against the criteria of relevance to the Russian higher education system development objectives; their validity; availability; relevance to the methodology;
- testing the template ranking methodology;
- weighting indicators within each functional area.

On the basis of the experts' assessment 65 indicators on 5 HEIs' functions (research, teaching and learning, internationalization, knowledge transfer, engagement with regional stakeholders) have been identified.

Sample of Research

There is more than a thousand of higher education institutions in the Russian Federation (Statistics in Education, 2012, retrieved 1 November, 2012, from URL: http://stat.edu.ru/scr/db.cgi?act=listDB&t=2_6_1a&ttype=2&Field=All). To construct the sample structure for the approbation of the developed multidimensional approach to academic ranking 10 per cent of higher education institutions were selected out of the general totality of HEIs in national system of higher education. The sample structure takes into account the existing typology of national HEIs and reflects the geographical distribution of HEIs across the country (Yadov 2007, 95 - 105).

Thus, 148 higher education institutions have been invited to participate in approbation of the methodology.

The sample structure for the approbation includes:

- Leading Russian universities (Moscow State University, Saint Petersburg State University);
- Federal universities (9 universities);
- National research universities (29 universities);
- Higher education institutions which received government support of their strategic development programmes (54 HEIs);
- Higher education institutions which education programmes have been listed as the best educational programmes (catalogue 2011 – 2012 “Best education programmes: innovation Russia) (42 HEIs);
- Higher education institutions recommended by experts (10 private HEIs);
- Higher education institutions which expresses interest in taking part in approbation (3 HEIs).

Selected HEIs demonstrate different missions. Leading national universities such as Moscow State University and Saint Petersburg State University are the acknowledged world leaders of higher education preserve traditions of academic universities with balanced functions of teaching and research.

As well as the Federal universities (FU) which are also aimed to provide high quality education and research but with a special focus to the needs of social and economic development of their regions. Each of federal universities functions in one of nine federal districts.

National Research Universities (NRU) are not affiliated to a special region. There are 29 research universities each of which is aimed at developing applied sciences to meet the needs of a particular industrial sector (aviation, space navigation, chemicals etc.).

Among other higher education institutions chosen for the approbation different types of higher education institutions presented. They also have a special vision.

HEIs which received government support of their strategic development programmes (ME) are committed to a holistic approach to university development and focused on education quality, international cooperation and networking with regional stakeholders. Most of these HEIs are regional universities, specialized in engineering, technical, pedagogic or social sciences programmes. The Peoples' Friendship University of Russia could be named here as an example.

Another type of higher education institutions presented in the sample are HEIs with the best innovative educational programmes recognized by the National Centre for Professional Accreditation (The Best Educational Programs of Innovate Russia, 2011).

10 privately funded institutions were recommended by experts to be included into the sample structure. These universities are also members of the National Association of private HEIs.

The main feature of those HEIs which expressed interest in taking part in approbation is that they offer special educational programmes in Technology and Engineering and usually are not covered by national academic rankings. These institutions, however, are interested in comparing themselves with other universities. The approbation is, therefore provide these universities an opportunity to attract additional attention to their special programmes.

Thus, this approach enables to include various types of education institutions into the approbation of the methodology.

The data received within the approbation is used as the base for a pilot ranking of Russian higher education institutions on 5 functions: research, teaching/learning, internationalization, knowledge transfer, engagement with regional stakeholders.

Table 2. Sampling structure of the approbation by types of HEIs and their geographical distribution.

	Federal District	Classical universities	Technical HEI	Pedag. HEI	HEI with Economics/Law programmes	Medical HEI	Agricultural HEI	TOTAL
1	North-Western	7	8	3	3	1		22
2	Central	9	17	8	5	2	1	42
3	Volga	9	12	3	2	1	2	29
4	Southern	3	4		2	1		10
5	North-Caucasian	5	1	1				7
6	Ural	3	3		1			7
7	Siberian	5	7	4	3	2	1	22
8	Far-Eastern	6	2		1			9
	TOTAL	47	54	19	17	7	4	148

All 148 universities presented in the sample were invited to the approbation of the methodology. 103 institutions (A leading university; 8 federal universities; 28 national research universities; 28 higher education institutions which received government support of their strategic development programmes and 38 other universities) agreed to take part in the approbation of the methodology. The sampling structure was saved, but agricultural universities refused to participate in the project. As the participation in approbation was voluntary the agricultural universities claimed that they do not have capacities to fill in the questionnaire and provide the data.

The approbation took place from April to July 2012.

Instrument and Procedures

A special toolkit was developed to carry out the approbation. The toolkit included the set of indicators and the questionnaire as mentioned below.

The set of indicators consists of 65 indicators divided into six groups. These groups include:

Group A «Higher Education Institution Profile»

Group B «Research»

Group C «Teaching and Learning»

Group D «Internationalization»

Group E «Knowledge Transfer»

Group F «Engagement with Regional Stakeholders»

Each group has its internal structure and content (National Training Foundation, 2012, retrieved 5 November, 2012, from URL: <http://ranking.ntf.ru/>)

Group A – Higher Education Institution Profile (A1 – A19)

This group consists of indicators providing general information on HEI. This information includes indicators such as HEI type (A2), category, group (A3, A4), affiliation (A5),

organisational and legal form (A6), HEI geographical location (A7) and territorial belonging (A8). Number of students (A9), number of academic staff (A10), number of researchers (A13), number of non-academic staff (A11) are also included in HEI profile. This group of indicators enables to define HEI's capacities for education services provision. Information on undergraduate education programmes (A12), and on opportunities for postgraduate education (PhD and doctorate programmes) (A14, A15) is added to provide more detailed information on HEI profile. Other information useful for users of education services can be added to HEI profile and the indicators' list could be expanded.

Specific characteristic of group A indicators is their functionality. On the one hand each indicator has its own meaning and can be used individually and not for assessment purposes, on the other hand some of these indicators are included in the structure of indicators from the groups (B, C, D, E, F) and can be used for calculations of indicators from these groups.

Data for group A indicators can be received from documents available in open access. The Federal law on "Education" specifies types and categories of higher education institutions. The RF Constitution defines the structure of the federal executive structures. A HEI's affiliation is specified by HEI's foundation documents. Organisational and legal forms of higher education institutions are described in the classification system developed by the Ministry of Education and Science of the RF. The territory belonging of HEIs can be identified by the Presidential Decree N 849 from 13 May 2000 "President's Representative in the Federal District" and the RF Constitution.

More detailed information on HEI profile can be obtained from the system that collects statistical information on Higher education institutions (HPE-1), and data provided by universities for accreditation purposes. Information on Federal universities and National Research universities can be received from the universities' development programmes. However, existing databases have limitations. Indicators definitions differ as various information and monitoring systems have different goals. Therefore, it is not possible to substitute indicators used for ranking purposes by indicators from these external systems. Though, the data from external databases are used to supplement and enhance reliability of the data used in the rankings.

Data sources for group A indicators are, as follows:

- Data provided by HEIs for accreditation purposes;
- HEIs' internal data.

Group B – Research (B1 – B15)

Indicators from the group B describe HEIs research performance. Both input and output indicators are included in the group.

The indicators of academic staff quality (B2), publication activity (B 12), HEI's participation in grant programmes/projects (B13 – B14) are traditionally used for assessment of HEI's research activity. International practice demonstrates that one of reliable methods to assess HEI's research potential is assessment of HEI's publication activity, its expenditure on research and research income.

Data sources for the group B indicators are:

- Data provided by HEIs for accreditation purposes;
- HEIs' internal data;
- Bibliometric databases.

Group C – Teaching and Learning (C1 – C18)

Group C indicators assess HEI's performance in learning and teaching.

This dimension can be characterized by quality of applicants / entrants (C3, C14),

quality of students (C4), quality of academic staff (C9, C10, C12, C16), quality of education programmes (C1, C2), graduates employability (C5), HEI expenditure on education services (C11, C18), opportunities for postgraduate education (C7, C13), and students mobility (C8). Russian and international practice demonstrate that assessment of applicants quality, quality of academic staff, expenditure on education services and graduates employability are one of the most frequently used indicators to assess HEI's teaching and learning.

Data sources for the group C indicators are:

- Data provided by HEIs for accreditation purposes;
- HEIs' internal data.

Group D – Internationalization (D1 – D12)

Group D indicators characterize HEI's internationalization. The quality of internationalization is assessed by indicators describing HEI's activity in attracting international students and lecturers (D1, D5, D12), students' and lecturers' mobility (D6, D7, D8), income from international sources (D2, D3, D4), and implementation of education programmes in collaboration with international partners (D10, D11). Both input and output indicators are included in this group. Thus, they enable to assess HEI's internationalization from different points of view.

Data sources for the group D indicators are:

- Data provided by HEIs for accreditation purposes;
- HEIs' internal data.

Data for federal and national research universities can be collected from universities' development programmes.

Group E – Knowledge Transfer (E1 – E5)

Group E indicators characterize HEIs activity in transfer of their knowledge to main stakeholders. HEI's performance in this area can be assessed by its economic activity (E1 – E3) and HEI's collaboration with external partners (E4, E5). It should be noted that the indicators used to assess this dimension of HEI's activity are insufficiently developed both in Russian and international practice. Data collecting on these indicators can be problematic. However, such indicators as income from non budgetary sources and income from intellectual property products are widely used both in Russian and international practice.

Data for the group E indicators can be obtained from:

- Data provided by HEIs for accreditation purposes;
- HEIs' internal data.

Group F – Engagement with Regional Stakeholders (F1 – F4)

The indicators from group F describe HEI's engagement with regional stakeholders. The indicators on HEI's economic activity in the region (F1, F2) and the indicators on training specialists for the region (F3, F4) enable to assess HEI's performance in this dimension.

Data for group F indicators can be collected from:

- Data provided by HEIs for accreditation purposes;
- HEIs' internal own data.

The questionnaire for approbation includes 6 semantic blocks representing various aspects of HEIs' activities, including:

- Higher education institution profile (general information);
- Undergraduate and postgraduate students;

- Academic, non-academic staff and researchers;
- Education programmes;
- Bibliometry;
- Budget.

6 blocks of indicators have been developed as the result of decomposition of 65 initial indicators identified by experts' assessment (expert panel consists of 17 experts represented HEIs, employers and representatives from the Ministry of Education and Science, RF). Most of these primary indicators present relative values (ratio, %) assessing respective functions of higher education institutions.

The questionnaire was constructed to collect separate absolute subindicators. Absolute sub-indicators data were used to calculate the 65 indicators.

Data Analysis

Standard mathematical and statistical procedures (normalization, aggregation) were employed for rankings construction (Antonov, 2004, OECD, 2008). Also, the received raw data from the universities were verified, processed and analysed.

The raw data verification revealed that some institutions were unable to provide data on some sub-indicators (primary indicators). Some universities do not collect data on specific indicators (nominal data absence) but some universities do not have outcomes on a certain activity which is reflected by a sub-indicator (actual data absence).

The absence data were restored by the following steps:

1 step: the missing data were restored from open sources (namely bibliometric databases).

2 step: some data are not available in open sources and can be received only from HEIs. Participated universities received a special form with missing data on some indicators and they have an opportunity to double check the data and complete the missing data. As mentioned above some universities were able to present additional information on missing data, but some universities were unable to do so.

To receive groups of higher education institutions that demonstrated high, middle and low performance the statistical method of data grouping was used. The next formula was applied to calculate intervals:

$$i = \frac{x_{max} - x_{min}}{n}$$

i – interval length, x_{max} and x_{min} – maximum and minimum of a grouping characteristic, n – number of groups. For research purposes the sample was divided into 3 groups (universities - leaders, universities – competitors, catching up universities).

Results of Research

The ranking of 103 HEIs enables to identify the following trends.

- Overall ranking of 103 HEIs indicates that 7 National Research Universities (NRU) are leaders among all universities (see table 3);
- The group of leaders is homogeneous and consists of National Research Universities;
- The group of “competitors” is heterogeneous and consists of HEIs from various categories (National Research Universities (NRU); Federal universities (FE); HEIs, which received government support of their strategic development programmes (ME); and other universities (other);

- The “catching up” group mostly includes HEIs, which received government support of their strategic development programmes, and HEIs from the category “other”. However, 8 National Research Universities and 8 Federal universities are also presented in this group.

Table 3. Groups of higher education institutions according to the rankings outputs.

	Ranking of 103 HEIs (103)	Ranking of 103 HEIs on 13 global indicators (103)	Ranking of federal universities (8)	Ranking of national research universities (28+1)	Ranking of universities supported by ME (28)	Ranking of other HEIs (38)	Ranking of federal universities on 13 (8)	Ranking of national research universities on 13 (28+1)	Ranking of universities supported by ME on 13 (28)	Ranking of other universities on 13 (38)
Leaders (Group 1)	7	4	4	9	5	3	1	4	3	4
Competitors (Group 2)	23	16	4	11	12	15	3	12	14	9
Catching up (Group 3)	73	83		9	11	20	4	13	11	25

Competition for leading positions among National Research Universities, Federal universities and universities, which received government support of their strategic development programmes, is strong.

Ranking of 103 HEIs on 5 functions of universities enables to conduct a thorough analysis of universities activities and identify their weak and strong areas. The obtained results allow researchers to compare groups of HEIs against maximum normalized score (see Table 4).

Table 4. Distribution of HEIs from 4 categories in 3 groups according to the ranking outcomes.

Groups/ function areas	Research	Teaching	Internationalization	Knowledge Transfer	Engagement with regional stakehold- ers
Leader	3 NRU 0 FU 0 ME 0 Other	5 NRU 1 FU 0 ME 0 Other	2 NRU 1 FU 0 ME 0 Other	3 NRU 1 FU 1 ME 0 Other	4 NRU 1 FU 0 ME 1 Other
Total	3	6	3	5	6
Competitors	8 NRU 1 FU 0 ME 1 Other	14 NRU 4 FU 8 ME 6 Other	4 NRU 0 FU 0 ME 3 Other	14 NRU 5 FU 10 ME 16 Other	13 NRU 5 FU 22 ME 23 Other
Total	10	32	7	45	63
Catching up	18 NRU 7 FU 28 ME 37 Other	10 NRU 3 FU 20 ME 32 Other	23 NRU 7 FU 28 ME 35 Other	12 NRU 2 FU 17 ME 22 Other	12 NRU 2 FU 6 ME 14 Other
Total	90	65	93	53	34

Leaders

The first group of leaders is characterized by high performance in such function areas as “Research” and “Teaching and learning”.

7 leaders also demonstrate high performance in “Internationalisation”. However their results in “Knowledge Transfer” are modest and do not achieve maximum.

The results of the leaders in “Engagement with regional stakeholders” are also not so high. Universities from other categories demonstrate high results in this dimension area.

The universities demonstrated leading positions in rankings have a long tradition in teaching excellence. They also established strong links with research centres and industry that allows them to conduct cutting edge research. Thus, their high results in “Research” and “Teaching and Learning” are not surprising. However, the ranking revealed that such functional areas as “Knowledge Transfer” and “Engagement with Regional Stakeholders” are neglected in these universities.

Competitors

The second group is represented by 14 National Research Universities, 4 Federal, 4 universities, which received government support of their strategic development programmes and 1 university from the category “other”.

This group demonstrates high results in “Teaching and learning” and modest results in “Research”. Modest results in “Research” could be explained by the fact that most Russian universities were mostly focused on teaching in previous years, thus they do not have enough capacities to conduct research to meet new requirements of the modernized higher education system. It is expected that they will enhance this capacity in this area in the nearest future.

The results of these institutions in “Internationalisation”, “Knowledge Transfer” and “Engagement with regional stakeholders” are not so high. This is also could be explained by current transformations within the system of higher education and its ongoing modernization. Thus the progress is expected

Traditionally, Russian universities have been excluded from the international education area. They do not have enough practice in engagement with international partners. However, there are a lot of positive trends in this area at the moment.

Catching up universities

The third group of universities consists of 73 universities. The most universities in this group are presented by “other” universities (34 universities). However, there are 8 National Research Universities and 4 Federal universities in this group.

This group of universities is characterized by high performance in “Knowledge Transfer”. The weakest area of these universities is “Internationalisation”.

It is seen that targeted efforts on internationalisation of education and research in these universities will enable to enhance teaching and research and competitiveness of these universities.

Conclusions

The developed methodology enables accurate assessment of universities with accounts of various HEIs functions.

The indicators used in the methodology meet the requirements of the Russian Higher Education system development objectives and facilitate promotion of the national universities into the global higher education area.

National research universities are leaders among 103 HEIs participated in the approbation.

There is strong competition among national research universities, federal universities and higher education institutions which received government support of their strategic development programmes for leading positions.

Most universities should enhance their research capacities (especially publication activity) and strengthen their efforts on internationalisation.

The template methodology developed within the project “Developing and Approbating a Template Methodology for National Ranking of Higher Education Institutions” lays the groundwork for a national approach to performance evaluation of national higher education institutions with account of the Russian Higher Education system diversity.

The approbation demonstrates that the developed multidimensional ranking methodology enables to reveal qualitative characteristics of the Russian higher education institutions; identify their strengths and weaknesses on 5 function areas, compare HEIs performance within categories. Thus, multidimensional assessment allows researchers to conduct a qualitative analysis of a university development and to draw up sound recommendations based on the outcomes of this analysis. This enhances capacities of the Russian higher education institutions both at national and global higher education area.

Implications for Practice

On the basis of the current study, the following practical steps were suggested:

- Amendment of the methodology by reducing the number of indicators (namely input indicators), clarification of definitions for some indicators, developing and clarification the system of weights for indicators and areas of assessment.
- Use the ranking outputs for universities strategic development by creating special profiles for every university participated in the approbation. The profile will include analysis of HEI strengths and weaknesses and HEIs position on key indicators and function areas.
- The amended methodology should undertake the IREG audit procedure.
- The multidimensional ranking should be done every year with the support of the Ministry of Education and Science.
- It is suggested to add qualitative assessment of universities on the basis of academic staff, students and employers surveys.
- Discuss an opportunity to develop a regional system of HEIs assessment with the inclusion of universities from the Eurasian Economic Community and Moldova, Ukraine, Armenia.
- In partnership with the IREG experts identify “core indicators” that are relevant both for foreign and Russian universities and various stakeholders.

Dilemmas of a Template Methodology

While designing a multidimensional ranking methodology the researchers face the following dilemmas:

1. National higher education system is highly differentiated which complicates comparison of different HEIs.
2. Identifying relevant indicators for various types of national HEIs is a challenging task. Not all indicators are completely relevant for various types and groups of Russian higher education institutions.
3. Various methods are applicable for procedures of aggregating and weighting of indicators. The large number of basic indicators, HEIs differentiation lead to dispersion of assessment scores and complicate the procedure of indicators weighting.

Possible approaches to address these dilemmas were suggested.

Dilemma 1. National higher education system differentiation

Choices:

- to include all groups and types of higher education institutions into the methodology;
- to limit coverage of higher education institutions: do not include specialist institutions (with art, physical education and sport programmes), private and municipal HEIs into the methodology.

Further amendment of the methodology will enable:

- to compare HEIs within separate groups
- by separate functions
- by tailored indicators
- by aggregate indicators;

Dilemma 2. Indicators relevance

Choices:

- to use the full set of indicators for all types and groups of higher education institutions;
- to identify “core” indicators that are relevant for all types and groups of HEIs and specific indicators that are relevant for separate HEIs groups;

Further amendment of the methodology will enable:

- to compare all HEIs by the full set of indicators;
- to compare all HEIs by a separate set of indicators (core and specific indicators);
- to compare separate HEIs groups by the full set of indicators;
- to compare separate HEIs groups by tailored set of indicators.

Dilemma 3. Aggregation and indicators weighting

Choices:

- to increase the number of experts involved in indicators weighting before obtaining the statistically significant results of experts assessments;
- to make the weighting procedure more complex to develop a separate system of weights for separate HEIs groups and separate HEIs functions;
- to aggregate only homogeneous or close indicators within single area of evaluation.

Further amendment of the methodology will enable:

- to compare single area of evaluation by aggregated indicators;

- to compare separate HEIs groups by aggregated indicators.

The next step of the methodology development will be its ammendment with account of the approbation outputs and experts consultations.

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