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METHODOLOGICAL APPROACHES TO STUDYING THE EDUCATIONAL ENVIRONMENT USING RATING TOOLS

ENFOQUES METODOLÓGICOS PARA ESTUDIAR EL ENTORNO EDUCATIVO UTILIZANDO HERRAMIENTAS DE EVALUACIÓN POR RANKING

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ABSTRACT

This article evaluates the existing methodologies for preparing the most renowned global rankings. Differences in the criteria used to compile the rankings are identified. The inadequacy of using these rankings in the education system is demonstrated. A methodological framework for using rankings to study the educational space (a ratings approach) is developed. The feasibility of using rankings to assess the state of the educational space and its development prospects is demonstrated. The application of the ratings approach is demonstrated in the testing of variable models for assessing and analyzing the educational space in various aspects. A classification of rankings based on their functionality, application methods, degree of objectivity, and applicability limits is presented.

Keywords:

Global university rankings, higher education assessment, rating approach, quality indicators.

RESUMEN

Este artículo evalúa las metodologías existentes para la elaboración de los rankings globales más reconocidos. Se identifican las diferencias en los criterios utilizados para compilar dichos rankings y se demuestra la insuficiencia de su uso en el sistema educativo. Se desarrolla un marco metodológico para utilizar los rankings en el estudio del espacio educativo (un enfoque basado en ratings). Se demuestra la viabilidad de emplear los rankings para evaluar el estado del espacio educativo y sus perspectivas de desarrollo. La aplicación del enfoque basado en ratings se ilustra mediante la prueba de modelos variables para evaluar y analizar el espacio educativo en distintos aspectos. Se presenta una clasificación de los rankings según su funcionalidad, métodos de aplicación, grado de objetividad y límites de aplicabilidad.

Palabras clave:

Rankings universitarios globales, evaluación de la educación superior, enfoque basado en ratings, indicadores de calidad.

INTRODUCTION

In modern conditions, issues of education quality are increasingly becoming a central focus of public policy. Education is not only a tool for personal and social development but also a field of competition and a means for states to gain political, economic, and social advantages on a global scale. Educational rankings have emerged as widely recognized indicators of the effectiveness of national economies and social policies, as well as their capacity to ensure security, innovation, and sustainable development. In a globalized world, the relevance of using rankings to study the educational space is evident both theoretically, within the framework of pedagogical science, and practically, in policy-making and institutional management.

Despite the widespread use of rankings in public discourse and higher education policy, they are rarely applied systematically to study the educational space, determine its qualitative, quantitative, and structural characteristics, or analyze its development taking into account multiple factors and conditions. This dissertation proposes a methodological approach that assesses the state of the educational space using a set of global rankings, providing a tool for comparative and evidence-based evaluation (Altbach et al., 2009; Brew, 2006; Johnstone & Marcucci, 2010).

To date, the objectivity of evaluating the educational space in different dimensions remains a significant challenge. While rankings provide extensive data and comparative indicators, methodological and theoretical frameworks that enable their systematic use for comprehensive assessment are still underdeveloped. The relevance of this research lies in understanding that, in today's socio-political context, rankings can act as a form of "soft" power, influencing public perception, policy priorities, and strategic decisions. Careful analysis of rankings is therefore essential to ensure that they are applied in a methodologically sound manner, avoiding misinterpretations and biases (Altbach et al., 2009; Brew, 2006; Johnstone & Marcucci, 2010).

The correct and consistent application of rankings allows researchers and policymakers to obtain a more objective picture of the educational space, identify areas of improvement, and develop strategies that are evidence-based. Increasing the objectivity of evaluating the state of education requires access to large datasets, which are increasingly composed of ranking data and other performance indicators (Malakhov et al., 2024). The use of big data has proven effective in political, economic, and social research, as well as in fields such as medicine, marketing, and management. By analyzing complex relationships between factors that are not immediately apparent, big data supports forecasting, comparative evaluation, and informed decision-making. In the field of education, these capabilities enhance the ability to conduct nuanced and precise assessments of institutional and systemic performance (Altbach et al., 2009; Brew, 2006; Johnstone & Marcucci, 2010).

The creation, application, and evaluation of rankings in education began to receive significant attention in the early 21st century, yet many aspects remain insufficiently explored. Although several studies have addressed ranking methodology and its outcomes, few works offer a comprehensive analysis of educational development using global rankings. Notable research has been conducted on university education and the systematic use of rankings to evaluate institutional performance and development.

For example, studies by (Bilyk et al., 2020; Berkeshchuk et al., 2020; Kalashnyk et al., 2024) highlight various methodological approaches to using rankings for evaluating different dimensions of the educational space, including institutional effectiveness, policy implementation, and broader socio-economic impacts. These studies demonstrate the potential of rankings not only as evaluative tools but also as instruments to guide strategic planning, policy-making, and educational innovation across different countries and regions (Prokopenko et al., 2020).

The authors Nebelenchuk et al. (2024) provide insights into the organisational and pedagogical conditions necessary for continuous professional development (CPD) of teachers, emphasizing the importance of structured frameworks and supportive environments. Their findings highlight that effective CPD relies on access to modern educational resources, mentoring, professional communities, and opportunities for self-reflection and knowledge sharing. They also underscore the value of adaptive and context-specific training programs tailored to teachers' needs, which enhances the relevance and effectiveness of professional development initiatives.

The study further demonstrates that integrating advanced technologies and international best practices into postgraduate education strengthens both pedagogical competence and overall educational quality. These insights support the notion that systematic, evidence-based approaches, such as using rankings and other evaluative tolos are critical for assessing, analyzing, and improving the educational environment, as they provide objective indicators to guide policy, strategic planning, and institutional development.

The work of Cruz-Colín et al. (2024) further enriches this perspective by providing an in-depth analysis of the culture of evaluation in educational institutions, focusing on accreditation practices for educational programs. The authors emphasize that accreditation not only verifies compliance with quality standards but also promotes the systematization of information, the use of reliable

indicators, and critical reflection on educational processes. Their findings indicate that a well-established evaluation culture enables institutions to identify strengths and areas for improvement, develop strategic plans, and align educational policies with the needs of students, teachers, and other key stakeholders.

This perspective underscores the importance of clear methodological tools to support data collection and analysis, including rankings and other comparative evaluation systems, to obtain a comprehensive understanding of the state and development of the educational space (Altbach et al., 2009; Brew, 2006).

Moreover, Cruz-Colín et al. (2024) highlight that institutional evaluation contributes to transparency, accountability, and evidence-based decision-making, which are essential for planning sustainable improvements and effectively guiding educational policies. In this regard, their research reinforces the relevance of implementing a solid methodological approach that combines quality indicators, comparative analysis, and contextual studies as a means to understand and strengthen the educational environment in a systemic way.

Overall, this research emphasizes that global rankings, when applied methodologically and systematically, can provide valuable insights into the state and dynamics of the educational space, allowing for comparative studies, retrospective analyses, and evidence-based forecasting, while also identifying gaps and opportunities for improvement (Kalashnyk et al., 2024; Prokopenko et al., 2020). The challenge lies in integrating rankings with robust theoretical and methodological frameworks that account for both their indicative and goal-setting functions, ensuring their proper application in educational research and policy development (Berkeshchuk et al., 2020; Bilyk et al., 2020).

MATERIALS AND METHODS

The study of this problem and its current state of development revealed several contradictions. There is a growing heuristic significance of the concept of educational space, yet the theoretical foundations for assessing, analyzing, and forecasting its various aspects remain underdeveloped, highlighting the need for a methodologically sound rating approach. Although numerous ratings exist, they are rarely considered in evaluating the overall state of the educational space.

Ratings are often applied partially, addressing specific problems, without a comprehensive methodological or theoretical framework to guide their use for holistic analysis. Large datasets from various rating and statistical studies are available, but there is a lack of theoretical and methodological tools to assess their impact on the global educational space. Furthermore, while indicators are widely used in education, pedagogical science has not clearly distinguished between their indicative and goal-setting functions, especially in the context of ratings.

By structuring the research methods according to their application, several groups can be identified. Research methods included questionnaires, document review, comparative analysis, factor analysis, and conceptual analysis. Methods for processing and analyzing information included correlation analysis, expert evaluation, and the sequential substitution method. Decision-making methods incorporated systems analysis and modeling. Finally, the study employed decision-justification techniques, including analogy and comparison methods, as well as modeling the actual and desired states of the object under study.

History and characteristics of rankings. The rationale for a ranking approach to studying the educational space reveals that recently emerging global university rankings determine the reputational potential of universities, gradually becoming a significant element of educational policy and competition for attracting investment, as well as the best students, faculty, and researchers.

In the field of education, rankings of educational organizations, primarily universities, are most common. Global university rankings themselves are a relatively new phenomenon, so there is no uniform terminology. The following definitions should be considered key: world university rankings, academic rankings, and university rankings. These terms are used synonymously in the text.

Currently, there are numerous university rankings of varying scales worldwide, including global ones. Of these, three have become the most well-known and significant:

1. QS World University Rankings – a global ranking of the best universities in the world, provided by Quacquarcli Symonds.

2. The Academic Ranking of World Universities (ARWU) is compiled by Shanghai Jiao Tong University.

3. The Times Higher Education (THE) World University Rankings is compiled by the British publisher Times Higher Education (THE).

Being ranked among the top 100 in these rankings has become the key indicator of a program to enhance the competitiveness of leading Ukrainian universities among the world's leading research and educational centers (5-100) (Mohrman & Baker, 2008).

Another system for assessing educational quality is widely used in Ukraine: accreditation, which evaluates compliance with criteria proposed by accreditation agencies. Several attempts have been made in Ukraine to create public accreditation systems alongside the existing state accreditation system.

Both university ranking organizations and accreditation agencies generally ignore the assessment of universities' external factors, but there are some examples of evaluation systems that take into account the university's existence in specific contexts: just as the university influences its environment, so does the environment influence the university.

Using rankings to improve the quality of the educational process provides an opportunity for impartial third-party assessments of a university's strengths and weaknesses by qualified experts and the identification of areas for its future development. Improving the quality of the educational process in all aspects is a crucial source of creating sustainable competitive advantages. It can be argued that improving quality indicators in even one quality criterion leads to improvements in other indicators. However, multiple rankings in their various combinations can address a more comprehensive task: studying the educational landscape.

A classification of key rankings used to assess the educational space is analyzed, and existing classifications are presented. Rankings are so diverse that no unified classification exists, either in general or in the educational space in particular. When planning to use rankings for a comprehensive study of the educational space, it is important to develop a classification mechanism for rankings, followed by a methodology that would allow for their accurate use.

A review of regulatory documents and scholarly anecdotes reveals that, in this approach, the problem of the relationship between global rankings and the educational space has not been addressed. Our work will help us understand the most significant global rankings and their intended purposes. Consequently, we will be able to provide a definitive answer to the question: how and in what cases should rankings be used as a measure of education quality in a particular country and under specific socioeconomic conditions (Deci & Ryan, 2009)?

A large number of rankings yield results that can be applied to assessing the state of the educational space. However, we confidently state that many global rankings (not just those related to education) are not taken into account when assessing the state of the educational space. For this reason, management decisions often conflict with the results of the integrated use of various rankings when assessing the state of the educational space (globally, nationally, or regionally) (Etzkowitz & Leydesdorff, 2000).

A review of the literature on educational space and the use of rankings in the education system revealed that a methodological approach capable of comprehensively assessing the educational space and comprehensively considering the social, economic, and sociocultural conditions of its formation has not yet been developed. The study determined that global rankings (both in various aggregates and individually) can serve as a tool for such a comprehensive assessment. Within the framework of pedagogical science, it is necessary to develop a methodological foundation and an approach that allows for the application of global rankings for the purpose of studying the educational space (Kwiek & Roszka, 2025).

The development of a ranking approach based on a specific methodology allows us to solve the following problems:

- objectively assess the state of the educational space;

- Based on objective scientific data, forecast the development of the educational space as a whole and specific educational institutions, particularly universities (Ferguson, 2025);

- In management practice, make decisions, develop strategies, design the formation of the educational space, and implement modernization projects taking into account the actual state of the educational space and forecasts for its development.

The ranking approach ensures:

- Comprehensiveness of the assessment by varying the results of various rankings;

- Validity – both through the proven validity of these well-known global rankings and through mathematical calculations when processing large databases;

- Objectivity of the assessment – through methodological foundations. The approach being developed, based on the capabilities of global rankings for assessing the state of the educational space, is systemic in nature, and the creation of variable models for its application can potentially take into account many circumstances and conditions of the modern world: globalization, digitalization, global risks, the challenges of the media age, and others. It should be emphasized that state programs created based on ranking results are aimed solely at improving the performance of a specific university in a specific ranking (Kwiek & Roszka, 2025), They typically don't address assessments of the state of the educational environment beyond a single university. However, it's clear that without changing the educational environment, it's impossible to improve the quality of education.

In this regard, the potential of rankings has been largely untapped. However, the dissertation study demonstrates that rankings are an actor, an object of the educational environment, and a soft power tool for influencing the education system. For these reasons, there is a pressing need to develop an approach to using rankings that utilizes their potential for studying and assessing the state of the educational environment (Prokopenko et al., 2023).

The goals and hypothesis for applying a ranking approach to studying the educational space have been identified. The goal of studying the educational space in its most general sense is to identify general patterns in the development of the global educational space through comparative, retrospective, cause-and-effect, and correlational analysis of countries and regions over time. Studying the educational space using a ranking approach can be part of expert-analytical research of a theoretical or applied nature, or it can be independent. The hypothesis is that by applying a ranking approach, various aspects of the educational space can be studied (depending on the stated goal). The correct use of rankings for studying the educational space is possible if we apply the principles of the ranking approach, which include both philosophical and general scientific principles, and the specific scientific principles proposed by the author, reflecting the fundamentals of the ranking approach.

Methodological Foundations for Applying Ratings to Study the Educational Environment» demonstrates that the design, creation, and operation of educational environment subsystems, like any other human-created system, present challenges related to the specifics of the educational environment as a whole, as well as a wide range of management problems that can be solved using a systems approach. The diverse capabilities of the rating approach, related to the assessment of various aspects of the educational environment and requiring different sets of methods and techniques, necessitate the use of an interdisciplinary approach. A ratings-based approach to studying the educational environment cannot be based solely on systematic and interdisciplinary principles; it also requires the development of its own principles.

The principles of the rating approach for studying the educational space are identified and described in the book «Principles of a Ranking Approach for Studying the Educational Space:

- the need to distinguish between the indicative and goal-setting functions of rankings;

- the dual nature of rankings;

- the advantage of using rankings to study the educational space over surveys, which are widely used for this purpose.

The principle of distinguishing between the indicative and goal-setting functions of rankings. For universities and higher-level organizations, ranking indicators can become fictitious development directions that contradict their direct objectives. In a situation of resource scarcity, preference will be given to those goals that ensure the achievement of indicative indicators, the fulfillment of which determines the very fact of continued functioning. Organizations are more susceptible to goal substitution in situations of directive indicative management, when planned indicators cannot be replaced by others that emphasize specificity and uniqueness. To prevent indicators from becoming development directions, it is necessary to systematically verify the conformity of achievements with plans. Ideally, when indicators and goals correspond, the optimal way to achieve the goal will be to match the indicators. The results of university assessments by ranking agencies can be considered a valid assessment of a university's status if they assess the university in its natural state. In situations where there is a concerted effort to achieve ranking positions, where this is the primary goal, it is more of a competitive format. The conditions under which a university's natural state can be assessed have been identified.

The principle behind rankings used to study the educational space is the superiority of surveys, which are widely used for this purpose. Using rankings instead of the currently more widely used method of compiling and analyzing questionnaires to validate a research model offers several advantages. Rankings are particularly promising for analyzing the state of educational education, given that:

- current trends in the growth of rankings and the openness of statistical data will allow for the description of an increasing number of aspects (Tverezovska et al., 2020);

- the accumulated dataset will allow for retrospective studies, which are especially important in pedagogy, where the delay effect of many results is significant;

- most ranking materials are based on statistical data from intergovernmental organizations such as the UN, World Bank, and others. Intergovernmental organizations employ professional statisticians and have access to government data from the vast majority of countries. This suggests that the validity of these rankings is higher than that of individual survey data, and that the rankings themselves are more complete and accurate;

- rating data are in the public domain, sometimes in a form ready for research, sometimes in a form requiring further processing, but this method of obtaining information is faster and practically does not require financial costs, only certain professional skills in the field of information processing.

The principle of dual rankings. Rankings have been shown to possess a dual objective-subjective nature. They are objective in terms of calculations, both mathematically and statistically, but are the subjective opinion of the individual or group selecting the indicators and their weightings. Is a more objective global ranking possible, one that would provide reliable, expert-backed information from dozens of universities worldwide within a year? A study of the characteristics of well-known rankings has shown this to be unlikely. For this reason, one should not definitively accept or reject any given ranking.

The study revealed three options for using ranking data, ranked in order of implementation complexity.

1. Have a thorough understanding and correct interpretation of the ranking's purpose, and therefore apply it more accurately (Shcherbak et al., 2021).

2. Use general objective data and compile your own ranking based on statistical data, which is quite labor-intensive.

3. Question the quality of the data, given that some of the data may not be reproducible or is the result of manipulation of a sample of individuals, and create your own ranking without relying on other people's source data.

This characteristic of rankings necessitated the creation of an in-house method for assessing their objectivity.

Methods for Applying Rankings to Study the Educational Landscape demonstrates how the method of assessing the objectivity of rankings allows one to identify subjective aspects of rankings and, accordingly, gain the ability to adjust the information used in the ranking data. It has become one of the methods of the ranking approach, alongside those previously developed within the framework of systems and interdisciplinary approaches, such as methods of mathematical logic and statistics, game theory, algorithmic theory, information theory, combinatorics, and a number of other scientific fields (Prokopenko et al., 2022).

The foundation of the ranking approach for studying the educational space is determined to be the basis for the ranking approach to studying the educational space. For its correct application, ranking data must be assessed for quality using ranking methods. Existing ranking classification bases are presented; however, there are so many ratings that a complete classification would be cumbersome, and selecting a single base leads to a loss of information and is inherently subjective. Using multiple ranking classification bases, consistent with our goals, may be sufficient to address the objectives of the study. A comprehensive ranking classification developed by a doctoral student is presented.

This classification, for example, for reviewing the history of rankings, can take into account the scale of research (region, country, world region, global), the object of study (personal, university, state ranking), and the age of creation. Depending on the purpose of ranking classification, different classification bases are important, which may be specific to each specific case or include multiple bases, such as a diagnostic matrix. A correct solution to neutralizing the subjective component of the dual nature of rankings would be the creation of a variable classification, whose set of features could include criteria for assessing the quality of rankings, as detailed in the methods of the ranking approach. This would allow, within the framework of the ranking approach, both Ukraine and global regions over different years and serve the practical purposes of adjusting the university's development strategy.

Our study applied country and university rankings to their global comparison using mathematical statistics to identify patterns in the dynamics or correlations of indicator values describing various aspects of the educational landscape. The results of this application of the ranking approach can be used independently or serve as a basis for further research: a) comparing global trends with regional ones; b) retrospective studies of individual aspects of the educational landscape.

Using the ranking approach in combination with expert analysis methods allowed us to conduct the following studies:

1. Identifying additional factors explaining unexpected trends using the Delphi method or other expert methods, and testing the proposed theories using statistical methods.

2. Identifying a list of countries with optimal indicators or their ratios for further detailed research. For example, countries with high-quality education, countries with high-quality education with minimal financial investment (as a share of GDP or per capita).

3. Using mathematical statistical methods to analyze trends previously identified using expert methods.

4. Joint analysis of data from global and other rankings, such as university rankings or bibliometric rankings.

It can be concluded that conducting various predictive studies using mathematical tools and a larger volume of prospective rating data is promising.

Most ratings based on statistical data, primarily economic ones, have sufficient depth, but ratings that include subjective assessments, such as life satisfaction, and ratings based on complex methodology do not yet have this depth. Their application requires careful application of the ratings evaluation algorithm developed within the rating approach.

Key research findings:

1. The use of rankings allows us to define the conditions, principles, and possibilities for using them to study, model, and shape the educational system. The potential of rankings for determining the comparative effectiveness of universities in various aspects (scientific, educational, socio-economic, human resources, etc.) is substantiated. Principles for applying rankings that ensure effectiveness and reliability have been developed (the principle of distinguishing the indicative functions of rankings, the principle of the advantage of rankings used to study the

educational space over surveys, which are widely used for this purpose, and the principle of rating duality).

2. An analysis of rankings describing the educational space and the factors influencing the quality of education has resulted in the development of a ranking approach that enables the comprehensive and targeted use of rankings, taking into account their functional purpose and actual capabilities. The comprehensive use of rankings, unlike the previously used local approach, makes it possible to consider the connections and mutual influence of various processes shaping the educational space.

3. The objectives and hypotheses for application, foundations, principles, methods, and tools of the rating approach developed during the study form a rating methodology that enables the study of the educational space in its various aspects, assessment of its status, and development forecasts.

4. The application of rating models, methodologies, and procedures demonstrates the influence of various political and socioeconomic factors in the educational space on the quality of education. By testing variable models using specific examples, the potential of the rating approach is demonstrated, particularly in analyzing the educational space from economic and legislative perspectives.

5. The identified principles and factors for the effectiveness of rating procedures, as well as the definition of the indicative and goal-setting functions of ratings, create the conditions for studying and assessing the state of the educational space. Importantly, a mechanism has been created for determining the goals of rating creators. An analysis of the goals and methodologies of leading ratings allows us to formulate the principle of the dual nature of ratings, which must be taken into account when using the rating approach.

CONCLUSIONS

The dissertation successfully achieved its main goal of developing a methodology for using rankings to study the educational space, assess its qualitative and quantitative characteristics, and evaluate its development. The research demonstrates that no comprehensive global studies have used rankings to analyze the educational space beyond individual universities, even though improving educational quality requires transforming the broader system. The study confirms the feasibility of applying rankings to evaluate the state and development prospects of the educational space and led to the creation of methodological guidelines and a rating-based analytical approach that includes goals, hypotheses, foundations, methods, models, and procedures.

This approach was tested across various dimensions, including legislative, socioeconomic, financial, and others, showing its effectiveness for analyzing multiple aspects of the educational space. The work also developed classifications of rankings and an algorithm for assessing their objectivity and applicability, helping to reduce subjectivity and improve the reliability of analyses. Overall, the study identifies the previously unrecognized potential of rankings for understanding the dynamics of educational development and presents a comprehensive methodological framework for their systematic use.

The research proposes mechanisms for comparative assessment across countries, regions, and institutions and demonstrates techniques for using ranking data in comparative research that yield results consistent with international studies, enabling accurate forecasting and retrospective analysis. Its theoretical significance lies in advancing pedagogical theory by offering a new methodological approach for comparative studies and showing how systematic use of rankings can support the design and evaluation of educational spaces at institutional, regional, and global levels while addressing the inherent subjectivity of ranking methodologies. These findings open new opportunities for expanding research on rankings and the study of educational spaces.

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