Design of a Multidimensional Index of Classification of Rankings of Ibero-American Universities

Vanesa Berlanga
Universitat Abat Oliba CEU, CEU Universities, Spain, *vberlangas@uao.es*

Franciele Corti
Dr., corresponding author, Universitat Abat Oliba CEU, CEU Universities, Spain, *fcorti@uao.es*

Eva Perea
Universitat Abat Oliba CEU, CEU Universities, Spain, *eperream@uao.es*

The university is an essential institution for the progress and modernization of society. The higher education sector has seen growing demand in recent decades, as well as a progressive internationalization. This implies greater possibilities to choose between universities and greater competitiveness among these institutions. In recent years, we have observed growing interest in developing university quality rankings. Accordingly, the main objective of our research is to propose a model for obtaining rankings with optimal properties: a ranking of universities according to teaching output, research output and global output will be established, to classify all universities, regardless of their size or their public or private nature. The multi-strategic methodology is applied from a systemic approach combining quantitative elements from a global and specific perspective of Ibero-American universities. A database has been developed that includes indicators and ratios based on information from the MECD and the National Commission for the Evaluation of Research Activity (CNEAI): teaching productivity, research productivity and overall productivity for each university. This ranking provides some novel indicators that would favor the appearance of new universities absent in the current rankings, a series of indicators that do not take into account volume, but rather performance. The results indicate that the impact of the Teaching dimension is greater because this is the dimension in which universities that do not currently appear in the rankings could stand out.

Keywords: universities, methodology, indicators, global ranking, research

INTRODUCTION

The growing proliferation of university rankings that have emerged over the last decade, both internationally and nationally requires permanent monitoring of the information

that they regularly generate. These rankings project an image of universities that affects the spheres of both science policy and public opinion. It is therefore vital that directors and managers of Ibero-American universities should receive summary, brief, simple and up-to-date information on the position and evolution of their universities in each different ranking (De la Torre & Pérez-Esparrells, 2017).

Over the last decade and a half there has been what we might call a boom in rankings of higher education institutions at both national and international level, to the extent that we can already speak of more than 10 rankings at world level and more than 150 at national or regional level. These rankings have become so popular because they provide information in an understandable, simple, and synthetic way that enables comparisons to be made between universities around the world. Their popularity reflects the degree to which higher education has become internationalized, shaping a global market for higher education as these rankings have helped to determine many of the strategies that countries and universities have implemented in recent years (Casani et al, 2014).

In recent years, according to Pérez-Esparrells and Casani (2012), we have seen a process of globalization in higher education that translates into an increase in competitiveness in the international arena as regards attracting the best students, teachers, researchers and so on (in short, talent) and obtaining financial resources. At the same time, following the Bologna Process, we can speak of the emergence of a true European system of universities, with a certain status, and which is becoming concentrated in a number of prestigious institutions that generate a considerable volume of total scientific output and aim to reduce the supremacy of research universities in the United States. Moreover, we are witnessing the phenomenon of the internationalization of research (more and more frequently in English) and in undergraduate and graduate programmes given in English.

This phenomenon coincides with the emergence of the term "world-class universities". These are defined by various authors (Bonaccorsi & Daraio, 2007; Palomares et al, 2008; Salmi, 2009) as universities with important resources, a significant concentration of talent, a powerful scientific and technological environment, and a strong degree of internationalization. Salmi (2009) also describes world-class universities as those that have abundant resources, are more open (with appropriate governance) and more international, and have more environments, noting that these are all factors of success that should be brought together.

According to Ordorika (2015), international university rankings give rise, time and again, to arguments and controversies, several times a year and in almost all countries. This dynamic has its origins in the emergence of the Academic Ranking of World Universities (ARWU), launched in 2003 by the Center for World-Class Universities (CWCU) of the School of Higher Education (formerly Institute of Higher Education) at Jiao Tong University of Shanghai of China. Since the ARWU first appears, such rankings have multiplied, to the point where they have significant impact on debates about universities in all countries and at international meetings.

Today, we can identify at least 18 world rankings and many more national and regional classifications. Besides the ranking published by ARWU, the most influential lists in the media include the Times Higher Education World University Ranking (THE), Webometrics and the QS World University Ranking (QS). These rankings use various indicators and methodologies and have different levels of credibility and impact. There are also others, such as the Scimago International Ranking (SIR) and that of the Centre for Science and Technology Studies at the University of Leiden, which are recognized among higher education specialists, but make less media impact. However, it should be noted that, in the selection of indicators and information sources, in the methodologies for the construction of indicators and in their weighting, there are hidden limitations and biases that are not explicitly indicated when results are presented.

Ordorika (2015) analyses the most significant biases in international rankings and points out that almost all international classifications focus on measuring indicators associated with the international circulation of research output, Nobel prizes, articles published in journals indexed in the Web of Science or Scopus, highly cited academics (HiCi), articles in *Nature* and *Science* and citations per article, among others. In consequence, Ordorika notes, activities linked to student training, university extension and cultural dissemination, and fulfilment of duties and commitments to society, all substantive functions of universities, are practically absent from rankings. Moreover, in the world of publications in journals indexed by Web of Science (WoS) and Scopus, there is also a highly marked bias in favour of English-speaking academics and universities. Ordorika also observes that there is a deficit of academic journals in Spanish and that Spanish-language journals have a very low presence in specialized indexes.

The indexing of journals also presents disciplinary biases. Since their origins, the ISI and, later, the WoS and Scopus have focused fundamentally on indexing biological and health science journals. Although both indices have since diversified, indexing and impact measurement systems for the social sciences and humanities are still at the early stages. Here, then, is yet another bias in the formulation of global rankings, one that again features the exclusion or inadequate classification of most universities.

Since the beginning of the 21st century, we can speak of a global higher education "market" in which the great research universities in all countries participate and compete. This market came into being, in part, due to the increased internationalization and commercialization of the higher education sector. One of the most symptomatic traits of this competition is the success achieved by international university rankings. In practice, the universities that compete for the top positions in these rankings are the so-called world-class universities or those that aspire to that status. Generally speaking, universities in the United States and the United Kingdom dominate the leading positions, while those in other the European countries are worse positioned and Ibero-American universities are still very far from achieving a leading role on the world stage (Pérez-Esparrells & Casani, 2012; Casani et al, 2014).

In Latin America, in spite of the economic difficulties, there are many young graduates who enthusiastically wish to make a career in science. This society has got used to expecting new science and technological developments to come from developed

countries rather than from their own scientists. That is why it is very necessary to generate closeness between the citizens and scientists through science education and the active participation of researchers in activities within the community. There is still hope that Latin America will again be the scientific powerhouse it was in the past. As stated by Ciocca and Delgado (2017) Latin American scientists are bright, innovative visionaries and hard workers, as shown by the great success of Latin American scientists when they are provided with stability, resources, and the freedom to investigate. Governments must follow the example of developed countries and invest in long-term research goals that are not subject to change by the transition from one political party to another.

According to Gómez-Gallego et al (2012), the higher education sector has seen growing demand and experienced progressive internationalization in recent decades. This generates greater possibilities for choosing between one university or another, as well as increasing the competitiveness between institutions. University rankings were established in order to assess the quality of universities and to help potential students to take decisions with regard to them.

The increased quality of universities embraces different spheres: effectiveness, excellence, and efficiency. Lemaitre (2003) reflects quality from three perspectives:

- Quality as the level of adjustment to stated purposes,

- Quality as level of excellence

- Quality as a response to environmental requirements.

Lemaitre defines university quality according to these three perspectives because thinking about quality based only on how far universities meet certain established objectives can be, in itself, both insufficient and unattainable. Thinking of quality as being synonymous with excellence implies a series of conditions that reality limits according to social, cultural, political, and economic contexts. And, finally, thinking about quality according to the requirements of the environment implies lowering the bar as regards general quality standards, as the context would determine what is considered a quality indicator.

The effectiveness of an education system can be defined as its capacity to make the best use of human and material resources, avoiding squandering and waste. Effectiveness can also be defined as the measure or proportion to which the educational objectives established in curricula are achieved and the rights of students are guaranteed (Shavelson & McDonnell,1991).

According to Palomares et al (2008), the challenge is to find an appropriate balance between the roles and responsibilities given to universities, and this makes it necessary to assess their resources, processes and results to: improve their efficiency (Bonaccorsi & Daraio, 2007); enable and clarify accountability (Lepori et al, 2007); advance in knowledge of the economic and social profitability of investment in education; and make horizontal comparisons – of different universities in the same fields – and/or

vertical comparisons of different services at the same university and enable analysis of their impact on society (Giménez & Martínez, 2006).

Over the last twenty years, university rankings have really served as a guide for students, since most present a very similar pattern of behaviour, identified in Sarrico et al (1997). From the perspective of the potential student, it is desirable that rankings should take into account certain requirements or needs of each client. In this respect, Sarrico et al (1997) conclude that the DEA approach enables rankings to be created that are more consistent with the requirements of different types of potential students, and that it does so with greater flexibility. Indicators are objective measurements, mostly quantitative, of the achievements of an institution or entire higher education system (Ball & Halwachi, 1987). Accordingly, they measure certain aspects of the inputs of universities, their functioning, and their results (Kells, 1991).

There are several international university quality rankings, some general and others more specific in nature. Buela-Casal et al (2007) and Pagani et al (2006) have described some of the most important, which focus primarily on research output. In the case of Spanish universities, some rankings focus on teaching quality and/or research output (Buesa et al, 2009; Buela-Casal et al, 2010; Montané López et al, 2017). However, global rankings do not classify even five percent of all the universities considered to exist in the world today, nor as many as one-quarter of higher education institutions in the most highly developed countries. As a result, in Europe and, especially, Spain, most universities have been unable to join that "club" of world-class universities (Gómez-Sancho & Pérez-Esparrells, 2012).

The fact that many Ibero-American universities are not classified below the top 150 in global rankings does not reveal conclusive evidence regarding their quality, teaching, research, and innovation, as a minimum level of scientific output is usually required, and this prevents the evaluation of smaller universities. In fact, at present, in our country, the expansion and development of university ranking initiatives at national level (U-ranking and CYD Ranking) are beginning to reveal the leading role played in teaching, knowledge creation, innovation and so on by several smaller Spanish universities, less well known or with lesser reputation (Robinson García et al, 2013).

The purpose of university rankings is, then, to compare universities according to criteria of quality (Gómez-Sancho & Pérez-Esparrells, 2012; Montané et al, 2017). And quality is a multidimensional concept on which there is no consensus. Most rankings measure academic quality (excellence) in its dual aspects of teaching and research (or only research). However, in recent years rankings have been greatly affected by considerations of reputation and by the lack of teaching and third mission indicators. In practice, most world rankings are biased towards research activity, the only activity for which comparable data is available on a global scale. In particular, the use (or abuse) of bibliometric indicators has led to a predominant focus on research (and, specifically, scientific output and productivity) at the expense of the other missions of universities: teaching, and innovation and knowledge transfer (Margison, 2017).

In view of all this, we cannot ignore the "pathologies" that world university rankings clearly present. Among other risks are those of evaluating all universities according to the criteria of the most important institutions, of the abusive use of those criteria or using them to guide activities other than those for which universities were designed, of confusing what can be measured with what is important to measure, of undervaluing teaching, of using weak synthetic indicators, of rewarding quantity over quality, of focusing only on the elite and ignoring the rest and, last but not least, of comparing heterogeneous universities (Ordorika, 2015).

There is no doubt that the current debate about the pattern of comparison that defines most international rankings is supported by a particular model of the university: that of the elitist North American research university, symbolized by institutions like Harvard, Stanford, and Berkeley. This model, replicated in other Anglo-Saxon countries such as Great Britain, Canada, and Australia, is characterized by its strong focus on research and post-graduate studies and the close links between certain research areas and companies and economic activities in different fields. The idea of "world class universities" promoted by the ARWU presents this model as the only desirable choice and marginalizes other university traditions with a strong presence in countries like Mexico and Spain (Orozco et al, 2015; Altbach & Hazelkorn, 2017). In response to all this data, many voices have been raised and reports published that highlight the need for a more appropriate ranking model or methodology that enables the great atomization of Ibero-American universities to be classified.

Our starting hypothesis that the main difficulty arises in the attempt to obtain an overall vision of the performance of the units evaluated. A frequent weakness consists in the absence of adequate selection of the criteria and of how these criteria should be weighted. Under this indicator-based methodology, a factor of vital importance in conducting a ranking is to determine the set of indicators to be used. For this, a procedure is proposed that enables the multidimensional information contained in a set of indicators on a sample of universities to be integrated into a one-dimensional indicator.

The criteria should be related to the current reality of Ibero-American universities, a reality which is determined to a large extent by their socioeconomic context. The institutions evaluated must be comparable to one another and, moreover, all this must be linked to the evaluation criteria. One-dimensional classifications that provide information on each of the criteria are required. And when these criteria are grouped in a multidimensional ranking, the weighting given to each classification with a view to composing the final multidimensional ranking must be very well grounded.

The purpose of the research is to open a new line of advance in including in the rankings some novel indicators that would favor the appearance of new universities that are absent in the current rankings. The goal is to establish a university ranking according to teaching output, research output and overall output. This will enable all universities to be classified, regardless of size or ownership.

This research forms part of a broader study that previously entailed analysing the procedure, indicators and criteria used in the ARWU, THE and QS global rankings. The study has also described the case of ARWU and analysed the positioning of the 83 Spanish public and private universities in global rankings.

In the present case, the aim is to achieve the following specific objectives over the course of the research: to select and describe indicators for the creation a new ranking; and to design a multidimensional index for the classification of rankings of Ibero-American universities: RUPPI.

METHOD

Taking into account the project objectives and the complexity of the phenomenon under study, we considered a multi-strategy method to be the most appropriate. The aim of this systemic methodological framework was to establish channels of connection between the explanation and understanding and, in turn, to find points of coincidence between micro and macro perspectives in the context of the models or methods of classifying and positioning Ibero-American universities.

Through this approach, we intend to form an overall vision of the entire phenomenon, formulating and applying research strategies based on the identity of the analysed object itself. Within this framework, we will combine quantitative elements from a global and specific perspective of Ibero-American universities in order to form a better understanding of these universities' strategic behaviour and the keys to their quality and success.

Chalkiadaki (2018) made a systematic literature review of the studies in the field of education, that mostly employ quantitative methods, purposive or random sampling techniques, and a sample size of below 500. Data collection tools mostly consist of scales and the data are mostly analyzed using descriptive statistics. It was suggested that there is a need for more qualitative or mixed methods to be used, more diverse sampling techniques to represent the populations studied better to be employed, and more sophisticated statistical data analysis techniques to be used: this is why this innovative methodology is proposed.

From the list of universities identified, a database was built up which includes the following indicators for each: teaching output; research output; and global output. Using this information, obtained from the Spanish Ministry of Education, Culture and Sport and the National Commission for the Evaluation of Research Activity (CNEAI), the aim is to establish a set of indicators such as: ISI articles, areas of research, R&D projects, doctoral theses, and FPU scholarships and PhDs with Quality Mention, among others. Moreover, several ratios will also be calculated in terms of productivity: teaching, research and global. This information will enable us to precisely rank universities from highest to lowest in the classification.

This new ranking features certain new indicators that could foster the appearance on it of universities currently absent from classifications. These indicators include:

- Official qualifications with teaching agreements at foreign universities.

- % of credits in face-to-face official qualifications that can be taken online.

- In-house qualifications linked to public and private companies among postgraduate programmes.

- Official degree/master's degree/PhD qualifications with at least 15% credits in a foreign language among the total of official qualifications.

FINDINGS

Description of the indicators

A file has been made for each of the indicators, separating them according to area or dimension. The system of indicators is divided into five dimensions or areas according to the different themes or information the indicator focuses on. These dimensions or areas are as follows:

- Teaching: Many rankings fail to attach sufficient importance to teaching, a key service provided by higher education institutions. Indicators based mainly on academic results will be applied in order to evaluate the quality of training at the institution.

- Innovation and technological development: in this dimension, we seek to evaluate the results of research carried out by the university based on patents, spin-offs and collaboration with and penetration of the business system.

- Research: since research is a basic mission of higher education institutions, the aim here is to evaluate their efforts through their doctoral students, the publications of their staff, and the quality of these publications.

- Internationalization: In an increasingly globalized world, it is important to be able to quantify the foreign presence at universities, and how this presence can affect university quality, in terms of both teaching and research.

- Web penetration: Participation or presence in open access academic initiatives is an important aspect for higher education institutions in the twenty-first century. For this reason, the information contained in the indicators compiled by Webometrics makes these indicators excellent for evaluating this subject, unlike others such as the design or popularity of their content based on numbers of visits.

Methodology for designing the new ranking

Before proceeding to establish the formula, the case of world rankings and two national rankings was analysed in order to ascertain how they formulate their classifications

based on data, as this might help us to contextualize and examine other cases before formulating our own ranking.

Firstly, we analysed the following global rankings:

- ARWU: The Shanghai ranking does not define specific areas, since it bases its calculations on only six indicators. However, two areas can be defined: one is teaching, which would include the Alumni and Award indicators (30% of the total); the other is research, which include the HiCi, N&S and PUB indicators (60% of the total). The remaining 10% is accounted for by an indicator for the weighted scores of the other five divided by the full-time equivalent academic staff. We consider that this ranking gives a very high weighting to research, as it was established with this goal in mind, that is, to evaluate higher education institutions through their research scores.

- THE: The Times Higher Education ranking does define weightings for the areas it considers. These are as follows: teaching (30%), research (60%), innovation (2.5%) and internationalization (7.5%). In this case, there is also a significant bias towards research, as the indicator focusing on citations received has a weighting of 30%.

- QS: The Quacquarelli Symonds ranking is another one that does not clearly define areas. The indicators linked to surveys conducted with academics and university administrators (academic reputation and employer reputation) account for 50% of the total score and it is not possible to place these indicators in a specific area. The education quality indicator comes under the teaching area and accounts for 20% of the total score. The research impact indicator comes under the research area and represents 20%. The rest of the score (the remaining 10%) is based on indicators linked to internationalization. This ranking, then, does give a higher weighting to the area of teaching.

Secondly, we analysed the weighting given to different areas in current national rankings:

- U-Ranking: This ranking, conducted by the BBVA Foundation and the Valencian Institute of Economic Studies (Ivie), considers three main dimensions in formulating the final index. These are: teaching, research, and innovation and technological development. In turn, each of these dimensions has four areas, which are the same for all four: resources, output, quality and internationalization. In these areas, the indicators are all weighted equally in order to establish a score. Subsequently, the areas are used to obtain a score for each of the three dimensions, when the weighting assigned to each dimension within the areas is different. These weightings are obtained through consultation with a committee of experts and range from the 18.4% assigned to the internationalization area within the innovation and technological development dimension to 34.2% in the resources area of the internationalization dimension. Finally, this ranking offers the possibility of

viewing classifications by area or in an index classifying all universities. To create this index, a committee of experts was again consulted, resulting in the following weighting: 56% for teaching, 34% for research and 10% for innovation and technological development.

- CYD ranking: the CYD ranking does not provide an ordered list of universities based on their scores. Rather, it enables each user to choose the most relevant indicators based on their own interests, either at university level or according to field of knowledge. The ranking then shows, for each university, the performance group in which it is located, that is to say, high, intermediate or low. For each of these groups, the following is indicated: membership of the higher performance group indicates that the university is above the 66th percentile for that indicator; for the intermediate group it is between the 33rd and 66th percentile; and for the lower group it is below the 33rd percentile. Although weightings are not assigned and a synthetic index is not provided, the ranking clearly groups its indicators into six areas: teaching; learning; research; knowledge transfer; internationalization; and contribution to regional development.

Design of the multidimensional index of classification of rankings of Ibero-American universities (RUPPI)

There follows a description of the process implemented in order to establish the ranking formula. In this process, a series of preliminary points were taken into account:

- Objective of the ranking: the main objective of our ranking, and the added value that it should give to existing rankings, is to classify all Spanish universities, regardless of their size or whether they are public or private. That is why we offer a series of indicators that do not take into account volume, but performance.

- Distribution of indicators by dimension: dimensions with a larger number of indicators should carry a higher weighting. Taking this aspect into account, we can decide which dimensions will be of greater importance in the preparation of the future index.

- Correction of unreported indicators: it must be decided whether indicators that are not reported should be estimated from the data provided by the other institutions or from data provided to prepare earlier rankings, or simply ignored, penalizing institutions that fail to provide the information. In our case, to classify as many universities as possible, the option chosen will be to estimate unreported indicators based on information provided for earlier ranking exercises. If no such historic data is available, this estimate will be based on the data provided by the other institutions.

Concerning the correction of unreported indicators, we leave the door open to three possible options. Of these, two practices are more widespread in rankings than the other. One is to penalize institutions that do not report indicators by giving them a score of 0

or even not classifying them in any of the dimensions in which this data is missing. The other most commonly used way of resolving these information gaps is to estimate the data from those provided by the other institutions. In our case, this latter option is the most appropriate, because what interests us is to be able to classify all universities, and penalizing them in some way would make participating less attractive to them.

Having reflected on these considerations, we now analyse our system of indicators. To this end, we have defined five dimensions, each with a series of indicators:

- Teaching: 13 indicators.

- Internationalization: 7 indicators.

- Research: 10 indicators.

- Innovation and technological development: 7 indicators.

- Web penetration: 4 indicators.

Regarding the sources that would be used to compose the ranking, while it is true that each is reported in order to compose the indicators, there follows a summary of the sources presented for each dimension:

- Teaching: Integrated University Information System (SIIU) and universities.

- Innovation and technological development: Universities.

- Internationalization: Integrated University Information System (SIIU), Universities, Web of Science (WoS).

- Research: Integrated University Information System (SIIU), Universities, IUNE Observatory, Web of Science (WoS).

- Web penetration: Ranking Web of Universities (www.webometrics.info).

The first point to be decided was whether all the indicators should have the same score in all dimensions, that is, whether certain indicators that should have a higher weighting. To make this decision, two aspects of an indicator should be taken into account:

- - Whether, by definition, it includes some element that is highly representative of the dimension it belongs to and it is thought that this dimension could be reproduced.

- - Whether an indicator has a high non-response rate and it is decided to attach less importance to it.

As our system includes a large number of highly varied indicators, it was decided to give the same weighting to each within its respective dimension. To obtain the aggregate for each dimension, it was decided to use the sum of the data on indicators that provide normalized information or are expressed as percentages. In the case of absolute

indicators, a score of 1 is assigned to the university with the highest data in each, and the score for the remaining universities will be calculated relative to this figure.

The next step is to establish the scores for the dimensions. Taking into account the objective of our ranking, and the deficiencies present in global rankings and which we hope to resolve, it was decided to give due importance to the teaching dimension. Two options were considered for assigning scores. These were, firstly, a score based on the number of indicators in each dimension, which would give us the following weightings:

- Teaching: 13 indicators/41 = 32%.

- Innovation and technological development: 7 indicators/41 = 17%.

- Internationalization: 7 indicators/41 = 17%.

- Research: 10 indicators/41 = 24%.

- Web penetration: 4 indicators/41 = 10%.

Secondly, consideration was given to assigning an arbitrary score according to the purpose of the ranking, since our goal is to offer a ranking that includes all universities. This would enable us to focus on those dimensions or indicators that may be most attractive to universities that have not yet participated in rankings.

It is clear from what has been argued so far that the dimension with the highest weighting should be teaching, since this dimension includes the largest number of indicators and is the most relevant for Ibero-American universities. Next should be the research dimension, the second fundamental mission of higher education institutions. Following that should be internationalization. With a score slightly lower than or identical to internationalization would come innovation and technological development and, finally, with a very low weighting, as this is data formulated and taken from another ranking, the web penetration dimension. The specific weightings assigned to each dimension are as follows:

- - Teaching: 45%.

- - Innovation and technological development: 10%.

- - Internationalization: 15%.

- - Research: 25%.

- - Web penetration: 5%.

It is noted that the impact of the teaching dimension is greater because, in our opinion, this is the dimension in which universities that do not currently appear in the rankings can stand out. This would be the justification for the weights chosen in our ranking, giving the highest weights to the dimensions that we consider most important in the university according to our criteria agreed with the committee of experts of the research, trying to favour the presence of smaller and private universities. As in most rankings,

these weights and indicators have been consulted with experts (U-Ranking and CYD Ranking, for instance) prior to their calculation and publication.

However, it is also true that in most rankings (U-Ranking and CYD Ranking, for instance), experts were consulted before these weightings and indicators were calculated and published.

Score = Teaching * 0.45 + Innovation and technological development * 0.1 + Internationalization * 0.15 + Research * 0.25 + Web penetration * 0.05

Figure 1
Formula for RUPPI ranking

Once the RUPPI formula has been established, the following stage will be to obtain data on the indicators from the different universities. It is noted that, generally speaking, requests are made in the name of the particular ranking (CYD, Shanghai, QS, etc.). Universities return a form (providing data that cannot be collected from other sources) and an application with an explanation the questionnaire, instructions for completing it, its purpose, deadlines, etc. Moreover, prior to this, ranking organisations usually contact universities at the level of the vice-chancellor to explain the purpose of the request for data and how the ranking process is conducted.

As regards the official bodies that can provide data, in Spain this is the Ministry of Education which, through the Integrated University Information System (SIIU), keeps academic data on the Spanish university system. The SIIU provides data for certain indicators to enable CRUE to formulate the Spanish University in Figures and the BBVA Foundation-Ivie to conduct their U-ranking. Other possible sources of research data are the IUNE observatory, the Web of Science (for publications and citations), the patents office, etc. Other rankings, such as that drawn up by the CYD Foundation, are provided with data through a cooperation agreement with U-Multirank. The sources can be very diverse depending on the type of data, but there is not one single source that can provide us with all the data required and, moreover, some of the indicators that we have established are new and will require hard work on the part of the universities. There will be a later stage to review and validate the data on the universities obtained from third parties outside their sphere of influence. Once the validity of the information has been confirmed, the ranking and classification will be calculated. Regarding the review and ratification of data, some information is obtained from third parties outside the universities, and this must be audited and validated by all the institutions. All this will give much-needed validity and reliability to the ranking published.

DISCUSSION AND CONCLUSION

Analysis of international rankings leads us to the first conclusion that these ranking attach greater importance to research than to any other dimension. This explains why "world-class" universities, with their enormous financial resources, always occupy the leading positions, making it very difficult for other institutions to enter their select group. Another aspect of these rankings is that they use indicators in which the size of the institution is a determining factor, since only Times Higher Education normalizes some of its indicators to formulate the final ranking. For this reason, these

methodologies are detrimental to the interests of small universities and those with low output.

An initial characteristic can be identified in national rankings that differentiates them from global rankings: the fact that they refuse to create a single synthetic index. Despite finally offering a classification, U-Ranking also offers lists for each dimension, as well as other classifications, differentiated by indicators that are normalized according to the size of the institution (usually known as performance ranking or classification), and other lists drawn up using indicators in absolute terms (known as volume rankings or classifications). The fact of not providing a classification is undoubtedly more pronounced in the CYD Ranking. Another characteristic of national rankings is that they tend to weight teaching more highly or provide a larger number of indicators for that dimension.

After examining the presence of Spanish universities in the rankings analysed, we can extract a series of features concerning these institutions that do not appear in any of them. These are private universities that are small in size compared to large public or larger private centres. The lack of research activity at these universities makes them evasive when it comes to being evaluated by rankings because, depending on how the absence of data is treated, this could be highly detrimental to them when it comes to determining their position. Another aspect that may discourage these universities from participating is the fact that they have neither the staff nor the time to devote to completing the questionnaires. That is why the participation of universities should be made as simple as possible, enabling them to provide data quickly and easily. Despite certain obstacles that these universities may encounter when participating, there is a growing tendency for their administrators to take an interest in rankings and in raising the profile of their institutions.

Also, according to Dumlao (2019) regarding research and publication of articles, journal writing for reflective practice is generally valued by teachers and seen as contributing to their individual development. However, finding time to reflect can be a problem for some lecturers, especially in small universities where teaching duties are very time-consuming.

In our selection of indicators, we attempt to emphasize novel aspects such as those related to online teaching, the possibility of taking credits at foreign universities and the presence of the business world in the university, either through teaching, such as sponsored chairs, or through funded research or patent applications. Since private universities tend to be more open to the involvement of business in their institutions, it is hoped that these indicators will prove attractive to them and encourage them to participate in ranking processes.

One limitation to the study conducted is the impossibility of obtaining the necessary data to formulate the ranking immediately. Much of the data requested is novel, and some of the institutions would have to make a considerable effort to provide it, as collecting and making a prior calculation based on it is no easy task. Requests for official data (SIIU, IUNE) must be properly prepared and justified, and the fact that it takes considerable

time to obtain the appropriate permits to use this data should also be taken into account. Similarly, there may be a certain reluctance to provide data if requests are made on behalf of a university rather than a foundation or a corporation, even though the motivation and use of this data is clearly recognised.

There is no doubt that the growth in the number of rankings will continue unstoppably. There are more and more aspects to be measured in the attempt to rank institutions. That is why universities should be prepared for the emergence of new classifications and should make participating in them one of their priority objectives. Moreover, rankings attempt to classify more and more universities at each successive edition, and those published aim to cover as many institutions as possible. The objective of our ranking – that of including all Ibero-American universities – though ambitious, is feasible. To this end, an attractive, interesting publication should be designed, one that extracts full value from this desire to measure, using each of these classifications to critically obtain characteristics and draw conclusions that can serve as a guide to improvement. Given the impossibility of many Ibero-American universities to occupy the leading positions in international rankings, largely due to economic questions, national rankings can provide more information on competitiveness in the different dimensions considered, as well as enabling comparison with similar institutions that will be of great value for university policy makers.

The aim of this research was to conduct a preliminary study in order to present a ranking of universities. However, although some data is public, other data is not. The difficulty of accessing the latter imposes a limitation on our research.

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