



# Key Indicators in International University Rankings: Some Considerations for Strategic Decision-Making

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*Abstract.* This study explores the influence of international university rankings on university management in Latin America. The objective is to identify and analyze the main indicators used in these rankings and their impact on strategic decisions. A theoretical review methodology was employed to explore the relationship between the indicators and university management. The results, derived from a systematic analysis of key ranking indicators and their documented impact on university strategic decisions, reveal the specific areas where these indicators exert substantial influence on institutional reputation and global positioning, particularly within the Latin American context. The study concludes by emphasizing the critical consideration of ranking indicators and by providing recommendations for strategic decision-making in Latin American universities aimed at targeted improvements in areas such as research quality, internationalization, and talent attraction, thereby contributing to the advancement of knowledge in the field of higher education in the region.

*Keywords:* International rankings, universities, indicators, university management, Latin America.

## **Indicadores clave en los rankings universitarios internacionales: algunas consideraciones para la toma de decisiones estratégicas**

*Resumen.* Este estudio explora la influencia de los rankings universitarios internacionales en la gestión universitaria en América Latina. El objetivo es identificar y analizar los principales indicadores utilizados en estos rankings y su impacto en las decisiones estratégicas. Se empleó una metodología de revisión teórica para examinar la relación entre los indicadores y la gestión universitaria. Los resultados, derivados de un análisis sistemático de los indicadores clave de los rankings y de su impacto documentado en las deci-

siones estratégicas de las universidades, revelan las áreas específicas en las que estos indicadores ejercen una influencia sustancial sobre la reputación institucional y el posicionamiento global, particularmente en el contexto latinoamericano. El estudio concluye destacando la importancia crítica de considerar los indicadores de los rankings y ofreciendo recomendaciones para la toma de decisiones estratégicas en las universidades de América Latina, orientadas a mejoras focalizadas en áreas como la calidad de la investigación, la internacionalización y la atracción de talento, contribuyendo así al avance del conocimiento en el campo de la educación superior en la región.

*Palabras clave:* Rankings internacionales, universidades, indicadores, gestión universitaria, América Latina.

## Introduction

In the realm of higher education, international university rankings have gained in importance in recent decades, becoming a fundamental tool for evaluating the performance and reputation of higher education institutions (HEIs). The influence of these instruments on strategic decision-making, especially in Latin America, has sparked significant interest in the academic community. According to Darwin and Barahona (2024) and Maldonado-Maldonado and Cortes-Velasco, (2021), rankings have generated tensions and challenges in the Latin American context, influencing institutional missions and the perception of educational quality while opening up a debate about their relevance and effects in the region. Despite valuable academic contributions, a significant gap persists in the literature with regard to a systematic and clear analysis of how indicators such as perception of academic quality and institutional missions are specifically used in rankings and, more crucially, how they are explicitly linked to documented strategic or management decisions within universities. While the importance of these indicators in decision-making is often acknowledged, there is a lack of rigorous categorization of key metrics, their specific impact on universities, and the significant changes they might have driven in university management. This deficiency underscores the critical need for research that not only identifies the main indicators but also systematically analyzes their direct influence on strategic planning and institutional responses, especially in the unique context of Latin American higher education.

Other authors have studied the effects of indicators in particular ways and in different contexts. In the case of Argentina, for example, Alborno and Osorio (2018) explained how rankings have become a kind of normative model to be taken into account by policies and higher education institutions. Through a conceptual approach to rankings, especially the most widely disseminated, these authors critically examined the implicit quality model and the theoretical and methodological criteria that structure global rankings. Specifically, they reflected on the tension exerted between global approaches and local contexts.

On the other hand, Vallaeys and Álvarez-Rodríguez (2022) underscored the importance of university social responsibility (USR) in the Latin American context and the effect this undertaking has on rankings, asserting the need to integrate USR into university management to improve educational quality and the societal perception of higher institutions. However, despite extensive research efforts, there remain significant gaps in the literature regarding the relationship between international university ranking indicators and their effect on strategic decision-making in Latin American

universities. A comprehensive and systematic analysis linking these specific indicators to documented strategic responses within the regional context is still underexplored, highlighting an urgent need for more detailed examination in this area.

### **Theoretical Framework**

The topic of international university rankings and university management, and the influence of these instruments on the strategic decisions of universities, is of great interest. Teixeira (2024) proposed a future research agenda through a systematic literature review, thereby establishing a solid foundation for educational managers, policymakers, and academics interested in the subject. On the other hand, Torabian (2019) highlighted the importance of reviewing global university rankings in the era of sustainable development amid a global “reputation race” among universities. Similarly, Robinson-Garcia et al. (2019) emphasized the informed and critical use of university rankings with the aim of improving decision-making and facilitating the work of university managers.

In this sense, this theoretical review aims to identify and analyze the main indicators used by international rankings and their effect on university management in the region, thereby contributing to filling this gap in the current academic literature.

### **Definition and Purpose of International University Rankings**

University rankings, or “league tables,” which classify higher education institutions according to various criteria such as academic quality, research, reputation, internationalization, employability, among others, aim to provide a relative evaluation of universities worldwide. This allows students, academics, and policymakers to make informed decisions about the quality and prestige of these institutions. Importantly, these rankings influence the strategic decision-making of universities, affecting important aspects such as reputation, talent attraction, and international competitiveness.

In more analytical terms, and drawing on Reyes (2016), rankings are defined as an ordering of universities, from highest to lowest value, based on a score calculated from an algorithm. This algorithm is constructed by weighting indicators or indexes that represent different dimensions of university “quality.”

Among these indexes, one can also consider a score associated with the results of perception surveys with a certain weighting: that is, the configuration of a mathematical model that involves the use of certain known variables. Its validity is related to a mathematical logic and methodological

coherence that represents the abstraction of an idea of university quality from available information. Building upon this understanding, the subsequent sections delve into the underlying logic and methodological coherence of these rankings but also systematically classify and analyze their key indicators, along with their documented impact on strategic decision-making in higher education. This development is circumscribed, in the logic of the experts or specialists who construct it (statisticians, methodologists, mathematicians, etc.), by a scientific-technical exercise whose result, the ranking, will be validated if the methodology used is consistent over time and gives rise to no logical or mathematical doubts.

### Rankings Based on the Logic of Quality

According to Reyes (2016), this mathematical language or logic can be defined as follows: The quality “**C**” of a specific institution “**i**” is a function of different dimensions of quality, **f(d<sub>j</sub>)**, where the subscript **j** represents the different dimensions of quality and is a value that varies between **1** and **m**, depending on the number of dimensions to be measured. In addition, “**n**” represents the total number of universities included in the ranking.

The formula can then be written as:

$$C_i = f(d_j), \text{ where } i = 1, n \text{ y } j = 1, m$$

To further define the dimensions to be evaluated and how they interact to result in quality “**C**” of institution “**i**,” we can propose the algorithm in the following terms:

$$C_i = \sum_{j=1}^m (d_j * \alpha_j)$$

Where: **i=1,n** according to the number of institutions to be evaluated, **j=1, m** according to the number of dimensions to be measured, and  $\alpha_j$  is the percentage by which dimension **d<sub>j</sub>** is weighted.  $0 \leq \alpha_j \leq 1$ .

This means that quality “**C**” of University **i** can be defined as the sum of **j** dimensions that will be evaluated and weighted in a certain way. Furthermore, quality dimension **d<sub>j</sub>** can be defined as a function of the group of indicators **I<sub>k</sub>** that define it, as follows:

$$D_j = \sum_{k=1}^l (I_k * \beta_k)$$

Where **(I\*β)<sub>k</sub>** corresponds to indicator **I** weighted by percentage  $\beta$ , and the subscript **k** represents the number of indicators and their corresponding weights that are summed **l** times. Analogously, **j=1,...,m** according to the number of dimensions to be measured, **k=1,...,l** according to the number

of indicators that represent the dimension, and  $0 \leq \beta_k \leq 1$ . Therefore, the final calculation algorithm for quality “C” of university  $i$  can be written as:

$$C_i = \sum_{j=1}^m (\sum_{k=1}^l (I * \beta)_k * \alpha)_j$$

For the aforementioned expression of the ranking of institutions, ordered from highest to lowest according to the final value of  $C_i$ , it will be assumed that the indicators  $I_k$  exist and that there are known data for all evaluated universities, such that the calculation of all quality dimensions  $d_j$  is possible. This assumption is crucial for the feasibility and comparability of the ranking, as it ensures that all institutions are evaluated based on the same set of indicators for which data is available.

Given this definition of the algorithm used in ranking construction, Reyes (2016) sought to show how an algorithm is constructed and how the quality of a particular university is represented in mathematical language. Both of these characteristics are crucial to the legitimacy conferred upon rankings by the context of their creation.

The discourse of those who produce the rankings, then, represents an effort to reduce the complexity of an idea, whose mathematical approach allows it to be distilled into a number and position that is easily transmissible to a mass audience. In this translation of quality into a mathematical language, there is a tendency to discriminate and choose only certain dimensions and parameters of quality based on the data that are available and that have been apparently validated by official sources. We could say that, as in any positivist approach, to solve a problem, there is an effort to reduce the complexity of the observed reality, where quality would be represented only by certain aspects, those most significant for those who construct the rankings (Reyes, 2016).

### **Evolution and Evaluation Methodologies**

Focusing on the evolution and evaluation methodologies of international university rankings, studies such as Ganga-Contreras et al. (2020) have highlighted the importance of these instruments as an external evaluation tool for university decision-making. Relatedly, Reyes (2022) has analyzed the positioning of Central American universities in these rankings, demonstrating their importance in the evaluation of academic excellence. And Abello-Romero et al. (2020) noted that, despite debates about their validity, university rankings are widely used by students and educational institutions, which highlights their influence on perceptions of institutional quality and on strategic decision-making in the university sphere.

## University Management in Latin America

### Context of University Management in the Region

University management in Latin America has undergone significant evolution in response to the current challenges of the educational environment. USR implementation is emerging as a key policy in university management, committing institutions to the social and environmental impact of their activities. Furthermore, the adoption of strategic information systems for university management has proven fundamental in supporting strategic planning, institutional evaluation, and decision-making in universities in the region.

### Importance of Strategic Decision-Making

Strategic decision-making in university management is crucial for the development and competitiveness of educational institutions in Latin America. The implementation of effective strategies based on the evaluation of key indicators is essential to guaranteeing academic quality, innovation, and institutional excellence. Morales et al. (2022) highlighted the importance of strategic decision-making in public management for social development, emphasizing its role in the formulation of effective policies. Likewise, Vega (2023) stressed the challenges of strategic intelligence in an environment of advances in artificial intelligence, underscoring the need for innovative decision-making strategies in a context where artificial intelligence is constantly evolving.

### Relationship between International Rankings and University Management

The relationship between international rankings and university management in Latin America is a topic of great interest in the current academic sphere. Flores (2024) explored the interconnection between knowledge management and university organizational development, highlighting possible strategies for implementing practices in alignment with institutional objectives. Some examples of implemented changes include:

- **Development of academic policies:** Universities have revised their academic policies and introduced specific faculty development programs to improve the quality of education and increase student satisfaction rates (Meng & Minogue, 2011; Zhang et al., 2020).
- **Strengthening research:** Many institutions have created research support offices and fostered interdepartmental cooperation to boost the production of quality research (Badawy et al., 2018; Domínguez et al., 2025).

- **Implementation of employability strategies:** Universities have begun developing programs that link the curriculum with in-demand labor market competencies, integrating internships and practical learning into their academic programs (Liu et al., 2020; Rusdi et al., 2023).
- **Social responsibility initiatives:** The adoption of social responsibility programs has transformed how universities interact with their local communities (Findler et al., 2018; Meng & Minogue, 2011).
- **Investment in sustainability:** Universities that have incorporated a focus on sustainability have seen positive changes in funding and reputation, driving green infrastructure projects and environmental management practices (Badawy et al., 2018; Volchik & Maslyukova, 2017)

On the other hand, Carreño (2022) analyzed the relationship between USR, management, and educational policies, stressing the importance of evaluating USR based on strategic planning and comprehensive management indicators. Valencia et al. (2022) addressed the perspective of USR from an institutional management standpoint, underscoring how universities express their commitment to society through strategies and actions integrated into academic training, research, and social outreach.

### **Effect of Rankings on University Management**

Past research has explored the ways in which university management in Latin America is influenced by international rankings, which, in turn affect the strategic decision-making of HEIs. Irarrázabal (2021) explored the university management environment based on social systems theory, highlighting the importance of counteracting uncertainty and conflict in decision-making. Vega (2023) addressed the challenges of strategic intelligence in the face of advances in artificial intelligence, emphasizing the importance of information evaluation for transcendental decisions. Furthermore, Yunga-Maño, (2024) analyzed the transformative role of management auditing in strategic decision-making at universities, allowing for the identification of needs, the implementation of solutions, and the achievement of higher levels of competitiveness and recognition in the university sphere.

### **Relevance of Indicators in Decision-Making**

The relevance of indicators in strategic university management decision-making is particularly notable in the case of international rankings. Rivas-Castillo & Cruz (2018) assessed the quality of Nicaraguan higher education institutions through relevant rankings in the Latin American region, pointing toward

the diversity of indicators used and their impact. López & Marquez (2020) identified the most common indicators in the development of university rankings, such as those related to material resources, research, and human resources. Guillén-Riquelme et al. (2017) evaluated the research ranking of Spanish public universities, highlighting the importance of criteria such as articles in indexed journals and research projects.

### Main Indicators Used in International Rankings and Impact on University Management

The identification and analysis of the main indicators used in international rankings is fundamental to understanding their impact on strategic decision-making in Latin American universities. Espinoza & Verhelst (2017) explored bibliometric indicators as a means of assessing the scientific impact of publications, while Durán-Tenesaca et al. (2022) noted the importance of overall equipment effectiveness (OEE) evaluation to unify key management indicators. Ganga-Contreras et al., (2020) analyzed the indicators used in international academic rankings, highlighting the diversity of criteria employed. Furthermore, Luque Martínez (2023) examined the sensitivity and elasticity of Spanish universities to the Shanghai Ranking indicators.

Table 1 presents the most common indicators used by international rankings, organized by area, indicator, description, and impact on university management.

Table 1  
Common Indicators Used by Rankings and Impact on Management

Area	Indicator	Description	Impact on Management
Academic Indicators	Quality of Education	Student and faculty evaluations of teaching quality.	Universities that focus on improving the quality of education often implement faculty training programs, which can lead to higher student satisfaction and, eventually, better rankings. A positive perception of academic quality can enhance the institution's reputation and attract high-potential students (Vernon et al., 2018).
	Publications in Indexed Journals	Number of articles published in high-impact scientific journals.	A high volume of publications in indexed journals is associated with an increased perception of a university's research quality, which can boost its international visibility and, in turn, influence strategic decisions related to research and development investment. This generates positive feedback, whereby better publications attract more funding and collaborations (Muñoz-Suárez et al., 2020; Szluka et al., 2023).

Research Indicators	International Collaborations	Proportion of co-authorships with foreign institutions.	Fostering collaborative research with international universities can not only improve research impact but also the university's global reputation. This can serve to verify research quality and open opportunities for academic exchanges and joint programs (Moed, 2016; Soysal et al., 2020).
	Employability Outcomes	Graduate placement rates in the job market	High graduate employability influences students' potential choices and strengthens institutional reputation. Universities that continue to improve their programs to increase their graduates' employability can see an increase in admission applications and an improvement in their overall ranking (Elbawab, 2022; Szluka et al., 2023).
Social Responsibility Indicators	University Social Responsibility	Initiatives for social impact and sustainability	Universities that demonstrate a strong commitment to social responsibility can not only improve their public image but also influence rankings that consider these aspects. This can lead to an increase in funding and support from governmental entities and non-governmental organizations (Kara et al., 2024; Olcay & Bulu, 2017).
Sustainability Indicators	Environmental Sustainability	Indicators that measure environmental and sustainable practices implemented by universities.	Incorporating sustainable practices can improve reputation and attract students interested in environmental issues, which can be a critical factor in students' decisions when choosing a university. This can also align with campus sustainable development goals (Muñoz-Suárez et al., 2020; Puertas & Martí, 2019).

Source: compiled by authors.

### **Analysis of Common Indicators**

To analyze the most common indicators used in international rankings, it is fundamental to understand their impact on strategic decision-making in Latin American universities. Linares et al. (2019) explored the aggregation procedures used to construct synthetic sustainability indicators in tourist destinations. Durán-Tenesaca et al. (2022) examined the importance of OEE evaluation in unifying key university management indicators. Ganga-Contreras et al. (2020) analyzed the diversity of indicators used in international academic rankings, while, as noted earlier, Luque Martínez (2023) examined the sensitivity and elasticity of Spanish universities to the Shanghai Ranking indicators.

## **Interpretation of the Relevance of Indicators**

The interpretation of the indicators used in international rankings is crucial for strategic decision-making in Latin American universities. Razafiarivony and Hosna-Janeta (2022) explored the effects of the quality of financial statements and user knowledge on decision considerations, highlighting the mediating role of satisfaction. Contreras et al. (2024) found that interpretations of rankings vary considerably depending on the position and national context, which suggests the need to adapt evaluation criteria to regional realities to improve the relevance of these indices in Latin America.

The interpretation of the indicators used in international rankings also has a significant impact on strategic decision-making in Latin American universities. Aguinis et al. (2020) despite some challenges, there are many benefits to conducting management research in Latin America. Some of these conditions include an upward trend in the productivity of Latin American researchers, increased collaboration between researchers in Latin America and those in other regions, and societal, cultural, and economic characteristics that make the region an ideal “natural laboratory” to build and test management theories. Demonstrating that our arguments are not just about potential but are founded in reality, we offer a selective summary of recent research conducted in Latin America that made important contributions to micro and macro management domains and theories. Specifically, they explore the importance of management in key areas of natural resource industries, such as leadership, social inclusion, and strategy. Lopez and Álvarez (2018) analyzed research on entrepreneurship in Latin America, identifying perspectives and challenges within the field of study. Finally, Doğan and Al (2019) investigated the possibility of classifying universities using fewer indicators, which underpins the importance of selecting key indicators.

## **Influence of Indicators on University Decisions**

The influence of indicators on university decisions is a key issue in the strategic management of educational institutions in Latin America. Acosta et al. (2017) analyzed the implementation of a strategic university management information system at the Universidad de Otavalo (Ecuador), highlighting its role in strategic planning and decision-making. On the other hand, Beut et al. (2017) explore the development of an evaluation instrument based on bio-data for university vocational behavior, highlighting the importance of indicators in this context. Another significant aspect to consider is the influence of the term “World Class University” (WCU), as promoted by international rankings, particularly the Shanghai Ranking. Factors such as

Quality, Language proficiency, and Economic Resources play a pivotal role in achieving this designation and cultivating an excellent global reputation (Paolillo, 2024).

### **Strategies to Leverage Ranking Results**

Strategies to maximize the results of international rankings in Latin American universities are fundamental to improving strategic decision-making and enhancing the impact of HEIs Reyes (2022) proposed 13 strategies and respective lines of action to create an impact on indicators so that universities can establish their own strategies based on ranking results.

Presented below is an analysis of institutional experiences of universities in relation to the strategic decisions they implement to improve their rankings, based on a literature review and the provided references.

### **Institutional Experiences and Strategies for Ranking Improvement**

#### **1. Use of Strategic Decision-Making Models**

Rodríguez-Cruz & Pinto (2018) presented a model for the use of information in strategic decision-making within Cuban information organizations, including higher education institutions. Aiming to improve strategic decision-making by emphasizing the importance of information in this process, their model is based on three fundamental dimensions: the informational, which addresses cognitive processes and information systems; the behavioral, which examines how managers use information; and the contextual, which considers the managerial processes that influence strategic decision-making. This approach is intended for organizations to perceive changes in their environment, generate knowledge, and innovate through the strategic use of information. Effective decision-making requires timely, reliable, and accessible information, managed by a robust organizational information system and skilled specialists.

#### **2. Diversification of Research and Improved Positioning**

According to Flores et al. (2024), universities in Honduras have begun to integrate innovative elements into their sectorial strategy to improve their research. By establishing a parameter based on metric indices used in rankings, institutions are optimizing their results through focused efforts in the areas evaluated. This leads to better collaboration in research projects and publication in indexed journals, which, in turn, correlates with better positions in rankings (Flores et al., 2024).

### 3. Sustainability in University Management

Telocken and Trevisan (2020) examined the integration of sustainability education into the strategic management of community universities, focusing on contextual, organizational, curricular, and pedagogical dimensions. Using a qualitative, exploratory case study in Brazil, their findings indicate that societal and governmental pressures, alongside universities' community orientation, drive sustainability integration. Organizations are embedding sustainability into administrative routines and fostering transversal curricular inclusion through active, interdisciplinary approaches. Despite varying implementation stages, these institutions show strong commitment to sustainability-related extension and research, underscoring their potential to advance sustainability through strategic management.

### 4. Distance Education and Technological Adaptation

Dobrota et al., (2015) explored strategic institutional decisions in the management of distance education in Argentine public universities. This study illustrates the need to standardize methods and techniques for the effective management of virtual education. Improved management of distance education has resulted in increased enrollment and allowed universities to extend their reach, and, in turn to potentially improve their rankings by attracting a greater number of students (Dobrota et al., 2015).

### 5. Implementation of Strategic Information Systems

As noted, Acosta et al. (2017) discussed the implementation of a strategic university management information system at the Universidad de Otavalo. This system is designed to support strategic planning and decision-making. The practice of monitoring and evaluating key indicators has allowed universities to respond in a more agile and effective manner to changes in the demands of the educational context and in expectations of rankings (Kwan et al., 2024). Martínez et al. (2020) highlighted the importance of analyzing data related to university rankings to develop effective strategies. López and Marquez (2020) implemented a comparative education methodology based on university ranking indicators to analyze institutional management.

## **Conclusions and Recommendations**

Our theoretical review has shown that research quality, internationalization, and academic reputation are fundamental for the global positioning of Latin American universities (see Table 1). These indicators profoundly influence visibility, driving concrete changes in resource allocation and institutional

policy development. By critically analyzing the main indicators used in international university rankings and their impact on strategic decision-making, this study offers a deeper understanding of how regional universities interact with and adapt to global ranking systems, thereby filling a crucial gap in existing literature.

However, while university rankings provide valuable insights, it is crucial to acknowledge their limitations. Their methodologies, often heavily weighted toward research output and internationalization, may not fully capture the diverse missions and unique societal contributions of universities, especially those in developing regions. For Latin American universities, this presents specific challenges: resource disparities, differing research priorities, and a focus on local impact might not always align perfectly with global metrics. Furthermore, pursuing higher rankings can lead to ethical and strategic dilemmas, potentially encouraging a narrow focus on quantifiable indicators over broader educational quality, social responsibility, or regional relevance, which raises questions about the true purpose and priorities of higher education institutions.

Building on these insights, we recommend that Latin American universities move beyond merely monitoring ranking indicators to implementing proactive and tailored strategies. Specifically, institutions should not only enhance research and citation metrics but also actively develop strategies like fostering robust international collaboration networks in areas of institutional strength. They should also provide substantial support for publishing in high-impact, internationally recognized journals, which may necessitate significant investments in research infrastructure, specialized faculty training, and robust incentives for academic productivity. Furthermore, universities could benefit from establishing internal “ranking observatories” to systematically track their performance, adapt global indicators to better reflect regional contexts and missions, and diversify their strategic approaches to encompass broader aspects of quality, social relevance, and innovation beyond current ranking methodologies.

Ultimately, this research aims to contribute to improving the educational quality, internationalization, and competitiveness of Latin American universities in an increasingly demanding global environment. In essence, strategic engagement with international ranking indicators, despite their limitations, is vital for Latin American universities to enhance their reputation, competitiveness, and overall decision-making.

## References

- Abello-Romero, J., Sáez, W., & Mancilla, C. (2020). Evaluación del desempeño de las universidades: El aporte de los rankings mundiales. *Hallazgos*, 18(35). <https://doi.org/10.15332/2422409x.5792>
- Acosta, L., Becerra, F. A., & Jaramillo, D. (2017). Sistema de información estratégica para la gestión universitaria en La Universidad De Otavalo (Ecuador). *Formación Universitaria*, 10(2), 103-112. <https://doi.org/10.4067/s0718-50062017000200011>
- Aguinis, H., Villamor, I., Lazzarini, S. G., Vassolo, R. S., Amorós, J. E., & Allen, D. G. (2020). Conducting management research in Latin America: Why and what's in it for you? *Journal of Management*, 46(5), 615-636. <https://doi.org/10.1177/0149206320901581>
- Albornoz, M., & Osorio, L. (2018). Rankings de universidades: Calidad global y contextos locales. *Revista Iberoamericana de Ciencia, Tecnología y Sociedad*, 13(37), 13-51.
- Badawy, M., El-Aziz, A. A. A., & Hefny, H. (2018). Exploring and measuring the key performance indicators in higher education institutions. *International Journal of Intelligent Computing and Information Sciences*, 18(1). <https://doi.org/10.21608/ijicis.2018.15914>
- Beut, E. R., Tomás, A. D., & Artiga, A. G. (2017). Los biodatos como indicadores de la conducta vocacional universitaria: Elaboración de un instrumento de evaluación. *Electronic Journal of Research in Educational Psychology*, 5(11). <https://doi.org/10.25115/ejrep.v5i11.1225>
- Carreño, C. J. C. (2022). Responsabilidad social universitaria, gestión y políticas educativas. *Human Review International Humanities Review / Revista Internacional De Humanidades*, 11(Monográfico), 1-17. <https://doi.org/10.37467/revhuman.v11.4048>
- Contreras, F. G., Romero, J. B. A., Viancos-González, P., Saéz-San Martin, W., & Ríos, L. A. (2024). Dimensiones de la evaluación de universidades según escalas de valoración: Percepción de los expertos latinoamericanos. *European Public & Social Innovation Review*, 9, 1-22.
- Darwin, S., & Barahona, M. (2024). Globalising or assimilating? Exploring the contemporary function of regionalised global university rankings in Latin America. *Higher Education*, 87(2), 287-304. <https://doi.org/10.1007/s10734-023-01007-x>
- Dobrota, M., Bulajić, M., Bornmann, L., & Jeremić, V. (2015). A new approach to the QS university ranking using the composite I-distance indicator: Uncertainty and sensitivity analyses. *Journal of the Association for Information Science and Technology*, 67(1). <https://doi.org/10.1002/asi.23355>
- Doğan, G., & Al, U. (2019). Is it possible to rank universities using fewer indicators? A Study on Five International University Rankings. *Aslib Journal of Information Management*, 71(1), 18-37. <https://doi.org/10.1108/ajim-05-2018-0118>
- Domínguez, E., Pérez, B., Rubio, Á. L., & Zapata, M. A. (2025). A flexible framework to ensure traceability, consistency, and propagation of KPIs evolution. *Journal of Software: Evolution and Process*, 37(2). <https://doi.org/10.1002/smr.70004>
- Durán-Tenesaca, J. C., Moreno-Narváez, V. P., & Humberto-Medina, E. (2022). Medición OEE en manufactura de línea blanca, máquina inyectora de plásticos con tecnología 4.0. *CIENCIAMATRIA*, 8(3), 738-763.

- Elbawab, R. (2022). University rankings and goals: A cluster analysis. *Economies*, 10(9). <https://doi.org/10.3390/economies10090209>
- Espinoza, Á. A. E., & Verhelst, N. L. (2017). Impacto científico en el departamento de Bolívar (Colombia). *Panorama Económico*, 25(3), 269-272. <https://doi.org/10.32997/2463-0470-vol.25-num.3-2017-2423>
- Findler, F., Schönherr, N., Lozano, R., & Stacherl, B. (2018). Assessing the impacts of higher education institutions on sustainable development—an analysis of tools and indicators. *Sustainability*, 11(1). <https://doi.org/10.3390/su11010059>
- Flores, O. J. J. (2024). Modelo estructural de la gestión del conocimiento en el desarrollo organizacional universitario. *Revista De Climatología*, 24, 1194-1202. <https://doi.org/10.59427/rcli/2024/v24cs.1194-1202>
- Flores, O. J. J., Castilla, J. U. J., Flores, V. J. J., Rojas, Y. V. G., Arias, C. S. N. M., & Flores, J. C. J. (2024). Modelo estructural de la gestión del conocimiento en el desarrollo organizacional universitario. *Revista De Climatología*, 24. <https://doi.org/10.59427/rcli/2024/v24cs.1194-1202>
- Ganga-Contreras, F., López-Nunez, J., & Sáez, W. (2020). Portal de ranking de universidades iberoamericanas: Una propuesta para facilitar procesos decisionales. *Revista Ibérica De Sistemas e Tecnologías De Informação*, E25, 472-488.
- Guillén-Riquelme, A., Ramiro-Sánchez, T., & Quevedo-Blasco, R. (2017). Ranking De investigación de las universidades públicas españolas. *Revista Iberoamericana De Psicología Y Salud*, 8(1), 21. <https://doi.org/10.23923/j.rips.2017.08.003>
- Irrarázabal, C. C. (2021). Análisis del entorno en la gestión universitaria: Una aproximación desde la teoría de sistemas sociales. *Actualidades Investigativas en Educación*, 21(1), 1-21. <https://doi.org/10.15517/aie.v21i1.44075>
- Kara, K., Yalçın, G. C., Kaygısız, E. G., & Edinsel, S. (2024). Assessing the academic performance of Turkish universities in 2023: A MEREC-WEDBA Hybrid Methodology Approach. *Journal of Operations Intelligence*, 2(1). <https://doi.org/10.31181/jopi21202422>
- Kwan, Y. M., Muhamad, F., & Chin, M.-Y. (2024). Setting the benchmark: a comparative analysis of research performance indicators between leading world research universities and top-ranked research universities in Malaysia. *Journal of Research Management and Governance*, 6(1). <https://doi.org/10.22452/jrmg.vol6no1.2>
- Linares, H. L., García, M. E. B., & Rodríguez, M. C. F. (2019). Sustainability and local development: procedure for integrated assessment of tourist destinations. *Revista Rosa Dos Ventos - Turismo E Hospitalidade*, 11(1), 84-102. <https://doi.org/10.18226/21789061.v11i1p84>
- Liu, L., Desai, M. M., Fetene, N., Ayehu, T., Nadew, K., & Linnander, E. (2020). District-level health management and health system performance: the Ethiopia primary healthcare transformation initiative. *International Journal of Health Policy and Management*. <https://doi.org/10.34172/ijhpm.2020.236>
- López, L. A. Á., & Marquez, C. Z. (2020). Gestión institucional de la Universidad Autónoma de Baja California frente a los indicadores de calidad de los rankings globales. *EDUCATECONCIENCIA*, 26(27), 79-100.
- Lopez, T., & Álvarez, C. (2018). Entrepreneurship research in Latin America: A literature review. *Academia Revista Latinoamericana de Administración*, 31(4), 736-756.

- Luque Martínez, T. (2023). *Sensibilidad y elasticidad de las universidades españolas a los indicadores del Ranking de Shanghái (ARWU)*. <https://digibug.ugr.es/handle/10481/80793>
- Maldonado-Maldonado, A., & Cortes-Velasco, C. (2021). Why research matters: Latin America facing world-class universities and rankings. *Research Handbook on University Rankings* (pp. 473-485). Edward Elgar Publishing. <https://www.elgaronline.com/edcollchap/book/9781788974981/book-part-9781788974981-47.xml>
- Martínez, T. L. (2023). Sensibilidad y elasticidad de las universidades españolas a los indicadores del ranking de Shanghái (ARWU). *Revista Española De Documentación Científica*, 46(1), e350. <https://doi.org/10.3989/redc.2023.1.1947>
- Martínez, T. L., Faraoni, N., & Toledo, L. D. (2020). Los rankings académicos y la distribución por género de las universidades. *Revista Española De Documentación Científica*, 43(2), 261. <https://doi.org/10.3989/redc.2020.2.1663>
- Meng, X., & Minogue, M. (2011). Performance measurement models in facility management: A comparative study. *Facilities*, 29(11/12). <https://doi.org/10.1108/02632771111157141>
- Moed, H. F. (2016). A critical comparative analysis of five world university rankings. *Scientometrics*, 110(2). <https://doi.org/10.1007/s11192-016-2212-y>
- Morales, H. Á., Pinto, G. B. P., De la Cruz Rios, H. A., & Auqui, J. A. O. (2022). Toma de decisiones estratégicas en la gestión pública para el desarrollo social. *Revista Venezolana de Gerencia: RVG*, 27(7), 648-662.
- Muñoz-Suárez, M., Olmeda, M. N. G., & Lluch, O. (2020). A comparative analysis between global university rankings and environmental sustainability of universities. *Sustainability*, 12(14). <https://doi.org/10.3390/su12145759>
- Olcay, G. A., & Bulu, M. (2017). Is measuring the knowledge creation of universities possible?: A Review of University Rankings. *Technological Forecasting and Social Change*, 123, 153-160. <https://doi.org/10.1016/j.techfore.2016.03.029>
- Paolillo, J. M. (2024). *L'institutionnalisation du discours sur l'Université de rang mondial dans le système d'enseignement supérieur Péruvien: Le cas de l'Université Catholique Santo Toribio de Mogrovejo au Chiclayo*. [Phdthesis, Université de Montpellier]. <https://hal.science/tel-04722308>
- Puertas, R., & Martí, L. (2019). Sustainability in universities: DEA-GreenMetric. *Sustainability*, 11(14). <https://doi.org/10.3390/su11143766>
- Razafiarivony, M.-A., & Hosna-Janeta, M. (2022). Effects of financial statements quality and users' knowledge on decision considerations and the role of Satisfaction as a potential mediator. *East African Journal of Business and Economics*, 5(1), 35-47.
- Reyes, C. (2016). Medición de la calidad universitaria en Chile: La influencia de los rankings. *Calidad en la Educación*, 44, 158-196.
- Reyes, L. J. B. (2022). Universidades centroamericanas: Posicionamiento en investigación y sugerencias para una estrategia de mejora en los rankings SIR Y QS. *Revista General De Información Y Documentación*, 32(1), 31-59. <https://doi.org/10.5209/rgid.80086>
- Rivas-Castillo, C., & Cruz, L. V. (2018). Rankings universitarios: Calidad de las instituciones de educación superior nicaragüenses. *Revista Ciencia jurídica y política*, 4(7), 34-48.

- Robinson-Garcia, N., Torres-Salinas, D., Herrera-Viedma, E., & Docampo, D. (2019). Mining university rankings: Publication output and citation impact as their basis. *Research Evaluation*, 28(3), 232-240.
- Rodríguez-Cruz, Y., & Pinto, M. (2018). Modelo de uso de información para la toma de decisiones estratégicas en organizaciones de información. *Transinformação*, 30, 51-64.
- Rusdi, M., Sartika, D., Putra, I., & Sari, N. (2023). Quality governance design good university governance in the education sector: A literature review of concepts performance models and audit practices from a risk management perspective. *International Journal of Humanities Education and Social Sciences (IJHES)*, 3(3). <https://doi.org/10.55227/ijhess.v3i3.682>
- Soysal, Y. N., Baltaru, R., & Cebolla-Boado, H. (2020). *Meritocracy or reputation? How university rankings matter*. Scite.Ai. <https://doi.org/10.31235/osf.io/f6by3>
- Szluka, P., Csajbók, E., & Györfy, B. (2023). Relationship between bibliometric indicators and university ranking positions. *Scientific Reports*, 13(1). <https://doi.org/10.1038/s41598-023-35306-1>
- Teixeira, T. (2024). University rankings: proposal for a future research agenda through a systematic literature review. *Sustainability*, 16(7), 3043. <https://doi.org/10.3390/su16073043>
- Telocken, S. G., & Trevisan, M. (2020). Educação para a sustentabilidade na gestão estratégica de Universidades Comunitárias. *Revista Gestão Universitária na América Latina-GUAL*, 92-115.
- Torabian, J. (2019). Revisiting global university rankings and their indicators in the age of sustainable development. *Sustainability: The Journal of Record*, 12(3), 167-172. <https://doi.org/10.1089/sus.2018.0037>
- Valencia, W. A., Presentación, R. V., Mejía, C. B., & Shuan, R. L. C. (2022). Responsabilidad social universitaria: perspectiva desde la gestión institucional. *Investigación Y Postgrado*, 37(2), 177-192. <https://doi.org/10.56219/investigacionpostgrado.v37i2.1466>
- Vallaey, F., & Álvarez-Rodríguez, J. (2022). El problema de la responsabilidad social de la Universidad. *Teoría de la Educación: Revista Interuniversitaria*: 34, 2, 2022, 109-139.
- Vega, D. C. S. (2023). Desafíos de la inteligencia estratégica ante los avances de la inteligencia artificial. *Revista De La Escuela Nacional De Inteligencia*, 1(2), 151-171. <https://doi.org/10.58752/1hnrlna>
- Vernon, M., Balas, E. A., & Momani, S. (2018). Are university rankings useful to improve research? A systematic review. *Plos One*, 13(3). <https://doi.org/10.1371/journal.pone.0193762>
- Volchik, V., & Maslyukova, E. (2017). Performance and sustainability of higher education: Key indicators versus academic values. *Journal of Security and Sustainability Issues*, 6(3). [https://doi.org/10.9770/jssi.2017.6.3\(14\)](https://doi.org/10.9770/jssi.2017.6.3(14))
- Yunga-Maño, Z. I. (2024). Toma de decisiones estratégicas en universidades: el papel transformador de la auditoría de gestión [Strategic decision making in universities: The transformative role of performance auditing]. *Rmpi*, 4(especial), 112-123. <https://doi.org/10.62574/rmpi.v4iespecial.116>
- Zhang, Q.-Z., Jiang, S., Liu, R., & Liu, H.-C. (2020). An integrated decision-making model for analyzing key performance indicators in university performance management. *Mathematics*, 8(10). <https://doi.org/10.3390/math8101729>