Synthetic Indicators of Spanish Universities

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Acknowledgements

The ISSUE (acronym for *Indicadores Sintéticos del Sistema Universitario Español*, in English Synthetic Indicators of the Spanish University System) project, developed by the Ivie (The Valencian Institute of Economic Research) and the BBVA Foundation, is an essential part of a program of activities carried out by both institutions to document and analyze the role of knowledge in social and economic development. This report presents the basic products of the project, U-Ranking and U-Ranking Volume, their methodology and results for the 2018 edition (sixth presented).

The approach of ISSUE, the selection of variables on which the rankings compiled are based and the methodology used when treating the data have been thoroughly discussed by the Ivie team with a large group of experts on the assessment of universities, university information and management. We would like to thank these specialists from fourteen universities for their invaluable collaboration.

We would also like to acknowledge the support of the Valencian public universities in the initial stages of the project and the suggestions made by members of different Spanish universities after the presentation of the first results in June 2013, which have been followed with interest by many people. From then until the end of May 2018, the U-Ranking website has received more than 800,000 hits, many of which have resulted in calculating personalized rankings (more than 150,000), as well as nearly 45,000 downloads of all the editions of the report. In addition, the project is being followed with interest from abroad: 30% of the visits to the website come from outside of Spain, the majority from Latin America and the United States which represent one fourth of the foreign visits. Visits from major European countries such as United Kingdom, Germany, France, Italy and Portugal also have significant percentages. These data provide a stimulus to maintain the continuity of the project while making improvements.

We would like to give special thanks to the extensive collaboration of the IUNE Observatory[1] in regard to research and innovation and technological development data. As well as participating in meetings on the availability and suitability of various sources and the problems of their treatment, the IUNE Observatory, and specially the INAECU team, directed by Professor Elías Sanz-Casado, have provided complete Bibliometric data regarding the research of all Spanish universities (source: Thomson-Reuters), from which many of the indicators relating to research have been calculated.

Also, the U-Ranking team acknowledges the cooperation of the General Secretariat of Universities and, in particular, the General Sub-Directorate of Universities Coordination and Monitoring of the Spanish Ministry of Education, Culture and Sports, which this year again has provided us access to the Integrated System of University Information (SIIU). In addition, the Ivie team would like to acknowledge firstly the support of the Spanish Ministry of Economy and Competitiveness which, through the General Directorate of Scientific and Technical Research, has provided information on the research resources available to universities; and secondly the Conference of Rectors of Spanish Universities (CRUE) for their invaluable collaboration, supplying data from different editions of the report *La Universidad en Cifras.*

The Ivie also acknowledges the contributions made by the following people who were part of the group of experts following the development of

[1] The IUNE Observatory is the result of work carried out by a group of researchers from the universities that make up the "Alianza 4U" (Universidad Carlos III de Madrid, Universidad Autónoma de Madrid, Universitat Autònoma de Barcelona and Universitat Pompeu Fabra). The general coordinator of IUNE is Elías Sanz-Casado, professor at the Department of Librarianship and Documentation of the Carlos III University Carlos III in Madrid and director of INAECU (Research Institute for Higher Education and Science).

the project: Antonio Villar (Universidad Pablo Olavide and Ivie Research Professor), Antonio Ariño (Universitat de València), Álvaro Berenguer (Universidad de Alicante), Gualberto Buela-Casal (Universidad de Granada), José Miguel Carot (Universitat Politècnica de València), Fernando Casani (Universidad Autónoma de Madrid), Daniela De Filippo (Universidad Carlos III), M.ª Ángeles Fernández (Universitat Jaume I), José M.ª Gómez Sancho (Universidad de Zaragoza), Juan Hernández Armenteros (Universidad de Jaén), Joan Oltra (Universitat de València), Carmen Pérez Esparrells (Universidad Autónoma de Madrid), José Antonio Pérez (Universitat Politècnica de València), Fernando Vidal (Universidad Miguel Hernández) and Carlos García Zorita (Universidad Carlos III).

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The results of the ISSUE project are, therefore, fruit of the collaboration of many people and institutions that share our interest in analyzing the performance of Spanish universities and facilitating comparable and synthetic images of them. Nevertheless, the indicators presented and the resulting conclusions are the sole responsibility of the U-Ranking team.

1. Introduction

This report presents the results of the research undertaken by the Ivie to develop the sixth edition of Synthetic Indicators of the Spanish Public University System (ISSUE), based on an analysis of university teaching activities, research, and innovation and technological development.

The developed indicators provide the basis for compiling different rankings of Spanish universities. The first of these rankings is **U-Ranking**, which analyzes the performance of the University System, synthesizing the universities' achievements in teaching, research and innovation and technological development in a single index. The fact that a smaller university achieves good results is relevant, but we should not ignore that their impact on their environment may be far smaller than a large university with less outstanding results. For this reason we provide a second global ranking, the **U-Ranking Volume**, which considers the combined effect of both variables, results and size, and classifies the universities according to their total contribution to the universities' missions. In addition to these two general rankings, we construct other more specific ones: **U-Ranking Dimensions**, focused on the classification of universities in three dimensions that make up the mission of the universities (teaching, research and innovation and technological development), and **U-Ranking Degrees,** which ranks the degrees offered by the different universities providing useful information to potential students for their decision making in the choice of a University.

All of these rankings are approximations of university results, allowing them to be compared from different perspectives. Through such comparisons, synthetic indicators assess their performance by answering to relevant questions, such as the following:

- Which Spanish universities are the most productive or efficient? Which achieve the greatest volume of results? Do the universities at the top of these rankings coincide?
- Do the positions of Spanish universities in international rankings meet the criteria in terms of volume of activity or in terms of output? Are the positions of Spanish universities in the U-Rankings correlated with the best-known international rankings such as that of Shanghai, QS or THE[2]?
- Do the universities with the best research results stand out for their teaching results? Are research results correlated with technological development and innovation?
- Do universities maintain their positions over time or do they vary?
- Are the general rankings on university activities as a whole similar to those obtained when comparing specific qualifications? Is the internal heterogeneity of universities high?

The sixth edition of U-Ranking raises additional questions with a view to analyzing the performance of Spanish universities over the study period:

- How has the Spanish university system as a whole performed in recent years? Has it performed consistently across all areas?
- How has each individual university performed? Are there any differences in performance depending on the type of ownership (private or public)?
- Are there any differences in university performance between regions? What is the pattern of regional performance in recent years?

Answering all these questions could be of great interest to form a vision of the Spanish public

[2] Academic Ranking of World Universities (ARWU), QS World University Rankings and Times Higher Education World University Rankings.

university system, identifying the strengths and weaknesses of each institution that forms part of it from a comparative perspective, classifying the position of universities within the university system. That is the purpose of this project and report, as noted in an earlier study by the Ivie, published by the BBVA Foundation (Pérez and Serrano [dirs.] 2012), the Spanish University system has greatly increased its size in recent decades but it is far from being homogenous. Not acknowledging its heterogeneity makes it difficult to assess. Thus, this assessment requires that the different specialization and changing characteristics of each university are taken into account, as well as their real possibility of competing in different areas (Aldás [dir.] et al. 2016; Escribá, Iborra and Safón 2018).

Rankings as synthetic indicators of results

The performance of Spanish universities receives constant attention, and debates about the exploitation of the resources used and their results are increasingly frequent. The driving force behind this interest are the significant amount of resources currently dedicated to these activities and the recognition of the important role universities play in generating and transmitting knowledge, two key areas in the social and economic development of countries today.

In Spain, discussions about university results frequently focus on public universities. There are two reasons for this: the volume of their activity accounts for most of the Spanish university system and the origin of the majority of the resources used is public; the assessment of their results is therefore considered to be of general interest. There is also a more practical reason. In Spain, traditionally, it has been more feasible to assess the resources and results of public universities based on relatively homogeneous data, because until recently most of the numerous private universities (currently 34[3]) did not provide the necessary data to carry out analyses. However, the participation of private universities in public statistics and information systems is increasing, and a project such as U-Ranking, which aims to provide an overall view of the Spanish university system, should take on the challenge of including these institutions. In this regard, the sixth edition of U-Ranking follows the same criteria as past editions in incorporating into the ranking system those private universities which have provided sufficient information of adequate quality, so that the data can be homogeneous with that of the public universities in order to construct synthetic indicators. After reviewing the available information, U-Ranking 2018 incorporates thirteen private universities which meet these characteristics.

Assessments to measure university results in many countries, as well as in Spain, are increasingly using rankings to classify institutions from different perspectives and with different criteria. Some international university rankings have found their place in debates about the quality of these institutions, becoming widely used references to assess the position of universities and national University systems. Thus, for example, the presence of eleven Spanish universities (13.1% of the total of 84 public and private Spanish universities) among the first 500 institutions of the world according to the Shanghai Ranking, with only one in the top 200, is a fact often mentioned as proof of the limited quality and insufficient international projection of our university system.

Researchers, public and private institutions, university associations, along with companies in information and media are increasingly taking more initiatives to compile rankings. The objectives and interests of such initiatives and their scope are diverse, both in terms of university activities studied (many rankings focus on research), as well as in terms of coverage (national and international), the data used and its treatment. Some recent reports (Rauhvargers 2011, 2013) stressed the importance of carefully assessing the criteria with which the rankings are compiled when demonstrating their significance and interpreting results. Accordingly, in 2015 IREG Observatory on Academic Ranking and Excellence developed a guide that provides recommendations to help stakeholders (students, families, higher education institutions, policymakers, etc.) interpret and use rankings appropriately.

[3] 32 out of 34 private universities have been active during the 2017-2018 academic year. The Mid-Atlantic University and the Technology and Business University are not offering any degrees at the moment.

Indeed, the rankings are a particular way to approach the assessment of university results and their appeal lies in the fact that they offer simple and concise information. This facilitates comparisons while simplifying them, and can make them sensitive to the criteria and procedures followed when constructing indicators. It is for this reason that the value given to the rankings should not be separated from how they are compiled or from the metric used.

These precautions are not always present when using rankings. On the one hand, the reputation of a good position in a ranking turns them into an intangible asset to universities. Therefore, increasingly more universities develop strategies to convey information about themselves (signaling) by advertising their more favorable results, and also to improve their positioning in the rankings. Certainly, the expected return of a good position in a ranking is significant, given that it can affect areas as diverse as recruiting students, attracting researchers, obtaining resources and the social projection of institutions.

On the other hand, the growing interest in these classifications is because they are perceived as useful tools (despite being imprecise) for various purposes and different stakeholder groups in universities as they:

a) Provide the members of each university with external references on their strengths and weaknesses, contributing to the perception of their position.

b) Provide the users of university services with information that is easy to interpret in terms of attractiveness or quality of institutions.

c) Provide comparative information to governments, with the possibility of being used to assign resources or for the accountability of universities to society.

d) Complement the work of university quality assurance agencies and provide information to analysts interested in having homogenized indicators available.

Approach of the project

In Spain different university rankings are being regularly presented, compiled with diverse perspectives and methodologies. What sets the rankings proposed by ISSUE apart is that its rankings (U-Ranking, U-Ranking Volume, U-Ranking Dimensions, U-Ranking Degrees) are developed according to criteria that respond to many recent international recommendations. One of them is that indicators should be created with the objective of studying university activities from a comprehensive approach, i.e. examining teaching, research, and innovation and technological development activities. Another important feature, is that it offers rankings by degrees (U-Ranking Degrees) giving specific guidance to students when choosing what to study.

The criteria used in developing U-Ranking that should be noted are:

- Developing multiple university rankings, in which university activities are examined from a general perspective, as well as in specific fields (teaching, research, innovation and technological development), but also in terms of the performance achieved (U-Ranking) or the total output (U-Ranking Volume) of each university.

- Taking into account the diverse perspectives and interests that potential users of the data have when using the rankings. In particular, special attention has been paid to the importance that many people give to specific areas of activity, such as degrees, when comparing universities. To deal with this concern, a web tool has been developed which enables users to create personalized rankings in terms of Bachelor's degrees (U-Ranking Degrees). It has been designed to guide students, their families and counsellors when choosing a university in which to study. The advantage of recognizing that users have different preferences is that the following problem can be avoided when constructing synthetic indicators: their excessive dependence on experts' opinions (subjective and sometimes contentious) regarding the weights that should be attributed to teaching or research.

The project therefore offers two different products:

- A general collection of rankings on Spanish universities, based on the criteria of the project's team and the experts consulted, allowing each institution to be compared with others from different points of view: U-Ranking, U-Ranking Volume and U-Ranking Dimensions.
- A web tool that provides personalized rankings for different Bachelor's degrees, grouped according to area of study and which allows universities to be compared taking into account the interests and criteria of each user (mainly students enrolling in universities, their parents or school counselors) on their choice of studies, the regions considered and the importance given to teaching and research: U-Ranking Degrees.

It is important to note that all the classifications are obtained from a common basis: the data correspond to the same set of variables and the same methodology has been followed when treating and aggregating variables, except obviously with regard to decisions taken by users when creating their *personalized* rankings.

Structure of the report

After this Introduction, the remainder of this report is structured in four chapters, with the following content. Chapter 2 details the methodology followed in preparing the different rankings. Chapter 3 describes the approach for the personalization of the rankings by the user and the web tool created to present the results to students. Chapter 4 provides an analysis of the main aggregated results, focusing on the comparison of the U-Rankings with the main international ranking of reference. Also, to assess robustness, a sensitivity analysis of our results to variations in some of the assumptions used in making the rankings is carried out. In addition, the results of the different regional university systems are analyzed. Furthermore, this year's edition shows the evolution of the Spanish University System's performance between 2010 and 2016. Finally, Chapter 5 summarizes the main features and results of the project.

New developments in the sixth edition of U-Ranking

This sixth edition of the U-Ranking Project corresponding to 2018 offers, as in previous editions, the general rankings U-Ranking, U-Ranking Volume and U-Ranking Dimensions as well as personalized rankings for Bachelor's degrees. Additionally, it presents the following new features:

Once again, U-Ranking 2018 includes information on 13 private universities, however, one of them is analyzed for the first time this year. One university that was included in previous editions has remained outside this year's analysis because, according to the methodological criteria, it did not provide sufficient information for a calculation of its indices.

In the 2018 edition, the effort to enhance the quality of the indicators continues, with a view to improving the information used to calculate the rankings. Hence, the main novelty of this edition is the improvement in the accuracy of the information on teaching used to obtain the customized rankings.

Currently, 10 indicators are used to evaluate universities' teaching performance: 3 for measuring access to resources, 3 for evaluating output, 2 for assessing teacher quality and 2 relating to internationalization. Only 6 of these 10 indicators can be assessed at degree level, as the others are the *Relative proportion of postgraduate and graduate students* indicator and the 3 resource indicators, which are common to all degrees.

In previous editions, information was available at individual degree level for 2 indicators (cut-off marks and percentage of foreign students) and at the level of groups of degrees (degrees classified in 139 groups) for 3 other indicators; the rest of the indicators were calculated at the level of the branch of knowledge or university. In this year's edition, with the collaboration of the CRUE, information has been obtained on the 3 performance and drop-out indicators (success, evaluation and drop-out rates) for each of the more than 2,000 degrees. Thus, the only information still missing in order to provide an accurate as possible teaching performance index (at degree level) in accordance with the proposed methodology is the percentage of students in

exchange programs. The recent editions of U-Ranking rely on the collaboration with the Spanish Ministry of Education, Culture and Sports, allowing access to the Integrated System of University Information (SIIU). The SIIU is a web-based platform that collects, processes, analyzes and disseminates data of the Spanish university system providing homogeneous and comparable statistical information of the Spanish universities. This platform provides detailed information on the degrees offered by each university, in which schools they are taught, the percentage of foreign students in each degree, as well as the percentage of students and full-time equivalent teaching and research staff. Since new information is continuously being added and updated in the SIIU, U-Ranking can rely on this source to access other indicators that can be expected to become more accurate over time.

One of U-Ranking's main objectives is to provide the most useful and detailed information as possible for the different target publics which are potential users. A university ranking allows to observe the relative position of one institution with respect to others, but it is not easy for university managers or researchers to analyze in depth the performance of a specific university, to assess the aspects in which it stands out or its distance from the average of the system or from a certain university that is taken as a reference. For this reason, since 2016, the www.u-ranking.es website also offers a **Panel of Indicators**[4] for each University, which is a file containing the values for each of the 25 indicators used and the mean value of the universities so that managers can observe the relative distance to the average of the system and use the data file to make a direct comparison with other universities. The added value[5] of the indicators is presented on a scale of 0 (minimum value obtained by a university of the system) to 100 (value given to the university that scores the most). In this way, it facilitates the comparison between very different indicators, offers a general profile of each university and respects the CRUE's confidentiality agreement to not publish individual data of the universities. Each panel of indicators also shows the university's position in U-Ranking, U-Ranking Volume and U-Ranking Dimensions, along with basic information regarding its year of foundation, ownership, number of students, teachers and degrees, amongst other data.

Information provided by rankings is useful to the extent that it can be used to compare the current position of one university against that of another. For certain purposes, however, the information may be difficult to interpret. For example, a drop in rank may be interpreted as a drop in performance (e.g., fewer publications, lower student success rate or fewer patents), when this is not necessarily the case. In fact, a university may have improved in all these factors but at a slower rate than the other universities in the system, thus falling in the ranking.

For this reason, as a novelty this year, U-Ranking analyzes the trend in university performance throughout the years of the project. U-Ranking considers each university's performance overall and in the areas of research and teaching over this period. Individual university performances are aggregated to analyze regional and national university system performance.

By analyzing universities' performance over time we hope to be able to answer the earlier questions about the performance of the Spanish university system, all of which are of interest to university administrators and are complementary to the rankings themselves.

[4] See appendix 3 for the panel of indicators of the 61 universities analyzed.

[5] Without distinction by learning areas, fields of knowledge or degrees.

2. Methodology

The starting point of the ISSUE project was an in-depth look at the most important national and international rankings that are available, so as to identify possible ways of reducing their shortcomings. The most significant problems of rankings arise in the following areas: (1) university activities studied, (2) disaggregation by subject or type of studies, (3) data availability and use, (4) methodological rigor in the treatment of data and construction of indicators, (5) recognition of the user's perspective when creating and providing data, and (6) user-friendly tools to select their preferences in the rankings.

The project has studied the shortcomings in all these areas and this chapter describes how they have been addressed.

2. 1. THE DESIGN OF RANKINGS

In the first editions of the ISSUE project, and due to its novelty, an entire chapter was dedicated to the limitations of rankings and the improvements that a new tool like this one should include. The reader can view previous reports —found on the U-Ranking website (www.u-ranking.es)— for a detailed analysis of these aspects, which are summarized in this edition.

The development and use of rankings entails a number of **risks** that should be forewarned. First of all, it is not wise to orient strategies focused on improvements of variables studied, instead of to the problems that underlie them: the improvement of the institutions should be based on principles of efficiency and the results are reflected in the indicators. The use of indicators that are not very robust, with values highly sensitive to the criteria of measuring the variables and aggregation procedures, and that focus on what should be measured and not only on what can be measured, must be avoided. Finally, a very common risk of rankings is to focus only on the elite (world-class universities) forgetting the rest. This may inadequately compare institutions with very different specializations and resources.

Some of the published rankings show **limitations** that users should be aware of. In the case of universities outside the circle of the great universities, many rankings are exclusively based on indicators which focus on research activity and unreliable reputation factors. For example, the exclusive use of these indicators to rank Spanish universities is in many cases inappropriate and risky, leading to wrong conclusions.

In the first three U-Ranking reports, a detailed review on the issues to be considered in the design of a good ranking, and their inclusion in the ISSUE project, was carried out. In this report it is not necessary to repeat the aforementioned analysis in detail, however, we summarize some of the most relevant aspects:

- The study *Principles of Berlin on University Rankings* (Centrum für Hochschlentwicklung, CHE 2006) stresses, among other recommendations, to indicate clearly what the target audience of the ranking is, to be clear about what each indicator measures to be methodologically scrupulous, to focus on the outcomes rather than inputs and to maintain a high ethical standard, given the responsibility and impact that rankings have.
- The results of discussions held by the European University Association and the International group of Experts in Rankings (CHE 2006) insist on the importance of providing a vision of all the institutions, addressing their multidimensional nature and diversity, respecting the user's perspective and maintaining the independence and temporal sustainability of the ranking.

The U-Ranking system expressly includes all the principles which were recently discussed internationally and proposed by the EU. The following sections detail the many aspects that have been

taken into account when working with these criteria.

2.2. ACTIVITIES STUDIED

One of the main failings of certain rankings in providing a general assessment of universities, particularly international ones, is that the activities are examined from a very partial perspective. The problem stems from the limited data availability on the results of teaching activities, and innovation and development technology, which are far less abundant than research.

In fact, most of the important rankings focus on analyzing research, taking little account of another significant function of universities which is teaching and barely considering technological development activities, despite their increasing importance. The rankings which are biased towards research are frequently interpreted as representative of university activity as a whole and they may not be.

There are three possible reasons for this: 1) the data available is used and, without a doubt, the abundance, quality and homogeneity of data on research is much greater than in the other two areas; 2) research activity is considered the most important distinctive element of universities in the last two centuries; and 3) the opinion holds that the research quality of professors is a proxy variable for other areas, and therefore it is enough to observe the results in this area to predict the others.

The first reason is practical, but can induce bias by omission in indicators and rankings. The second needs some clarification in that it is a powerful argument regarding postgraduate studies but less so in relation to the degree, especially in mass university systems, such as those of most developed countries today. In fact, in many of these systems there is a significant concentration of research activity in a small number of universities, while in a large number of institutions there is fundamentally teaching activity. The third reason is a hypothesis, which validity should be tested by developing indicators for all activities and testing whether the correlation between teaching and research results is high. If the validity of this hypothesis is not tested, and given that the intensity of university teaching specialization, research and innovation and technological development varies greatly[6], overlooking the direct indicators of teaching and innovation and technological development can bias the rankings.

Therefore, it is important to take advantage of the data available on university activity in the field of teaching, and innovation and technological development, so that the rankings reflect university activity as a whole more accurately. In addition, this also allows us to recognize the different specialization profiles of universities, as some focus more on basic research (as occurs in many of those most often included in the world rankings), others on higher education and professional development, and others on applied research, innovation and technological development.

Studying these three dimensions is a first step in the direction of addressing the different perspectives on university systems and the different interests that potential users of the rankings may have. Thus, a degree student probably shows greater interest in teaching, while a postgraduate student and teachers focus more on aspects related to the quality of research. On the other hand, a company interested in signing a contract for a line of specific research, may want to identify which university has a greater capacity to apply research or produce patents. If the data focuses solely on research results then these distinct approaches cannot be carried out accurately.

The U-Ranking system specifically studies these three categories of university activities, analyzing the data available on each of them in Spain. The national dimension of the project ensures that reasonably homogeneous data is available with a set of variables representing the activity of Spanish public universities and a certain number of private universities. In the future, it would certainly be desirable that data on the rest of the private universities were available with a guarantee of similar quality and homogeneity as those included in the ranking, which would improve the scope of the project.

[6] See Pérez and Serrano (dirs.) (2012, ch. 1 and 4).

The total amount of 61 universities included in the ranking is sufficiently high for the data available to allow a contrast of the hypothesis to which we referred earlier: if research results can predict correctly those of teaching or not. The project has examined this specific objective, with the results presented in Section 4.

2.3. DISAGGREGATION OF ACTIVITIES

A further shortcoming noticed when analyzing current rankings is that many deal with universities in a unitary manner, not recognizing the diversity of areas in which these institutions can offer professional development or conduct research. This problem needs little explanation: to be more useful, a ranking has to inform as far as possible the user on specific areas or scientific fields of their interest, since universities may not be homogeneous in the quality of each of their areas.

It is for this reason that a ranking system can be improved if it provides data disaggregated by areas of study, fields of knowledge or specific degrees. This last level of detail could be very significant for students, given that their fundamental interest is generally linked to the quality of the specific studies that they want to pursue.

For the disaggregation, the U-Ranking project had to work in several directions. Firstly, it followed the criteria that it is important to start with the most disaggregated data available, maintaining its detail whenever possible, so as not to lose the wealth of its heterogeneity. Secondly, the disaggregated data had to be homogenized properly before adding it to the indicators. And third, the problems of combining (for the construction of some of the indicators studied) the data disaggregated according to scientific fields or degrees with other data aggregated at university or branch of knowledge level had to be solved. When there is no disaggregated data, or its disaggregation makes no sense, the aggregated data has been allocated to the various elements of the set, following the criteria considered more reasonable in each case.

Addressing the above problems is not trivial. For example, in the case of the rankings on specific Bachelor's degrees of Spanish universities, to deal with data on areas with different levels of disaggregation a series of matrices have been created that connect them. In order to do this, accurate connections had to be established between university, branch of knowledge, Web of Science category, areas of the National Evaluation and Foresight Agency (ANEP) and Bachelor's degrees.

In allocating research results to each degree, the starting point was data disaggregated by the Web of Science categories (more than 250 items). Given that one classification is not perfectly nested in another, both classifications have been connected, and the two types of errors that could be made have been taken into account:

1. *Inclusion error.* That is, attributing to a given degree the research carried out by teachers from other areas. For example, attributing to the Pharmacy degree of a given university, the research in "Hematology" that has actually been conducted by teachers from the Faculty of Medicine and who only teach in Medicine.

2. *Exclusion error.* That is, excluding research by teachers in areas that are not exactly the subject of the degree courses they teach in, as a result of being too restrictive when allocating areas to degrees. For example, if in Economy we only allocate the category "Economics", then important research may be missed in the area of "Business and Finance", theoretically closer to Business Administration degrees but also carried out by economists who teach in the degree of Economy.

These problems do not have a perfect solution and we had to choose one of the alternatives. We have opted for a more inclusive criterion: when in doubt about whether to associate a category or scientific field to a degree we have chosen to include it, minimizing exclusion errors on the grounds that they are more serious errors.

2.4. INDICATORS, AREAS AND DIMENSIONS

The main pillar of a ranking system is the rigor of the procedure followed when dealing with existing

problems so that the created classification is based on appropriate data and is treated with reasonable methodological criteria. Many of the rankings have clear shortcomings in this aspect, which international literature has analyzed in detail.

The U-Ranking system considers that a university ranking should consider all their activities and be structured according to the three following major dimensions:

- *Teaching*
- *Research*
- *Innovation and technological development*

The assessment of each of these dimensions can take into account multiple areas of activity. However, many experts agree that an excessive number of indicators obscure the meaning of a ranking and complicate the construction of synthetic indices, a complex matter as it is. Following a criterion of (relative) simplicity, four **areas** have been studied in each of the three large dimensions aforementioned:

- *Access to financing*
- *Output obtained*
- *Quality (particularly in the results and in some cases, resources and processes)*
- *Internationalization of the activities*

The main reference to assess universities should be the results, but these can be studied both from the perspective of total volume as well as from the perspective of their quality. If there were a market that assessed the differences in quality, then results showing a higher quality would have a higher price. These prices hardly exist in the area of public universities. The differences in rates, currently very diverse between regions and degrees, respond in many cases to factors that have nothing to do with quality. However, some indicators can supplement, in part, this limited information. Thus, for example, there are indicators on the quality of teaching and research and also on a very relevant feature today regarding the specialization (and quality) of universities: their internationalization.

However, as we pointed out in the introduction, the assessment of the quality of the output is incomplete if we want to take into account the impact of the university system on its environment. A university can generate high-quality results, but if its size is very small, its contribution to technological development or to the production of human capital through its graduates may have a much smaller influence on the productive environment than a university with somewhat lower levels of quality in its output but a significantly larger size. This obliges us to introduce also the size factor in the rankings system, thus generating U-Ranking Volume.

Each of the four areas mentioned has been analyzed using a series of indicators. For each area, between one and three indicators have been taken into account, depending on the availability and suitability of data, in the dimension that is being studied.

Table 1 shows the indicators studied, after analyzing the availability of data and discussing alternatives with the group of experts working on the project. Agreements were reached by analyzing the suitability of each indicator in capturing significant data on the area and dimension it forms part of it.[7] It is important to stress that the data used is obtained from sources allowing the project database and the rankings based on it not to require universities to provide data directly to U-Ranking.

The logic underlying this selection of indicators, disclosed in summary form, is the following:

Teaching

- Teaching *resources* are characterized by budgetary allocations per student, and faculty and research staff per student, with special attention paid to faculty members with PhD
- Teaching *output* is measured by using results obtained by students, analyzing how many students undergo evaluation, how many succeed in those evaluations and how many drop out.

[7] In order to ensure the transparency of the process in developing indicators, the definition of each indicator, its source and its time frame are all included in Appendix 1 and in the following website of the project: www.u-ranking.es.

Table 1. List of indicators, areas and dimensions

Dimension	Area	Indicator
Teaching	Resources	Faculty member per 100 students
		Budget / Student
		Faculty member with PhD / Faculty members
	Production	Success rate
		Evaluation rate
		Drop-out rate
	Quality	Attractiveness index
		Percentage of postgraduate students
		Cut-off mark[1]
	Internationalization	Percentage of foreign students
		Percentage of students in exchange programs
		Percentage of students registered in programs imparted in non-official languages
Research	Resources	Competitive public resources per faculty member with PhD
		Contracts with PhDs, research grants and technical support over total budget
	Production	Citable documents with ISI reference per faculty member with PhD
		Total *sexenios*[2] over possible *sexenios*
		Doctoral theses read per 100 faculty members with PhD
	Quality	Mean impact factor
		Percentage of publications in the first quartile
		Citations per document
	Internationalization	European or international research funds per faculty member with PhD
		Percentage of publications with international co-authorship
Innovation and Technological Development	Resources	Income from licenses per 100 faculty members with PhD
		Income from consultancy contracts per 100 faculty members with PhD
		Income from CPD[3] courses per faculty member with PhD
	Production	Number of patents per 100 faculty members with PhD
		CPD hours per faculty member with PhD
		Number of contracts by faculty member with PhD
	Quality	Commercialized patents per faculty member with PhD
	Internationalization	Triadic patents per 100 faculty members with PhD
		Income from international contracts per faculty member with PhD

[1] Mark of the last student who gained admission to a degree with limited places. [2] Monetary compensation received for research activity based on the last six years.
[3] Continuing professional development.

Source: Own elaboration.

- The *quality* of teaching is very difficult to observe at present, but we studied as a proxy the ability to attract students from other provinces, the quality of students as measured by the cut-off mark of each area and the percentage of postgraduate students.

- The *internationalization* of teaching is shown by the percentage of foreign students, the percentage of students in exchange programs and by courses offered in non-official languages.

Research

- The *research* process is characterized by data referring to two types of resources: competitive public funds raised and the provision of research staff, scholarships and qualified technical support.

- *Output* is accounted for by citable papers published in each area, in the six years of research work that are achieved with publications, as well as in the number of doctoral theses, which are an indicator of the training activity of a researcher in a given area.

- The *quality* of the research is reflected in the impact the publications have and the citations that these papers generate.

- Finally, a greater proportion of international publications, international co-authoring and the percentage of research funds from external sources indicate a greater *international* vocation in research activity.

Innovation and technological development

- The *resources* studied cover the three main activities of innovation and technological development: income from patents, income from consulting contracts and income from the offer of continuing professional development.

- In terms of measurement of gross *output* in these activities, the total number of patents, the hours of professional development and the number of contracts for services.

- As an indicator of *quality*, due to the limited availability of data, only patents that are commercialized by faculty members with PhD are included.

- The *internationalization* of the transfer of knowledge is reflected through triadic patents (valid in Europe, US and Japan) and income for international contracts.

The list in table 1 defines the objective that is hoped to be completed in the medium term, given that not all the required data is available today. In part, this is due to the ongoing process of adaptation of the Spanish university system to the European Higher Education Area (EHEA). This process continues to affect the computed data because averages are calculated over several years, but the process itself is practically completed. The data deficiencies in certain areas are also attributable to other causes[8]. The project is open in this sense, with the possibility of completing this information as it improves, especially in the different areas of innovation and technological development.

Regarding the indicators, the second edition of U-Ranking introduced several improvements thanks to the inclusion of new variables and data sources. As shown in table 2, since the third edition, the rankings have incorporated 25 of the 31 indicators defined in table 1. Of these 25, 9 are calculated at degree level, 8 at branch level and 8 at university level.

[8] Specifically in this edition, the following variables were not taken into account for reasons of availability or quality of data: Index on Attraction Capacity, percentage of students in non-official language programs, hours of continuing professional development, number of professor contracts and number of patents commercialized per PhD professor. The relationship between indicators used will be adjusted as the availability of quality information increases and is consolidated.

Table 2. Indicators and level of disaggregation of U-Ranking 2013-2018

	2013 Ranking	2014 and 2015 Rankings	2016 and 2018 Ranking
Defined indicators	31	31	31
Used indicators	23	25	25
Degree level[1]	5	8	9
Area of study level	1	1	0
Branch of knowledge level	9	7	8
University level	8	9	8

[1] Bachelor's degree or Bachelor's degree group. The category bachelor's degree group is the result of aggregating more than 2,362 degrees offered by Spanish universities analyzed into 139 groups.

Source: Own elaboration.

2.5. TIME COVERED BY THE DATA

University rankings aspire to offer an image of the current position of each institution, though they should not be conceived of as a snapshot of a given year. Many indicators have the character of a flow, and as such, can present high variability from year to year, both in the quality of the information and in the distance between the actual reality and what the information reflects, given the delays in information availability. In addition, other indicators reflect the accumulation of results over long periods of time.

The rankings referred to usually recognize this problem by taking comparison periods longer than a single year, either using moving averages and even considering the complete history of the University (as in the case of the treatment of the Nobel Prize and Fields Medal winners in the Shanghai Ranking). Considering multi-year periods when elaborating the indicators provides greater interannual stability of the rankings and permits specific random disturbances to be smoothed out by considering a longer time range.

Our approach follows this criterion, considering that one cannot reasonably expect abrupt changes in the universities' real situation, so the ranking should avoid giving that impression. Therefore, as information has become available, we have converged towards a 6-year moving average for nearly all the indicators. Most of the variables linked to research and to innovation and technological development, taken from Thomson-Reuters (2011-2016) and the RedOtri (2010-2015), are already being calculated as a mean of six years. Furthermore, in this year's edition, the teaching results have been reached with data by university from 6 academic years (except those mentioned in table 3) supplied by CRUE through its reports *La Universidad Española en Cifras*; and by SIIU which, depending on the variable, has also supplied detailed information for the academic years 2009-2010 to 2016-2017.

Table 3 shows the updating in terms of years and time series registered by the indicators used in the ranking for 2018. All the indicators include an additional year compared to the previous edition, covering data for the majority of indicators up to 2016. In the case of the Innovation and Technological Development dimension, all the indicators cover the period 2010-2015, except for national patents, which offers data up to 2016. This dimension is the one with the greatest margin of improvement. The Spanish RedOtri and CRUE survey on *Research and Knowledge Transfer* is a helpful tool for obtaining this type of information, but not all the universities take part or allow the survey data to be published, and the information is valid for 2 or 3 years.

In sum, the methodology on which the calculation of the U-Ranking system is based leads one to expect that the rankings of universities will not present sudden changes from one year to another. The existence of an inertia in the rankings seems to be a desirable property, since the quality of university institutions does not change radically in the short term, though some of their annual results may do so.

Table 3. Time series used in the 2018 rankings

Dimension	Area	Indicator	Period
Teaching	Resources	Faculty member per 100 students	2012-13 to 2015-16
		Budget / Student	2010, 2012 to 2015
		Faculty member with PhD / University teachers	2010-11, 2012-13 to 2015-16
	Production	Success rate	2010-11 to 2015-16*
		Evaluation rate	2010-11 to 2015-16*
		Drop-out rate	2010-11 to 2015-16*
	Quality	Attractiveness index	-
		Percentage of postgraduate students	2010-11 to 2015-16
		Cut-off marks	2017-18
	Internationalization	Percentage of foreign students	2010-11 to 2015-16
		Percentage of students in exchange programs	2010-11, 2012-13 to 2015-16
		Percentage of students registered in programs imparted in non-official languages	-
Research	Resources	Competitive public resources per faculty member with PhD	2011 to 2016
		Contracts with PhDs, research grants and technical support contracts over total budget	2011 to 2016
	Production	Citable documents with ISI reference per faculty member with PhD	2011 to 2016
		Total *sexenios* over possible *sexenios*	2012 to 2015
		Doctoral theses completed per 100 faculty members with PhD	2011 to 2016
	Quality	Mean impact factor	2011 to 2016
		Percentage of publications in the first quartile	2011 to 2016
		Citations per document	2011 to 2016
	Internationalization	European or international research funds per faculty member with PhD	2014 and 2015
		Percentage of publications with international co-authorship	2011 to 2016
Innovation and Technological Development	Resources	Income from licenses per 100 faculty members with PhD	2010 to 2015
		Income from consultancy contracts per 100 faculty members with PhD	2010 to 2015
		Income from CPD courses per faculty member with PhD	2010, 2012 to 2015
	Production	Number of patents per 100 faculty members with PhD	2011 to 2016
		Hours of CPD per faculty member with PhD	-
		Number of contracts by faculty member with PhD	-
	Quality	Commercialized patents per faculty member with PhD	-
	Internationalization	Triadic patents per 100 faculty members with PhD	2010 to 2015
		Income from international contracts per faculty member with PhD	-

*For the calculation of the personalized rankings we are still using the information supplied by the CRUE for the academic years 2010-11, 2012-13 to 2015-16 which is offered by degree and university.

Source: Own elaboration.

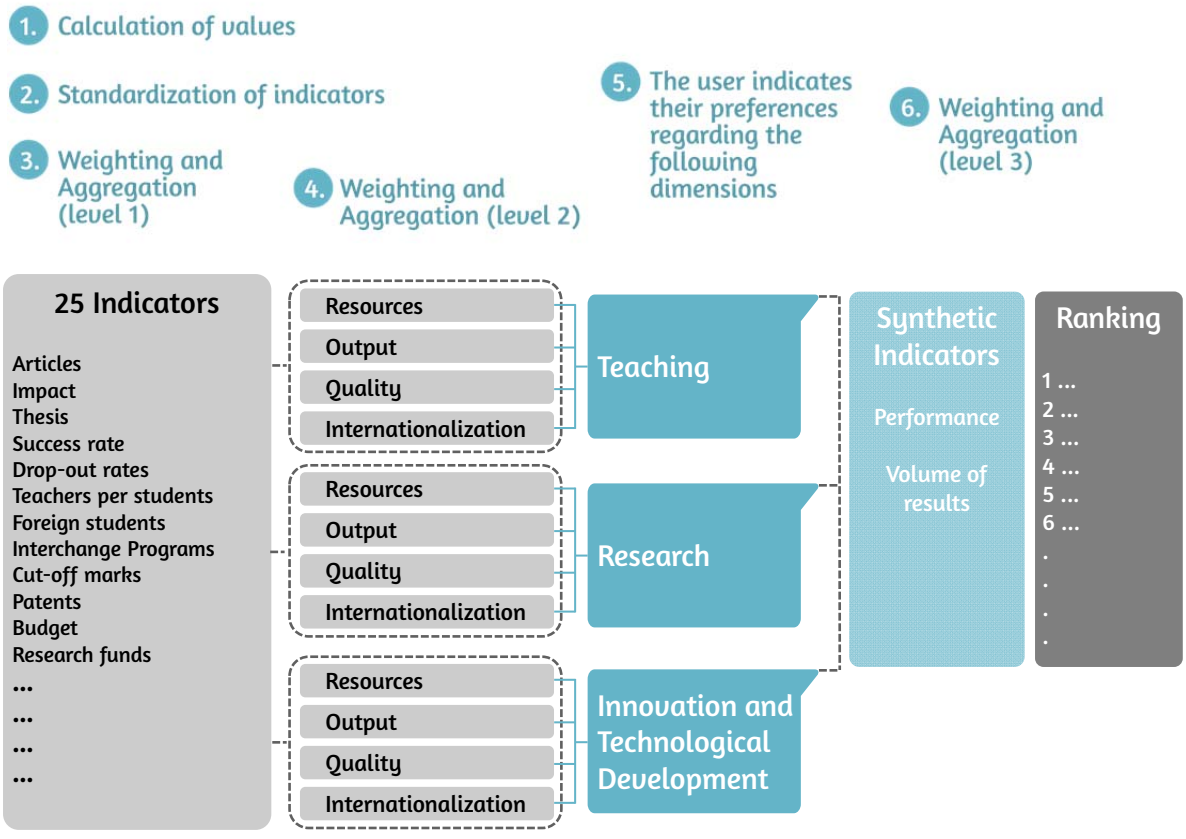
2.6. CRITERIA FOR THE CONSTRUCTION OF INDICATORS

Key to being able to trust the meaning of the rankings is that the processes on which their elaborations are based should be transparent and respect the foundations established by statistical publications for the construction of indicators. In this regard, the project team contacted specialists in the subject and analyzed the methodological principles established in the specialized literature, especially in the *Handbook on constructing composite indicators: methodology and user guide* (The Organisation for Economic Co-operation and Development [OECD] 2008).

The underlying process of drawing up any of the rankings of universities constructed is structured according to the following six steps —the fifth one being unnecessary in the case of the partial rankings of teaching, research and innovation and technological development:

1. Preparation of the data bank and estimation and allocation of missing values
2. Standardization of indicators
3. Weighting and aggregation of indicators within the areas of each dimension
4. Weighting and aggregation of area indicators, within the dimensions
5. Weighting and aggregation of the dimensions
6. Obtaining of rankings

The following scheme graphically illustrates the time sequence of the steps. To complete each of them it is necessary to solve technical problems, as described and indicated below.



2.6.1. Allocation of missing data

The starting point for any ranking is to have available the necessary information on the variables to be considered in order to construct each indicator. A first technical problem to be solved is the treatment of the data missing from certain universities in some of the variables to be used. For example, the number of theses read in the last year in a particular university may not be available. Such gaps may be due to several factors, whether technical (an error in loading the data), or of availability (the university may not have generated certain information or not done so in time) and even strategic (a university may opt not to give certain information because it is not in its interests to do so).

Not facing this problem rigorously would condition the comparability of the universities, the quality of the aggregate indices, and the final results. Specifically, to calculate the ranking ignoring such missing information would be equivalent to allocating a value for that variable equivalent to the mean of the rest of the variables forming the dimension. This criteria is problematic if it is the university itself that does not reveal the information for strategic reasons, as that mean value might favor it. On the other hand, to calculate the ranking on the assumption that the real value of the missing variable is zero would be to penalize the university unfairly if the data is missing due to a technical problem of data availability or of deadlines.

To estimate and allocate the missing values of each variable we have proceeded as follows:

1. From a matrix of correlations[9] we identify, for each variable, the two variables with the highest correlation (in absolute terms) and associate them with the variable to be estimated.

2. We estimate a linear model (by minimum squares) between the variable to be allocated and the two most correlated variables —that is, those which the variable to be estimated had the highest absolute correlation. For the estimation of this model we use only the information from the same area of study, thus acknowledging the different operational situation of each subject area in the areas studied.

3. From the parameters estimated in the above model we calculate the estimated value of the missing variable, using the said parameters and the existing information for that university in the related variables.

For example, let us suppose a university for which there are no data on doctoral theses directed by a faculty member with PhD (T) in an engineering degree. After analyzing all the variables of the Spanish universities we observe that, within the engineering degrees, the theses directed are highly correlated with the research *sexenios* obtained as a proportion of the total of possible *sexenios* of its teaching staff (S) and also with the percentage of postgraduate students of that university (P). On the basis of this ratio, $T = f(S,P)$, we estimate linear model $T = a_0 + a_1S + a_2P$. Once the values of a_0, a_1 and a_2 have been estimated, the theses directed in that engineering degree of that university are estimated from the data available on *sexenios* and postgraduate students.

2.6.2. Standardization of indicators

One of the pillars upon which the construction of synthetic indicators rests is the proper standardization of the information, that is, its transformation in order to homogenize it and make possible its comparison and aggregation. There are numerous systems of standardization, such as the Gaussian (subtracting from each variable its arithmetic mean and dividing by its standard deviation), relative order (ordering the values according to their relative value), distances from the mean or the median, and the ratio between the variable and its mean or its median.

The standardization chosen must be in consonance with the method of aggregation to be used subsequently. Because as a general rule the geometric aggregation method has been chosen, requiring the value of the standardized variables to be positive, we must exclude the Gaussian and absolute distances from the mean

[9] The correlations matrix is constructed by calculating, for each possible pair of indicators, their linear correlation coefficient.

and from the median, which necessarily generate negative values, as alternatives of standardization.

For this reason, the standardization method chosen is the calculation of the ratio between the variable and its median. Taking into account that the median is the value separating each distribution into two halves, the standardized results will be centered on the value 1: values below the median are bounded between 0 and 1, while those above will be greater than 1.

2.6.3. Weighting and aggregation of indicators within an area

Once the missing values have been allocated and the basic indicators standardized, we aggregated these to obtain a first synthetic indicator for each area. Thus, for example, to obtain the value of the indicator for the *quality* area in the *Research* dimension we aggregate the standardized values of the *Mean impact factor of publications* and the *Percentage of publications in the first quartile*.

As in the case of standardization, there exist numerous aggregation procedures, such as the arithmetic, the geometric or those based on factor analysis. The choice of one method or the other has implications in the substitutability of the indicators or the importance of extreme values (both large and small). The aggregation criterion chosen implies a weighting of the indicators, which is important to bear in mind.

It must be taken into account that some universities might have zeros in some indicator of a specific area (for example, they may not possess *Triadic patents*). For this reason we have opted in this phase for an arithmetic aggregation, ruling out the geometric aggregation because the presence of a zero in the product would cause the whole area analyzed to take a nil value.

As the weighting of the indicators shows the importance assigned to each variable when aggregating it into a synthetic indicator, we also reflect on this question. This is a classic problem in the construction of synthetic indices and generally requires a judgment on the relative importance of each element. In the case of economic aggregates the weights are offered by prices —which reflect the market valuation of the goods, services or factors exchanged— but in many other cases there are no prices and the indicators have to be constructed following other criteria, frequently based on subjective opinions.

There are three possible approaches to weighting: 1) assignation of identical weights (which also implies a judgment, since the weight of one indicator is conditioned by the number of indicators included); 2) consultation among experts to identify the most widely held opinions (by means of surveys or methods such as the Delphi); 3) weighting according to the user's preferences. These three alternatives have been used in each case according to the level of aggregation to be achieved.

At this first level of aggregation (changing of simple indicators into synthetic indicators for each area) we have opted for the first system, that is, equal weighting. This is because in most cases the indicators capture different aspects of the area analyzed, but there are no clear arguments for granting one of them greater or lesser importance. Also, the nature of the information captured in each indicator is fairly homogeneous and in that case there is less interest in giving greater weight to one indicator or another, because in many cases they are correlated. This occurs, for example, in the case of the mean impact of publications index and the percentage of these in the first quartile. Consequently, the different simple indicators will enter into the calculation of the arithmetic mean with the same weight.

2.6.4. Weighting and aggregation of the area indicators within each dimension

At the second level of aggregation the indicators of the different areas are grouped into an indicator for each of the three dimensions considered: teaching, research, and innovation and technological development. At this stage there are reasons for following a different criterion, as after the arithmetic aggregation of the previous stage no area indicator presents zeros.

Table 4. Weights by area

	Resources	Production	Quality	Internationalization
Teaching	25.4	30.4	23.9	20.3
Research	20	30	30	20
Innovation and Technological Development	34.2	26.3	21.1	18.4

Source: Own elaboration.

This stage proceeds by means of a *geometric* aggregation method. Among the most interesting properties of geometric aggregation is that it limits the substitutability among the components that it aggregates. In other words, geometric aggregation penalizes those universities that have neglected any of the four transversal areas (*Resources, Output, Quality, Internationalization*) as against those that attend to them in a balanced manner.

As to the weight to be given to each area within each dimension at this second level of aggregation, we carried out a survey of university experts, applying the Delphi method, instead of granting them the same weight, as in the previous stage.

One reason for changing the criterion is that if all the areas were aggregated with the same weight, this being a geometric mean the number of areas considered would influence the result. For example, if we had decided to group the indicators of quality and internationalization in a single area, their influence on the dimension would have been less than if considered separately. Another reason is that, unlike what occurred with the basic indicators, in this case there may be reasons to grant different values to each of the areas. Thus the decisions on the number of areas to be considered and their weights are relevant, and we have preferred to ask experts about the importance that should be given to each area. To make this valuation easier we followed the criterion that the number of areas should be small, and similar within each dimension.

Table 4 shows the weights given to the different areas by the experts consulted[10].

2.6.5. Weighting and aggregation of the dimensions to obtain the rankings

The last phase of the methodology establishes how the different rankings of the project are drawn up. This offers university rankings for each of the three dimensions separately, so it is no longer necessary to take any further step beyond those described in the above sections. On the other hand, to draw up the rankings combining the three dimensions it is necessary to perform a new aggregation, deciding the most reasonable criteria for doing so.

In the transition from the dimensions to the final ranking we consider that the importance attributed to each dimension can be different depending on the interests of the people contemplating the ranking, that is, of its potential users: students, researchers, managers, society. For this reason, we have come to the conclusion that the user's perspective can be the key to giving more or less importance to each of the dimensions. It could be unconvincing to impose weights from a specific standpoint —for example, that of a group of experts, who consider that research is the most important—.For individuals with another standpoint, such as students or careers guidance staff, it is more important to attend to the teaching aspects, while for firms the capacity of technological transfer.

[10] Two rounds of consultation were carried out, after which a reduction of 2.1 percentage points was obtained in the mean interquantile range.

After due reflection, therefore, we have opted to consider two alternatives.

1. First, U-Ranking Degrees offers the option of the system earlier described as *personalized ranking*, based on the user's own preferences. We understand that in this case users are more likely to seek to compare the universities with fairly closely defined interests and diverse criteria, probably different from those of the experts. For this reason, with the help of a web tool, users can decide the importance for them of each of the three dimensions when placing the degrees in order, and the tool automatically offers them the ranking corresponding to the preferences revealed by the user.

   To apply this first approach we have considered various alternatives for the choice of weights by the user. We opted for the procedure known as Budget Allocation Process, that is, for the distribution by the user of 100 points among the dimensions to be valued. This method, widely used in marketing to find out a consumer's valuation of the characteristics of a product, has the principal advantage of forcing the user to adopt a more active and reflexive position by distributing points, being therefore more aware of the opinion that he/she displays.

2. Second, for the general rankings (U-Ranking and U-Ranking Volume), corresponding to the universities' activities as a whole, the three dimensions are weighted on the basis of the experts' opinions, according to a survey such as that mentioned above when aggregating areas into dimensions, and a Delphi process to achieve convergence among the experts' opinions.

The weights to be given to teaching, research, and technological development and innovation according to the Delphi study are, respectively, 56%, 34% and 10%. These weights are included as a default option for calculating the personalized rankings when the user does not enter any preferences of his/her own.

2.7. PERFORMANCE RANKINGS *VS.* VOLUME RANKINGS

When comparing universities, it is relevant whether or not their size is taken into account. Making one choice or the other is not in itself a methodological advantage or failure, but implies adopting a particular perspective which affects the rankings and must be borne in mind when interpreting the results.

In the same way as when analyzing the activity of a firm or a country we can consider its volume of output or its achieved performance, and both positions are reasonable, the same occurs in the case of analysis of the results of universities. Neither of the two approaches is, *a priori*, more valid than the other, and the choice depends on the intended use of the results. The per capita GDP is more useful than total GDP when comparing the quality of life between countries or regions, but the volume or the growth of GDP are also important for explaining, for example, the employment generated. So, although in some cases the performance reached to obtain the results may be more important than their volume, in other cases the size may also be relevant. A very productive and at the same time large university is more beneficial to society than one that offers the same quality but has a small size; likewise, a very large university with a poor level of results is a much bigger problem than a small university with the same level of results.

2.7.1. Interest of the two approaches

Another reason to pay attention to this aspect is that the existing rankings adopt on occasions an approach based on the performance by which the results are obtained and in other cases deal with the volume of results. For example, some of the most cited international rankings —especially, the Academic Ranking of World Universities (ARWU), known as the Shanghai Ranking— are volume rankings.

The Shanghai Ranking can be said to be one rather of volume, because most of the variables from which it is built —number of Nobel prize-

winners or Fields medalists among their ex-students or staff, widely cited researchers, publications in Nature or Science, articles published in indexed journals— are not relativized by the size of the university. Such variables make up the greater part of the weight in the ranking, while only one indicator (academic performance) is expressed in *per capita* terms. So, the universities' positions are conditioned both by their quality and by their size, both qualities being necessary for reaching good positions in this ranking.

Other rankings, on the other hand, make their comparisons from the point of view of quality. Such is the case of the QS World Universities Ranking, whose indicators are taken from surveys of academic reputation or are variables standardized by size. There are rankings that expressly contemplate both approaches, and make differentiated comparisons based on quality or on the total volume of results, as does the I-UGR Ranking[11] of research results (www.rankinguniversidades.-es).

The reason for acknowledging the interest of both approaches is that the size of institutions can be relevant for valuing the contributions of the universities, but correcting the results for size permits us to compare the universities from a perspective that makes them, in a certain sense, more homogeneous. However, since it has already been pointed out that it is not the same for the university system that a university of high (low) quality is large or small, we should ask whether the universities' positions would be the same in terms of performance as in terms of volume of results and underline the specific meaning of both rankings. To sum up:

- The rankings of volume of production are based on indicators not relativized by size, and depend on both the university's performance and its size. Thus, a university may generate a greater volume of research results than another of smaller size, even though the second is more productive.
- The performance rankings are based on indicators of results corrected by size, and seek to measure the output per unit of inputs or resources used. For example, scientific output is measured as a function of the number of faculty members with PhD and the teaching results are relativized by the number of students. This enables some smaller universities to obtain a better final result in the ranking than other much larger ones.

An interesting question is whether size influences performance positively or negatively, that is, whether performance/efficiency increases or decreases with the size of the university. In the first case, the universities' positions in the rankings of volume would be favored by two factors (size and performance). The testing of the two hypotheses is an empirical matter, which can be analyzed by drawing up both types of rankings using the same approach, as will be presented later.

2.7.2. Treatment of the size of universities

The selection of simple indicators with which we started implies that all are relativized depending on the variable considered most appropriate (students, faculty members, budget, etc.), so that size does not have a direct influence on the results. Consequently, the general scheme of the methodology described leads to measuring each university's results independently of its size, so these are performance rankings. Therefore, to construct volume rankings, the size variable has to be added to the indicators hitherto described. This task has been undertaken following the criteria detailed below.

The first criterion for introducing the role of size is to preserve, as far as possible, the methodological homogeneity of both rankings, calculating them on the basis of the same set of indicators and with the same aggregation criteria. For this reason the ranking of volume was not drawn up simply by not relativizing those indicators that can be expressed in total terms — for example, reflecting the income from patents or the doctoral theses read without dividing them by the number of faculty members with PhD— as the Shanghai Ranking does.

It is not reasonable to proceed in that way because some variables cannot be presented in

[11] This ranking was last updated in 2014.

absolute terms, being rates or indices, such as the percentage of publications in the first quartile or the mean impact of publications factor.

If some variables are expressed in absolute terms and others are not, the relative importance of the size within the results would fall only on the variables that can be expressed in absolute terms. In that case, the importance accorded to size would depend implicitly on the proportion of variables that can be expressed in absolute terms. For example, in the variables considered in our study only 13 of the 25 indicators finally used could be expressed in absolute terms, which would be equivalent to the acknowledged importance of size being 52%. This percentage would be arbitrary because it would reflect the number of indicators that form part of the database expressed in absolute terms.

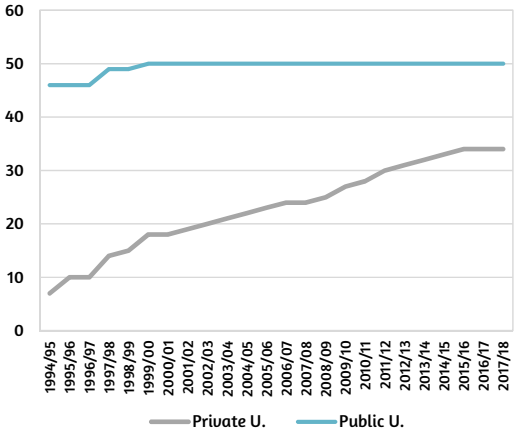
This solution is unsatisfactory, and we have explored other alternatives for introducing size. The option chosen consists of calculating the total volume of results of each university by multiplying the performance index by a measure of size. We have considered three indicators of the size of a university: the number of faculty members, the number of students, and the budget. Each one has its specificities and can be a better proxy of different aspects of the university's activity that do not have the same importance in each of them. To avoid skewing the size proxy in one or other direction in the most general indices — which could favor some institutions by giving greater weight to one of the aspects— we have taken as indicator of size the standardized arithmetic mean of the three variables.

2.8. PRIVATE UNIVERSITIES

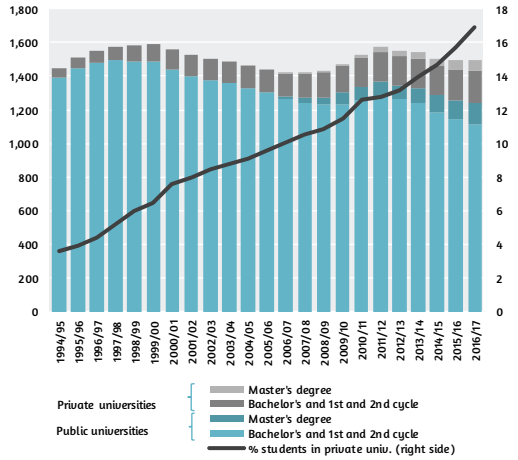
Private universities are an important part of the Spanish university system. As shown in figure 1, they have experienced a large growth in the last twenty years, quadrupling in number to 34 institutions out of the 84 that make up the Spanish university system today (see panel a). Likewise, the number of Bachelor's and Master's students has quintupled, from 52,000 to more than 252,000 students in the 2016-2017 academic year, which represents 16.9% of university students studying in Spain, compared to 4% twenty years ago.

Figure 1. Evolution of the number of private universities and students. 1994/95 to 2017/18 academic years

a) Number of public and private universities



b) University students by level of studies and type of university. 1994/95 to 2016/17 academic years (number and percentage)



Source: Registro de Universidades Centros y Titulaciones (2018) and Spanish Ministry of Education, Culture and Sport.

An important characteristic of the private universities, apart from their relative youth, is their smaller size. If we compare the number of private universities as a percentage of the total (40%) and the number of private university students as a percentage of the total (16%), it becomes clear that private universities are generally smaller. Another distinctive feature is their greater degree of specialization in postgraduate studies. The private universities have placed great emphasis on master's degrees,

as the make-up of their students shows. Whereas the proportion of master's students in public universities is barely 10%, in the private universities it is 25.4%. Indeed, one in three master's students in Spain studies at a private university.

Due to the idiosyncrasies of private universities, two of the indicators defined in the methodology, "Total *sexenios* over possible *sexenios*" (Research) and "Cut-off marks"[12] (Teaching), are not applicable to these institutions. The *sexenios* are a monetary compensation that the Spanish Ministry of Education, Culture and Sport gives to teachers in recognition of their research activity based on six years.[13] In the second case, students must pass a university admissions test (PAU) and upper secondary education tests in order to study a degree regardless of whether it is offered by a public or private university. However, for private universities, although it is a requirement, the mark obtained does not always constitute a criterion of admission, since these universities have their own procedures, based on specific tests, personal interviews and academic record. As a result, private universities do not publish cut-off marks for their degrees.[14]

Also, it should be emphasized that, in general, information on innovation and technological development is more limited in private universities. It is difficult with public universities to obtain public and homogeneous information, since there are few sources. The Spanish RedOtri survey on *Research and Knowledge Transfer* is the main source of data and requires active participation of the universities that must complete the survey and authorize the diffusion of data. So far, there was less participation on behalf of private universities than public ones, due either to their management model or because their specialization makes them focus less on these activities.

All these things considered, U-Ranking 2018 has reviewed all the information available for private universities following the criteria of including those institutions which can provide at least 18 indicators out of the 25 considered for the public system.[15] As a result, in the sixth edition of U-Ranking the following private universities are analyzed:

- Mondragon Unibertsitatea
- Universidad a Distancia de Madrid
- Universidad Nebrija
- Universidad Católica de València San Vicente Mártir
- Universidad de Deusto
- Universidad de Navarra
- Universidad Europea Miguel de Cervantes
- Universidad Pontificia Comillas
- Universitat de Vic-Universitat Central de Catalunya
- Universitat Internacional de Catalunya
- Universitat Oberta de Catalunya
- Universidad San Pablo CEU
- Universitat Ramon Llull

In the 2018 edition the number of private universities analyzed remains the same, however, the Universidad San Jorge has ceased to be included because of lack of information available, while the Universidad San Pablo CEU has been included for the first time since it meets the minimum requirements.

[12] The cut-off mark is the mark of the last student who gained admission to a degree with limited places. This mark is only a guideline and varies from one year to the next, depending on the number of free places and the marks of the students registered.

13 Some private universities have signed agreements with the National Evaluation Committee on Research Activities (CNEAI) for the recognition of their research activity; however, this information is not available yet.

[14] For private universities, the cut-off mark for each degree is 5 since the prerequisite is to pass the university admissions test.

[15] Since the indicators are based on moving averages, the requirement has been for each of the chosen indicators, with data offered by CRUE, to have information that would enable to calculate them.

3. Rankings personalized by the user

The appropriate response to one of the issues related to the aggregation of the information analyzed in the previous point —the importance assigned to each of the aspects of a complex problem when evaluating it synthetically— may depend on the user. Certainly, in the case of the universities, there are different dimensions in their performance, but also different profiles of users interested in them: undergraduate or postgraduate student, teacher, manager, member of the governing team or of the Board of Directors, head of university policy in the Public Administration, journalist, interested citizen, etc. The importance granted by each to the different activities of the universities may be different and their interest may focus on one or more of their activities. For example, students are likely to focus their interest on those aspects of the university related with the degree that they wish to study and teachers may focus more on research.

Given the high number of users that might value the universities' activity from this particular viewpoint, it makes sense to consider the possibility of drawing up personalized rankings, established taking into account the interest from which the user contemplates the universities. The U-Ranking project considers this question for the case of Bachelor's degrees, in order to offer a tool to facilitate for students, their families and careers advisers, information on the ranking of degrees, taking into account their specific interests.

3.1. EXAMPLES OF PERSONALIZED RANKINGS

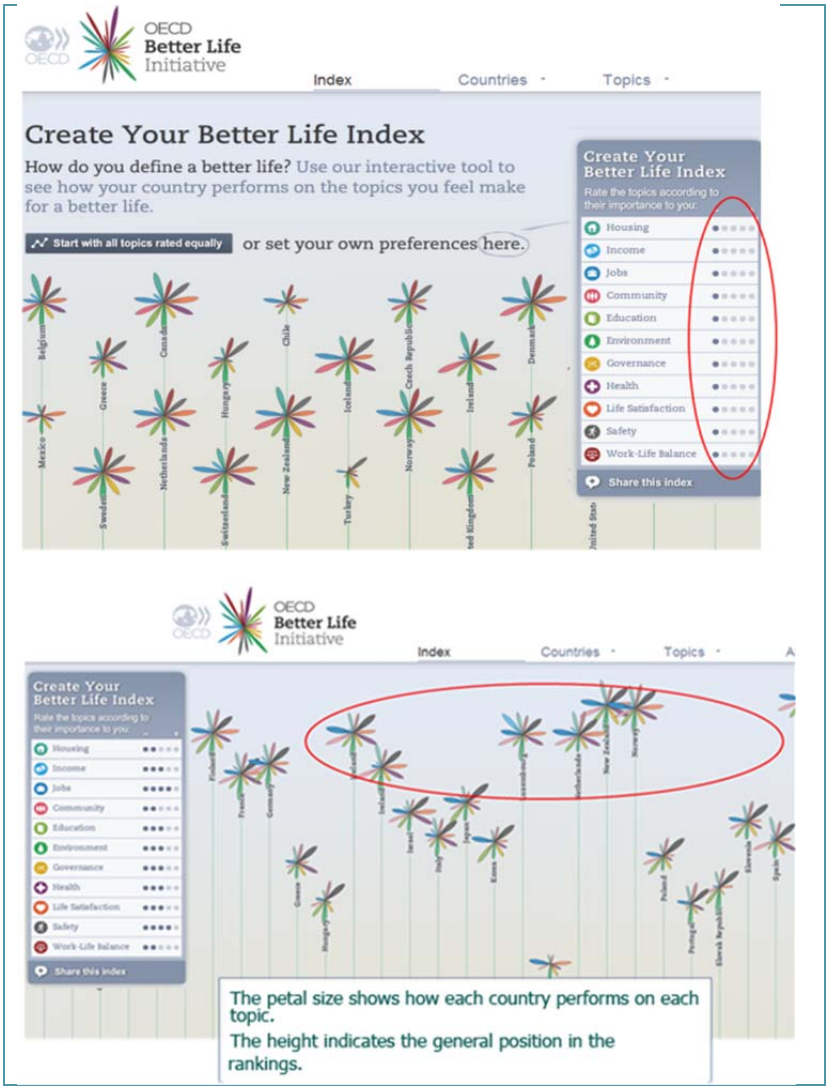
The possibility of constructing synthetic indicators acknowledging the preferences of users has been possible for a relatively short time, thanks to the interactivity permitted by web tools. Through them, the user can value for him/herself each one of the dimensions considered, indicating which areas he/she wants to consider and which are the most important for him/her. Web technology allows these preferences revealed by the users to be incorporated and combined with other elements contributed by the experts, such as the selection of variables and aggregating them in intermediate indicators according to criteria as described in section 2.

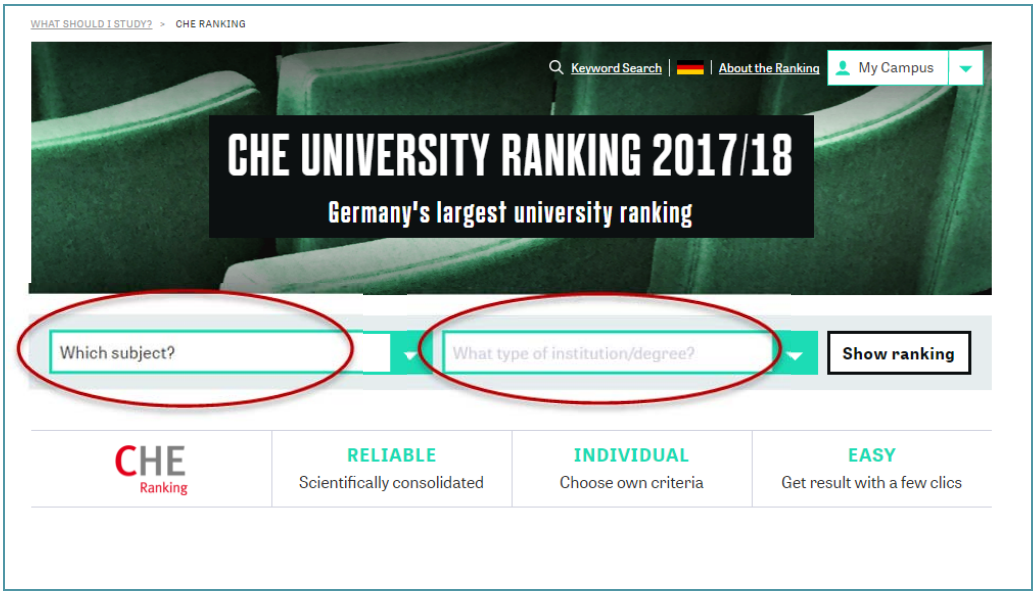
Two interesting examples of this approach, referring to very distinct areas, are those corresponding to the quality of life index Better Life Index, drawn up by the OECD, and the CHE Ranking, a ranking of university degrees drawn up by the German Center for Higher Education.

The OECD draws up a synthetic index that allows countries to be ranked according to their characteristics in various areas relevant to the quality of life (access to housing, income, education, security and safety, etc.), according to the aspects most valued by the user. These valuations are introduced through the website, on which a score must be assigned to each one of the dimensions of quality of life considered.

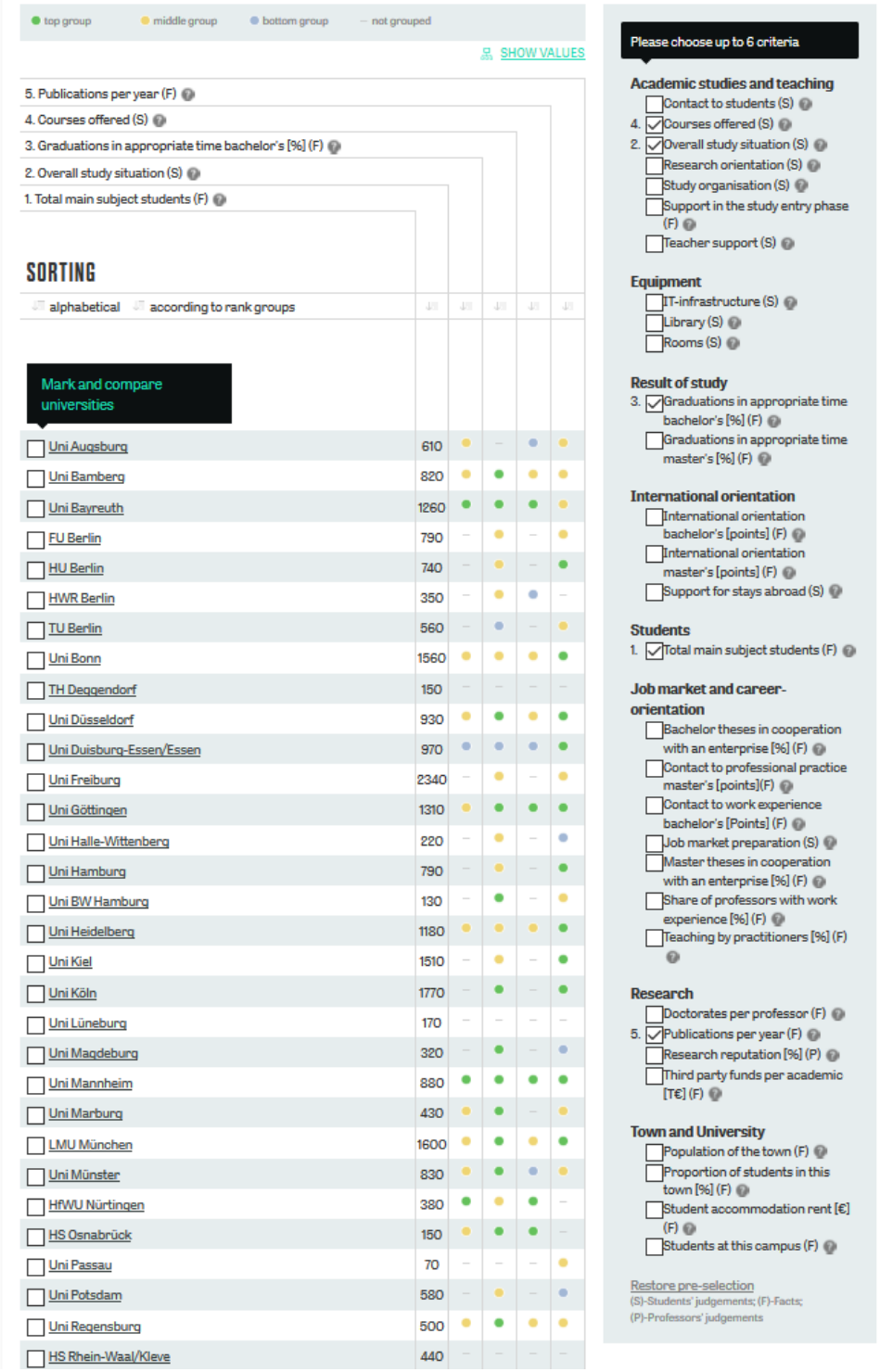
The experts prepare the set of relevant dimensions and variables and, after the user has introduced his/her valuation of each area, the web tool shows a synthetic index of quality of life that takes into account the weights awarded by the user.

A similar approach is used by one of the university rankings analyzed, the CHE Ranking, drawn up by Germany's Center for Higher Education for the journal *Zeit*. In this case, the student who wishes to choose a degree should select the subject he/she wishes to study, the type of course that interests him/her and the aspects that he/she considers most important (the teaching, the subsequent employment opportunities, research, etc.). Based on these preferences, a personalized university ranking is created.


OECD
Better Life
Initiative
Index
Countries
Topics
Create Your Better Life Index
How do you define a better life? Use our interactive tool to see how your country performs on the topics you feel make for a better life.
Start with all topics rated equally
or set your own preferences here.
Create Your Better Life Index
Rate the topics according to their importance to you:
Housing
Income
Jobs
Community
Education
Environment
Governance
Health
Life Satisfaction
Safety
Work-Life Balance
Share this index
The petal size shows how each country performs on each topic.
The height indicates the general position in the rankings.


WHAT SHOULD I STUDY? > CHE RANKING
Keyword Search
About the Ranking
My Campus
CHE UNIVERSITY RANKING 2017/18
Germany's largest university ranking
Which subject?
What type of institution/degree?
Show ranking
CHE Ranking
RELIABLE
Scientifically consolidated
INDIVIDUAL
Choose own criteria
EASY
Get result with a few clics

Example:


top group
middle group
bottom group
not grouped
SHOW VALUES
5. Publications per year (F)
4. Courses offered (S)
3. Graduations in appropriate time bachelor's [%] (F)
2. Overall study situation (S)
1. Total main subject students (F)
SORTING
alphabetical
according to rank groups
Mark and compare universities
Uni Augsburg 610
Uni Bamberg 820
Uni Bayreuth 1260
FU Berlin 790
HU Berlin 740
HWR Berlin 350
TU Berlin 560
Uni Bonn 1560
TH Deggendorf 150
Uni Düsseldorf 930
Uni Duisburg-Essen/Essen 970
Uni Freiburg 2340
Uni Göttingen 1310
Uni Halle-Wittenberg 220
Uni Hamburg 790
Uni BW Hamburg 130
Uni Heidelberg 1180
Uni Kiel 1510
Uni Köln 1770
Uni Lüneburg 170
Uni Magdeburg 320
Uni Mannheim 880
Uni Marburg 430
LMU München 1600
Uni Münster 830
HfWU Nürtingen 380
HS Osnabrück 150
Uni Passau 70
Uni Potsdam 580
Uni Regensburg 500
HS Rhein-Waal/Kleve 440
Please choose up to 6 criteria
Academic studies and teaching
Contact to students (S)
4. Courses offered (S)
2. Overall study situation (S)
Research orientation (S)
Study organisation (S)
Support in the study entry phase (F)
Teacher support (S)
Equipment
IT-infrastructure (S)
Library (S)
Rooms (S)
Result of study
3. Graduations in appropriate time bachelor's [%] (F)
Graduations in appropriate time master's [%] (F)
International orientation
International orientation bachelor's [points] (F)
International orientation master's [points] (F)
Support for stays abroad (S)
Students
1. Total main subject students (F)
Job market and career-orientation
Bachelor theses in cooperation with an enterprise [%] (F)
Contact to professional practice master's [points](F)
Contact to work experience bachelor's [Points] (F)
Job market preparation (S)
Master theses in cooperation with an enterprise [%] (F)
Share of professors with work experience [%] (F)
Teaching by practitioners [%] (F)
Research
Doctorates per professor (F)
5. Publications per year (F)
Research reputation [%] (P)
Third party funds per academic [T€] (F)
Town and University
Population of the town (F)
Proportion of students in this town [%] (F)
Student accommodation rent [€] (F)
Students at this campus (F)
Restore pre-selection
(S)-Students' judgements; (F)-Facts; (P)-Professors' judgements

3.2. DESCRIPTION OF THE WEB TOOL FOR GENERATING PERSONALIZED RANKINGS OF DEGREES

This personalized rankings approach has been used in the U-Ranking Project to arrange degrees in order, constructing rankings of universities for the different Bachelor's degrees. In the future it is intended to extend this approach to other university activities, in particular to Master's degrees, when the necessary databases are available.

The value of a tool like this depends greatly on the effort made to facilitate its use. The objective of U-Ranking is to present a simple intuitive tool to minimize the number of clicks needed to obtain the relevant information, which is above all the corresponding ranking. This ease of use must be present both when limiting the degrees to be compared and when permitting the user to declare his/her preferences in order to draw up the personalized rankings.

The opinion as to when a user-friendly procedure has been achieved must also take into account the user's point of view. Therefore, to harmonize the tool with the most frequent potential users we performed trials among students of 17-18 years, who are less familiar with the concepts of the university world than the experts participating in the project. On the basis of these trials the necessary corrections were made to the tool in order to adapt it better to students and make understanding of the results easier.

The tool is presented on the screen of the project's website via the *Select University* tab. When this part of the screen is clicked, it shows the three questions that must be answered in order to obtain a ranking of a university adapted to the interests of the student in three aspects:

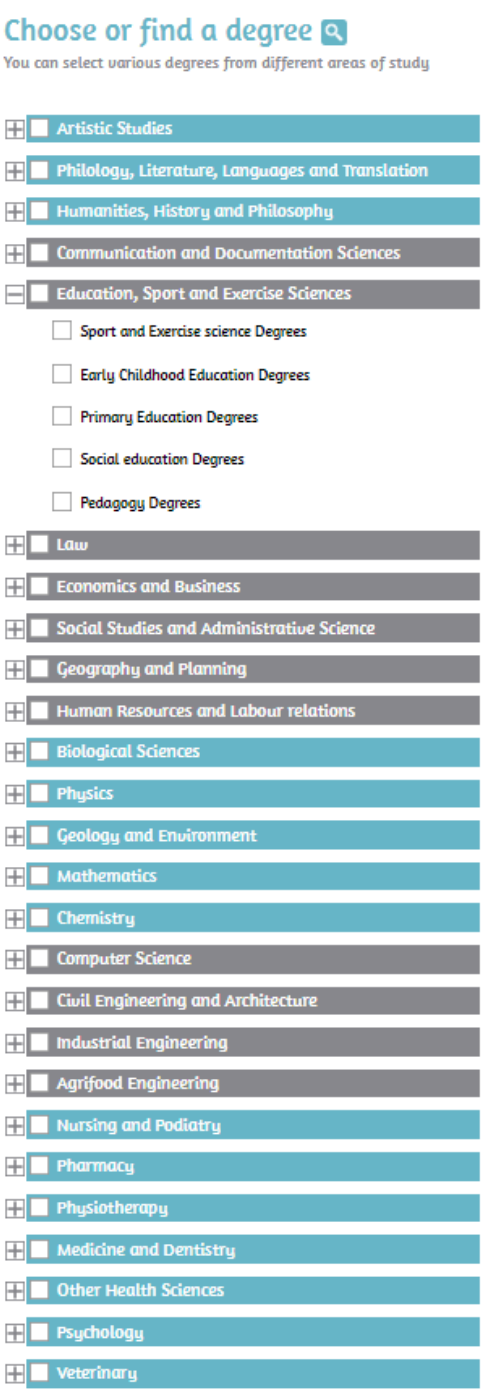
- *What to study*
- *Where to study*
- *Study and research*

When each of the three questions are clicked, a selection box opens in which the user has to choose, respectively:

- The Bachelor's degree or degrees that he/she wishes to study
- The autonomous community or regions whose universities he/she wants to compare
- The importance for the user of the teaching, research and innovation and technological development activities.

The user can choose either one or several options in the first two questions (one or several degrees; one, several or all of the autonomous communities).

To avoid having to make the choice among the nearly 2,700 different Bachelor's degrees offered by Spanish universities, the first selection window shows 2,362 degrees offered by 61 universities analyzed and grouped into 26 *areas of study*.



When one of these areas is clicked, a drop-down list is displayed showing the Bachelor's degrees that it contains. Thus, for example, when the "Artistic Studies" area of study is selected the Bachelor's degrees included in this area of study are displayed.

The names of the degrees that appear in the drop-down list are not exhaustive or literal either, as those Bachelor's degrees with very similar names have been grouped, as for example "Humanities" and "Humanities and social studies" have been grouped under the name "Humanities Degrees". In this way the initial more than 2,362 Bachelor's degrees have been reduced to 139, to make the user's decision easier. However, irrespective of this initial reduction, the final results show the complete title of the degree, as well as the center where it is taught in case there are various options.

The second step is to choose the autonomous community or regions that are being considered as places in which to study. For this, the user must mark those chosen on the following table, one of the options being "Any region". The

option of restricting the search to specific autonomous communities is a response to the fact that many students do not contemplate geographical mobility as an alternative, or contemplate it restrictively. In this case, their interest will be to know which of the studies offered are valued best in the territories that the student is considering. Anyway, complementary information is offered to position their options relative to the remaining offers of the Spanish University System.

Thirdly, the user must declare his/her preferences with regard to the importance given to study, research or innovation when valuing the universities' profiles, assigning the 100 points available to him/her according to the weight he/she wishes to grant to teaching, research, and innovation and technological development.

As the user chooses the degrees and the autonomous communities of his/her interest and distributes the 100 points among the three dimensions in such a way as to reflect his/her preferences, those decisions are registered in the boxes below. Once the information is introduced in the three fields, the "Create your own ranking" button appears on screen.

When this button is clicked the personalized ranking corresponding to the selection criteria introduced is displayed, showing in order the corresponding Bachelor's degrees of the universities that offer those studies in the territories considered. The user is also informed that there are other options in addition to those selected in the same area of study, in case he/she is interested. This more complete set of alternatives is offered in a pdf file.

The first column shows the position of the Bachelor's degree in the personalized ranking. The second shows the value of the index reached for the particular degree. As we observe in the example, various Bachelor's degrees can occupy the same position in the ranking, since the indices are rounded to one decimal because greater precision is not considered to reflect, more accurately, differences among the degrees.

Together with the names of the Bachelor's degrees appears a link to the web address of each university. Next the cut-off mark of the last year is indicated and the price per credit on first registration, information that is completed when various centers of a university impart the same Bachelor's degree, if it is offered in one center or there is any commentary relating to the cost of the degree. The last columns at the right show the information on the environment which will be described in the next section.

To sum up, the web tool for constructing personalized rankings is easy to use, very flexible, and is underpinned by a rigorous methodology identical to the one described in previous sections on how general rankings are constructed. Therefore, it is a complement to the latter with a high potential for students, families and careers counsellors, as well as for the universities themselves. The more than 150,000 personalized rankings that have been calculated testify to the level of interest in the tool. For this potential interest in the tool to be effective, it is essential to keep all the supporting information up-to-date and to constantly incorporate improvements, taking the users' experience into account, work which is currently underway.

Ranking	Index	University	Degree		2017/2018 (*) Cut-off mark	Cost	Environment
1	2.3	Universidad Politécnica de Madrid	Grado en Matemáticas e Informática	WWW	10.676	21.94	
2	1.9	Universitat Politècnica de Catalunya	Grado en Matemáticas	WWW	12.38	35.77	
3	1.4	Universidad Autónoma de Madrid	Grado en Matemáticas	WWW	12.026	21.94	
4	1.3	Universitat de Barcelona	Grado en Estadística	WWW	7.732	35.77	
4	1.3	Universitat Autònoma de Barcelona	Grado en Matemáticas	WWW	10.6	35.77	
4	1.3	Universitat de Barcelona	Grado en Matemáticas	WWW	11.19	35.77	
5	1.2	Universitat Autònoma de Barcelona	Grado en Estadística Aplicada	WWW	5	35.77	
5	1.2	Universidad de Cantabria	Grado en Matemáticas	WWW	8.746	12.62	
5	1.2	Universidade de Santiago de Compostela	Grado en Matemáticas	WWW	10.54	13.93	
5	1.2	Universitat de les Illes Balears	Grado en Matemáticas	WWW	5.174	15.03	
5	1.2	Universitat de València	Grado en Matemáticas	WWW	11.56	17.95	
6	1.1	Universidad Complutense	Grado en Estadística Aplicada	WWW	5.604	21.94	

3.3. COMPLEMENTARY INFORMATION ON THE UNIVERSITIES' ENVIRONMENTS

The geographical and social environment in which a university is situated influences the users' valuations of its services. In particular, the costs of accessing the services can condition decisions affecting their demand. This seems to be indicated by, for example, the distribution of foreign students of the Erasmus program. For this reason, it has been considered appropriate to include information on environmental variables as a complement to that offered by the rankings.

The data of the environment should be treated differently from the rest of the variables considered, since they represent circumstances external to the universities and not features that are under their control. For this reason, we decided to provide the information without integrating it with the indicators computed in the ranking as a complement to them.

We have included four categories of environmental variables: a) climate —temperatures and rainfall— b) cost of living —housing prices—, c) accessibility —airports, railways and their connections— and d) socio-cultural environment —art and entertainment activities. This information is presented by means of a system of icons (similar to that of hotel guides) to make easier the identification of the advantages of the universities in these four aspects. The web tool offers up to four icons against each university, one for each environmental category considered, when the environment reinforces the university's attraction. The size of the icon indicates, intuitively, what university environments offer him/her a better quality of life (see, for example, the following diagram).

To decide the size of the corresponding icons, a synthetic indicator[16] has been calculated for each of them, based on the data available, which in general is by province. After arranging the provinces in order of these indices, a large icon is assigned to those universities located in provinces situated in the tertile with highest value in the distribution (best climate, highest cost, greatest connectivity, most socio-cultural opportunities) and an identical but smaller icon to those in the second tertile (between 33% and 66%); finally, those in the third tertile are indicated with even smaller icons.

It should be taken into account that three of the four environmental characteristics are more favorable the larger the icon (climate, transport and socio-cultural opportunities), while a higher cost of living must be understood as less attractive.

The same as in previous editions, the 2018 edition also includes the price per credit for over 2,362 Bachelor's degrees analyzed by U-Ranking, based on information provided by the Spanish Ministry of Education, Culture and Sport. In recent years university fees have increased considerably and unequally. These prices, despite the maximum limit set by the Spanish Ministry, can vary depending on the autonomous community, the university, the cycle —Bachelor, Master, Doctorate— the level of experimentality of the degree and the ownership of the center[17] offering that degree. As can be appreciated in table 5, the current range of fees by regions is considerable, even more if differences of experimentality and cycle are considered.

For this reason, it can be considered relevant that, as a guide, the user of U-Ranking will be able to

[16] The synthetic indicators were constructed, for those environmental variables with more than one indicator, by first standardising each indicator with respect to its distance (ratio) from the median and then applying a geometric mean to those indicators. Next, each sample was divided into three sets bounded by the tertiles of each distribution in order to subsequently assign them to each group.

[17] U-Ranking also includes Bachelor's degrees imparted by private centres attached to public universities. In general, the price of these degrees includes an extra cost above public prices.

know the price per credit at first registration for each Bachelor's degree. The prices included in U-Ranking correspond to those established for the academic year 2017-2018. Also, the cost was included by degree course offered by private universities when this information was available on their web pages.

Table 5. Public price per credit at the time of first enrolment by region. 2017-2018 academic year (€/credit)

Region	Average price	Min. price	Max. price
Andalusia	12.62	12.62	12.62
Aragon	18.74	13.70	23.39
Asturias	17.13	12.11	22.03
The Balearic Islands	17.92	12.88	23.13
The Canary Islands	14.00	11.32	17.43
Cantabria	13.03	10.28	16.07
Castile-La Mancha	15.81	12.13	18.87
Castile and Leon[1]	23.34	17.07	30.25
Catalonia[2]	33.52	25.27	39.53
The Valencian Community	18.96	15.17	23.15
Extremadura	14.74	10.31	18.51
Galicia	11.89	9.85	13.93
Madrid	24.64	21.94	26.81
Murcia	15.58	14.38	16.78
Navarre	19.66	16.27	23.05
Basque Country	16.88	14.08	19.84
La Rioja	19.77	14.60	23.51
UNED[3]	16.06	13.00	21.60

(1) Castile and León subdivides the level 2 subject groups into subgroups B1 and B2 and the level 3 groups into subgroups C1 and C2. These prices have been weighted in calculating the average.

(2) The government of Catalonia has extended the Equidad grants (which offer reductions in the standard price per credit for degree students) to master's degree courses that give access to regulated professional activities, based on the level of household income, so that the resulting prices, after deducting the grant, are those set out in Annexe 5 of the Price Decree, in accordance with the terms and conditions stated in the call for applications.

(3) UNED organizes its degrees in 4 groups with different prices on first enrolment, within each group, depending on the subject of study. These prices have been weighted in calculating the average.

Source: Spanish Ministry of Education, Culture and Sport.

4. Main results

This chapter offers the principal results obtained in this sixth edition of U-Ranking, corresponding to 2018, in which both the general rankings and the personalized rankings of Bachelor's degrees have been updated. Both rankings are available in full on the project website www.U-ranking.es.

The 2018 rankings will be analyzed from six different perspectives in order to emphasize the contribution made by the project and its methodology: a) comparing them with other rankings already known in order to evaluate their similarities and differences; b) assessing the sensitivity of the results to changes in some of the hypotheses put forward, specifically the relative weights assigned to the teaching and research activities, and the importance of considering or not the size of the university; c) comparing the 2017 results with those of the 2018 edition; d) analyzing the differences in the performance of the various regional university systems; e) analyzing, as a one-off exercise for the 2018 edition, the evolution of performance of each university, of the Spanish university system and the regional university systems during the 2010-2016 period.

4.1. U-RANKING

Table 6 offers the ranking of 61 Spanish universities according to their indices of performance (U-Ranking). Keeping in mind that performance is the relationship between the volume of the results of the universities in the areas analyzed and the resources used to accomplish them, i.e. if two universities generate the same results, the one that makes use of less resources to achieve them will have a higher performance. The order is based on the value of the synthetic indicator obtained by each university, offered in the second column. This indicator has been rounded to one decimal as a greater detail of the index would not reflect more accurately the differences among universities, given the set of decisions adopted in the process of construction of indicators already described.

According to the table, various universities obtain the same index and therefore present the same position in the ranking. As a result of this criterion, the 61 universities are grouped into twelve levels of performance. Those universities with the same index have been ordered alphabetically within their group. Only those cardinal and ordinal aspects of the universities that make notable differences will be commented upon.

In table 6, universities that are 15 years or younger are marked with an asterisk (*), so the reader can put into context the results in the following sense. While a university must be able to show its teaching potential since the start, because its graduates must acquire all the competences associated to a degree, however, most results in research or innovation and technological development require a longer amount of time in order to create research teams and generate physical capital (i.e. equipment and infrastructures) which are needed to develop their full potential. Thus, pointing out the universities with 15 years or less of existence allows the reader to better understand why the results for these universities in research and transfer are often lower.

In addition, table 6 includes at the end a list of the universities that have not been analyzed because of insufficient information to construct the indices. Eleven are marked with an asterisk: these are the universities that have existed for fewer than 15 years. The purpose of including this group is to highlight the transparency of the universities that are included in the rankings, as a result of having to generate and disclose the information required in order to be included, regardless of their final position. When interpreting a university's results in the ranking, it is important to bear in mind, therefore, that a large part of the private university system is not included. Their results could conceivably put an indeterminate number of universities below the lowest level (12) in the current ranking.

Table 6. U-Ranking of the Spanish universities

Ranking	Index	University
1	1.7	Universitat Pompeu Fabra
2	1.5	Universidad Carlos III de Madrid
2	1.5	Universitat Politècnica de Catalunya
3	1.4	Universitat Politècnica de València
4	1.3	Universidad Autónoma de Madrid
4	1.3	Universidad de Cantabria
4	1.3	Universitat Autònoma de Barcelona
4	1.3	Universitat Rovira i Virgili
5	1.2	Universidad de Navarra
5	1.2	U.Miguel Hernández de Elche
5	1.2	Universidad Politécnica de Madrid
5	1.2	Universidade de Santiago de Compostela
5	1.2	Universitat de Barcelona
5	1.2	Universitat de València
6	1.1	Universidad de Alcalá
6	1.1	Universidad de Córdoba
6	1.1	Universidad de Deusto
6	1.1	Universidad de Zaragoza
6	1.1	Universidad Pablo de Olavide
6	1.1	Universidad Pública de Navarra
6	1.1	Universidade de Vigo
6	1.1	Universitat de Girona
6	1.1	Universitat de les Illes Balears
6	1.1	Universitat de Lleida
6	1.1	Universitat Ramon Llull
7	1	Mondragón Unibertsitatea
7	1	Universidad Complutense de Madrid
7	1	Universidad de Alicante
7	1	Universidad de Almería
7	1	Universidad de Granada
7	1	Universidad de La Rioja
7	1	Universidad de Murcia
7	1	Universidad de Salamanca
7	1	Universidad de Sevilla
7	1	Universidad del País Vasco
7	1	Universidad Politécnica de Cartagena
7	1	Universidad Rey Juan Carlos
7	1	Universidade da Coruña
7	1	Universitat Jaume I de Castellón
8	0.9	Universidad de Burgos
8	0.9	Universidad de Cádiz
8	0.9	Universidad de Huelva
8	0.9	Universidad de Jaén
8	0.9	Universidad de León
8	0.9	Universidad de Málaga
8	0.9	Universidad de Oviedo
8	0.9	Universidad de Valladolid
8	0.9	Universidad Nebrija
8	0.9	Universidad San Pablo-CEU
9	0.8	Universidad de Castilla-La Mancha
9	0.8	Universidad de Extremadura
9	0.8	Universidad de La Laguna
9	0.8	U. de Las Palmas de Gran Canaria
9	0.8	Universidad Pontificia Comillas
9	0.8	U. de Vic-U. Central de Catalunya
9	0.8	U, Internacional de Catalunya
9	0.8	Universitat Oberta de Catalunya
10	0.7	UNED
11	0.6	Universidad A Distancia de Madrid*
11	0.6	Universidad Católica de Valencia*
12	0.5	U.Europea Miguel de Cervantes
IE Universidad		
Universidad Alfonso X El Sabio		
Universidad Camilo José Cela		
Universidad Cardenal Herrera-CEU		
Universidad Católica San Antonio		
Universidad Católica Santa Teresa de Jesús de Ávila		
Universidad del Atlántico Medio *		
Universidad Europea de Canarias*		
Universidad Europea de Madrid		
Universidad Europea de Valencia*		
Universidad Europea del Atlántico*		
Universidad Fernando Pessoa-Canarias*		
Universidad Francisco de Vitoria		
Universidad Internacional de Andalucía		
Universidad Internacional de La Rioja*		
Universidad Internacional Isabel I de Castilla*		
Universidad Internacional Menéndez Pelayo		
Universidad Internacional Valenciana*		
Universidad Loyola Andalucía*		
Universidad Pontificia de Salamanca		
Universidad San Jorge*		
Universidad Tecnología y Empresa*		
Universitat Abat Oliba CEU*		

Notes: Universities are ordered from the highest to the lowest index value. Universities with the same index value are ordered alphabetically. Universities that have not been analyzed due to lack of data are shaded in dark grey.

*Universities 15 years or younger.

Source: BBVA Foundation-Ivie

Regarding the results, an aspect worth mentioning is that the range of the index from which this ranking is derived continues to show, as in previous editions, significant differences of performance among the Spanish universities, the most productive ones doubling the results of those in the last positions. As an example of this, the first university of the U-Ranking more than triples the performance value of the last one.

In U-ranking, the leading group is formed by fourteen universities occupying the first to the fifth positions (various universities share the same position), 20% above the national average. These universities are: Pompeu Fabra in first place, followed in second place by Universidad Carlos III of Madrid and Universitat Politècnica de Catalunya. The third place corresponds to Politècnica de València. The fourth place is occupied by four universities: Autónoma de Madrid, Universidad de Cantabria, Universitat Rovira I Virgili and Autònoma de Barcelona. In fifth place, the first private university appears Universidad de Navarra, along with five public: Politécnica de Madrid, Santiago de Compostela, Universitat de Barcelona and Universitat de València.

In sixth place, which is the last position above average, consists of 11 universities, featuring two new private ones, Deusto and Ramon Llull. Other groups of universities with similar levels of performance are found in the following positions: fourteen share the seventh position (equivalent to the average of the system), ten others are found in eighth place, eight are in the ninth position, and finally, one in the tenth, two in the eleventh and finally one in the twelfth place.

If we take a look at the universities in the top five positions, they are the same 14 universities as in the 2017 edition, with the exception of the inclusion of the Universidad Politécnica de Madrid and the exclusion (with only a one-place difference) of University of Deusto and Balearic Islands.

In sum, the 2018 U-Ranking results reveal stability, which is to be expected as there have been no major structural changes resulting from legislative amendments nor any significant changes in competitive research funding.

4.2. U-RANKING VOLUME

Table 7 shows the index and the ranking of Spain's 61 public universities according to their volume of results (U-Ranking Volume), which differs from that of performance because it is obtained by calculating the effect of the size of each university. The underlying idea to justify the need for a volume index is that a small university can also have a great performance (i.e. its researchers can publish almost all of their articles in first quartile [Q1] journals), but if its size is very small, the impact on the environment will be limited. A very large university may have a low performance (i.e. the percentage of articles published in Q1 journals is small), but if its size makes the total output bigger (the total number of published Q1 articles will be higher) its total impact can be significantly relevant.

Table 7 shows the universities ranked by the volume index. In first place Universidad Complutense stands out with an index (4.2) half a point higher than the one in second place, the Universitat de Barcelona (3.7). In third position are the Universidad de Granada and Universitat de València, and in the fourth the Universidad de Sevilla and Universidad del País Vasco. In fifth place, the Universitat Politécnica de València. The top ten places are completed by the Politécnica de Madrid and the Politécnica de Barcelona, as well as the Autònoma de Barcelona. These ten universities are the same that occupied the top places in the 2017 edition, reordered slightly due to the rise of Universidad de Granada and the Politécnica de Madrid.

Table 7. U-Ranking Volume of the Spanish universities

Ranking	Index	University	Ranking	Index	University	Ranking	Index	University
1	4.2	Universidad Complutense de Madrid	16	1	Universidad de Extremadura	24	0.2	Universitat de Vic-U. Central de Catalunya
2	3.7	Universitat de Barcelona	16	1	Universidad de La Laguna	24	0.2	Universitat Internacional de Catalunya
3	3.2	Universidad de Granada	16	1	Universitat Rovira i Virgili	25	0.1	Universidad A Distancia de Madrid*
3	3.2	Universitat de València	17	0.9	Universidad de Cantabria	25	0.1	Universidad Nebrija
4	3	Universidad de Sevilla	17	0.9	Universidade da Coruña	26	<0,1	Universidad Europea Miguel de Cervantes
4	3	Universidad del País Vasco	18	0.8	Universidad de Las Palmas de Gran Canaria	IE Universidad		
5	2.9	Universitat Politècnica de València	18	0.8	Universidad de Navarra	Universidad Alfonso X El Sabio		
6	2.7	Universidad Politécnica de Madrid	18	0.8	Universidad Miguel Hernández de Elche	Universidad Camilo José Cela		
6	2.7	Universitat Autònoma de Barcelona	18	0.8	Universitat de les Illes Balears	Universidad Cardenal Herrera-CEU		
6	2.7	Universitat Politècnica de Catalunya	18	0.8	Universitat Jaume I de Castellón	Universidad Católica San Antonio		
7	2.3	Universidad Autónoma de Madrid	18	0.8	Universitat Ramon Llull	Universidad Católica Santa Teresa de Jesús de Ávila		
7	2.3	Universidad de Zaragoza	19	0.7	Universidad de Almería	Universidad del Atlántico Medio *		
8	2	UNED	19	0.7	Universidad de Jaén	Universidad Europea de Canarias*		
8	2	Universidade de Santiago de Compostela	19	0.7	Universidad Pablo de Olavide	Universidad Europea de Madrid		
9	1.7	Universidad de Málaga	19	0.7	Universitat de Girona	Universidad Europea de Valencia*		
9	1.7	Universidad de Murcia	20	0.6	Universidad de León	Universidad Europea del Atlántico*		
10	1.6	Universidad Carlos III de Madrid	20	0.6	Universidad Pública de Navarra	Universidad Fernando Pessoa-Canarias*		
11	1.5	Universidad de Alicante	20	0.6	Universitat de Lleida	Universidad Francisco de Vitoria*		
11	1.5	Universidad de Salamanca	20	0.6	Universitat Oberta de Catalunya	Universidad Internacional de Andalucía		
12	1.4	Universidad de Oviedo	21	0.5	Universidad de Deusto	Universidad Internacional de La Rioja*		
13	1.3	Universidad de Valladolid	21	0.5	Universidad de Huelva	Universidad Internacional Isabel I de Castilla*		
13	1.3	Universidad Rey Juan Carlos	21	0.5	Universidad San Pablo-CEU	Universidad Internacional Menéndez Pelayo		
14	1.2	Universidad de Alcalá	22	0.4	Universidad de Burgos	Universidad Internacional Valenciana*		
14	1.2	Universidad de Castilla-La Mancha	22	0.4	Universidad Politécnica de Cartagena	Universidad Loyola Andalucía*		
14	1.2	Universidade de Vigo	22	0.4	Universidad Pontificia Comillas	Universidad Pontificia de Salamanca		
14	1.2	Universitat Pompeu Fabra	23	0.3	Universidad Católica de Valencia*	Universidad San Jorge*		
15	1.1	Universidad de Córdoba	23	0.3	Universidad de La Rioja	Universidad Tecnología y Empresa*		
16	1	Universidad de Cádiz	24	0.2	Mondragón Unibertsitatea	Universitat Abat Oliba CEU*		

Notes: Universities are ordered from the highest to the lowest index value. Universities with the same index value are ordered alphabetically. Universities that have not been analyzed due to lack of data are shaded in dark grey.

*Universities 15 years or younger.

Source: BBVA Foundation-Ivie

Following are the rest of the universities grouped in most cases by the same level of results. The number of different positions in this order is twenty-six, much more than in the performance ranking because the size of the universities adds variability to the rankings.

The ranking by volume shows the smaller size of the private universities compared to the public ones. Because of their smaller size they rank lower in this ranking by volume of results than in the ranking by performance. Thus, in table 7, it can be observed that all the private universities are located in the lower half of the list. The highest-ranking private universities in terms of volume of results when combining better results and larger size are Universitat Ramon Llull and Universidad de Navarra.

4.3. U-RANKING VOLUME VS. U-RANKING PERFORMANCE

The comparison of the above two tables indicates that the differences between the U-Ranking Volume and U-Ranking, which measures the performance, are substantial. But both approaches can be useful, depending on the question to be answered.

The differences in the values of the indicators are much greater in the volume ranking due to the importance of size. The indicator of total results ranges from 4.2 to 0.1, very much wider than for the indicator of performance, which goes from 1.7 to 0.5.

Figure 2 combines the two types of rankings and facilitates the comparison of the position of each university in both. The results of U-Ranking Volume, which depend on the size, are shown on the vertical axis, while on the horizontal axis the results of U-Ranking, which measures the performance and corrects the effects of size, are seen.

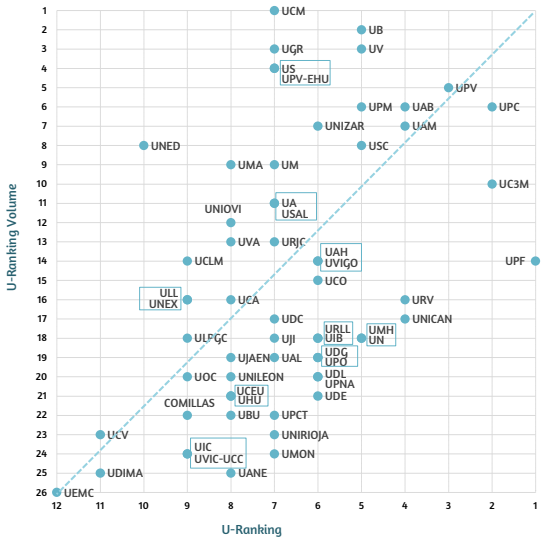
The universities are ordered from top to bottom on the first and from right to left on the second. In each case the scale is different, to reflect that each ranking establishes a different number of groups of universities with the same index. As can be observed, the dispersion of points in the figure is significant and reflects that there is no definite correlation between the two rankings. Therefore, size does not seem, in general, to have any positive or negative influence on performance.

In the top part of the figure are the universities with the highest output: Universidad Complutense, Universitat de Barcelona, Universidad de Granada, Universitat de València, Universidad de Sevilla, Universidad del País Vasco, Universitat Politècnica de València, Universidad Politécnica de Madrid, , Universitat Autònoma de Barcelona, Universitat Politècnica de Catalunya, Universidad de Zaragoza, Universidad Autónoma de Madrid, UNED and Universidade de Santiago.

However, not all of these large universities show a good performance. In fact, other smaller ones stand out in this regard (see them more to the right in the figure). An example of the former case is UNED, a large university with a great volume of results that is placed among the top 8 in U-Ranking Volume. And an example for the latter is the Universitat Pompeu Fabra, which shows the highest performance in U-Ranking, as well as other very productive medium- or small-sized universities such as Universidad Carlos III, Universitat Rovira i Virgili and Universidad de Cantabria, whose output places them around the middle of U-Ranking Volume.

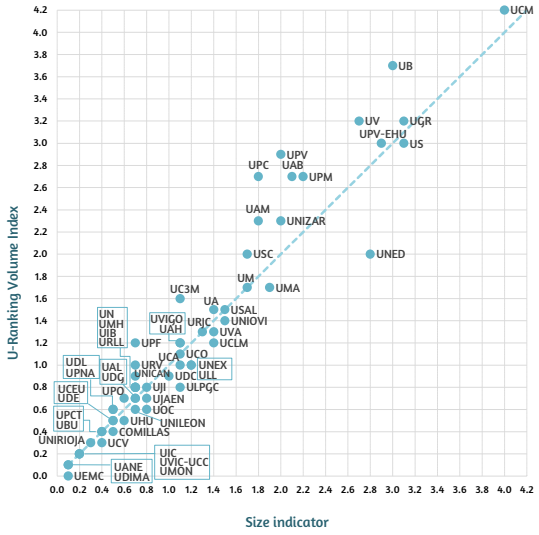
Figure 2. U-Ranking vs. U-Ranking Volume of the Spanish public universities

Position in each ranking



See appendix 2 for a list of the University abbreviations used.
Source: BBVA Foundation-Ivie.

Figure 3. U-Ranking Volume vs. Size indicator*



(*) The Size indicator is a standard arithmetic mean of the teachers, students and budget of each university.

See appendix 2 for a list of the University abbreviations used.

Source: BBVA Foundation-Ivie.

In fact, examples of higher or lower performance can be found among universities of very different sizes.[18] Figure 3 shows this by representing the size indicator on the horizontal axis and the index of U-Ranking Volume for each university on the vertical axis. Those situated above the diagonal achieve results higher than the average performance, the gradient of the vector radius joining each position to the origin being the measure of their performance. It is visually evident that size is not a determinant of the universities' performance. There are institutions of large size like the Universitat de Barcelona, the Universitat de València, the Polytechnics of Madrid, València and Catalunya or the Autonomous Universities of Barcelona or Madrid, which performance is high. However, some universities of smaller size such as Universitat Pompeu Fabra, Carlos III de Madrid, Rovira i Virgili or Universidad de Navarra also present high performance indices. There are large institutions like the Universities of Barcelona and Valencia, the Polytechnics of Madrid, València and Catalunya or the Autonomous Universities of Barcelona and Madrid, which show a high performance as their volume indices are superior to what it would correspond to them strictly by their size. Or take the opposite example: the UNED, which is situated far below the diagonal. However, some universities of smaller size such as Universitat Pompeu Fabra and Carlos III de Madrid also have high performance rates, far above the diagonal.

4.4. U-RANKING VS. SHANGHAI RANKING

Given the popularity attained by some international rankings, many universities are interested in being compared with the best in the world. For this reason, it is obligatory to ask to what extent the U-Rankings constructed offer results different or similar to international ones. As external reference for comparison we will consider especially the Shanghai Ranking, which without a doubt has become the most widely known to date.

As can be seen in figure 4, in the latest edition of this international ranking only 11 Spanish universities appear among the top 500. All except one, Universitat de Barcelona, are below the 200th place. Therefore, a comparison between U-Ranking and Shanghai Ranking would be very limited. However, a recent study (Docampo 2017) offers a version of the Shanghai Ranking 2016 adapted to the Spanish universities that includes the majority of the private and public universities, allowing a better comparison.

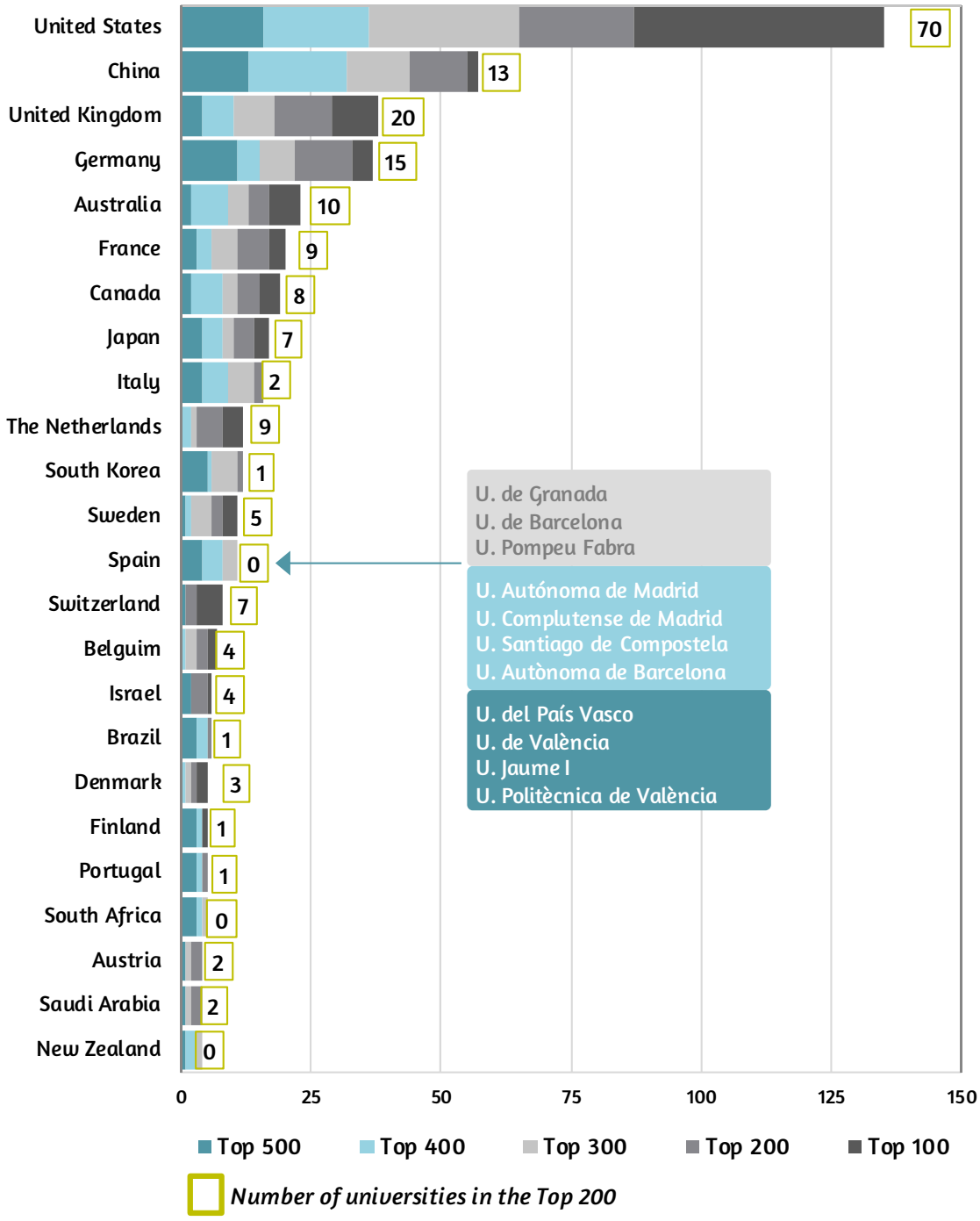
The results of the U-Ranking Volume and the Shanghai Ranking are much more alike than those of our two U-Rankings with each other, as shown by the following figures. The first of them (figure 5) represents on the horizontal axis the position of the Spanish universities in U-Ranking Volume, while the vertical axis represents the Shanghai Ranking. Regardless of the different number of levels that each ranking sets, both offer a fairly similar order, and therefore the universities are mostly grouped around areas I and III of the figure.

The universities located in area II of the figure are comparatively better situated in our ranking. The case of the UNED stands out, occupying a clearly better position in U-Ranking Volume than in that of Shanghai Ranking. The universities in area IV, on the contrary, are comparatively bet-

[18] As mentioned previously, the indicator of size is the result of calculating the standardized arithmetic mean of the number of students, faculty members and budget of each university.

ter placed in the adaptation for Spain of the Shanghai Ranking. The common denominator in many cases is that these are small but more productive universities, such as Pompeu Fabra or Rovira i Virgili, whose greater efficiency already became apparent in the U-Ranking's measurement of performance.

Figure 4. Spanish universities in the 2017 Shanghai Ranking



Note: Ordered from the countries' highest to lowest number of universities in the Top 500.

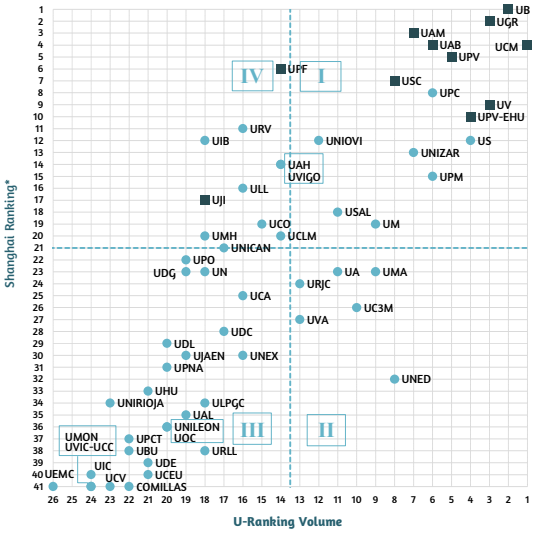
Source: Academic Ranking of Word Universities (CWCU 2017).

In the figure 5 we have highlighted with dark squares the universities that are expressly mentioned among the top 500 of the Shanghai Ranking 2017 — not only in the adaptation for Spain. As can be observed, they are all at the top in the adaptation by Docampo (2017). The only exception is Universitat Jaume I, which appears for the first time among the top 500 in the Shanghai Ranking 2017, a discrepancy explained by the fact that the Docampo adaptation is based on 2016 data. Almost all the universities are among the top places of U-Ranking Volume: Universitat de Barcelona, Universidad de Granada, Autónoma de Madrid, Universitat Autònoma de Barcelona, Universidad Complutense, Universitat Politècnica de València, Universidade de Santiago de Compostela, Universitat de València and Universidad de País Basco. The remaining ones are the Universitat Pompeu Fabra and Universitat Jaume I, located in the center of U-Ranking Volume.

The inclusion of private universities does not alter the high consistency of our volume ranking with the Shanghai Ranking. As seen in figure 5, all the private universities analyzed are found in area III. Hence, the less prominent places in U-Ranking Volume also correspond with those in the lowest positions in Docampo's adaptation (2017).

Up to what point the comparison between the Shanghai Ranking adapted to Spain and the U-Ranking, which measures the performance, offers conclusions different to the above is shown in figure 6. In it, almost half of the universities change area between one ranking and the other. In short, the differences with Shanghai are much more substantial in the case of the U-Ranking of performance than in that of U-Ranking Volume, which agrees with the characteristic of the Shanghai Ranking already pointed out: it scarcely corrects the indicators used to take into account the size and, therefore, it is more a ranking of volume of results than of performance.[19]

Figure 5. U-Ranking Volume vs. Shanghai Ranking*
Position in each ranking



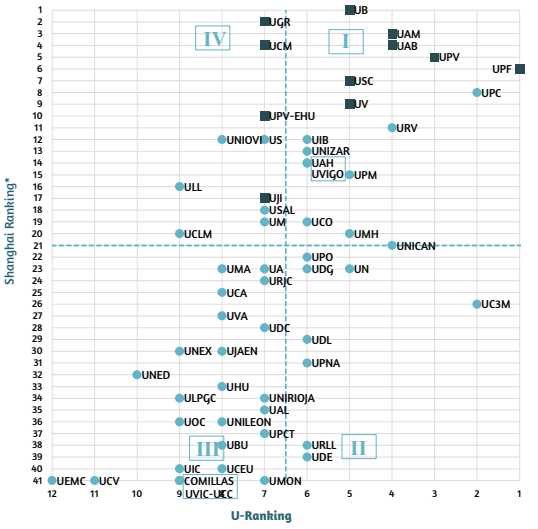
(*) Results correspond to our adaptation of the Shanghai Ranking by Docampo (2017) for Spanish universities. Nine private universities that appear in Docampo's ranking have been excluded and are not analyzed in U-Ranking. UANE and UDIMA are not analyzed in the adapted 2016 edition of the Shanghai Ranking. The numbers assigned in Docampo's ranking have been changed to facilitate the comparison.

■ Universities in the Shanghai Ranking Top 500 2017.

See appendix 2 for a list of the University abbreviations used.

Source: BBVA Foundation-Ivie, ARWU (CWCU 2017) and Docampo (2017).

Figure 6. U-Ranking vs. Shanghai Ranking*
Position in each ranking



(*) Results correspond to our adaptation of the Shanghai Ranking by Docampo (2017) for Spanish universities. Nine private universities that appear in Docampo's ranking have been excluded and are not analyzed in U-Ranking. UANE and UDIMA are not analyzed in the adapted 2016 edition of the Shanghai Ranking. The numbers assigned in Docampo's ranking have been changed to facilitate the comparison.

■ Universities in the Shanghai Ranking Top 500 2017.

See appendix 2 for a list of the University abbreviations used.

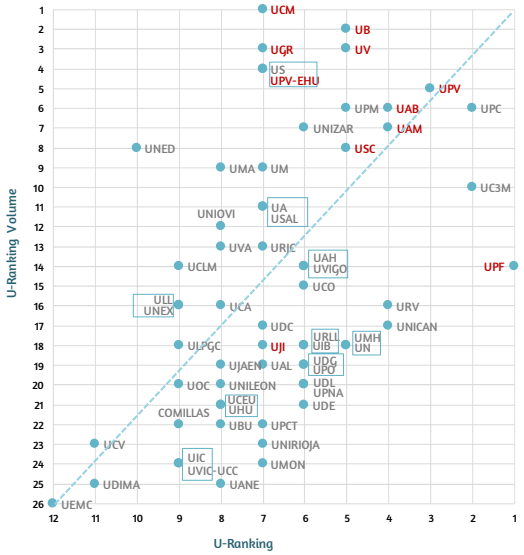
Source: BBVA Foundation-Ivie, ARWU (CWCU 2017) and Docampo (2017).

[19] As an example, the Shanghai Ranking uses as an indicator of teachers' quality the number of teachers who have received a Nobel Prize or a Fields Medal, not this number divided by the number of professors of the university.

To view the simultaneous level of consistency of both U-Rankings (performance and volume) with the Shanghai Ranking, the shaded area in graph 7 shows the fifteen universities that stand out in U-Ranking, both for their high performance and their great volume of results. The Spanish universities that appear in the Shanghai Ranking 2017 are marked in red. The exceptions are, on the one hand, Universitat Jaume I, which appears in the Top 500 of the Shanghai Ranking for the first time in 2017 but is not in a top position in U-Ranking; and on the other, five universities that rank near the top in U-Ranking but are not in the Top 500 of the 2017 Shanghai Ranking, namely, Universidad Politécnica de Madrid and Carlos III, which have not yet reached the Top 500 of the Shanghai Ranking, Universitat Politècnica de Barcelona, which is not included in the latest edition, and the universities of Seville and Zaragoza, which were excluded in the 2016 edition.

Figure 7. U-Ranking and the Spanish universities in the Top 500 of Shanghai Ranking

Position in each ranking



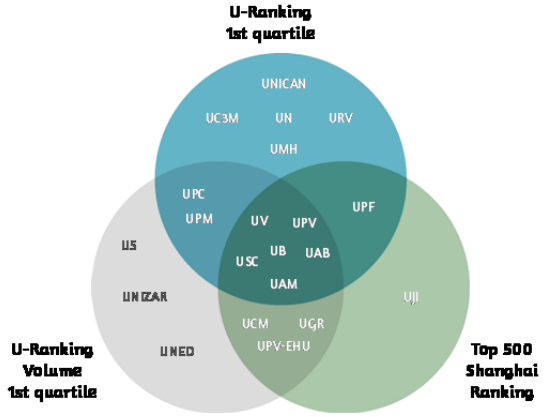
Spanish universities in the Top 500 of the Shanghai Ranking are marked in red.
See appendix 2 for a list of the University abbreviations used.

Source: BBVA Foundation-Ivie and ARWU (CWCU 2017).

To illustrate at the same time the extent to which the three rankings compared generate different groupings of the universities a Venn diagram can be used that represents , representing the universities that form part of the first quartile in each of the classifications and the intersections among the three.

In the center of the diagram (figure 8) appear the seven universities situated in the first quartile in the three rankings. They are Universitat de Barcelona, Universitat de València, Universitat Autònoma de Barcelona, Universidad Autónoma de Madrid, Polytechnics of València and of Catalunya and Universidad de Santiago de Compostela. Five other universities are in the first quartile of two of the rankings: Universitat Pompeu Fabra and Rovira I Virgili in Shanghai and U-Ranking (performance); and Universidad del País Vasco, Universidad de Granada and Complutense de Madrid in Shanghai and U-Ranking Volume. Finally, eleven universities stand out by only one of the three criteria considered.

Figure 8. U-Rankings vs. Shanghai Ranking



The 11 Spanish universities in the Top 500 of the Shanghai Ranking 2017 and the 14 first universities in U-Ranking and U-Ranking Volume are included.
See appendix 2 for a list of the University abbreviations used.

Source: BBVA Foundation-Ivie and ARWU (CWCU 2017).

In sum, these results show important coincidences between the rankings when identifying the universities that stand out, but also significant differences that reflect the different approach of each ranking. It is especially interesting to observe that of the eleven universities that the Shanghai Ranking (not Docampo's 2016 adaptation) places in its Top 500, six also appear in the first quartile of our two rankings, in the intersection of the three circles of the diagram; two head the ranking of performance (Universitat Pompeu Fabra) and volume (Universidad Complutense de Madrid) and two other universities occupy dominant places in the volume ranking

Therefore, it can be said that, of the eleven Spanish universities included in the Top 500 of the Shanghai Ranking, nine are to be found in our quartile with greatest volume of results according to the U-Ranking Volume and seven among our most productive universities according to the U-Ranking of performance. Consequently, our classifications, specially of volume, present a substantial harmony with those of the Shanghai Ranking, which strengthens their interest as instruments for identifying best practice. They also allow us to see that there may be differences in the rankings according to the perspective with which they were drawn up, and at the same time indicate that some universities are well positioned from any perspective.

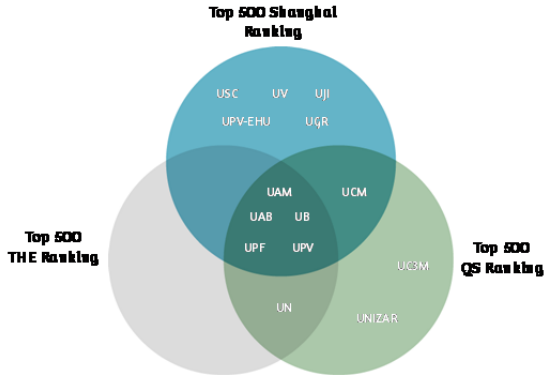
4.5. COMPARISON OF RESULTS OF OTHER INTERNATIONAL RANKINGS

Although the Shanghai ranking is consolidating its influence as the most cited international indicator, there exist other initiatives of high international repute, such as the Times Higher Education (THE) or the QS-Ranking. The principal differences between these two initiatives and the Shanghai ranking are that they (i) try to measure the role of teaching and (ii) incorporate subjective valuations based on surveys of international employers and experts. The results for the Spanish universities in the three initiatives present similarities but also some differences, as shown in figure 9.

In the intersection of the three rankings we find a set of five universities (Universidad Autónoma de Madrid, Universitat Autònoma de Barcelona, Universitat de Barcelona, Universitat Pompeu Fabra and Universitat Politècnica de València) which appear systematically in the top positions of our rankings and also belong to the group of universities at the *frontier* of figure 7 —that is, those universities that are not dominated by hardly any other university—. Finally, among the universities that belong to the Top 500 of THE or the TOP 500 of the QS Ranking, only the Universidad de Navarra is not on the efficient frontier of U-Ranking.

These results again confirm the presence of a group of Spanish universities in the top positions within our university system, regardless of the prism with which it is analyzed and that the discrepancies between our ranking and any of the well-known international rankings are not any greater than those among them.

Figure 9. Comparison of the results of three international rankings. 2017-2018



See appendix 2 for a list of the University abbreviations used.

Source: ARWU (CWCU 2017), THE (2018) and QS (2018).

4.6. RESEARCH *VS.* TEACHING: SENSITIVITY ANALYSIS

One of the biggest problems inherent to any composite indicator is the effect of the relative weight of the elements composing it. The U-Ranking methodological expressly considers that teaching and research can have different importance for each user of the universities' services. This is acknowledged by allowing a web tool to draw up personalized rankings that take into account each user's preferences in this sense.

The question posed in this section is how much the general rankings of the universities would change if the weights allocated to teaching and to research were to change. In the results presented above the weights used to calculate the rankings were those obtained by applying the Delphi method that captures the opinions of the

experts who collaborated in the project as well as other available information.[20] But other experts or other users could give different valuations. Consequently, we should analyze whether the results are sensitive or not—in the latter case we will say that they are *robust*— to changes in the weights of these dimensions.

Would the results change much if a greater weight was granted to research, as in other well-known rankings? Can a university occupy a high place in a ranking if the weights of teaching and research change to suit its interests? The answers to these questions are important in assessing the extent to which the results of a ranking are reliable, given the possibly arbitrary nature of the weight assigned to research or any other university activity. As we shall see, the answer to each question is very different.

Studying the sensitivity of rankings to changes of the weights of teaching and research permits us to analyze also whether the universities' results in these two activities are correlated. Most rankings place great emphasis on research because the information on the results of this activity is abundant and seems more precise and reliable. But, although it is often argued that teaching and research are highly correlated, this hypothesis has barely been tested for lack of indicators of teaching results. We will revisit this question in a later section.

That the research dimension is easier to measure should not be an argument for not measuring the quality of teaching. Likewise, the existence of a positive correlation between the quality of teaching and that of research should not hide the fact that disparity is also possible: if for the same level of research quality there are different teaching results between universities, ignoring this information biases the results in favor of one and against the other.

To value the effect of the selection of the weights given to teaching and to research we performed an analysis of sensitivity to their variations on the ranking of performance. We calculated three rankings that are differentiated by the very different relative weights of research and of teaching:

- Option 1: Teaching 20 / Research 70 / Innovation 10
- Option 2: Teaching 45 / Research 45 / Innovation 10
- Option 3: Teaching 70 / Research 20 / Innovation 10

We opted to leave the weight of innovation and technological development with a fixed value of 10 points so as not to hinder comparisons of the effect of a greater or lesser relative weight of the other two variables. If together with a reduction of the weight of research we applied a reduction of the weight of innovation (or vice versa), we could not know to which of the two variations the changes in the ranking were due.[21]

Figure 10 shows the effect on the position in the ranking of each of Spain's 61 universities analyzed when the weight of research varies, according to the three weightings chosen.

The evolution of the universities implies a setback when it presents movements from right to left (regressions) which are characterized by:

- Moderate decreases or increases in the weight given to research (options 2 and 3), compared to the weights used by U-Ranking, give rise to hardly any changes in rank compared to the performance ranking (boxed in the chart).
- If the weight given to research were reduced to 20% (option 3), there would be only a few improvements in position. Note that the ranking generates 10 levels, instead

[20] The weights used are 56% for teaching, 34% for research and 10% for innovation and technological development. The weights were established on the basis of the opinion of the experts consulted, and agree practically with the distribution of resources among the teaching, research and transfer activities in the universities' budgets. It also reflects an intensity of research activity in accordance with the results of the Spanish universities: if we consider that in the top universities of the world by their research results these activities had a weight of 85-90%, the corresponding figure for the Spanish universities would be 35%.

[21] Furthermore, significantly increasing the weight of the activities relating to innovation and technological development would not be justified, given their limited importance in the budgets of the Spanish universities. Certainly, in the Polytechnic universities the weight of these activities is greater, but disaggregated information is not available to value more precisely the results of each in this aspect of their specialization.

of 12, because, as will be explained in section 4.7, the differences in teaching performance are less than the differences in research performance. As the weight given to teaching increases, the number of groups decreases. The resulting improvements are never more than two places. In this option, 11 universities —two public (Almería and Málaga), Universidad de Extremadura and 8 of the 13 private universities (with a higher degree of teaching specialization)— would rise two places.

- When the weight of research rises moderately up to 45% (option 2), the ranking remains stable, with no university being affected in more than one position, either up or down.

- The ranking shows significant changes when the weight of research doubles from its starting position (from 34% to 70% of option 1). The universities are sorted into 15 groups, instead of 12, and the biggest changes are 5 places. The fundamental pattern of these changes is that the universities that fall most sharply in the ranking are the private ones, which are the ones with the least tradition of research. If we focus on the changes of more than two positions, the ten drops in the rankings correspond to private universities: Navarra, Ramon Llull, Mondragón, Nebrija, San Pablo CEU, Pontificia de Comillas, Internacional de Cataluña, A distancia de Madrid, Católica de València and Europea Miguel de Cervantes.

- This last result reveals another pattern of sensitivity of the ranking to changes in weights: because of their high degree of specialization in teaching, private universities are much more sensitive than public universities to increases in the weight of research.

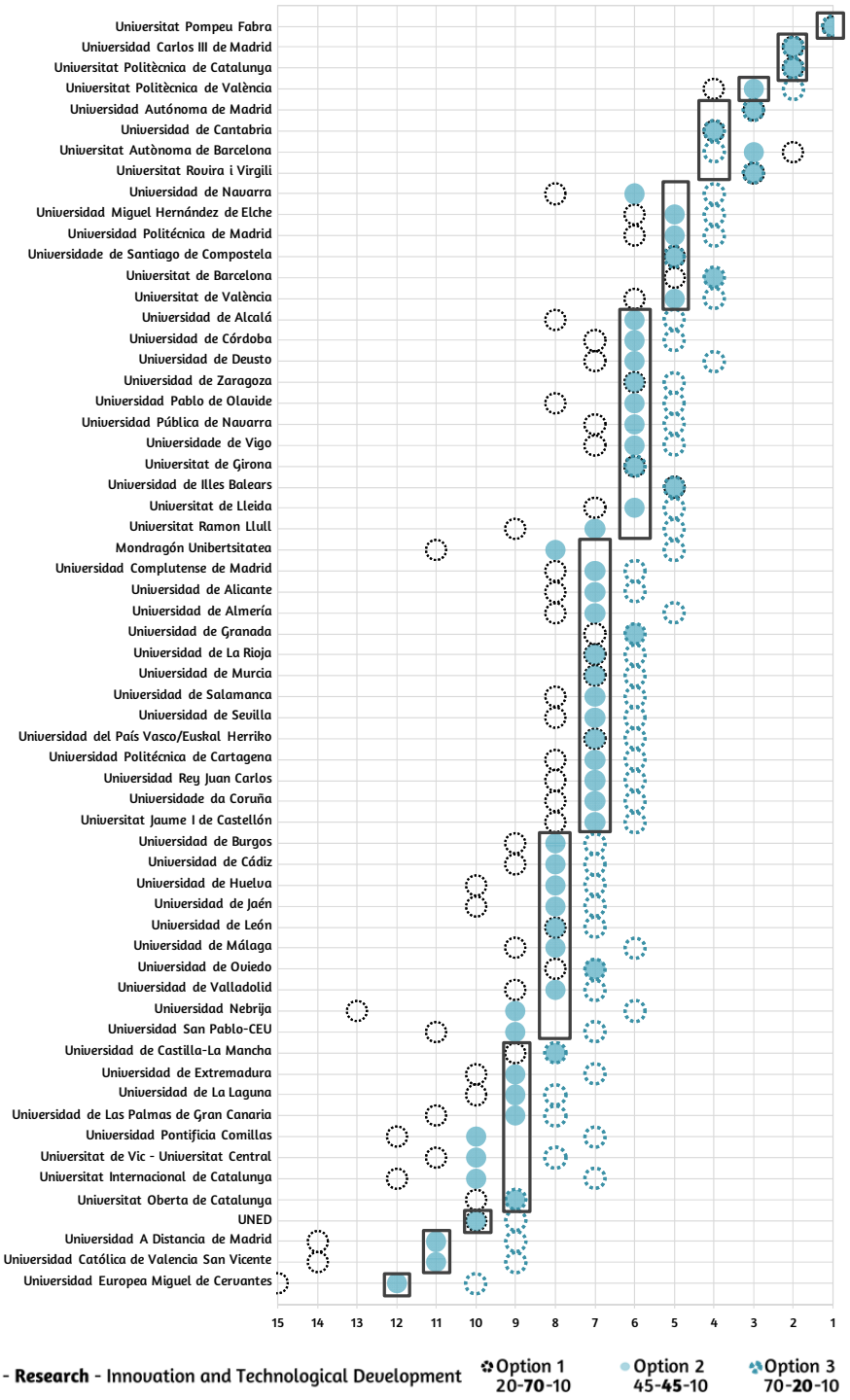
Thus, the rankings are sensitive to changes in the weights given to teaching and to research, if we compare weightings as different as those corresponding to our options 1 and 3. While, when these weights change less, variations are minor and, definitely, alterations never occur for this reason in the classifications. A university does not pass from the top places to the bottom ones no matter how substantial the changes in the weights may be, although, it is true that some can improve in the ranking if greater importance is accorded to teaching or research.

We must consider that, as with any type of measuring instrument, the sensitivity to changes is desirable. If the instrument is insensitive to the weights that reflect different attribution of importance to different factors, it would not be reliable. In this sense, U-Ranking proves to be tolerant to moderate changes in the weights, but reacts to very significant changes.

If instead of focusing on the analysis of sensitivity of the ranking, in other words, in the positions of the universities, we consider the values of the index by which U-Ranking is obtained, we observe that their stability when changing the weights of teaching and research is very notable. Figure 11 presents the synthetic indicator from which the U-Ranking is derived for research weights of 20% and 70%. It shows that a drastic change in the weights would cause an increase of only three decimal points or more for Universitat Pompeu Fabra and Autònoma de Barcelona, improving their index. On the contrary, only some private universities such as Miguel de Cervantes, Nebrija and Mondragón would experience a fall in the index of three decimal points or more.

To offer another sample of the stability of the groups of universities, the Venn diagram in figure 12 presents the results of the U-Ranking for the three weights described above. Based upon the value of the index, each circle contains the dominant universities. Looking at the diagram we see that changing the weights does not alter the index so much as to cause the appearance or disappearance of universities in those top positions. In extreme cases where a small value is given to research (20%) two private universities, Deusto and Navarra, are incorporated to the top list. On the other hand, if more weight is given to research these two private universities would leave the first positions, and Universitat de Girona and Universidad de Zaragoza would then also appear among the top places. If the weight of research is moderately increased (45%), the Universidade de Santiago and Universitat de les Illes Balears would be included.

Figure 10. Evolution of U-Ranking according to variations in the weight of research



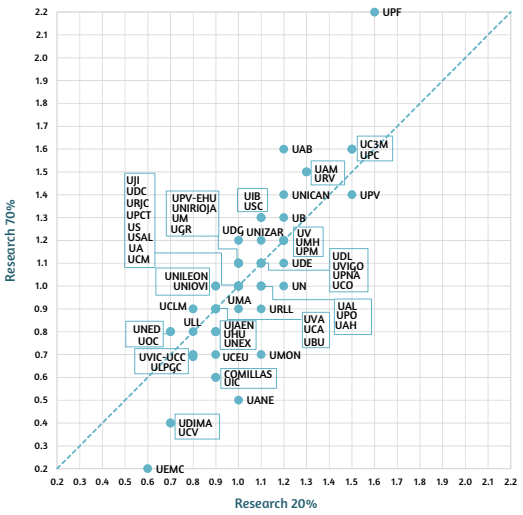
Position in the global performance ranking

Note: Universities are ordered by their position in the global performance ranking with the following weights: 56/34/10.

Source: BBVA Foundation-Ivie.

Figure 11. U-Ranking for two different weights in research

Weights of Teaching/Research/Innovation: 70/20/10 vs. 20/70/10. Index

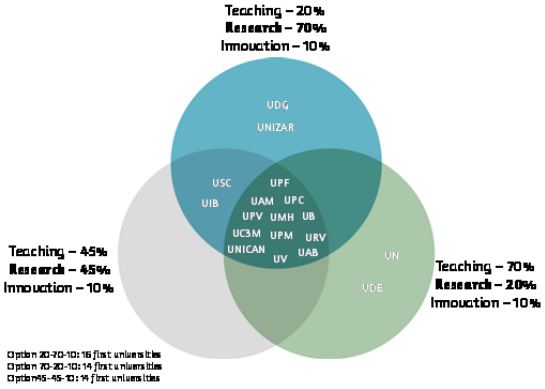


See appendix 2 for a list of the University abbreviations used.

Source: BBVA Foundation-Ivie.

Figure 12. Effects of the change in the weight given to research in U-Ranking on the top-ranking universities.

Top universities according to different weights given



See appendix 2 for a list of the University abbreviations used.

Source: BBVA Foundation-Ivie.

4.7. RANKINGS OF TEACHING, RESEARCH, AND INNOVATION AND TECHNOLOGICAL DEVELOPMENT

The methodology used constructs indicators of results of the three activities of the universities, which are then aggregated to draw up the two global rankings presented (U-Ranking and U-Ranking Volume). The results for each university in each of the three dimensions can be arranged in order to obtain a *teaching ranking*, a *research ranking* and an *innovation and technological development ranking*. Each of them can be calculated according to both variants: volume of results and performance.

Figure 13 shows by means of *box plots* the distribution corresponding to the indices of the different dimensions and the global index of a university in the case of performance (panel a) and volume of results (panel b). It shows the distributions for the university system as a whole and for public vs. private universities. The extremes of the black lines represent the maximum and minimum values reached by the indices in each dimension and define the range of variation of the index; the top of the central box indicates the 75% percentile and the 25% percentile is marked by the bottom of the box, so that between them is situated 50% of the distribution (interquartile range). The border between the two parts of the box defines the median value. From the comparative analysis of the panels, four essential features stand out:

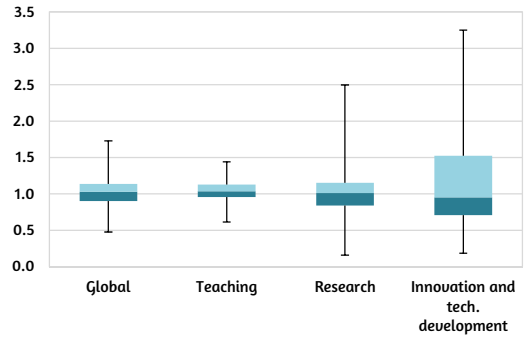
- The comparison of panels *a* and *b* permits us to observe that the differences between the public universities are much greater if their volume of results is analyzed and not their performance. This feature is observed in any of the dimensions considered, but in the activities of innovation and technological development it is greater than in teaching and research. Given the total weight of public universities in the university system, this pattern applies to the average of the system.

- In private universities, since they all have a smaller size, the situation is the opposite, and the volume index has much greater homogeneity than the performance index.

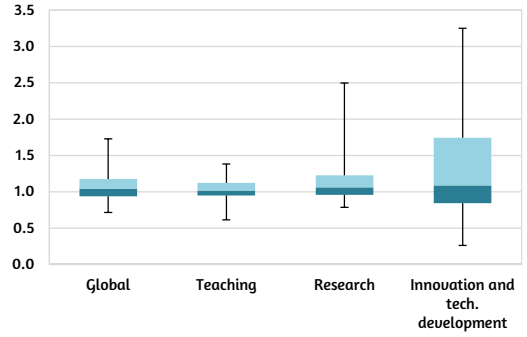
Figure 13. U-Ranking. Distribution of the indices obtained in each dimension

a) U-Ranking (performance)

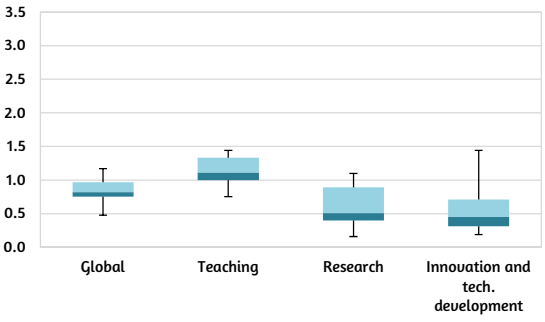
a1. Total universities



a2. Public universities

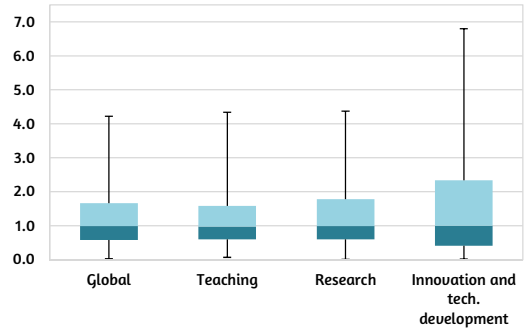


a3. Private universities

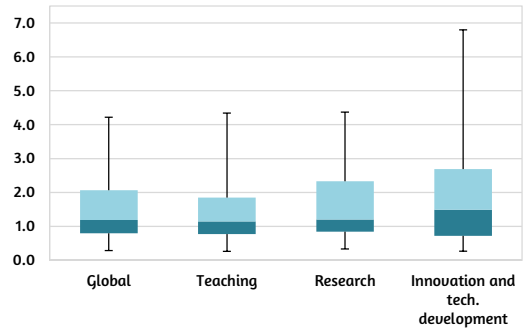


b) U-Ranking Volume

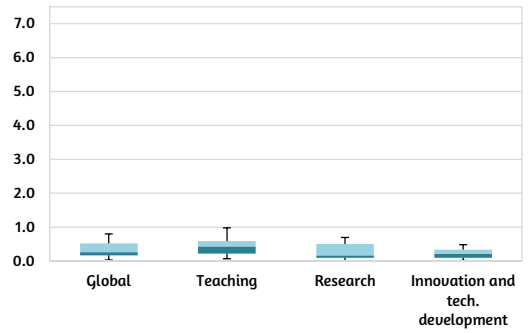
b1. Total universities



b2. Public universities



b3. Private universities



Source: BBVA Foundation-Ivie.

- Second, the differences in performance present an increasing scale when going from teaching to research and from the latter to innovation and technological development for both public and private universities. Thus, the range of the teaching index is 0.8 points, that of research 2.3 and that of innovation and technological development 3.1. The relative differences of the interquartile ranges are even greater in the last dimension.

- In construction, the median for the total number of universities in the distribution of the indices is 1 (see figures 13, panels a1 and b1). However, when we analyze the private universities (figures 13, panel a3 and b3), we clearly observe the difference that exists in specialization to which we have been making reference. Fixing our attention on the indices of performance, we observe that the median is higher than the average of the system in teaching, somewhat below in innovation and technological development, but, above all, it is half in research.

Table 8 shows the coefficients of correlation between the different rankings and performance indices for each pair of activities. Once again, we can observe that the behavior is different depending on whether a university is private or public. While the correlation is high and fairly homogeneous among the three dimensions in the public universities, in private universities the strongest correlation is found between teaching and innovation, with a significantly low correlation in the other cases.

These results suggest that complementarity exists among the different activities, but is limited above all, they warn that if the aim is to analyze the university system as a whole, the existence of groups of institutions with different characteristics that result from the coexistence of private and public institutions cannot be ignored, as analyzed by Aldás (dir.) (2016). If we did, it could lead to biases in the analysis of the reality of the university system.

Table 8. Correlation coefficients of the indices and U-rankings by dimension

a) Index

	Total	Public U.	Private U.
Teaching - Research	0.17	0.52	0.19
Teaching - Innovation and Technological Development	0.32	0.62	0.44
Research - Innovation and Technological Development	0.61	0.48	0.01

b) Ranking

	Total	Public U.	Private U.
Teaching - Research	0.22	0.50	0.34
Teaching - Innovation and Technological Development	0.26	0.59	0.48
Research - Innovation and Technological Development	0.55	0.43	0.24

Note: The ranking values are calculated by means of a Spearman correlation coefficient and the index values by means of a Pearson correlation coefficient.
Source: BBVA Foundation-Ivie.

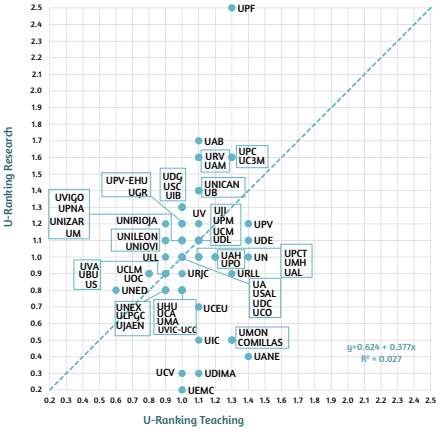
A validation of these differences can be obtained by checking if the hypothesis that research results can predict correctly those of teaching is true or not, this being the assumption of many rankings that concentrate exclusively on the research dimension. Therefore, the rates of performance in research are represented against the rates of performance in teaching (figure 14, panel a). We can see that this relationship is practically undetectable, since the coefficient of determination of the regression line does not exceed 3%.

If we examine the heterogeneity of the universities and focus the analysis only on the public system (figure 14, panel b), the adjustment between the synthetic indices of teaching and research improves and reaches a coefficient of determination of 0.33, giving evidence of stronger relationship than in the private system but, in any case, limited. In the subset of private universities, the relationship is even smaller than for the overall system (figure 14, panel c).

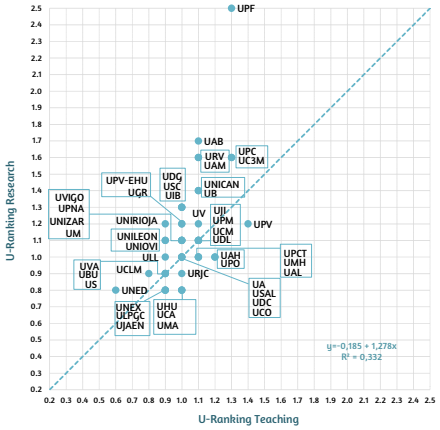
Finally, after describing the results of the rankings of teaching, research and innovation and technological development, tables 9 and 10 present in detail the results of the eight rankings drawn up for all Spanish universities (general performance U-Ranking and its ranking for the three dimensions of teaching, research and innovation, and general U-Ranking Volume and its ranking by each of the aforesaid dimensions). In the performance ranking a well-defined pattern of teaching specialization of private universities can be seen: all improve when comparing their position in teaching ranking with the global ranking and worsen when considering the research ranking. That pattern is also shown in panel c of figure 14: almost all the private universities are located below the diagonal because their research rate is lower than their teaching rate (the only exception is the Universitat Oberta de Catalunya which has a research index than the teaching index) has the same indices and the Universitat de Vic which would improve). On the other hand, in the case of the public universities the opposite happens in the majority of cases.

Figure 14. U-Ranking. Teaching vs. Research Index

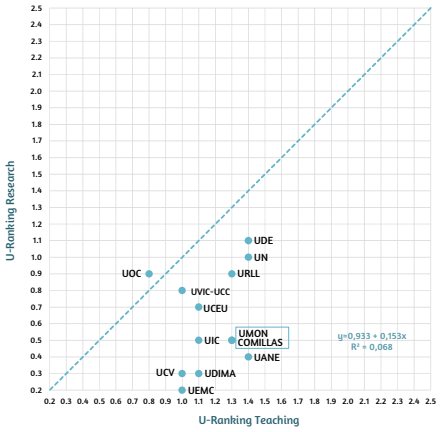
a) Public and private universities



b) Public universities



c) Private universities



See appendix 2 for a list of the University abbreviations used.

Source: BBVA Foundation-Ivie.

Table 9. U-Ranking for Teaching, Research and Innovation and Technological Development

University	Global		Teaching		Research		Innovation and Tech. Development	
	Ranking	Index	Ranking	Index	Ranking	Index	Ranking	Index
Universitat Pompeu Fabra	1	1.7	2	1.3	1	2.5	3	2.5
Universidad Carlos III de Madrid	2	1.5	2	1.3	3	1.6	2	3.1
Universitat Politècnica de Catalunya	2	1.5	2	1.3	3	1.6	1	3.2
Universitat Politècnica de València	3	1.4	1	1.4	6	1.2	2	3.1
Universidad Autónoma de Madrid	4	1.3	4	1.1	3	1.6	9	1.6
Universidad de Cantabria	4	1.3	4	1.1	4	1.4	4	2.3
Universitat Autònoma de Barcelona	4	1.3	4	1.1	2	1.7	8	1.7
Universitat Rovira i Virgili	4	1.3	4	1.1	3	1.6	4	2.3
Universidad de Navarra	5	1.2	1	1.4	8	1	18	0.7
Universidad Miguel Hernández de Elche	5	1.2	4	1.1	8	1	3	2.5
Universidad Politécnica de Madrid	5	1.2	4	1.1	7	1.1	2	3.1
Universidade de Santiago de Compostela	5	1.2	5	1	5	1.3	5	2.1
Universitat de Barcelona	5	1.2	4	1.1	4	1.4	10	1.5
Universitat de València	5	1.2	4	1.1	6	1.2	12	1.3
Universidad de Alcalá	6	1.1	3	1.2	8	1	10	1.5
Universidad de Córdoba	6	1.1	5	1	8	1	11	1.4
Universidad de Deusto	6	1.1	1	1.4	7	1.1	20	0.5
Universidad de Zaragoza	6	1.1	5	1	7	1.1	6	1.9
Universidad Pablo de Olavide	6	1.1	3	1.2	8	1	15	1
Universidad Pública de Navarra	6	1.1	5	1	7	1.1	12	1.3
Universidade de Vigo	6	1.1	5	1	7	1.1	13	1.2
Universitat de Girona	6	1.1	5	1	5	1.3	17	0.8
Universitat de les Illes Balears	6	1.1	5	1	5	1.3	9	1.6
Universitat de Lleida	6	1.1	4	1.1	7	1.1	15	1
Universitat Ramon Lull	6	1.1	2	1.3	9	0.9	19	0.6
Mondragón Unibertsitatea	7	1	2	1.3	12	0.5	11	1.4
Universidad Complutense de Madrid	7	1	4	1.1	7	1.1	17	0.8
Universidad de Alicante	7	1	5	1	8	1	7	1.8
Universidad de Almería	7	1	4	1.1	8	1	13	1.2
Universidad de Granada	7	1	5	1	6	1.2	17	0.8
Universidad de La Rioja	7	1	6	0.9	6	1.2	16	0.9
Universidad de Murcia	7	1	5	1	7	1.1	16	0.9
Universidad de Salamanca	7	1	5	1	8	1	14	1.1
Universidad de Sevilla	7	1	6	0.9	9	0.9	6	1.9
Universidad del País Vasco	7	1	5	1	6	1.2	18	0.7
Universidad Politécnica de Cartagena	7	1	4	1.1	8	1	18	0.7
Universidad Rey Juan Carlos	7	1	5	1	9	0.9	16	0.9
Universidade da Coruña	7	1	5	1	8	1	16	0.9
Universitat Jaume I de Castellón	7	1	4	1.1	7	1.1	19	0.6
Universidad de Burgos	8	0.9	6	0.9	9	0.9	15	1
Universidad de Cádiz	8	0.9	5	1	10	0.8	14	1.1
Universidad de Huelva	8	0.9	5	1	10	0.8	16	0.9
Universidad de Jaén	8	0.9	6	0.9	10	0.8	16	0.9
Universidad de León	8	0.9	6	0.9	7	1.1	19	0.6
Universidad de Málaga	8	0.9	5	1	10	0.8	12	1.3
Universidad de Oviedo	8	0.9	6	0.9	7	1.1	18	0.7
Universidad de Valladolid	8	0.9	6	0.9	9	0.9	16	0.9
Universidad Nebrija	8	0.9	1	1.4	13	0.4	17	0.8
Universidad San Pablo-CEU	8	0.9	4	1.1	11	0.7	21	0.4
Universidad de Castilla-La Mancha	9	0.8	7	0.8	9	0.9	18	0.7
Universidad de Extremadura	9	0.8	6	0.9	10	0.8	18	0.7
Universidad de La Laguna	9	0.8	6	0.9	8	1	22	0.3
Universidad de Las Palmas de Gran Canaria	9	0.8	6	0.9	10	0.8	22	0.3
Universidad Pontificia Comillas	9	0.8	2	1.3	12	0.5	23	0.2
Universitat de Vic-U. Central de Catalunya	9	0.8	5	1	10	0.8	23	0.2
Universitat Internacional de Catalunya	9	0.8	4	1.1	12	0.5	14	1.1
Universitat Oberta de Catalunya	9	0.8	7	0.8	9	0.9	20	0.5
UNED	10	0.7	8	0.6	10	0.8	15	1
Universidad A Distancia de Madrid	11	0.6	4	1.1	14	0.3	22	0.3
Universidad Católica de Valencia San Vicente Mártir	11	0.6	5	1	14	0.3	22	0.3
Universidad Europea Miguel de Cervantes	12	0.5	5	1	15	0.2	22	0.3

Note: Universities are ordered from the highest to the lowest global index value. Universities with the same index value are ordered alphabetically.
Source: BBVA Foundation-Ivie.

Table 10. U-Ranking Volume for Teaching, Research and Innovation and Technological Development

University	Global		Teaching		Research		Innovation and Tech. Development	
	Ranking	Index	Ranking	Index	Ranking	Index	Ranking	Index
Universidad Complutense de Madrid	1	4.2	1	4.3	1	4.4	9	3.2
Universitat de Barcelona	2	3.7	2	3.4	2	4.1	4	4.5
Universidad de Granada	3	3.2	3	3.1	3	3.6	12	2.4
Universitat de València	3	3.2	3	3.1	5	3.3	7	3.5
Universidad de Sevilla	4	3	6	2.7	6	2.9	3	5.9
Universidad del País Vasco	4	3	4	2.9	4	3.4	14	2.1
Universitat Politècnica de València	5	2.9	5	2.8	8	2.5	2	6.3
Universidad Politécnica de Madrid	6	2.7	7	2.5	9	2.4	1	6.8
Universitat Autònoma de Barcelona	6	2.7	9	2.2	3	3.6	6	3.6
Universitat Politècnica de Catalunya	6	2.7	8	2.3	7	2.8	3	5.9
Universidad Autónoma de Madrid	7	2.3	11	2	7	2.8	10	2.8
Universidad de Zaragoza	7	2.3	10	2.1	10	2.3	5	3.8
UNED	8	2	13	1.7	10	2.3	11	2.6
Universidade de Santiago de Compostela	8	2	13	1.7	11	2.2	7	3.5
Universidad de Málaga	9	1.7	12	1.8	15	1.5	13	2.3
Universidad de Murcia	9	1.7	14	1.6	12	1.8	17	1.6
Universidad Carlos III de Madrid	10	1.6	16	1.4	13	1.7	8	3.3
Universidad de Alicante	11	1.5	16	1.4	16	1.3	11	2.6
Universidad de Salamanca	11	1.5	15	1.5	15	1.5	17	1.6
Universidad de Oviedo	12	1.4	16	1.4	14	1.6	21	1
Universidad de Valladolid	13	1.3	17	1.3	16	1.3	19	1.3
Universidad Rey Juan Carlos	13	1.3	17	1.3	17	1.2	20	1.2
Universidad de Alcalá	14	1.2	18	1.2	19	1	17	1.6
Universidad de Castilla-La Mancha	14	1.2	18	1.2	16	1.3	21	1
Universidade de Vigo	14	1.2	19	1.1	17	1.2	18	1.4
Universitat Pompeu Fabra	14	1.2	21	0.9	12	1.8	15	1.8
Universidad de Córdoba	15	1.1	19	1.1	18	1.1	18	1.4
Universidad de Cádiz	16	1	20	1	20	0.9	20	1.2
Universidad de Extremadura	16	1	20	1	19	1	22	0.9
Universidad de La Laguna	16	1	19	1.1	17	1.2	28	0.3
Universitat Rovira i Virgili	16	1	22	0.8	17	1.2	16	1.7
Universidad de Cantabria	17	0.9	22	0.8	19	1	16	1.7
Universidade da Coruña	17	0.9	21	0.9	19	1	22	0.9
Universidad de Las Palmas de Gran Canaria	18	0.8	20	1	20	0.9	28	0.3
Universidad de Navarra	18	0.8	20	1	22	0.7	26	0.5
Universidad Miguel Hernández de Elche	18	0.8	22	0.8	22	0.7	16	1.7
Universitat de les Illes Balears	18	0.8	23	0.7	20	0.9	21	1
Universitat Jaume I de Castellón	18	0.8	21	0.9	21	0.8	26	0.5
Universitat Ramon Lull	18	0.8	20	1	22	0.7	26	0.5
Universidad de Almería	19	0.7	23	0.7	23	0.6	23	0.8
Universidad de Jaén	19	0.7	22	0.8	23	0.6	24	0.7
Universidad Pablo de Olavide	19	0.7	23	0.7	23	0.6	25	0.6
Universitat de Girona	19	0.7	23	0.7	21	0.8	26	0.5
Universidad de León	20	0.6	24	0.6	22	0.7	27	0.4
Universidad Pública de Navarra	20	0.6	25	0.5	24	0.5	24	0.7
Universitat de Lleida	20	0.6	24	0.6	23	0.6	25	0.6
Universitat Oberta de Catalunya	20	0.6	24	0.6	22	0.7	28	0.3
Universidad de Deusto	21	0.5	24	0.6	24	0.5	29	0.2
Universidad de Huelva	21	0.5	24	0.6	24	0.5	26	0.5
Universidad San Pablo-CEU	21	0.5	24	0.6	25	0.4	29	0.2
Universidad de Burgos	22	0.4	26	0.4	25	0.4	27	0.4
Universidad Politécnica de Cartagena	22	0.4	26	0.4	25	0.4	28	0.3
Universidad Pontificia Comillas	22	0.4	24	0.6	27	0.2	30	0.1
Universidad Católica de Valencia San Vicente Mártir	23	0.3	26	0.4	28	0.1	30	0.1
Universidad de La Rioja	23	0.3	27	0.3	26	0.3	28	0.3
Mondragón Unibertsitatea	24	0.2	27	0.3	28	0.1	28	0.3
Universitat de Vic-U. Central de Catalunya	24	0.2	28	0.2	27	0.2	31	<0,1
Universitat Internacional de Catalunya	24	0.2	28	0.2	28	0.1	29	0.2
Universidad A Distancia de Madrid	25	0.1	28	0.2	29	<0,1	31	<0,1
Universidad Nebrija	25	0.1	28	0.2	28	0.1	30	0.1
Universidad Europea Miguel de Cervantes	26	<0,1	29	0.1	29	<0,1	31	<0,1

Note: Universities are ordered from the highest to the lowest global index value. Universities with the same index value are ordered alphabetically.
Source: BBVA Foundation-Ivie.

4.8. PUBLIC AND PRIVATE UNIVERSITIES' RESULTS COMPARED

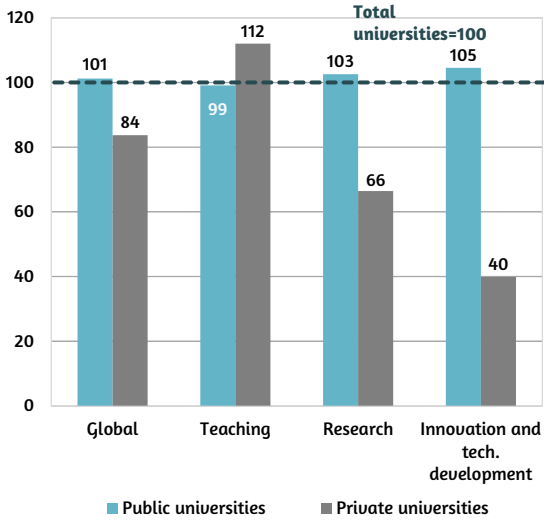
The increased weight of private universities in the Spanish university system is making the comparison of the results that depend on the ownership of the universities –public or private- much more relevant. It is undeniable that many variables may cause non-equivalent results: private universities are much younger on average, many are located in geographic areas with higher per capita income, with a less diversified range of courses than the public system and also with a smaller size. But to determine the differences in the results its necessary to find evidence that these differences do exist. The indices of the U-Ranking system allow us to address this issue with accurate data.

Figure 15 shows the average results for U-Ranking indices for each one of the key dimensions —teaching, research and innovation and technological development—, as well as in the global index of results. If we take the average of the whole system as basis 100, built as an average weighted by the weight of the individual indices of universities, we observe that the performance of the private universities is 16 points less than the public system. Analyzing the dimensions we see that this result is due, primarily, to a different specialization than other universities, much more focused on the teaching dimension, in which they achieve a greater performance than public universities. This teaching specialization makes their research results to be well below the public universities (their performance being 34 points lower) and also the results in innovation and technological development (60 points below the national average).

Averages may always hide a more complex reality. An average value can be caused by consistent values in all universities or by a great heterogeneity of results. This heterogeneity, which is shared by the private and public systems, is clearly visible in Figure 16. In all the panels (global, teaching and research) we can observe how the distribution of both types of universities along the range of values of the index is a clear indicator of the diversity in the results.

Figure 15. Average performance of the Spanish public and private universities

Total of universities = 100



Source: BBVA Foundation-Ivie.

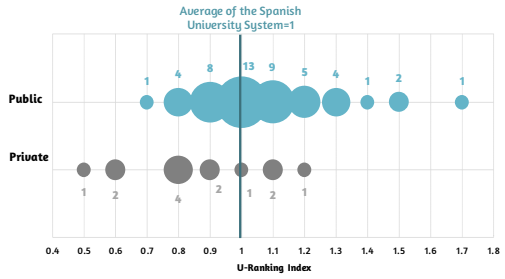
In panel *a* we observe that public universities are distributed along the whole range of values of the global index of U-Ranking, but a third of them (13) are below average. In the private ones (9) have lower values than the average, hence their lower overall performance. The situation is the opposite with the teaching dimension (panel *b*), where both groups maintain their heterogeneity, but the better performance of the private institutions can be seen by the fact that nearly 70% of them (9) are above the average values, which is only true for 39% of the public universities. Panel *c* shows that research is dominated by public universities and only one private university exceeds the average of the system.

In short, the public and private systems are both heterogeneous with respect to the performance of the institutions that comprise them, there being a great diversity in the global, teaching and research results. However, the public system stands out with respect to private universities in their research achievements and innovation results. On the other hand, the teaching specialization of the private system achieves better results in this dimension.

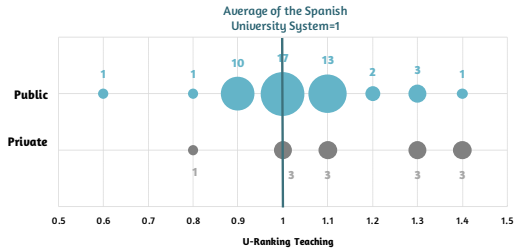
Figure 16. U-Ranking index of the public and private universities, 2018

Index and number of universities with the same index

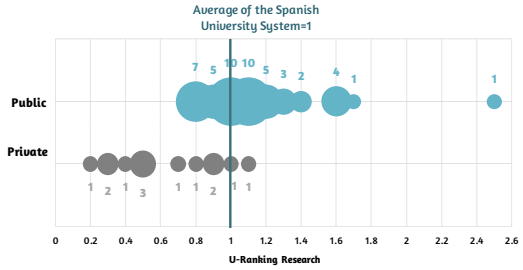
a) Global



b) Teaching



c) Research



Source: BBVA Foundation-Ivie.

4.9. U-RANKING 2017 AND 2018

The aim of this section is not to examine the performance of the institutions, which analysis has already been carried out before, but to confirm the stability of results between both editions. Direct comparisons between the 2017 and 2018 editions of U-Ranking are difficult to make because of the inclusion or exclusion in each edition of private universities, depending on whether they were able to provide the necessary data. Such inclusions and exclusions could result in changes in a university's position in the ranking not because of its performance but because another university entered or exited the ranking. For that reason, we will calculate the correlation in the position occupied and also that of the indices, which is more indicative of the relationship between the two editions.

The results obtained by 2018 U-Ranking are highly correlated with those presented in 2017. As table 11 shows, the coefficients of correlation between the indices and the rankings corresponding to the two editions are very high. All the correlations, both those referring to the positions in the ranking (Spearman) and to the values of the synthetic indicator (Pearson), are significant to 1% and, for the global index, present coefficients higher than 0.96 in all cases. This result is not surprising but it is important because it means that data updates have not significantly altered the results confirming the reliability of the methodology used.

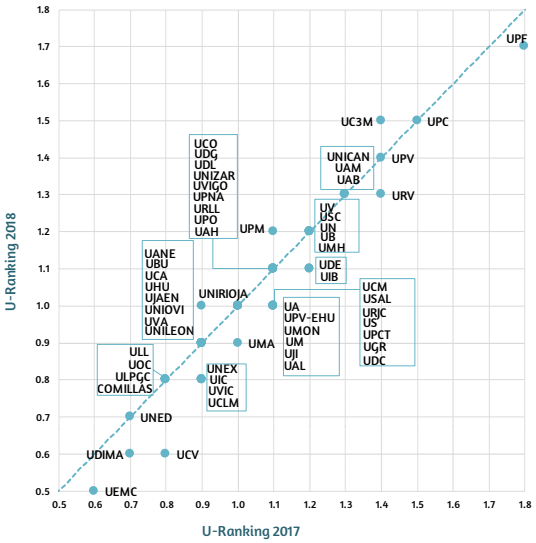
The close fit between the indicators of both editions of the rankings can also be appreciated in the following figures, which show on the horizontal axis the synthetic indicator of each university in 2018 and on the vertical axis the results for 2017, both for U-Ranking (figure 17) and for U-Ranking Volume (figure 18). As can be observed in the case of the volume index, the correlation is almost perfect, therefore, few changes are produced.

Table 11. Correlation coefficients of 2017 and 2018 U-Rankings

	Performance		Volume	
	Ranking	Index	Ranking	Index
Global	0.97	0.96	1.00	1.00
Teaching	0.99	0.95	1.00	1.00
Research	0.97	0.94	0.99	0.99
Innovation and Technological Development	0.95	0.86	0.99	0.98

Note: The ranking values are calculated by means of a Spearman correlation coefficient and the index values by means of a Pearson correlation coefficient.
Source: BBVA Foundation-Ivie.

Figure 17. U-Ranking (performance) of the Spanish public universities. 2017 and 2018
Index

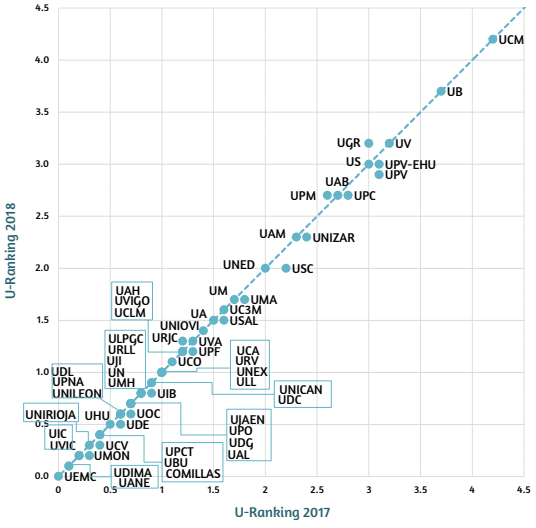


The CEU San Pablo University is not included because it has been analyzed for the first time in U-Ranking 2018.

See appendix 2 for a list of the University abbreviations used.

Source: BBVA Foundation-Ivie.

Figure 18. U-Ranking Volume of the Spanish public universities. 2017 and 2018
Index



The CEU San Pablo University is not included because it has been analyzed for the first time in U-Ranking 2018.

See appendix 2 for a list of the University abbreviations used.

Source: BBVA Foundation-Ivie.

4.10. REGIONAL UNIVERSITY SYSTEMS

Universities undertake their teaching and research activities in a certain geographic context that influences them in different ways. On the one hand, if they are public, investment efforts as well as incentive policies, quality assessments and plans to boost internationalization vary greatly from one region to another. On the other hand, the socio-economic environments of each region are different: there are differences in the levels of income, the population's educational levels, type of industries, labor market, urbanization, etc. For all these reasons, it is interesting to analyze the performance of the universities by delimiting their action area, the so-called *regional university systems*.

Figure 19 shows the averages of the 2018 U-Ranking index of all universities, both public and private, of each autonomous community. The three distance-learning universities have been removed from this analysis because, given their teaching method, it would be difficult to assign their scope of action to a particular region.

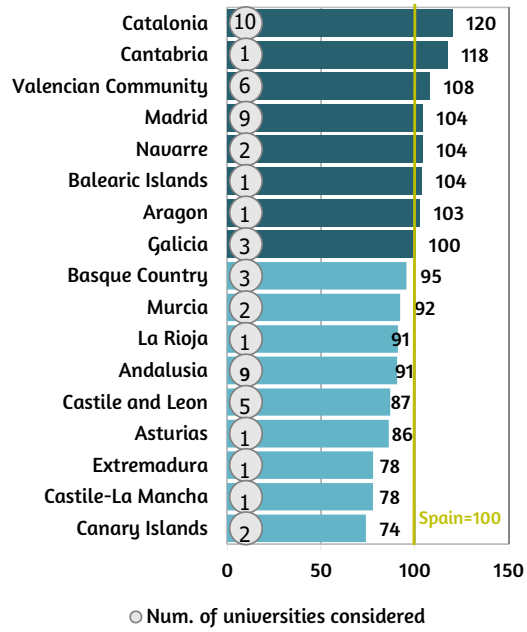
The results show, firstly, large differences regarding performance among the regional university systems: the autonomous community with the highest performance exceeds by 46 percentage points the region with the lowest performance.

The best-performing university systems are those of Catalonia (10 universities) and Cantabria (with just one university), which have performance indices of 20% and 18%, respectively. They are followed by the Valencian Community (+8%), a group made up of Madrid, Navarra and the Balearics (+4%), Aragon at a distance of +3%, and Galicia at the average.

Among the regional university systems with performance levels below the average, we can distinguish several levels: some do not reach 10%—Basque Country, Murcia, Rioja or Andalusia—, others are slightly above 10% —Castile and Leon and Asturias—, while other communities are less than 20%, as in the cases of Extremadura, Canary Islands and Castile-La Mancha.

Figure 19. Performance of the regional university systems. U-Ranking 2018

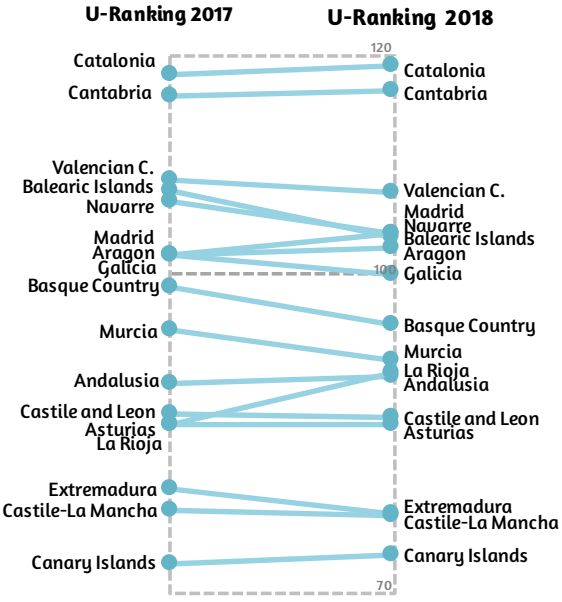
Spain = 100



Source: BBVA Foundation-Ivie.

Figure 20. Evolution of the regional university systems. 2017 and 2018

Spain = 100



Source: BBVA Foundation-Ivie.

When comparing the regional university systems, we must take into account that private universities, which on average have a lower performance, tend to be concentrated, as we already have seen, in regions with high levels of income and large potential markets. However, the regions with more private universities are not the ones that appear in the last positions.

Figure 20 compares the results obtained by the autonomous communities in the 2017 edition with the results from the present edition. In general, we can highlight the stability of the results, but with some changes. The most outstanding movement corresponds to the growth of La Rioja and the relative drop of Balearic Islands, Basque Country, Murcia and Navarre. The increases or decreases in performance with respect to the national average do not necessarily mean a change in the position of the ranking. Thus, we see that Basque Country increased its index from 99 in 2017 to 95 in 2018. However, it continues to be in ninth place.

4.11. EVOLUTION OF UNIVERSITY PERFORMANCE

As we said in the introduction to this report, the information provided by a ranking is useful insofar as it allows us to compare the situation of one university with that of another. For some purposes, any given ordering may conceal valuable information and may even lead to misinterpretations if it is not analyzed with proper care. A fall in the ranking, for example, may be interpreted as an indication that a university's results have deteriorated (e.g., fewer publications, lower student success rate or fewer patents). That need not necessarily be the case, however, as the university may be improving in all those indicators, simply not as fast as the other universities in the system, with the result that its position in the ranking has fallen.

An analysis of the performance of a particular university (or of the university system as a whole) over a period of time, that is, of its performance record, is a valuable supplement to the analysis provided by a ranking. It allows us to determine whether changes in position reflect an overall improvement or deterioration in the system and to examine each university's track record and deter-

mine whether any changes in position reflect an improvement or deterioration in the university's performance over time.

Such an analysis requires a panel of consistently defined indicators covering a long enough time horizon. A comparison of U-Ranking results between two consecutive years is generally unlikely to show many changes, but we believe that the information system used to calculate the U-Ranking provides a longer-term perspective, now that it has been prepared for six years running. The exercise set out in this section shows the performance record of each university overall and in each of the two dimensions of research and teaching. The individual university performance results are aggregated to analyze the performance of the regional and national university systems.

These analyses allow us to address certain questions about how the Spanish university system is evolving. We know that some universities rank higher than others, but is the system as a whole more or less productive? Are its research and teaching results improving or deteriorating? Is the trend the same across all regions? And at a more detailed level, how is each individual university performing in terms of results? Does a university's rise in the ranking reflect improved performance compared to the others? Has a university fallen in the ranking despite improving its results? Or has a university dropped in the ranking precisely because its results have deteriorated? Has a university performed consistently in both research and teaching? These questions are clearly of interest to administrators and answering them will add useful information to that provided by the ranking.

The exercise has been carried out by comparing performance in the teaching, research and global indices over the 7-year period from 2010 to 2016. The information available for this period is that of the 25 indicators that U-Ranking uses to calculate the synthetic indices, which, as we know, are based on moving averages (table 3).

The comparison is performed for the start and end years of the study period, not for each year, on the grounds that the aim is to detect trends, not year-to-year changes. The indicators are presented as annual average rates of change for the period as a whole, so as to be more easily comparable with the rates of change of other commonly used social and economic variables.

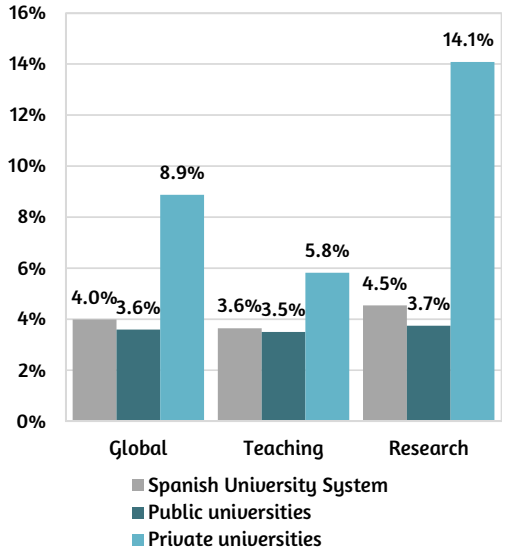
The evolution of the performance of the university system and of the individual universities has been calculated without taking their performance in knowledge transfer into account. That is because at present, as table 3 shows, all but one of the knowledge transfer indicators reach only as far as 2015, which means the data are further removed from the present. As the aim is to analyze performance at regional level, the distance-learning universities (UDIMA, UOC, UNED) have not been included, as they cannot be assigned to any particular region. The last methodological point to be mentioned is that, for the global indicator, the indicators have been aggregated by dimension, using the weights described in the methodology, and giving each university its relative weight in the system, following the criterion described for U-Ranking Volume.

Figure 21 shows the cumulative annual rate of change of the overall performance of the university system and of the teaching and research performance of all the universities (Spanish University System), the public universities and the private universities. In the global indicator, the Spanish University System improved its performance at an average rate of 4% per year over the period. The improvement was more pronounced in research (4.5%) than in teaching (3.6%). In context, these figures indicate that despite the economic crisis, which directly affected the performance of university activities through cutbacks (including the freezing of competitive research funding and a staff replacement rate insufficient to cover all retirements), the university system improved its results (producing more articles with higher impact and more citations, acquiring more competitive funding and improving the success rates, evaluations and drop-out rates of its students).

The results show that over this period the performance of the private universities improved faster, at a rate of 8.9%, compared to 3.6% for the public system. The private universities (which gained market share in students and suffered very little from the cutbacks in public funding) improved faster than the public universities in both areas of activity but most of all in research, where their results started from very low levels.

Figure 21. Average annual rate of change in university performance. 2010-2016

2010 =100



Source: BBVA Foundation-Ivie.

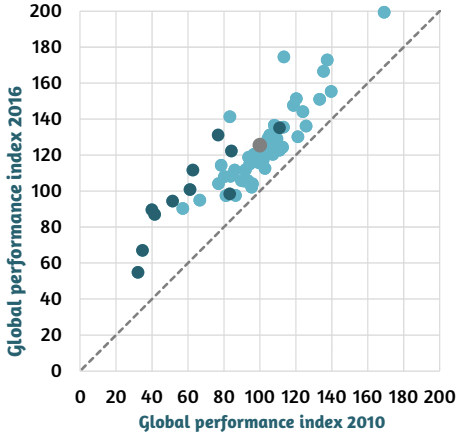
Figure 22 shows that the changes in the universities' performance indices between 2010 and 2016 were across the board. All the universities improved in teaching, almost all in research and all in the global index. That is why the points representing the universities appear above the diagonal in the figure, as their performance in 2016 (measured on the vertical axis) was higher than in 2010 (measured on the horizontal axis). The greater the vertical distance of a point (a university) above the diagonal, the greater the improvement.

The improvements are across the board, but the diversity of results between universities persists, as the range of values along the diagonal between the two comparison years shows. An interesting question is whether, within that diversity, the universities are tending to converge or diverge. For instance, it is well known that private universities perform less well than public universities in research, while figure 21 indicates that the private universities have improved more than the public ones, so one might conclude that private and public universities have converged. However, the hypothesis that the higher growth rates of certain universities are generally due to their having started from a lower performance level requires empirical verification. If it were confirmed, we could say that the universities have converged, as the more backward ones have improved more quickly.

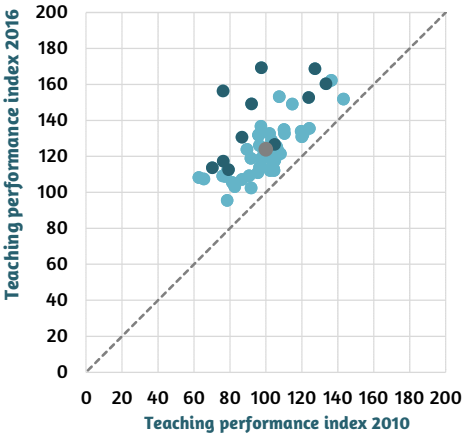
Figure 22. Changes in the universities' performance indices 2010-2016

Spanish University System 2010 =100

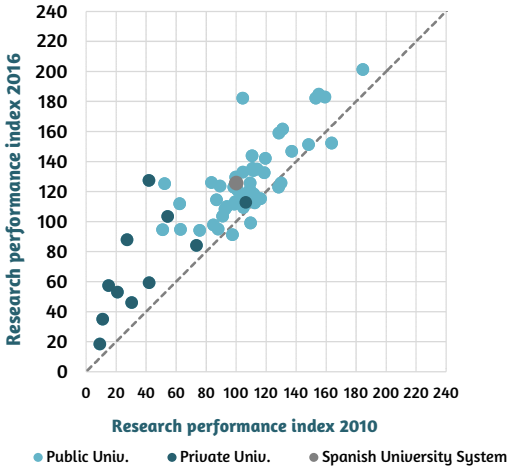
a) Global



b) Teaching



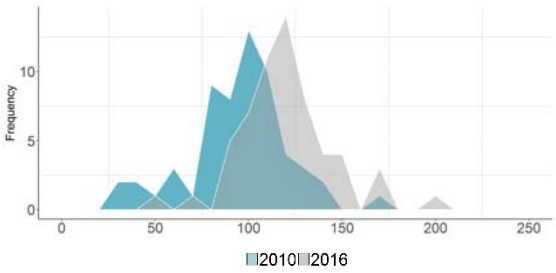
c) Research



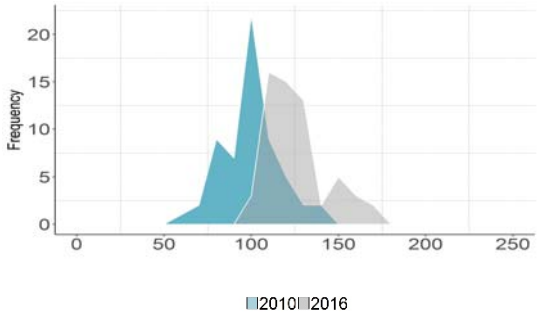
Source: BBVA Foundation-Ivie.

Figure 23. Distribution of performance indices by dimension. 2010 and 2016

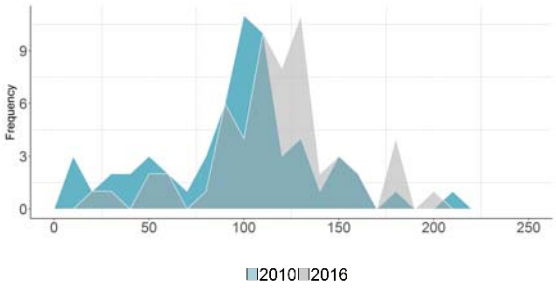
a) Global index



b) Teaching index



c) Research index



Source: BBVA Foundation-Ivie

Figure 23 shows the distribution of the universities' performance in the two years under consideration. The horizontal axis shows the relative performance values and the vertical axis, the frequencies with which those values are observed. In all three indices (global, teaching and research) the average performance is better at the end of the period than at the start, as the rightward shift of the grey frequencies (2016) compared to the green ones (2010) shows. But whether the dispersion around the mean has increased or decreased is not easy to determine. Panel b shows that teaching performance is much more homogeneous than research performance (panel c), as the range of variation in the index is much smaller. Panel b also shows a second peak of frequencies to the right: time will tell whether we are moving towards a bimodal system, in which a certain subgroup of universities performs significantly better than the rest. Panel c shows that in research there are frequency peaks of universities both above and below the average and that these peaks have changed over the period. Time and further studies in the future will show whether we are moving towards a more homogeneous system overall or one that is becoming polarized into various groups, including a majority group with average performance and one or two minority groups with above- or below-average performance.

In order to compare 2010 and 2016 and determine whether or not there is any trend towards convergence, two indicators have been calculated. The first is the dispersion of the logs of the indices in 2010 and 2016. If the dispersion has increased, the system has become more diverse; if it has decreased, the system has become more homogeneous (the so-called *sigma convergence*). Table 12 shows that for the global index, the teaching index and, in particular, the research index the dispersion in all cases is less at the end of the period (2016) than at the start. Therefore, the system is actually more homogeneous at the end of the period than it was 6 years earlier.

Table 12. Result of the sigma and beta convergence analysis

Convergence		Global	Teaching	Research
	Year		σ	
Sigma	2010	0.275	0.171	0.420
	2016	0.206	0.138	0.346
	Parameter		Estimates	
Beta	β0(t)	0.122***	0.126***	0.141***
		(12.801)	(8.94)	(11.091)
	β1(t)	-0.001***	-0.001***	-0.001***
		(-8.582)	(-6.157)	(-7.955)
	β1(t) standardized	-0.751***	-0.632***	-0.725***
		(-8.582)	(-6.157)	(-7.955)
	F(1,57)	73.646***	37.909***	63.284***
	R^2	0.5637	0.3994	0.5261
	N	59	59	59

Source: BBVA Foundation-Ivie

Another question we can answer from the data is whether the universities that had worse results in 2010 have advanced faster towards the average, that is, whether the initial relative backwardness has acted as a stimulus to improvement or whether, on the contrary, it has slowed the improvement process. To answer this question we estimated a regression, exploring the extent to which the value of each university's performance index at the start of the study period, in 2010, is able to explain the rate of change of that index between 2016 and 2010i:

$$\ln I_{i,2016} - \ln I_{i,2010} = \beta_0 + \beta_1 \ln I_{i,2010} + \epsilon_i$$

If the slope β_1 were negative and significant, we would have what is known as a *beta convergence*[22], that is, the universities with lower index values in 2010 would have had higher positive rates of change over the period, confirming the positive effect of relative backwardness on the rate of improvement. As can be observed in table 12, the regression coefficient is negative and significant for all three indices (global, teaching and research).

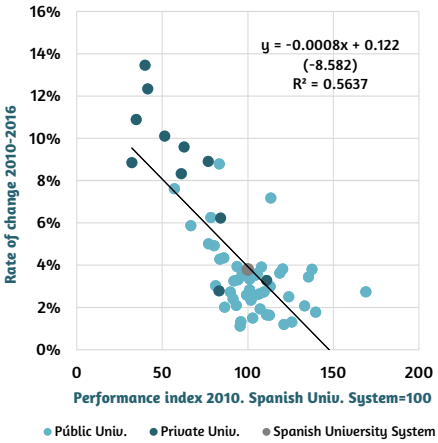
Figure 24 illustrates the results of table 12. In overall performance (panel *a*) we see that the universities with lower values on the x axis (performance in 2010) have higher values on the y axis (rate of change in performance). It can also be observed that these points are mainly those corresponding to private universities, as predicted. This pattern, though common to teaching and research, can be seen to be much more pronounced in research, as the higher regression coefficient indicates. Panel *b* of figure 24 also shows that, in the teaching dimension, it is not mainly private universities whose performance grows fastest, starting from lower levels (as can be seen in panel *c* for the research dimension), but rather that the lower performance levels at the start of the period are occupied by a mix of public and private universities.

[22] A *beta convergence* is a situation in which the units that start from lower levels grow faster. This does not necessarily mean that the gap between the units will be closed, as a higher growth rate calculated on a smaller base may result in a smaller absolute increase than a lower rate applied to a larger base.

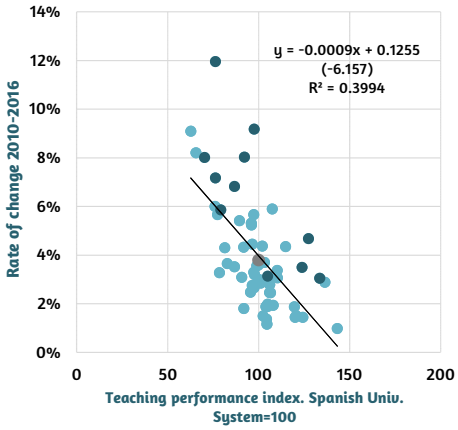
Figure 24. Performance indices in 2010 vs rates of change 2016-2010. On-site universities

Spanish University System=100

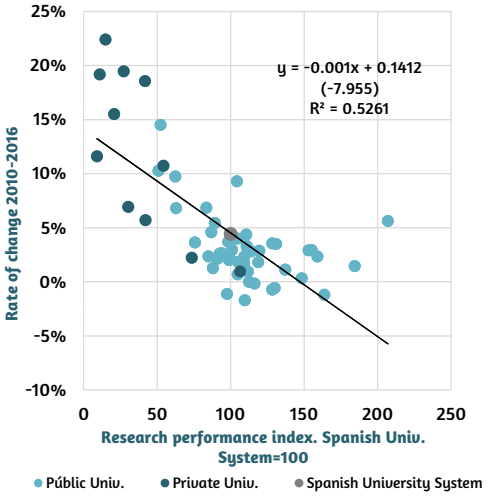
a) Global performance



b) Teaching performance



c) Research performance



Source: BBVA Foundation-Ivie

To sum up, the universities are converging in performance (*sigma convergence*) as a result of the faster pace of improvement among the more backward universities (*beta convergence*), eroding the competitive advantages of those that started from a better position. Although the process is slow and is not noticeable in any one year, it becomes perceptible if we look at a longer period.

Table 13 shows the performance of the universities in each autonomous community, calculated as an average weighted by the size of the universities located in each region. As noted earlier, the distance-learning universities have been removed from the sample because they cannot be assigned to any particular region. It should also be noted that some regions have only one university, which means that any such region's performance is tied to the performance of its one university. The table shows that there is a group of regions in which the growth in overall performance has been above the national average, namely, the Canary Islands, La Rioja, the Community of Madrid, the Basque Country and Asturias. It can also be observed that the range of variation is greater in research performance (the performance improvement of the top-ranking region is 11 percentage points higher than that of the bottom-ranking region, whose performance has actually deteriorated) than in teaching performance, where the difference is 6 percentage points.

The autonomous communities also differ as regards which dimension contributed most to the improvement in the global index. Whereas in the Canaries, the Community of Madrid and the Basque Country the growth is supported mainly by research, in La Rioja and Asturias (limiting our analysis to the regions with above-average overall growth) the biggest contribution comes from teaching performance. In any case, all the autonomous regions (with the exception of the Balearic Islands in the research dimension) improved their performance in both dimensions.

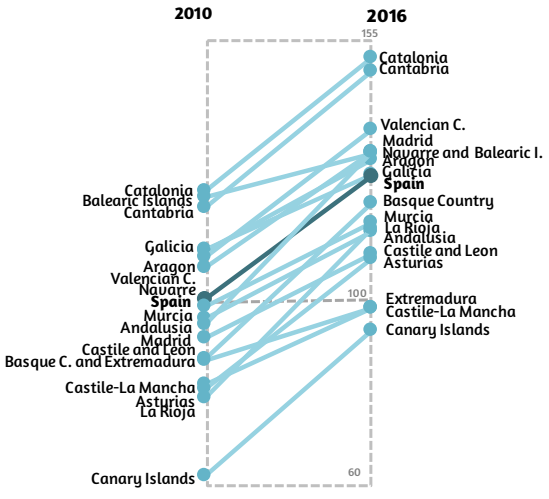
Figure 25 shows the change in the regions' performance between the start (2010) and the end (2016) of the study period. In quite a few cases the lines run parallel to the Spanish average, indicating similar regional performance. But not in all cases.

Table 13. Average annual rate of change of the performance of the regional university systems. On-site universities. 2010-2016

	Global	Teaching	Research	Num. of universities analyzed
Canary Islands	7%	5%	10%	2
La Rioja	6%	9%	3%	1
Madrid	6%	5%	7%	9
Basque C.	6%	5%	7%	3
Asturias	5%	6%	4%	1
Spanish Univ. System	4%	4%	5%	58
Valencian C.	4%	3%	5%	6
Cantabria	4%	4%	4%	1
Navarre	4%	4%	3%	2
Catalonia	4%	3%	5%	10
Castilla-La Mancha	3%	3%	3%	1
Castile and Leon	3%	4%	1%	5
Andalusia	3%	3%	3%	9
Murcia	3%	2%	4%	2
Aragon	3%	3%	2%	1
Galicia	2%	3%	0%	3
Extremadura	2%	2%	2%	1
Balearic I.	1%	3%	-1%	1

Note: In descending order of global performance growth
Source: BBVA Foundation-Ivie

Figure 25. Level of university performance by autonomous community compared to Spain. 2010-2016. Spain 2010=100



Source: BBVA Foundation-Ivie

As already mentioned, a region that improves its performance at a faster rate does not necessarily rise in the ranking. The Canary Islands is a case in point: despite being the autonomous community with the biggest improvement in overall performance, it ranked bottom in 2010 and still ranks bottom in 2016. In contrast, some communities have risen in the ranking and overtaken others as a result of having improved faster. The lines that cross one another in the figure show these overtakings.

Again, it is worth asking ourselves whether or not the Spanish University System is more homogeneous at the end of the period due to convergence between the results of the university systems of the different autonomous communities (*sigma convergence*) and, if so, whether the convergence is attributable to higher rates of improvement in the less advanced regional systems. Table 14 confirms that the results for the regional systems are equivalent to those obtained for the universities individually: at the end of the period the dispersion is lower in all three indices and the significant negative slope confirms that the regional systems that started from lower levels achieved a greater improvement in performance, not only overall but also for teaching and, more markedly, for research.

Table 14. Result of the sigma and beta convergence analysis

Convergence		Global	Teaching	Research
Sigma	Year		σ	
	2010	0.169	0.143	0.227
	2016	0.135	0.114	0.152
Beta	Parameter		Estimates	
	β0(t)	0.093***	0.101***	0.117***
		(5.348)	(4.913)	(6.094)
	β1(t)	-0.001***	-0.001***	-0.001***
		(-3.249)	(-3.09)	(-4.34)
	β1(t) standardized	-0.631***	-0.611***	-0.735***
		(-3.249)	(-3.09)	(-4.34)
	F(1,16)	10.558***	9.547	18.834
	R^2	0.3976	0.3737	0.5407
	N	18	18	18

Source: BBVA Foundation-Ivie

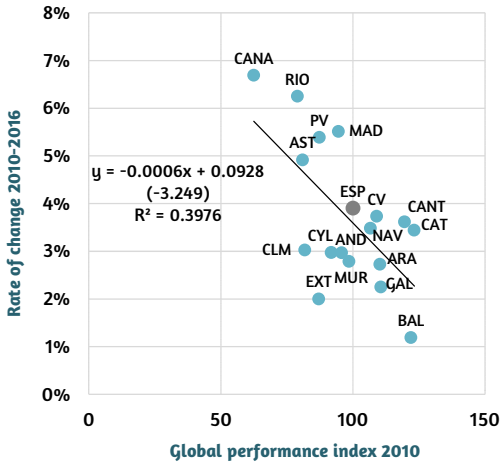
Figure 26 (which illustrates the beta convergence) shows more graphically that the Canary Islands, starting from a lower level, have the highest rate of growth, both in global performance and in research performance. The La Rioja university system exemplifies the same situation in teaching performance. The explanatory power of the starting point in predicting improvements in performance is quite substantial, both for the regional systems and for the individual universities, as the R^2 values of the regressions show.

Lastly, table 15 shows the rates of growth of the global, teaching and research performance of each of the Spanish universities analyzed and their aggregates, by ownership (public or private). This table can be read as the league table of a "league of effort" to improve. We have already noted that a bigger improvement does not necessarily mean a higher position in the ranking, but it does indicate which universities have been most successful in their efforts to boost their results. The table shows what each university has achieved in this area and may be of interest to the administrators of university policies.

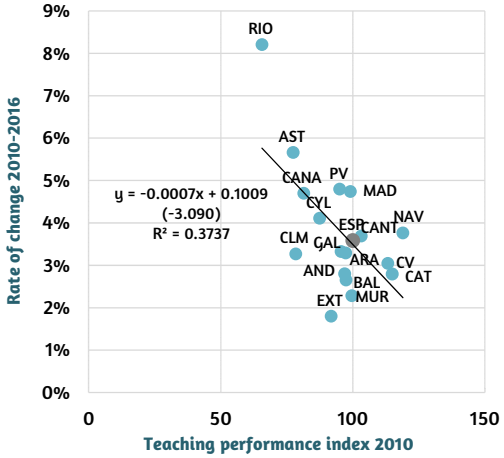
The range of results is very wide, especially in research, where the effort expended by many private universities in building up this fundamental dimension of university activity is excellent news. Another welcome finding is the improvement in research results (with rare exceptions) among the public universities, which are the most active in this field. Despite having had to sustain these activities in the face of adverse financial conditions during the study period, the improvements are widespread and in some cases reach double-digit rates.

Figure 26. Performance index 2010 vs. Rates of change 2010-2016. Spanish autonomous regions
Spain 2010=100

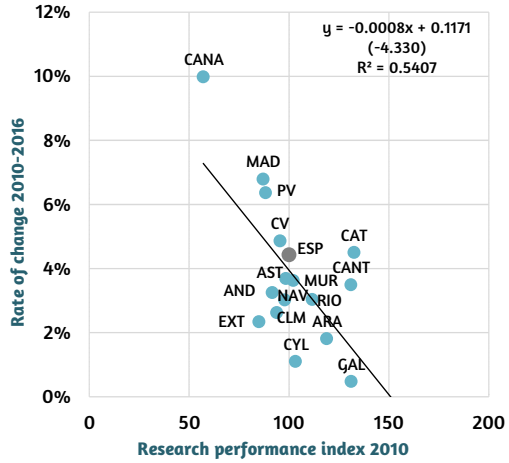
a) Global performance



b) Teaching performance



c) Research performance



Source: BBVA Foundation-Ivie

Table 15. Evolution of performance per university. 2010-2016

University	Annual accumulated rate of change		
	Global	Teaching	Research
Universidad A Distancia de Madrid	15%	10%	24%
Universidad Pontificia Comillas	14%	8%	25%
Universitat de Vic-U. Central de Catalunya	13%	8%	21%
Universitat Oberta de Catalunya	12%	10%	16%
Universidad Católica de Valencia San Vicente Mártir	12%	6%	21%
Universitat Internacional de Catalunya	11%	7%	17%
Mondragón Unibertsitatea	10%	13%	6%
Universidad de Deusto	9%	3%	20%
Universidad Europea Miguel de Cervantes	9%	7%	12%
Universidad Politécnica de Madrid	9%	5%	16%
Universidad Nebrija	9%	10%	7%
Universidad de Las Palmas de Gran Canaria	8%	6%	11%
Universidad Carlos III de Madrid	7%	6%	10%
Universidad de La Rioja	6%	9%	3%
Universitat Ramon Llull	6%	4%	11%
Universidad de La Laguna	6%	4%	10%
Universidad de Burgos	5%	10%	-2%
Universidad de Oviedo	5%	6%	4%
Universidad Nacional de Educación a Distancia	5%	5%	5%
Universidade da Coruña	4%	6%	2%
Universidad de Málaga	4%	3%	7%
Universidad del País Vasco/Euskal Herriko Unibertsitatea	4%	4%	3%
Universidad Miguel Hernández de Elche	4%	5%	2%
Universidad Autónoma de Madrid	4%	4%	3%
Universitat Politècnica de Catalunya	4%	4%	3%
Universidad Complutense de Madrid	4%	5%	2%
Universidad de Cantabria	4%	4%	4%
Universitat de Lleida	4%	3%	4%
Universidad Pública de Navarra	4%	2%	6%
Universidad de Alcalá	4%	6%	0%
Universitat Jaume I de Castellón	4%	2%	7%
Universitat Politècnica de València	3%	3%	4%
Universidad de Córdoba	3%	4%	3%
Universidad Politécnica de Cartagena	3%	6%	0%
Universidad de Navarra	3%	5%	1%
Universidad de Sevilla	3%	4%	3%
Universidad de Castilla-La Mancha	3%	3%	3%
Universitat de València	3%	3%	3%
Universidad de Granada	3%	3%	3%
Universidad San Pablo-CEU	3%	3%	2%
Universitat Pompeu Fabra	3%	1%	6%
Universidad de Zaragoza	3%	3%	2%
Universidad de Valladolid	3%	3%	2%
Universidad Pablo de Olavide	3%	1%	5%
Universidad de Murcia	3%	2%	4%
Universidad de Almería	3%	3%	2%
Universitat de Barcelona	3%	2%	4%
Universidad de León	2%	4%	-1%
Universidad de Salamanca	2%	3%	1%
Universidad de Cádiz	2%	1%	4%
Universitat Autònoma de Barcelona	2%	2%	1%
Universidad de Extremadura	2%	2%	2%
Universidad de Alicante	2%	2%	2%
Universitat Rovira i Virgili	2%	1%	2%
Universidade de Vigo	2%	3%	-1%
Universitat de Girona	2%	2%	1%
Universidad Rey Juan Carlos	2%	2%	1%
Universidad de Huelva	1%	1%	1%
Universidad de Santiago de Compostela	1%	2%	0%
Universitat de les Illes Balears	1%	3%	-1%
Universidad de Jaén	1%	3%	-1%
Spanish University System	**4%**	**4%**	**5%**
Public university	**4%**	**3%**	**4%**
Private university	**9%**	**6%**	**14%**

Note: In descending order of global performance growth
Source: BBVA Foundation-Ivie

5. Conclusions

The aim of the ISSUE (Synthetic Indicators of the Spanish University System) project is to generate classifications and analyze the Spanish universities on the basis of broad data sets that consider the principal dimensions of their activities: teaching, research and innovation and technological development. This project builds two main rankings: U-Ranking, which correcting for the institutions' size, measures the performance of the Spanish universities and ranks them according to their level, and U-Ranking Volume, taking into account the size. The methodology used in U-Ranking is rigorous and is aligned with the recommendations of the recent international studies on this subject.

Aggregating the information on the results of the universities in different areas presents difficulties. Not considering them and contemplating the numerous indicators separately that can be contemplated is not a practical solution, since most people interested in comparing the universities do not want to face large and complex volumes of information. Students, faculty members, researchers, university managers or politicians, and communications media appreciate having synthetic indicators available. The rankings —provided they are constructed with suitable criteria and clear metrics— are useful in this sense, because they condense the results of universities in several areas, reducing the effort that the users must make to obtain and analyze the information.

The U-Ranking indices permit to overcome both limitations in good measure by analyzing the teaching, research and innovation and technological development all the public universities of Spain (48) and 13 private universities that offer the information needed to make the comparison. In the near future we will incorporate the rest of the private universities for which similar information is available to that used to analyze the 61 universities that are now included.

The rankings were constructed from 25 variables that take into account the following aspects: (i) the universities' different missions (teaching, research, innovation and technological development); (ii) the existence of differences in the results of a university in the different areas of study; and (iii) the importance of considering the preferences of the users of university services when constructing some rankings.

The project has generated two general rankings of the universities —that of volume of results (U-Ranking Volume) and that of performance (U-Ranking)— as well as six partial rankings: teaching, research and innovation and technological development, in terms both of volume and of performance. These eight profiles of each of the universities can be of interest for assessing them from different perspectives. In some cases the images of a university projected by each ranking are the same, and in others they are different. It corresponds to the users of the information —university or political leaders, researchers, students, analysts, etc.— to consider which of these images are the most relevant for their needs or interests.

The main change in the 2018 edition, apart from the improvements in the information available and the updating of that information, is the inclusion of an analysis of the performance of the Spanish university system over time, since the first edition of U-Ranking. This analysis examines the growth of each university's performance global and in teaching and research between 2010 and 2016. It also provides information about the performance of the regional and national university systems over that period.

The main results of the analysis of the 2018 edition of U-Ranking, are:

1. The synthetic indicators from which the rankings are obtained show that the differences in performance among universities are relevant: the level of the indicator of those with better results triples

that of the universities with the lower performance levels.

2. The differences among universities in terms of volume of results are much higher, since they are influenced by performance and the different sizes of the universities.

3. Public universities dominate the Spanish university system. The universities Pompeu Fabra, Carlos III and the Polytechnic Univerisities of Catalunya and Valencia lead the 2018 U-Ranking.

4. The leadership of some of these universities is especially outstanding in the research and innovation and technological development dimensions. More specifically, two Catalan universities lead the research (Pompeu Fabra) and innovation and technological development (Politècnica de Catalunya) rankings. The Universitat Politècnica de València together with the private universities Deusto, Navarra, and Nebrija head the teaching ranking.

5. There is a group of universities, made up of institutions with varied profiles among which predominate those of larger dimension- that occupy the prominent places regarding volume of results and also performance. Most of them appear at the top 500 universities in the well-known international rankings, such as Shanghai, THE and QS. Thus, U-Ranking confirms that Spanish universities that frequently appear in the international rankings with greater volume of results are more productive. The reiterated signals of quality sent by these institutions allow us to identify them as the excellent Spanish universities, above and beyond any differences in classification criteria. Any effort to improve the positioning of Spanish universities at the international level should therefore focus on these institutions.

6. With regard to the private universities, we confirm their high specialization and remarkable performance in teaching which exceeds by 12% the Spanish average. Five out of ten universities with a high level of performance in teaching are private. To evaluate this result in perspective, it is important to note that the private universities that have been included have higher indicators than the majority of the private one not included due to lack of information, in view of the values which are available. Thus, the average level of the teaching results of private universities could be lower if U-Ranking ever included all the private universities.

7. The specialization in teaching of the private universities has its counterpart in a worse position with respect to the public system regarding research performance: on average 34% less than the mean value of the university system. None of the sixteen universities with best performance in research is private. Public universities present higher levels of performance in research, and in innovation and technological development activities. The mean distance of private universities is 60 percentage points below the national average in innovation.

8. Some international initiatives in this area are already very well known —such as the Shanghai Ranking or THE— and have increased the visibility of the classifications of universities and the social demand for such rankings. But these rankings place the emphasis on the indicators of research and training of high international prestige, leaving out most of the activity of our university system, focused on the teaching of the Bachelor's degree and not really competing in these leagues. This orientation towards indicators of research is also characteristic of most of the existing national rankings, drawn up with guarantees of quality but considering indicators of the activities of universities that are too partial. Our results highlight the key importance of combining research performance with teaching performance measures. Using the former as a proxy for the latter offers a very biased view of reality because the correlation between the two measures is low. The incorporation of private universities further blurs the relationship between the two dimensions, owing to their combination of strong teaching performance and (in many cases) weak research performance, confirming the need to acknowledge the heterogeneity of the Spanish university system.

9. Differences in the results of the universities are also seen at regional level. Catalonia, Cantabria, Valencian Community, Madrid, Navarre, Balearic Islands and Aragon are the regions with the most productive university systems, with average performance levels higher than that of the whole of Spain. Differences in performance among the regional university systems are great: 46 percentage points between the best-performing region and the worst-performing region.

10. U-Ranking 2018 shows considerable stability in its results, compared with those obtained in 2017, which is to be expected, given that the indicators are calculated as moving averages and there have been no significant structural changes in the variables underlying the indicators.

11. Nevertheless, an analysis of the performance of the Spanish University System over the 2010-2016 period shows some interesting changes. The Spanish University System has improved its performance in a period of crisis accompanied by restrictions on staff recruitment and competitive research funding, especially for public universities. Since 2010, Spanish universities have increased their performance at an average annual rate of 4%, which may reflect efficiency improvements in adverse financial circumstances.

12. This growth is spread across practically all universities in both dimensions of the university mission included in the study, namely, teaching and research, but especially in research. Teaching performance has increased at an average annual rate of 3.6%, compared to 4.5% for research performance.

13. The general finding is that the universities that started from lower results improved more, both global and also in teaching and, particularly, research. As a result, the dispersion of results between universities has decreased and the results can be said to have converged. Even so, the more recent results show significant differences in results between the more and the less productive universities.

14. Private universities, less hard hit by the cutbacks in public funding, have increased their share within the system, both in number of students and in the pace of improvement of their performance in teaching (5.8% compared to 3.5% for public universities) and research (14.1% vs 3.7%). Starting from much lower levels in research than the public universities, the private universities have achieved much higher rates of growth, indicating the increased attention some of their units have given to this important dimension of university activity. However, these improvements in research have not translated into significant changes in the research ranking, where they continue to rank below the average and far behind the leaders. In teaching performance, by contrast, the private universities have also achieved more rapid improvements, starting from high positions in the ranking and thus further strengthening their position.

15. The growth in overall performance is found in all the autonomous communities, but the rates of growth vary considerably, from 7% in the Balearic Islands to nearly 50% in the Canary Islands and La Rioja. All the regional systems have also grown in the teaching and research dimensions. The growth has been led by the university systems of La Rioja and Asturias in teaching and those of the Canary Islands, Madrid and the Basque Country in research.

16. The regional systems have also undergone a process of convergence, generating a somewhat more homogeneous Spanish University System at the end of the period. This greater homogeneity is a result of a more marked improvement in the results of the regional systems that started from lower levels, although significant regional differences continue to exist.

Whether the improvement in results and the convergence observed over the study period are in any way attributable to the greater availability of university performance data, in particular the assessments of the universities' position in the rankings, and the increased attention given to such data is impossible to say. But given that these processes have coincided in time, an un-

derlying relationship cannot be ruled out and, if confirmed, would justify the utility of rankings as a driver of improvement efforts.

Beyond these general assessments, rankings are also of use to people who want to use university services, especially prospective students looking for information about teaching performance to help them choose a university. Such students are likely to be interested in teaching quality in particular areas of study, rather than in a university's research performance or overall quality. Indeed, the diversity of the universities is reflected in their varying ability to excel in particular study areas or degree programs. Many universities that do not excel overall nevertheless perform very well in certain degree programs; similarly, a generally high-performing university may perform below average in some degree programs.

To take this fact into account and meet the demand for information about specific areas of study, U-Ranking provides an online tool that generates *personalized rankings* of undergraduate programs. These personalized rankings are based on what students want to study, where they are willing to study and the importance they give to the level of teaching. There are plans to extend this tool in the future to include postgraduate programs, but this cannot be done with the information currently available.

The online tool is designed to provide students with high quality information and easy rankings. It thus simplifies the task of weighing up the options that best match a student's criteria for selecting a university. If the rankings are carefully constructed, they can provide guidance for making decisions that can be complex for non-experts and even for professionals such as careers advisers. No ranking is exempt from problems when it condenses information into an indicator, but the costs of not constructing synthetic indicators by making the effort to gather and organize a large volume of complex information are very high. Those costs may also lead people to make their decisions based on inappropriate or partial information, or even ignoring information because they do not know how to interpret it. For that reason, a system of well-constructed rankings such as the one offered by U-Ranking (together with the supplementary information on cut-off marks, tuition fees and other characteristics of the university environment) may facilitate decision making for many people by encouraging them to consider the best information available. This appears to be confirmed by the intensive use of the U-Ranking website in the six years it has been in operation.

In summary, the general results of the analyses show a university system that has improved in recent years, very different degrees of specialization in teaching, research and knowledge transfer activities between universities and considerable heterogeneity in the ability to produce results. These three characteristics are very relevant when diagnosing the situation of the Spanish University System and offering guidance for university policies because they do not support the view that the system is stagnating, nor do they suggest that the problems of the universities can be solved by applying uniform measures that ignore the biodiversity of the university system. The recognition of that diversity is also a relevant factor for university administrators, who may find useful guidance in the analyses that will help them improve their universities by comparison with their closest peers.

The broad set of information on the universities provided by U-Ranking serves to identify important aspects of the heterogeneity of the Spanish university system and within the universities themselves. Recognition of that diversity is very important for various purposes: to assess the universities' performance; to more selectively guide their improvement strategies and university policies; to guide potential users of the universities' teaching services; and to provide information for companies and institutions interested in knowing the universities' capacity to generate R&D&I results.

Appendix 1: Glossary of Indicators

Appendix 1. Glossary of indicators and statistical sources of U-Ranking 2018

Dimension	Area	Indicator and definition	Source	Period	Disaggregation
Teaching	Resources	**Faculty member per 100 students:** Full-time equivalent faculty and research staff in centers belonging to the University per 100 full-time equivalent students in studies of 1st and 2nd cycle, Bachelor's and Master's degrees and students in Doctoral degrees (all of these students registered in centers belonging to the University)	SIIU CRUE	2012-13 to 2015-16	Branch of knowledge
		Budget / Student: Effective income of the University by number of full-time equivalent students in studies of 1st and 2nd cycle, Bachelor's and Master's degrees and of students in Doctoral degrees (all of these students registered in centers belonging to the University)	SIIU CRUE	2010, 2012 to 2015	University
		Faculty member with PhD / Faculty members: Full-time equivalent faculty members with PhD in centers belonging to the University over total full-time equivalent faculty and research staff in centers belonging to the University	CRUE	2010-11, 2012-13 to 2015-16	University
	Output	**Success rate:** Number of credits passed by grade students registered in an academic year over total credits evaluated within the same course (excluding transfer and recognized credits)	SIIU[1]	2010-11 to 2015-16	Branch of knowledge
		Evaluation rate: Number of credits evaluated by grade students registered in an academic year over total credits registered within the same course (excluding transfer and recognized credits)	SIIU[1]	2010-11 to 2015-16	Branch of knowledge
		Drop-out rate: Number of students registered in academic year t who, two years after registering in the first year of a degree, abandon it without graduating, over the total number of students registered in year t	SIIU[1]	2010-11 to 2015-16	Branch of knowledge
	Quality	**Attractiveness index**	-	-	-
		Percentage of postgraduate students: Full-time equivalent students registered in Master's degrees over the total number of full-time equivalent students registered in studies of 1st and 2nd cycle, Bachelor's and Master's degrees (all of these students registered in centers belonging to the University)	SIIU	2010-11 to 2015-16	Branch of knowledge
		Cut-off mark: Mark of the last *general group*[2] student that gained admission to a degree with limited places	SIIU	2017-18	Bachelor's degree
	Internationalization	**Percentage of foreign students:** Non-Spanish students of 1st and 2nd cycle, Bachelor's and Master's degrees over the total number of students of 1st and 2nd cycle, Bachelor's and Master's degrees	SIIU	2010-11 to 2015-16	Bachelor's degree
		Percentage of students in exchange programs: Spanish students of 1st and 2nd cycle and Bachelor's degrees who participate in the ERASMUS program, over the total number of students of 1st and 2nd cycle and Bachelor's degrees	CRUE	2010-11, 2012-13 to 2015-16	Branch of knowledge
		Percentage of students registered in programs imparted in non-official languages	-	-	-

Appendix 1. Glossary of indicators and statistical sources of U-Ranking 2018 (continued)

Dimension	Area	Indicator and definition	Source	Period	Disaggregation
Research	Resources	**Competitive public resources per faculty member with PhD:** Competitive public resources for undirected research projects, including both projects and complementary actions and ERDF funds, over the total number of faculty members with full-time equivalent PhD	DGICT CRUE	2011 to 2016	Branch of knowledge
		Contracts with PhDs, research grants and technical support over total budget: Competitive resources obtained for research staff training, Juan de la Cierva, Ramón and Cajal and support technicians over total effective income	DGICT CRUE	2011 to 2016	Branch of knowledge
	Output	**Citable documents with ISI reference per faculty member with PhD:** Documents with ISI reference published per 100 faculty members with full-time equivalent PhD	IUNE (Thomson Reuters) CRUE	2011 to 2016	Branch of knowledge
		Total *sexenios*[3] over possible sexenios: Sexenios obtained over the total possible sexenios for the universities' tenured research staff	CRUE	2012 to 2015	Branch of knowledge
		Doctoral theses read per 100 faculty members with PhD: Doctoral theses read per 100 faculty members with full-time equivalent PhD	MECD CRUE	2011 to 2016	Branch of knowledge
	Quality	**Mean impact factor:** Mean impact factor of the publications with at least one author affiliated to the University	IUNE (Thomson Reuters)	2011 to 2016	Bachelor's degree group
		Percentage of publications in the first quartile: Publications corresponding to journals in the first quartile of relevance within the Thomson Reuters classification by areas, over the total number of publications belonging to that area	IUNE (Thomson Reuters)	2011 to 2016	Bachelor's degree group
		Citations per document: Citations received per document from the date of publication to the date of data gathering	IUNE (Thomson Reuters)	2011 to 2016	Bachelor's degree group
	Internationalization	**European or international research funds per faculty member with PhD:** Effective income received from abroad due to applied research per 100 faculty members with full-time equivalent PhD in centers belonging to the University	CRUE	2014 and 2015	University
		Percentage of publications with international co-authorship: Publications with at least one co-author affiliated to a foreign institution over the total number of publications	IUNE (Thomson Reuters)	2011 to 2016	Bachelor's degree group

Appendix 1. Glossary of indicators and statistical sources of U-Ranking 2018 (continued)

Dimension	Area	Indicator and definition	Source	Period	Disaggregation
Innovation and Technological Development	Resources	**Income from licenses per 100 faculty members with PhD[4]:** Income generated by the use and exploitation of licenses of the university for each 100 faculty members with PhD	IUNE (OTRIs and MECD)	2010 to 2015	University
		Income from consultancy contracts per 100 faculty members with PhD[4]: Income from R&D and consultancy contracts and from provision of services per 100 faculty members with PhD	IUNE (OTRIs and MECD)	2010 to 2015	University
		Income from continuing professional development (CPD) courses per faculty member with PhD[4]: Fees received from registration both for CPD and for the university's own postgraduate programs (master, specialist and expert) per faculty member with PhD	IUNE (OTRIs and MECD)	2010, 2012 to 2015	University
	Output	**Number of patents per 100 faculty members with PhD[4]**: Number of national patents granted to each Spanish university by the Spanish Patents and Trade Marks Office per 100 faculty members with PhD	IUNE (INVENES and MECD)	2011 to 2016	University
		CPD hours per faculty member with PhD[4]	-	-	-
		Number of contracts per faculty member with PhD[4]	-	-	-
	Quality	Patents commercialized per faculty member with PhD[4]		-	-
	Internationalization	**Triadic patents per 100 faculty members with PhD[4]**: Number of simultaneous protections of inventions in different countries obtained through an international patent application, per 100 faculty members with PhD	IUNE (OTRIs and MECD)	2010 to 2015	University
		Income from international contracts per faculty member with PhD[4]	-	-	-

[1]For the calculation of the personalized rankings, information provided by the CRUE for the academic years 2010-11, 2012-13, 2013-14 and 2014-15 is used since it is offered by degree and university.

[2]General group: students finishing high school or students graduated in Advanced Vocational Training or foreign students.

[3] Monetary compensation received for research activity based on the last six years. This indicator is only considered for public universities

[4] The faculty members with PhD used for calculating the indicators of Innovation and Technological Development are those in the following categories: Professor, University School Professor, Associate Professor, University School Associate Professor, and Assistant Professor, registered each year in the centers belonging to the public universities. In the case of private universities it considers university professors with permanent contracts registered each year.

Appendix 2: List of University Abbreviations

Abbreviation	University	Type
COMILLAS	Universidad Pontificia Comillas	Private
UA	Universidad de Alicante	Public
UAB	Universitat Autònoma de Barcelona	Public
UAH	Universidad de Alcalá de Henares	Public
UAL	Universidad de Almería	Public
UAM	Universidad Autónoma de Madrid	Public
UANE	Universidad Antonio de Nebrija	Private
UB	Universitat de Barcelona	Public
UBU	Universidad de Burgos	Public
UC3M	Universidad Carlos III	Public
UCA	Universidad de Cádiz	Public
UCEU	Universidad San Pablo-CEU	Private
UCLM	Universidad de Castilla-La Mancha	Public
UCM	Universidad Complutense	Public
UCO	Universidad de Córdoba	Public
UCV	Universidad Católica de València San Vicente Mártir	Private
UDC	Universidade da Coruña	Public
UDE	Universidad de Deusto	Private
UDG	Universitat de Girona	Public
UDIMA	Universidad a distancia de Madrid	Private
UDL	Universitat de Lleida	Public
UEMC	Universidad Europea Miguel de Cervantes	Private
UGR	Universidad de Granada	Public
UHU	Universidad de Huelva	Public
UIB	Universitat de les Illes Balears	Public
UIC	Universitat Internacional de Catalunya	Private
UJAEN	Universidad de Jaén	Public
UJI	Universitat Jaume I	Public
ULL	Universidad de La Laguna	Public
ULPGC	Universidad de Las Palmas de Gran Canaria	Public
UM	Universidad de Murcia	Public
UMA	Universidad de Málaga	Public
UMH	Universidad Miguel Hernández de Elche	Public
UMON	Mondragon Unibertsitatea	Private
UN	Universidad de Navarra	Private
UNED	Universidad Nacional de Educación a Distancia	Public
UNEX	Universidad de Extremadura	Public
UNICAN	Universidad de Cantabria	Public
UNILEON	Universidad de León	Public
UNIOVI	Universidad de Oviedo	Public
UNIRIOJA	Universidad de La Rioja	Public
UNIZAR	Universidad de Zaragoza	Public
UOC	Universitat Oberta de Catalunya	Private
UPC	Universitat Politècnica de Catalunya	Public
UPCT	Universidad Politécnica de Cartagena	Public
UPF	Universitat Pompeu Fabra	Public
UPM	Universidad Politécnica de Madrid	Public
UPNA	Universidad Pública de Navarra	Public
UPO	Universidad Pablo de Olavide	Public
UPV	Universitat Politècnica de València	Public
UPV-EHU	Universidad del País Vasco	Public
URJC	Universidad Rey Juan Carlos	Public
URLL	Universitat Ramon Llull	Private
URV	Universitat Rovira i Virgili	Public
US	Universidad de Sevilla	Public
USAL	Universidad de Salamanca	Public
USC	Universidade de Santiago de Compostela	Public
UV	Universitat de València	Public
UVA	Universidad de Valladolid	Public
UVIC	Universitat de Vic	Private
UVIGO	Universidade de Vigo	Public

Appendix 3: Universities' Panel of Indicators

1. Mondragon Unibertsitatea
2. Universidad a distancia de Madrid
3. Universidad Autónoma de Madrid
4. Universidad Carlos III
5. U. Católica de Valencia S. Vte. Mártir
6. Universidad Complutense
7. Universidad de Alcalá de Henares
8. Universidad de Alicante
9. Universidad de Almería
10. Universidad de Burgos
11. Universidad de Cádiz
12. Universidad de Cantabria
13. Universidad de Castilla-La Mancha
14. Universidad de Córdoba
15. Universidad de Deusto
16. Universidad de Extremadura
17. Universidad de Granada
18. Universidad de Huelva
19. Universidad de Jaén
20. Universidad de La Laguna
21. Universidad de La Rioja
22. U. de Las Palmas de Gran Canaria
23. Universidad de León
24. Universidad de Málaga
25. Universidad de Murcia
26. Universidad de Navarra
27. Universidad de Oviedo
28. Universidad de Salamanca
29. Universidad de Sevilla
30. Universidad de Valladolid
31. Universidad de Zaragoza
32. Universidad del País Vasco
33. U. Europea Miguel de Cervantes
34. U. Miguel Hernández de Elche
35. U. Nacional de Educación a Distancia
36. Universidad Nebrija
37. Universidad Pablo de Olavide
38. Universidad Politécnica de Cartagena
39. Universidad Politécnica de Madrid
40. Universidad Pontificia Comillas
41. Universidad Pública de Navarra
42. Universidad Rey Juan Carlos
43. Universidad San Pablo-CEU
44. Universidade da Coruña
45. U. de Santiago de Compostela
46. Universidade de Vigo
47. Universitat Autònoma de Barcelona
48. Universitat de Barcelona
49. Universitat de Girona
50. Universitat de les Illes Balears
51. Universitat de Lleida
52. Universitat de València
53. U. de Vic-U. Central de Catalunya
54. Universitat Internacional de Catalunya
55. Universitat Jaume I
56. Universitat Oberta de Catalunya
57. Universitat Politècnica de Catalunya
58. Universitat Politècnica de València
59. Universitat Pompeu Fabra
60. Universitat Ramon Llull
61. Universitat Rovira i Virgili

MONDRAGON UNIBERTSITATEA

Year of foundation: 1997

Type of ownership: Private

Bachelor's degree students[1]: 3,485

Master's degree students[1]: 597

Faculty members[1]: 384

Administration and service staff[1]: 105

Budget[2]: no disponible

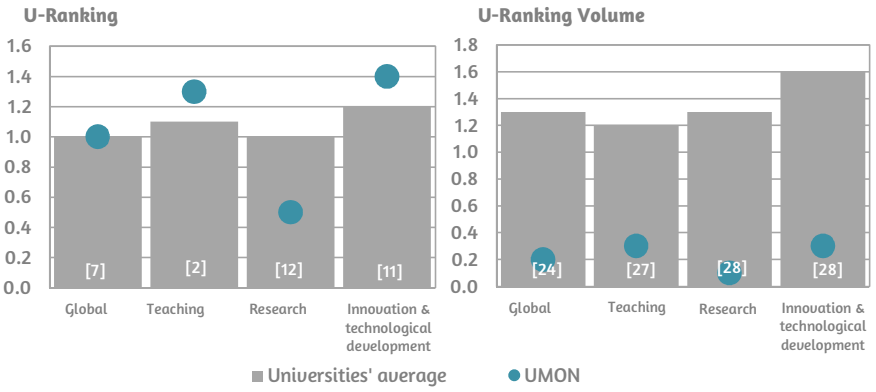
Bachelor's degrees[3]: 15

Master's degrees[3]: 17

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

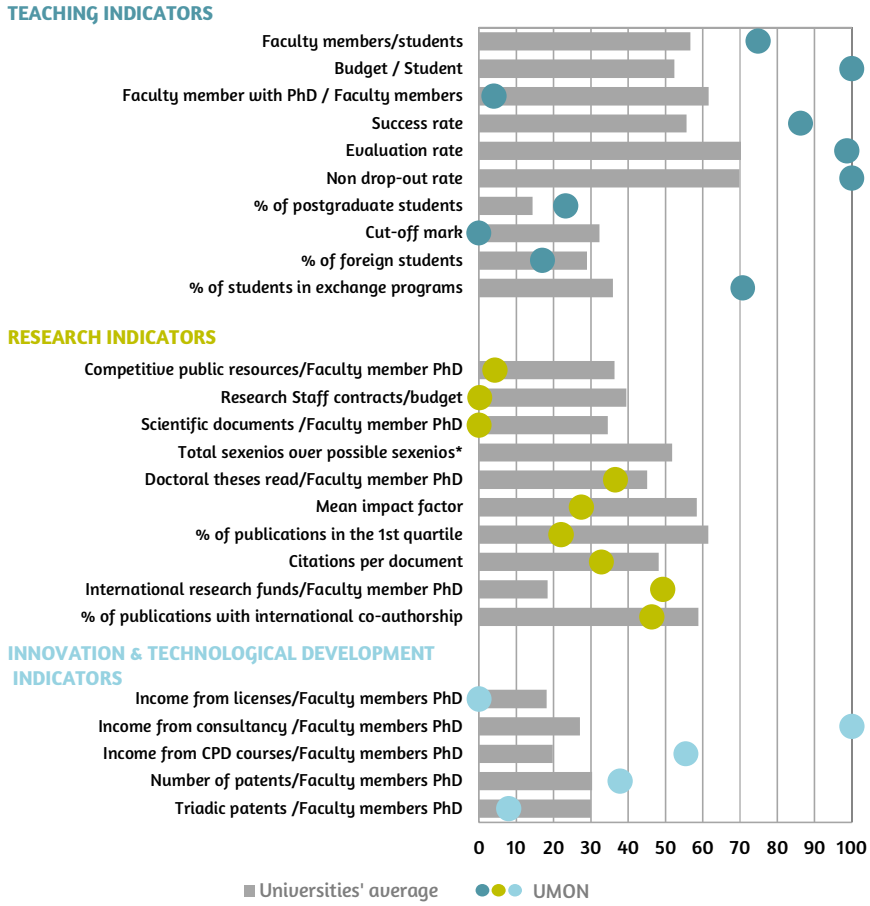
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



U-Ranking 2018 indicators

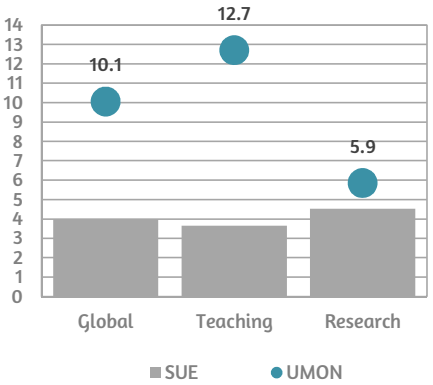
University with the minimum value=0; University with the maximum value=100



*The "sexenios" indicator is not considered for private universities

Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD A DISTANCIA DE MADRID

Year of foundation: 2008

Type of ownership: Private

Bachelor's degree students[1]: 3,458

Master's degree students[1]: 3,950

Faculty members[1]: 212

Administration and service staff[1]: 69

Budget[2]: no disponible

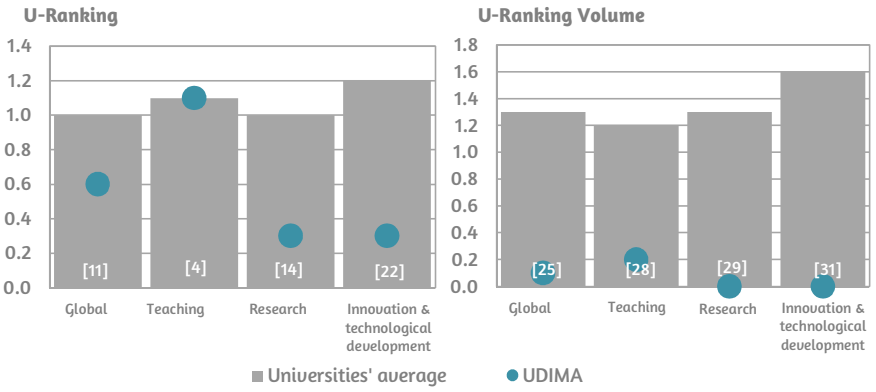
Bachelor's degrees[3]: 25

Master's degrees[3]: 35

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

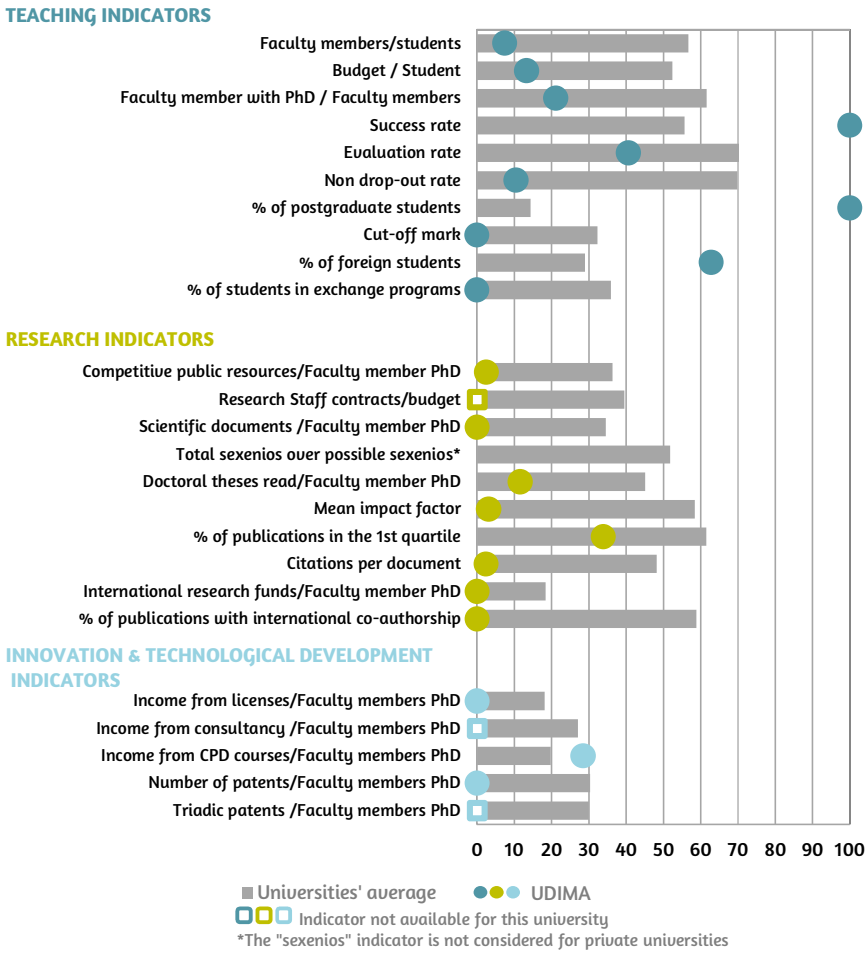
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



U-Ranking 2018 indicators

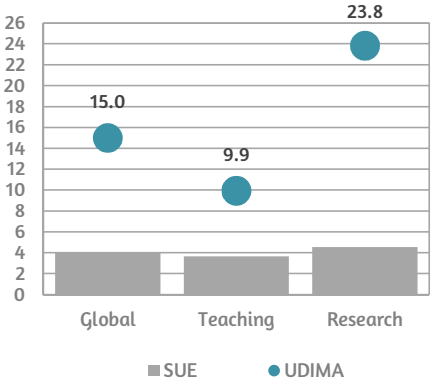
University with the minimum value=0; University with the maximum value=100



*The "sexenios" indicator is not considered for private universities

Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD AUTÓNOMA DE MADRID

Year of foundation: 1968

Type of ownership: Public

Bachelor's degree students[1]: 21,297

Master's degree students[1]: 3,065

Faculty members[1]: 2,520

Administration and service staff[1]: 1,038

Budget[2]: 235,089,299€

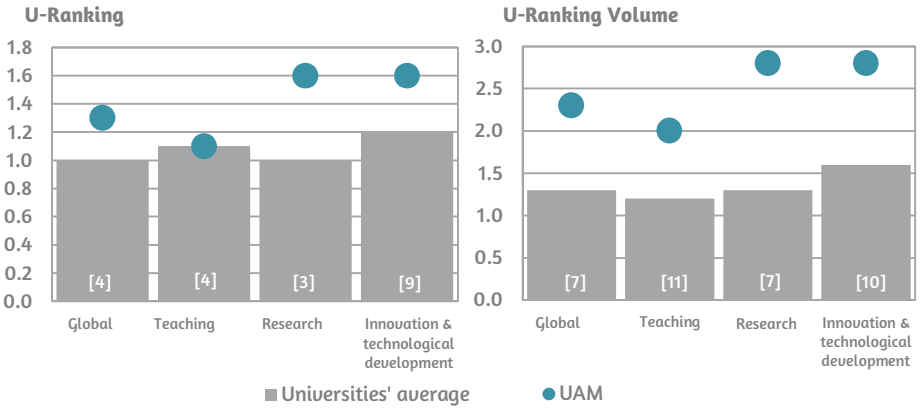
Bachelor's degrees[3]: 38

Master's degrees[3]: 80

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

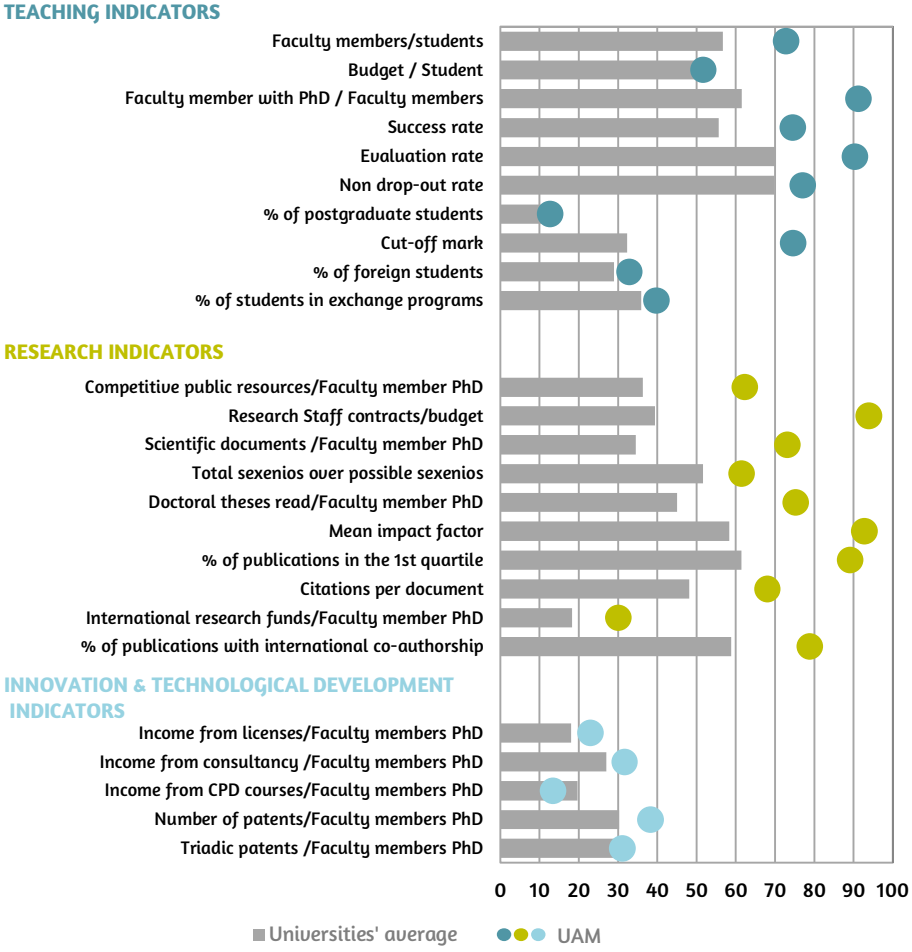
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



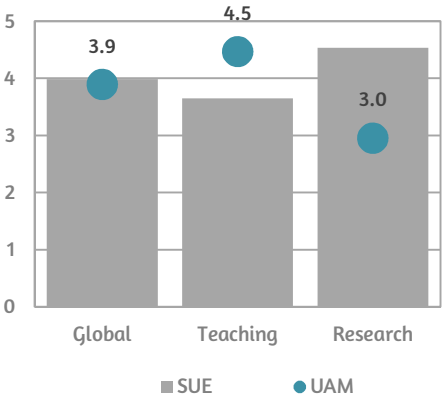
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD CARLOS III

Universidad Carlos III de Madrid

Year of foundation: 1989

Type of ownership: Public

Bachelor's degree students[1]: 15,348

Master's degree students[1]: 3,026

Faculty members[1]: 1,555

Administration and service staff[1]: 689

Budget[2]: 159,649,107€

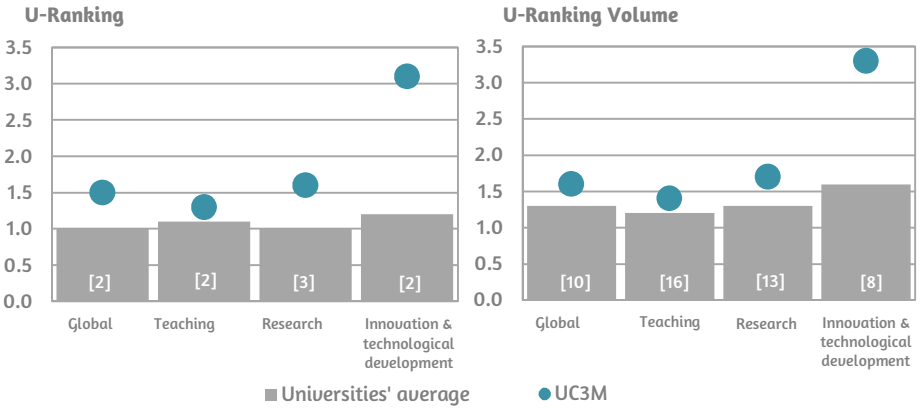
Bachelor's degrees[3]: 28

Master's degrees[3]: 66

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers. Source: Ministry of Education, Culture and Sport

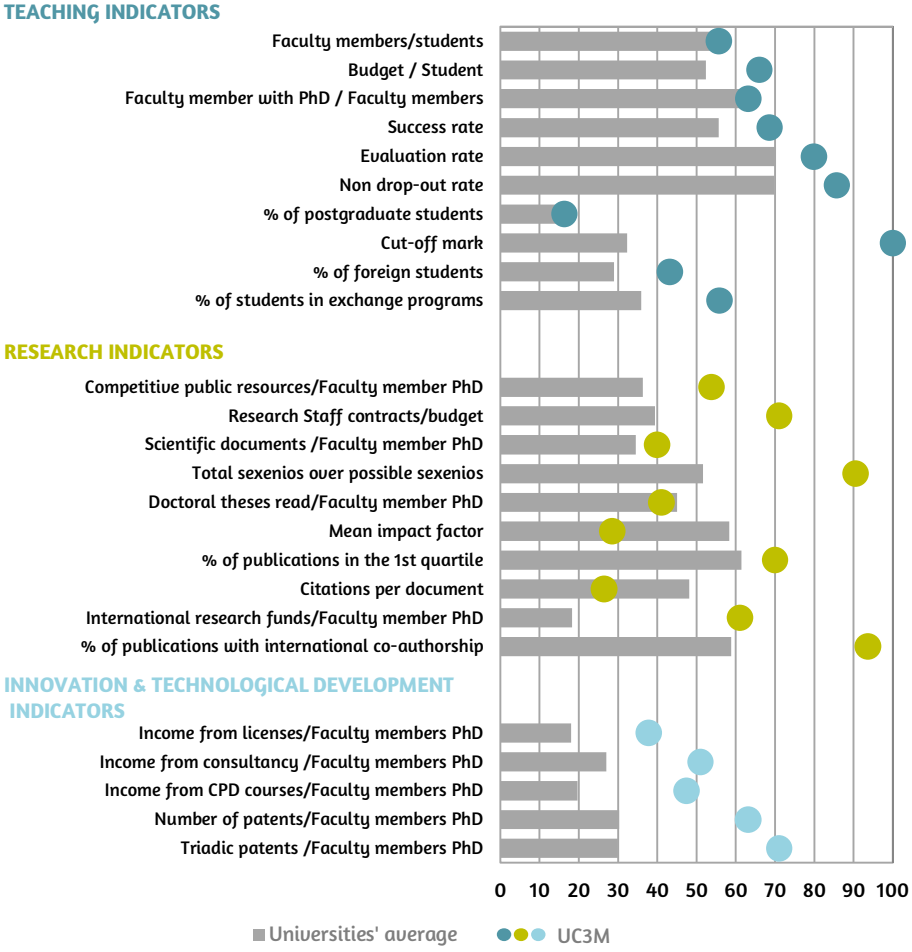
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



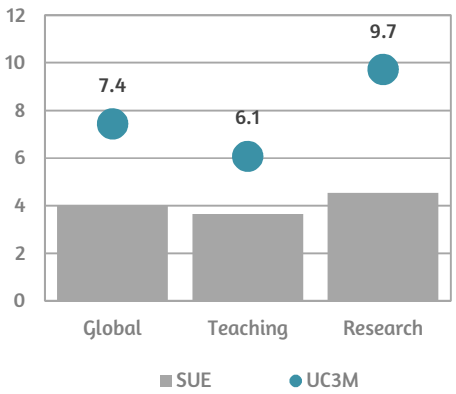
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD CATÓLICA DE VALENCIA SAN VICENTE MÁRTIR

Year of foundation: 2004

Type of ownership: Private

Bachelor's degree students[1]: 9,106

Master's degree students[1]: 1,819

Faculty members[1]: 873

Administration and service staff[1]: 379

Budget[2]: no disponible

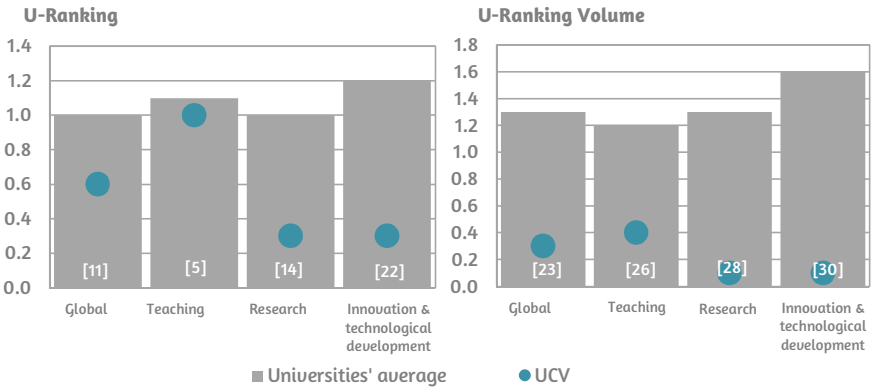
Bachelor's degrees[3]: 26

Master's degrees[3]: 40

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

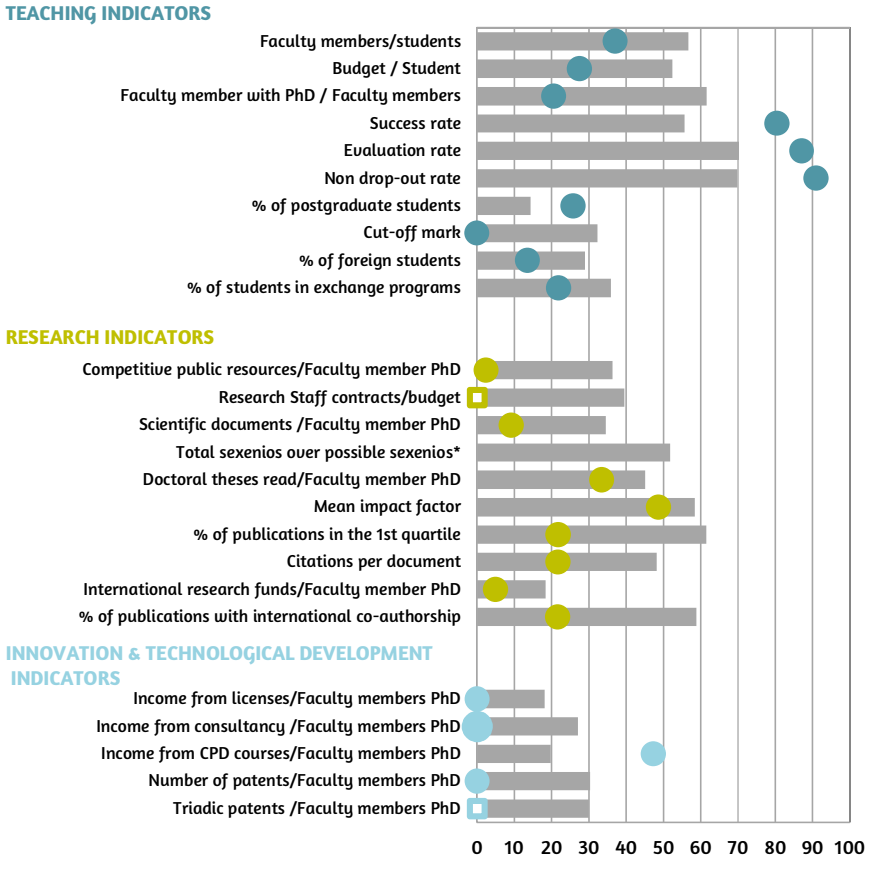
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



U-Ranking 2018 indicators

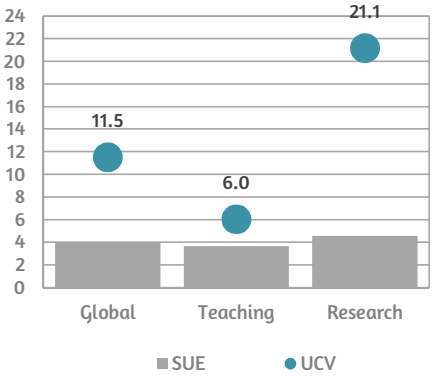
University with the minimum value=0; University with the maximum value=100



*The "sexenios" indicator is not considered for private universities

Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD COMPLUTENSE

Year of foundation: 1508

Type of ownership: Public

Bachelor's degree students[1]: 54,029

Master's degree students[1]: 6,422

Faculty members[1]: 5,727

Administration and service staff[1]: 3,241

Budget[2]: 504,932,980€

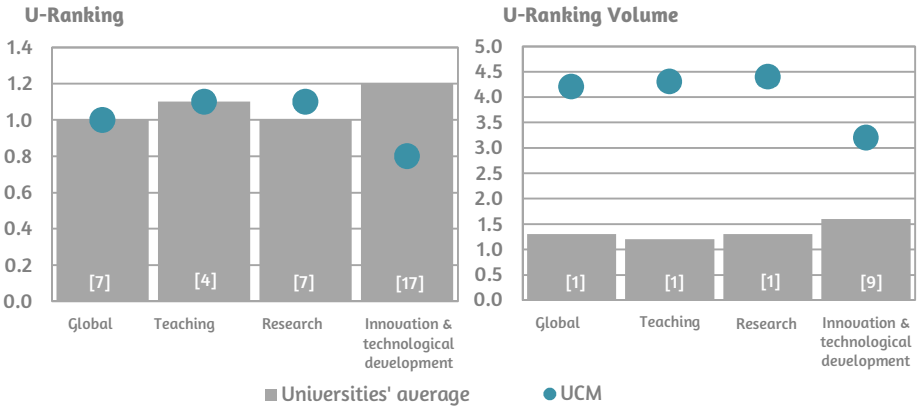
Bachelor's degrees[3]: 70

Master's degrees[3]: 163

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

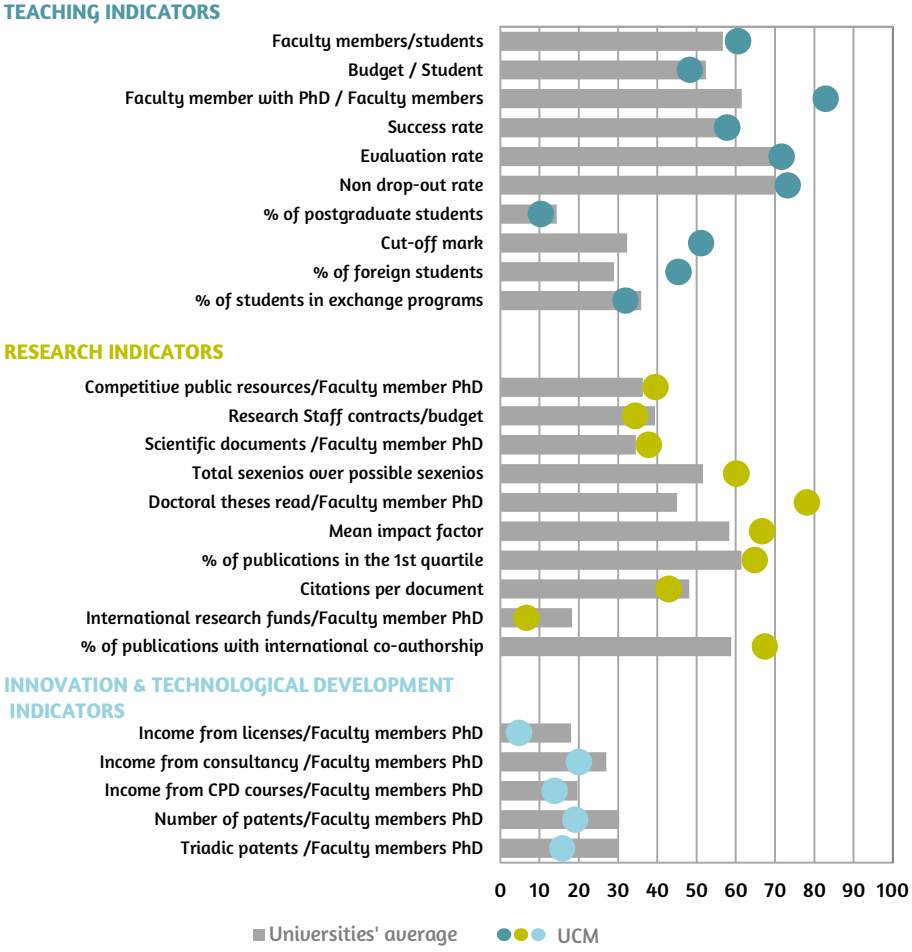
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



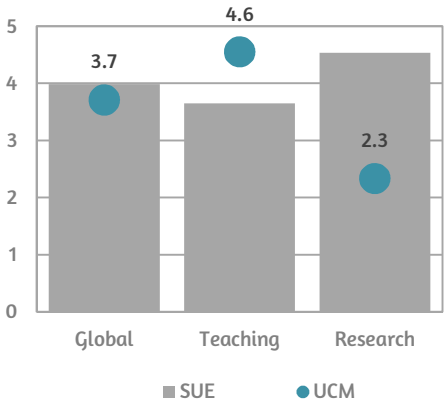
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE ALCALÁ DE HENARES

Universidad de Alcalá

Year of foundation: 1977

Type of ownership: Public

Bachelor's degree students[1]: 13,651

Master's degree students[1]: 2,481

Faculty members[1]: 1,659

Administration and service staff[1]: 785

Budget[2]: 142,204,056€

Bachelor's degrees[3]: 35

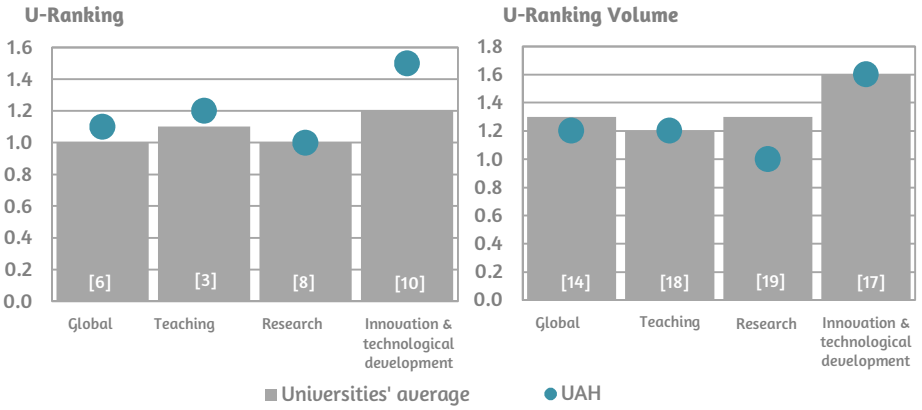
Master's degrees[3]: 48

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

Ũ Ranking

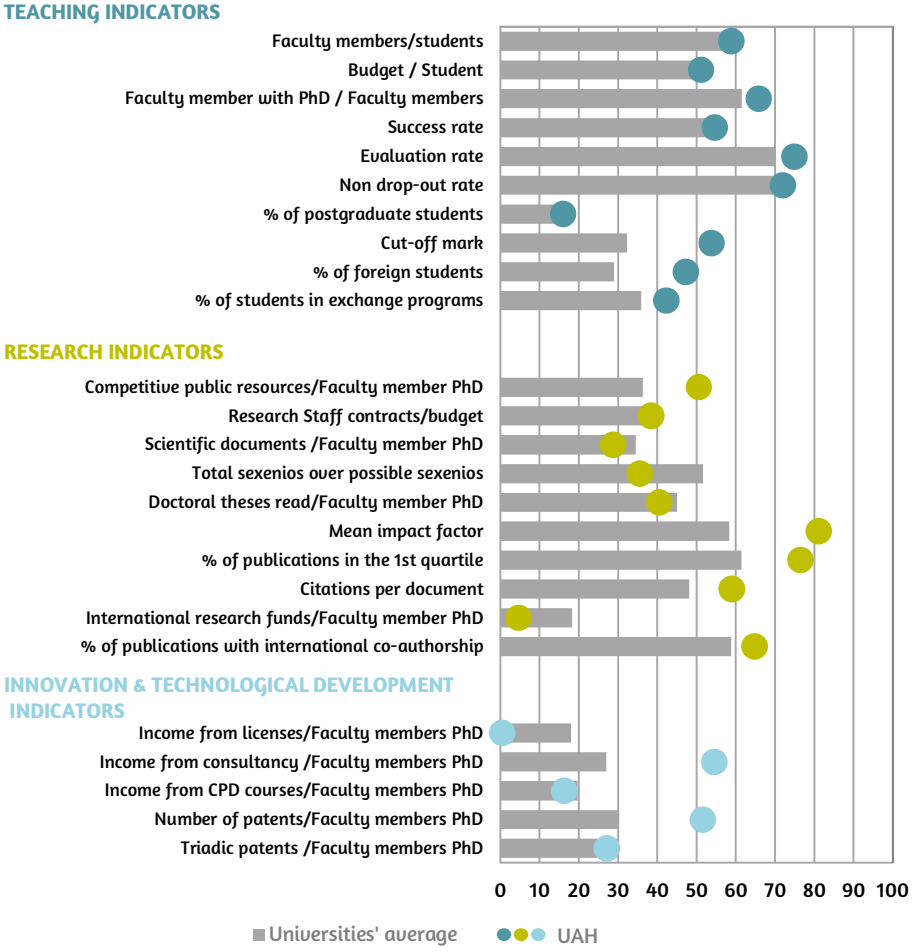
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



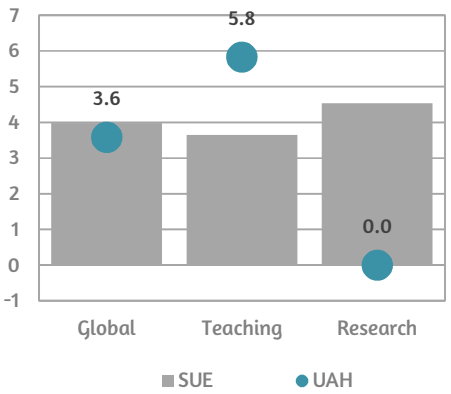
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE ALICANTE

Universitat d'Alacant
Universidad de Alicante

Year of foundation: 1979

Type of ownership: Public

Bachelor's degree students[1]: 22,244

Master's degree students[1]: 1,748

Faculty members[1]: 2,180

Administration and service staff[1]: 1,245

Budget[2]: 186,345,904€

Bachelor's degrees[3]: 41

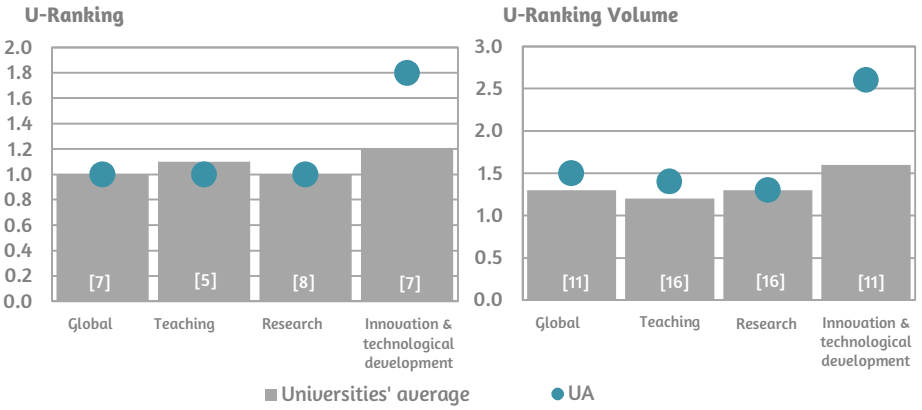
Master's degrees[3]: 54

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

Ranking

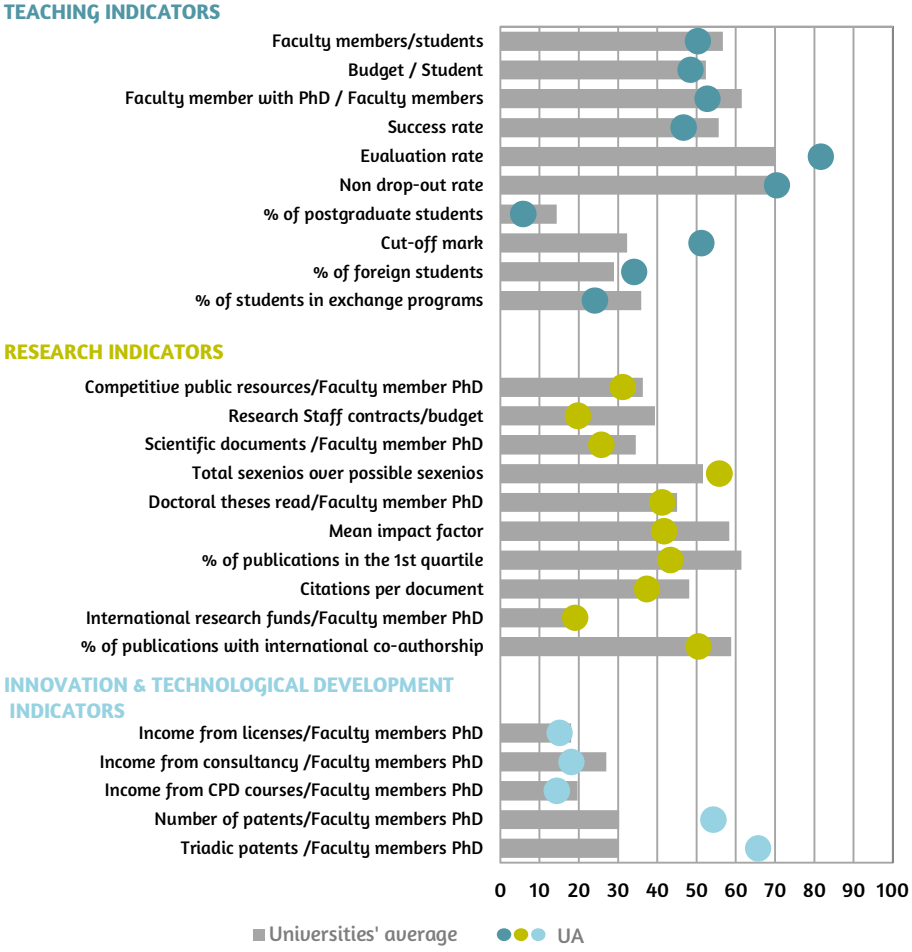
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



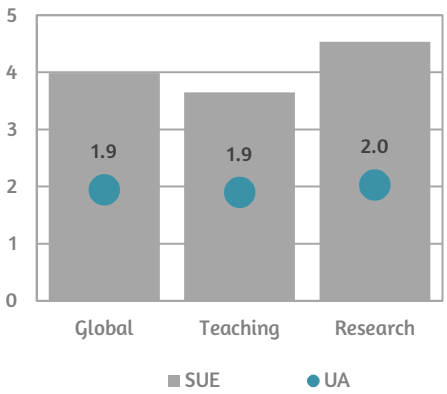
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE ALMERÍA

UNIVERSIDAD DE ALMERÍA

Year of foundation: 1993

Type of ownership: Public

Bachelor's degree students[1]: 11,124

Master's degree students[1]: 1,208

Faculty members[1]: 780

Administration and service staff[1]: 464

Budget[2]: 85,036,546€

Bachelor's degrees[3]: 29

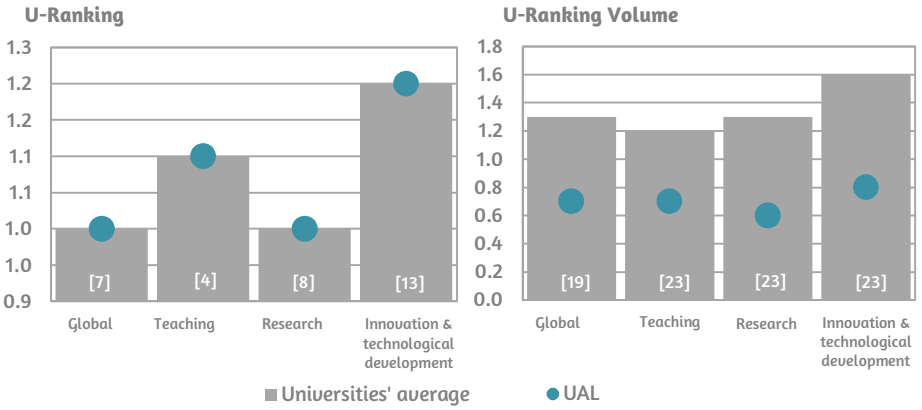
Master's degrees[3]: 44

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers. Source: Ministry of Education, Culture and Sport

Ranking

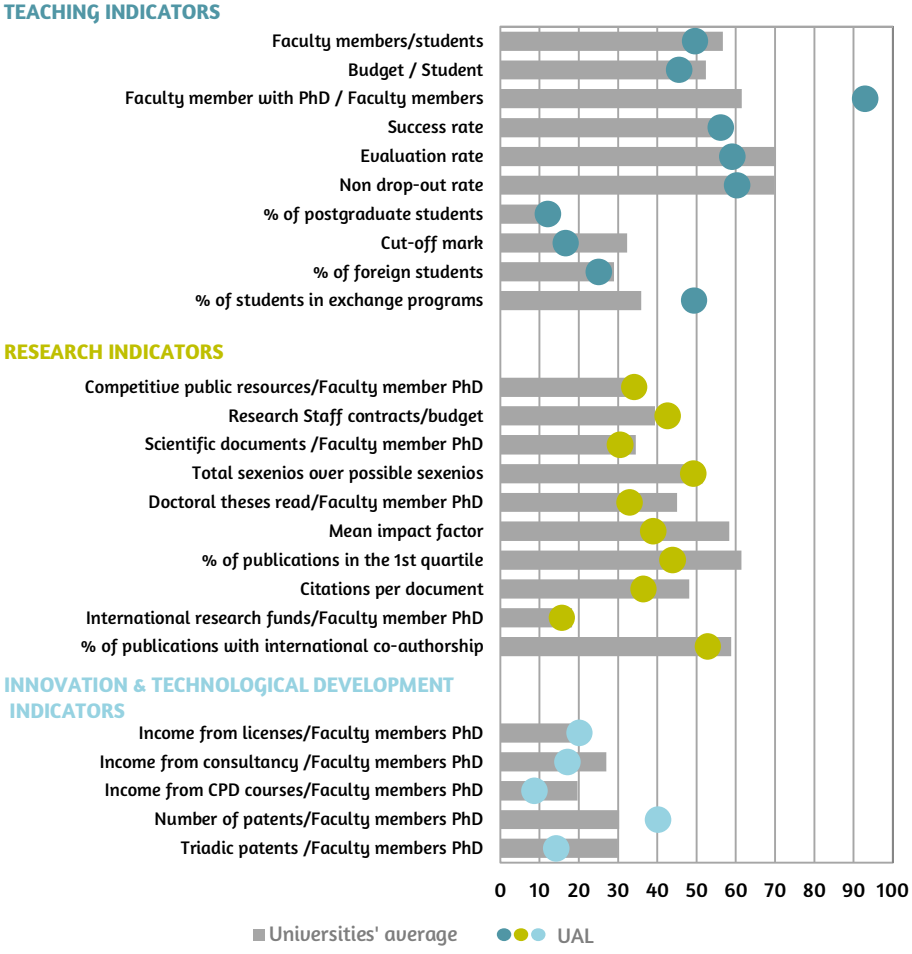
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



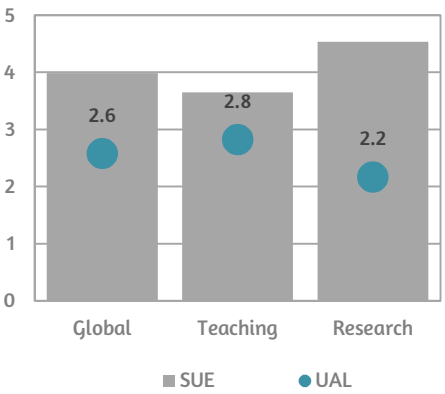
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE BURGOS

UNIVERSIDAD DE BURGOS

Year of foundation: 1994

Type of ownership: Public

Bachelor's degree students[1]: 6,365

Master's degree students[1]: 481

Faculty members[1]: 789

Administration and service staff[1]: 345

Budget[2]: 57,827,434€

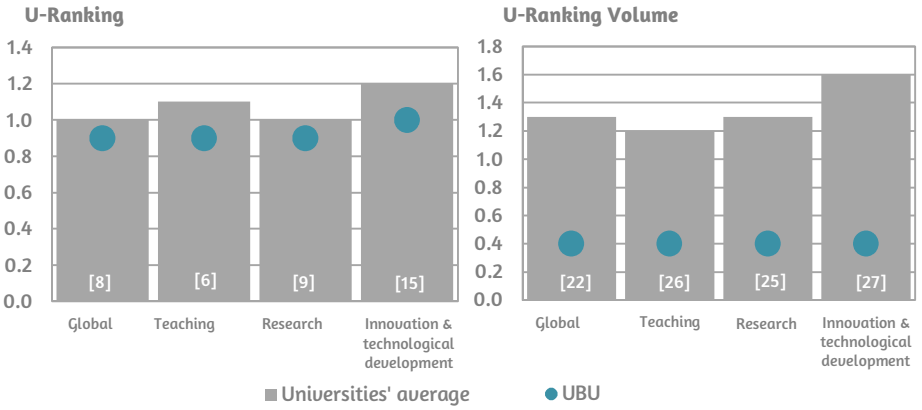
Bachelor's degrees[3]: 25

Master's degrees[3]: 21

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

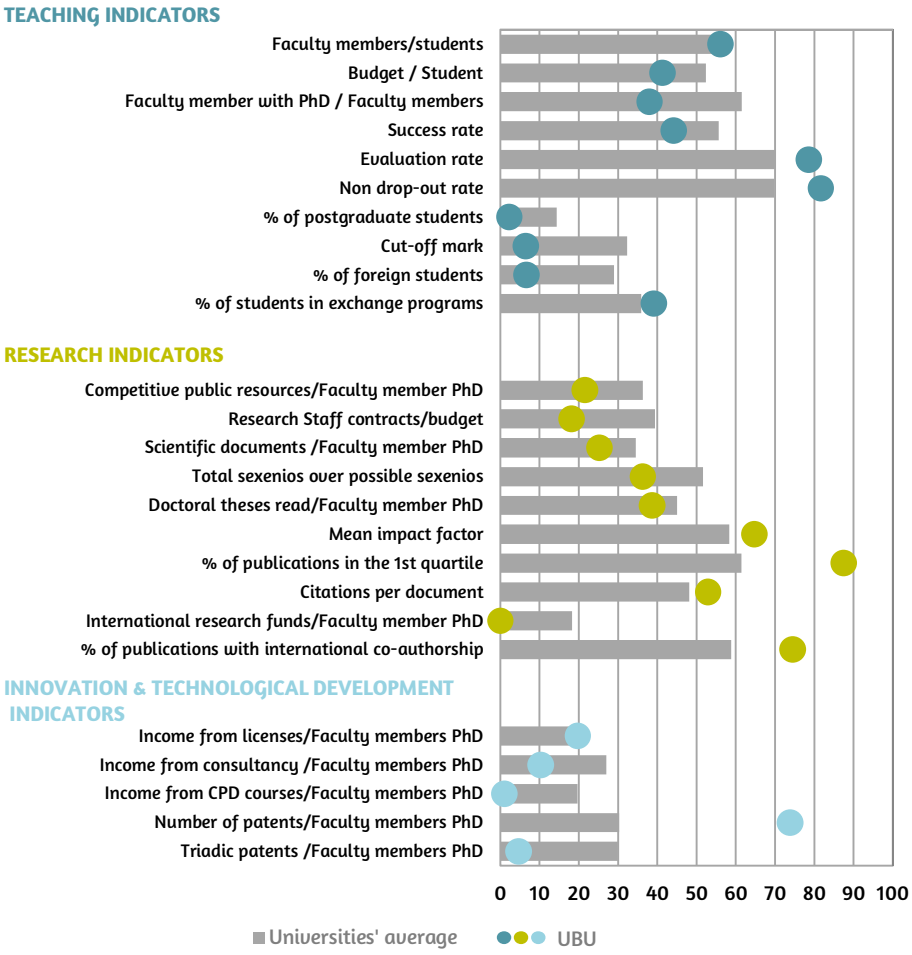
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



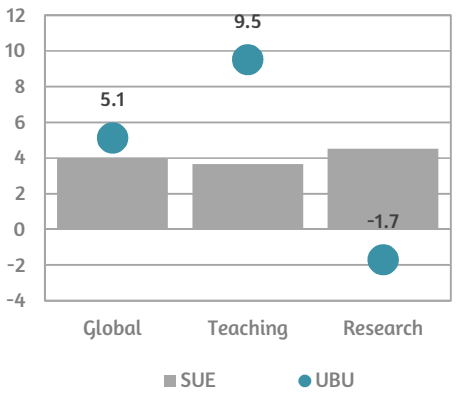
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE CÁDIZ

Year of foundation: 1979

Type of ownership: Public

Bachelor's degree students[1]: 18,899

Master's degree students[1]: 1,543

Faculty members[1]: 1,532

Administration and service staff[1]: 700

Budget[2]: 141,661,339€

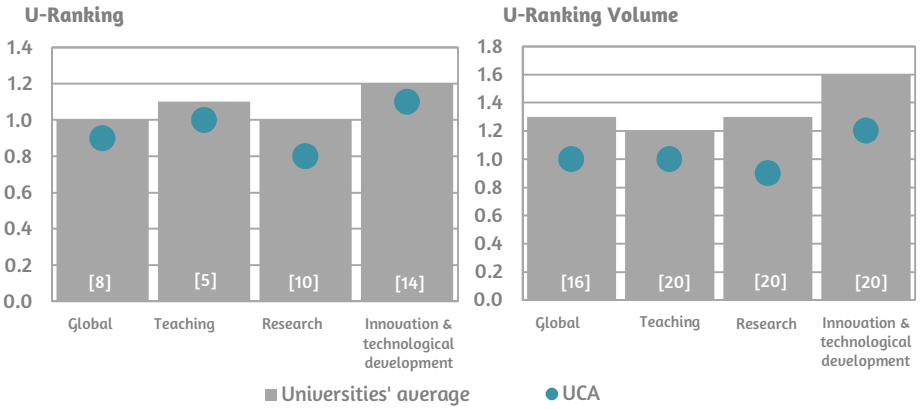
Bachelor's degrees[3]: 44

Master's degrees[3]: 49

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

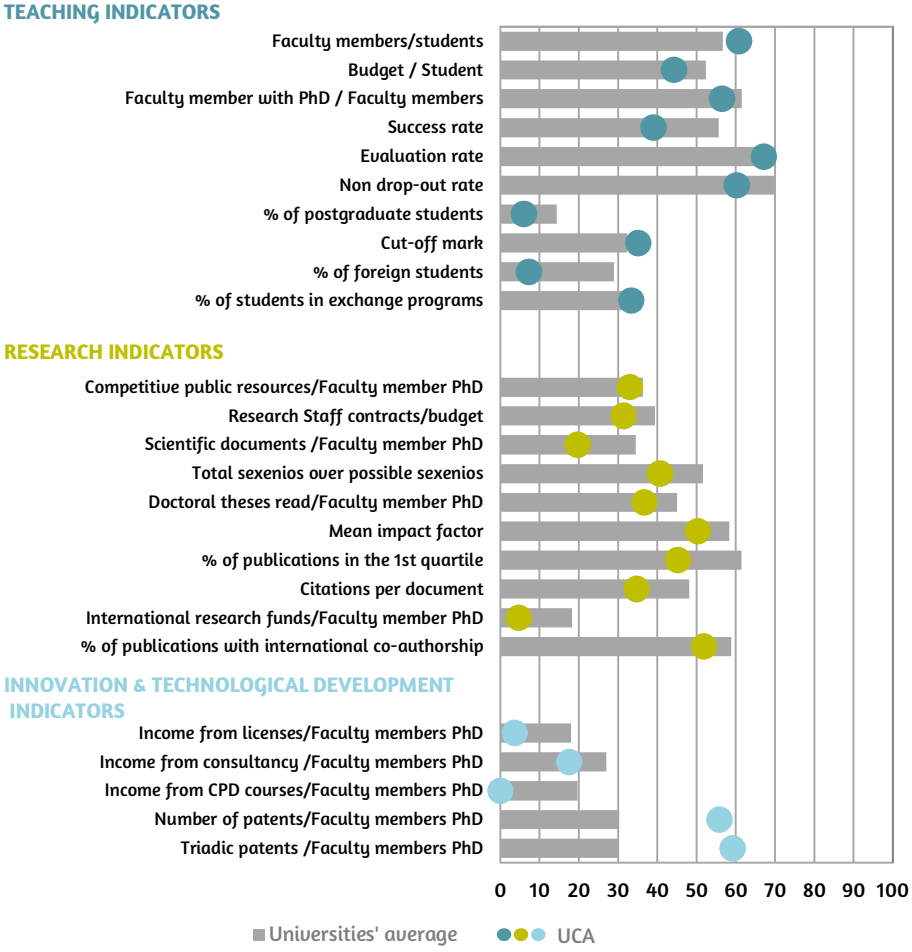
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



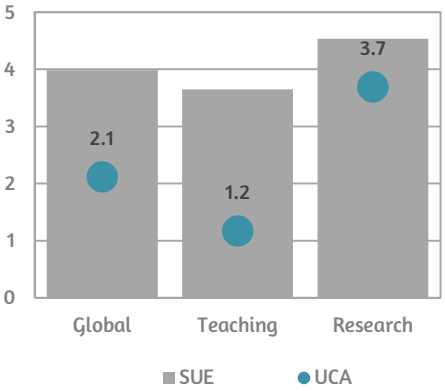
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE CANTABRIA

Year of foundation: 1972

Type of ownership: Public

Bachelor's degree students[1]: 8,106

Master's degree students[1]: 1,075

Faculty members[1]: 1,226

Administration and service staff[1]: 597

Budget[2]: 104,839,015€

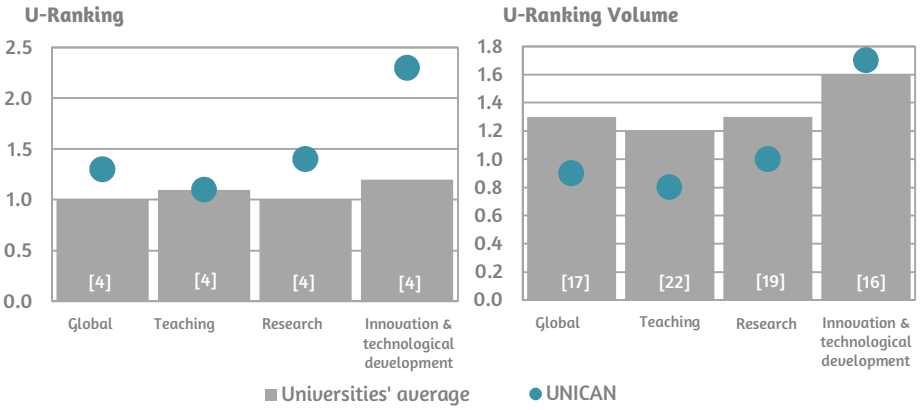
Bachelor's degrees[3]: 25

Master's degrees[3]: 44

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers. Source: Ministry of Education, Culture and Sport

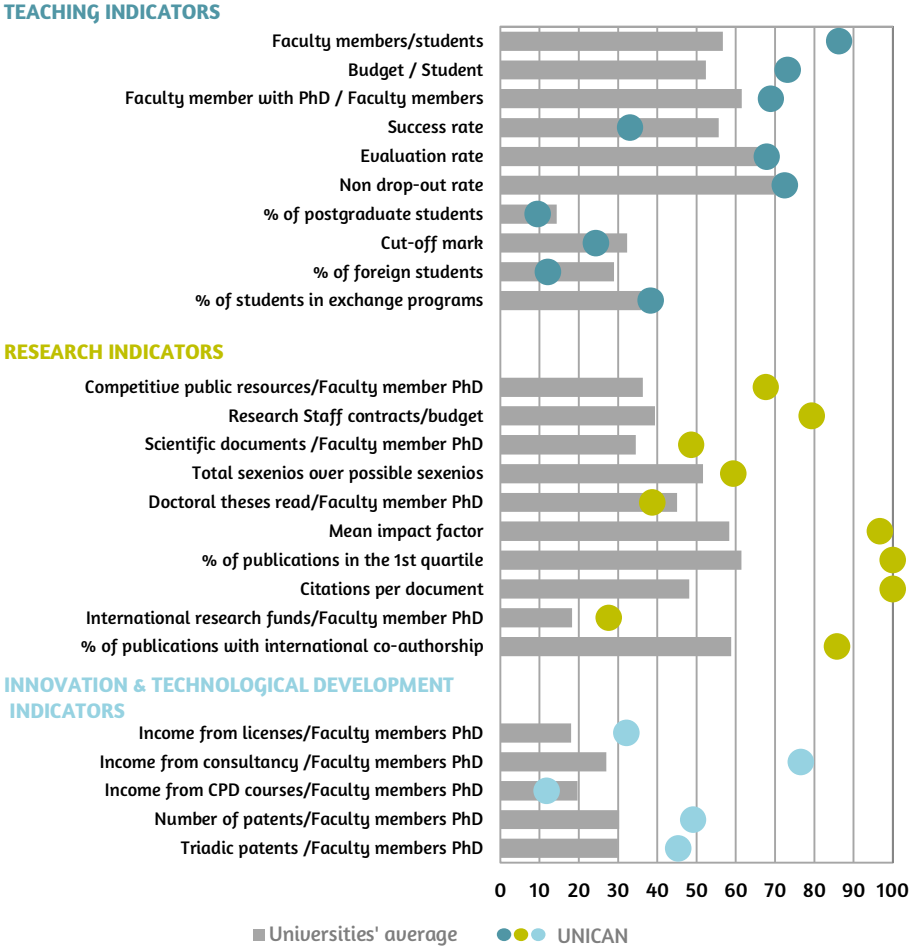
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



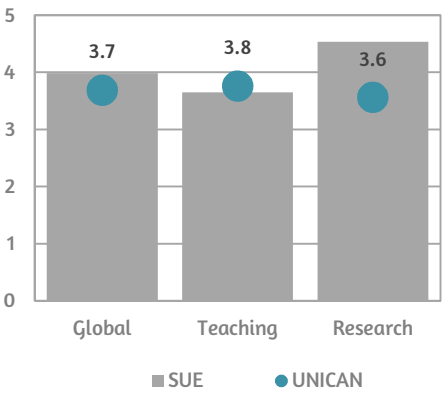
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE CASTILLA-LA MANCHA

Year of foundation: 1982

Type of ownership: Public

Bachelor's degree students[1]: 22,582

Master's degree students[1]: 1,760

Faculty members[1]: 2,383

Administration and service staff[1]: 1,087

Budget[2]: 178,832,829€

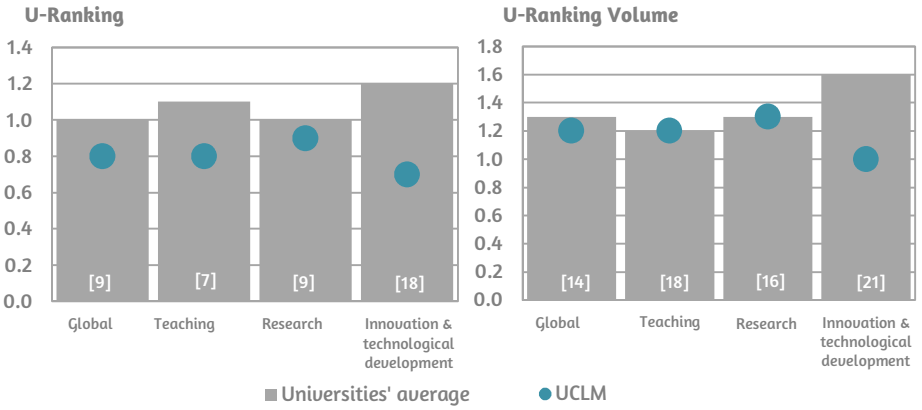
Bachelor's degrees[3]: 47

Master's degrees[3]: 35

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers. Source: Ministry of Education, Culture and Sport

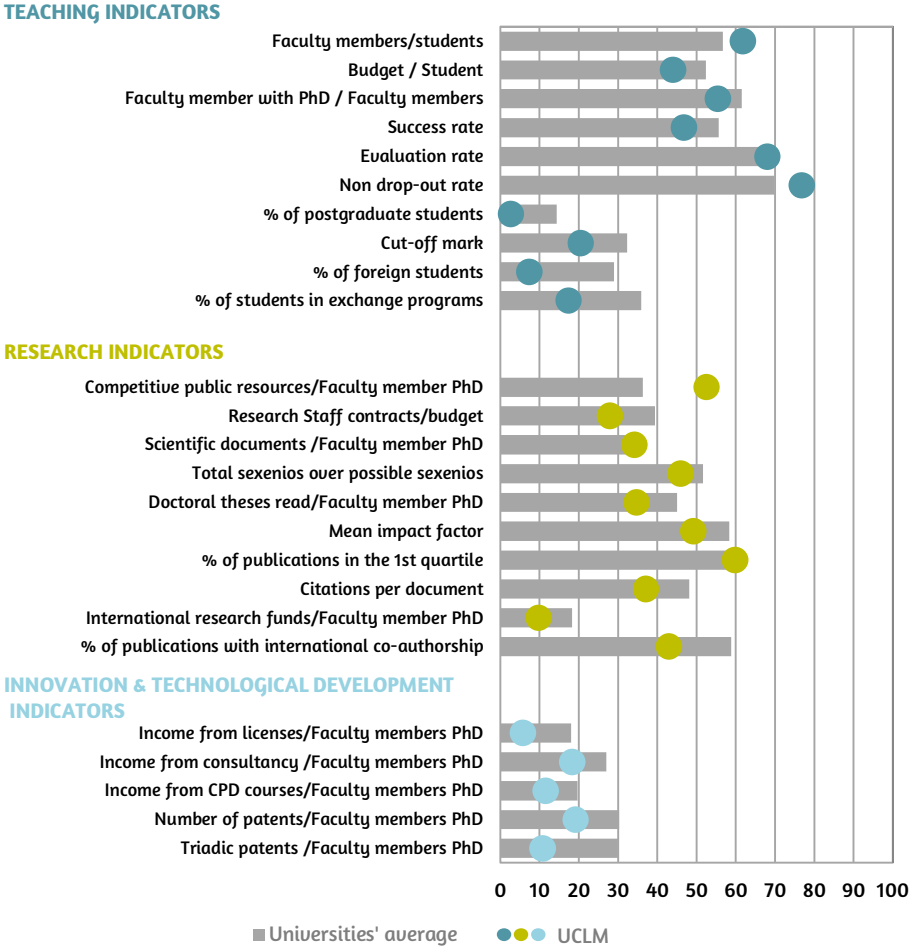
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



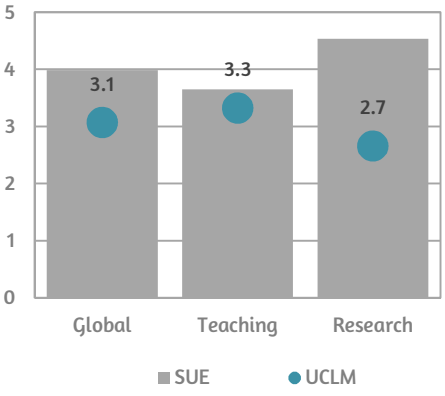
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE CÓRDOBA

Year of foundation: 1972

Type of ownership: Public

Bachelor's degree students[1]: 14,692

Master's degree students[1]: 1,442

Faculty members[1]: 1,372

Administration and service staff[1]: 753

Budget[2]: 134,395,784€

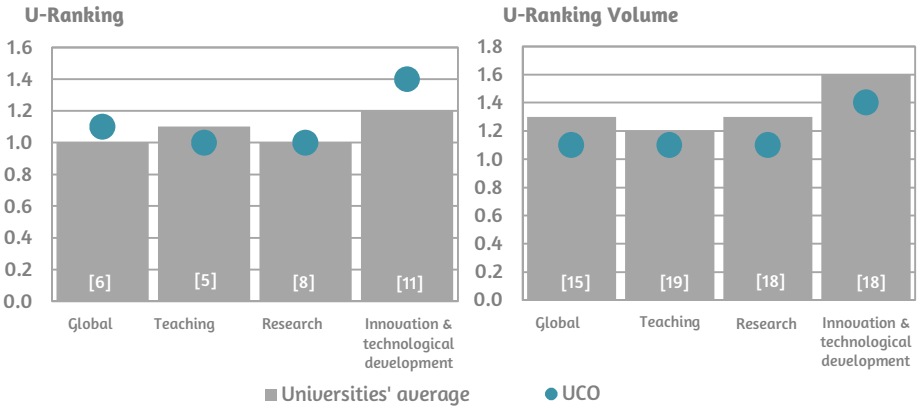
Bachelor's degrees[3]: 33

Master's degrees[3]: 44

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

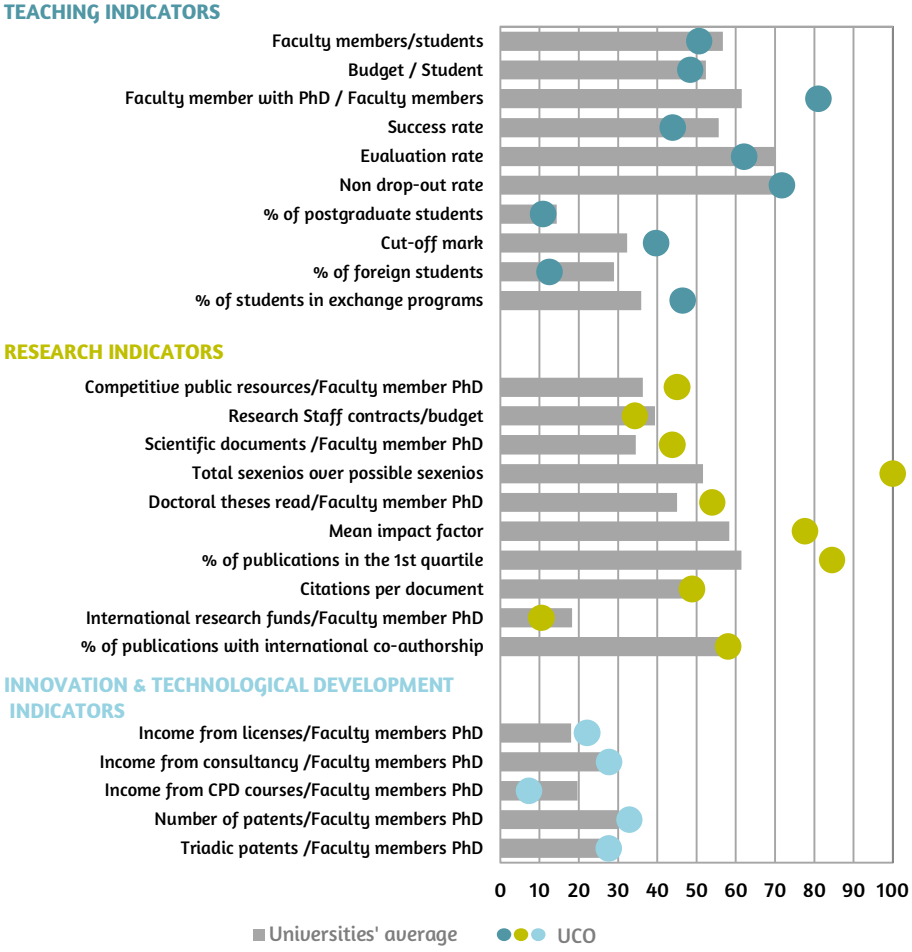
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



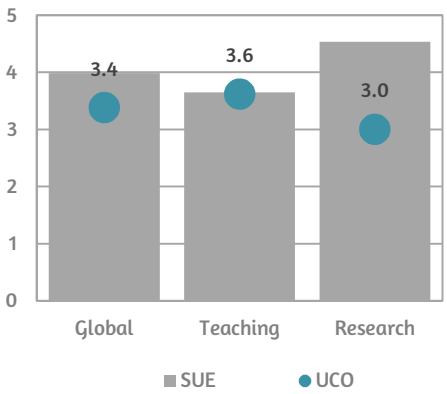
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE DEUSTO

Year of foundation: 1886

Type of ownership: Private

Bachelor's degree students[1]: 6,888

Master's degree students[1]: 1,468

Faculty members[1]: 557

Administration and service staff[1]: 469

Budget[2]: no disponible

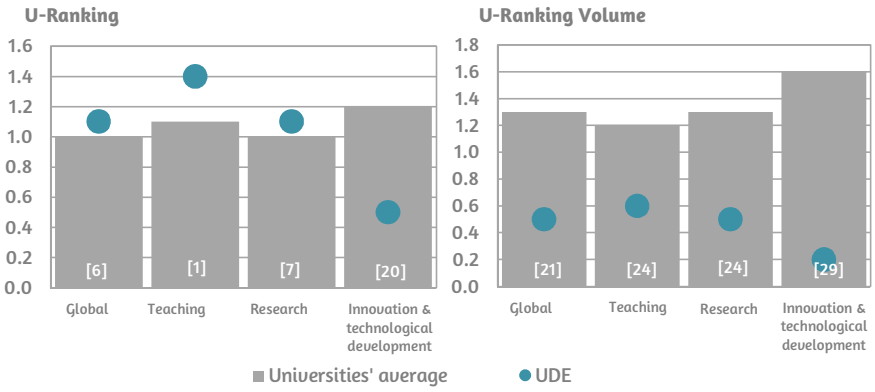
Bachelor's degrees[3]: 23

Master's degrees[3]: 41

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

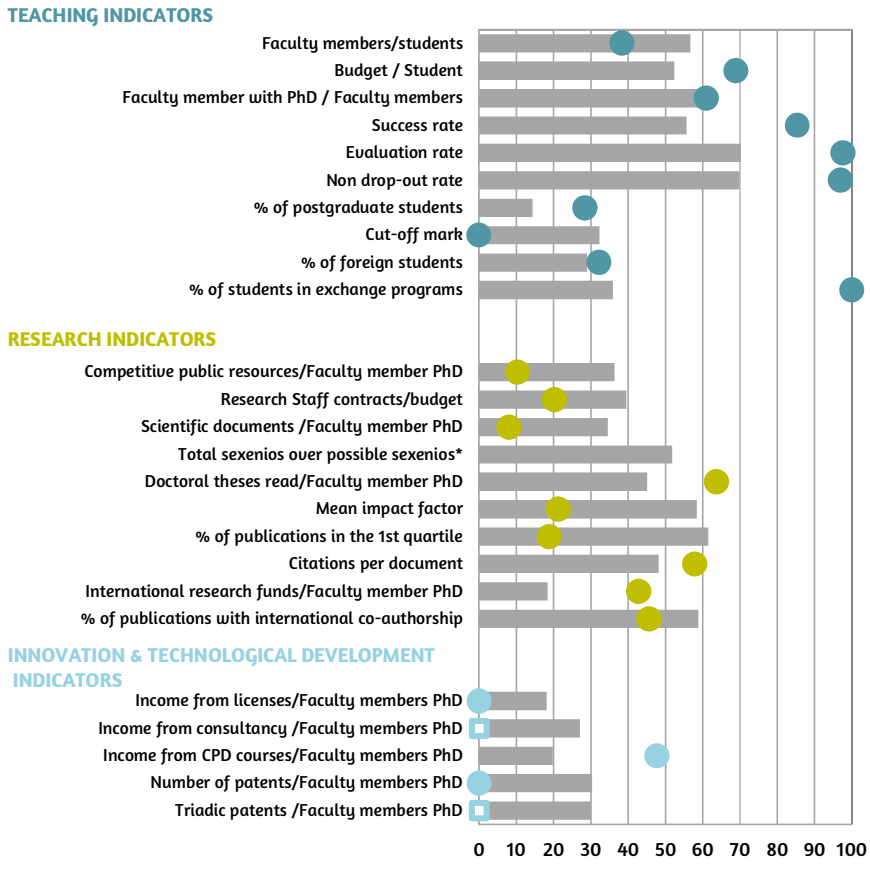
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



U-Ranking 2018 indicators

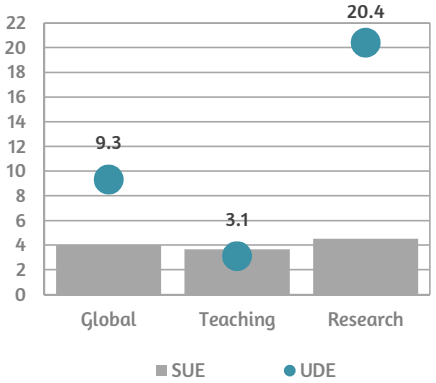
University with the minimum value=0; University with the maximum value=100



*The "sexenios" indicator is not considered for private universities

Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE EXTREMADURA

Year of foundation: 1973

Type of ownership: Public

Bachelor's degree students[1]: 18,547

Master's degree students[1]: 1,568

Faculty members[1]: 1,814

Administration and service staff[1]: 870

Budget[2]: 141,471,869€

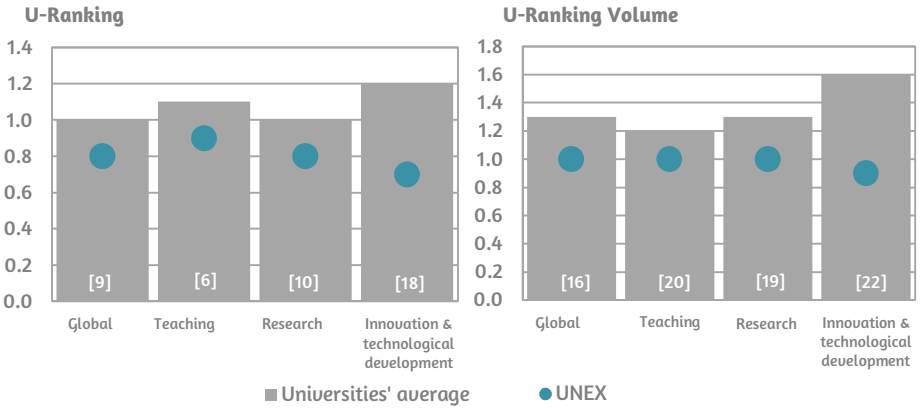
Bachelor's degrees[3]: 59

Master's degrees[3]: 45

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers. Source: Ministry of Education, Culture and Sport

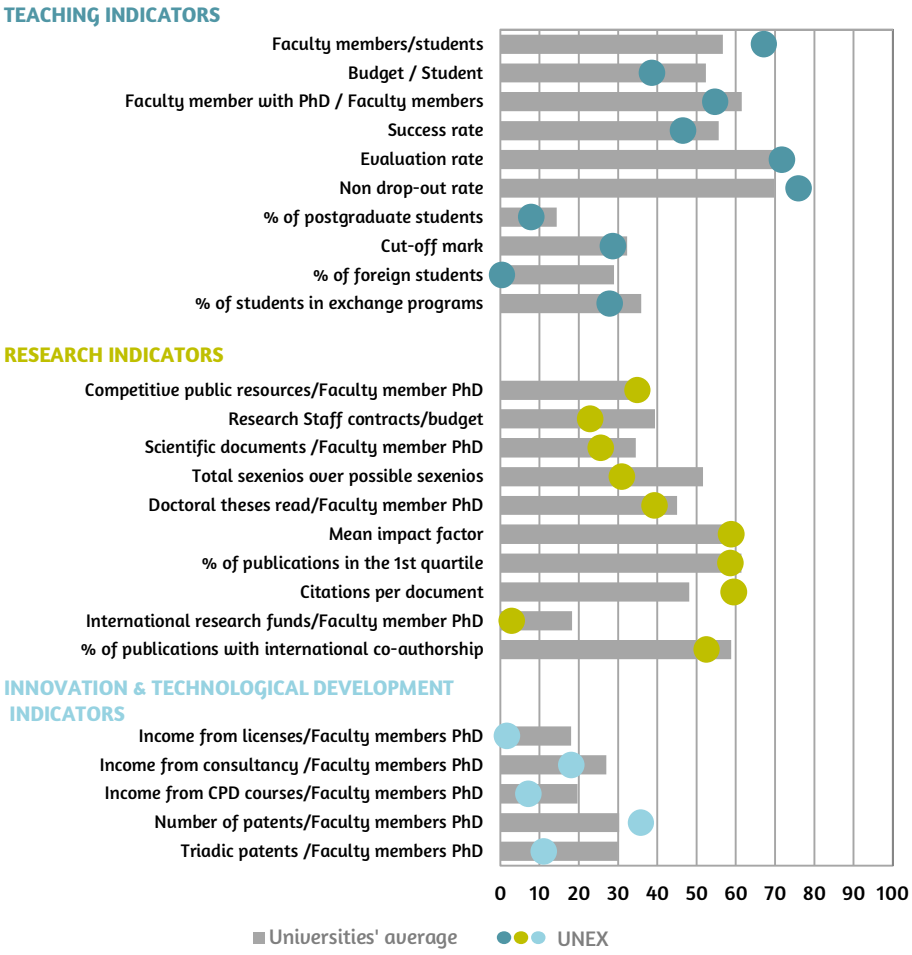
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



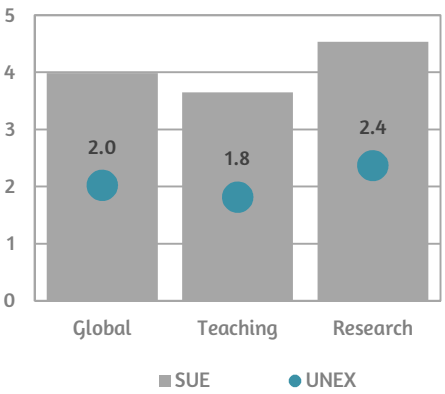
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE GRANADA

Universidad de Granada

Year of foundation: 1531

Type of ownership: Public

Bachelor's degree students[1]: 43,270

Master's degree students[1]: 5,079

Faculty members[1]: 3,502

Administration and service staff[1]: 2,234

Budget[2]: 372,863,852€

Bachelor's degrees[3]: 63

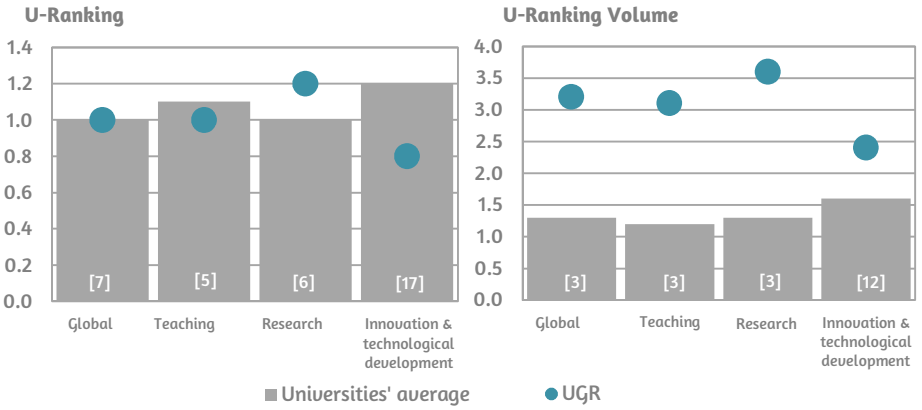
Master's degrees[3]: 114

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

U-Ranking

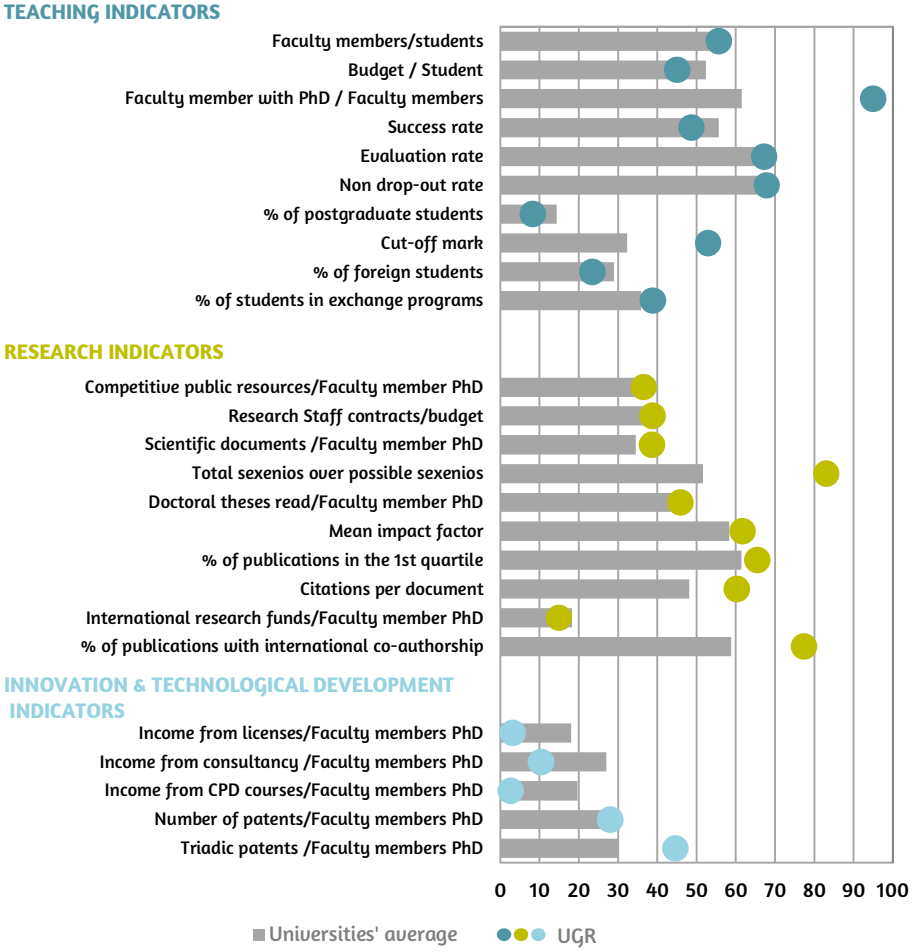
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



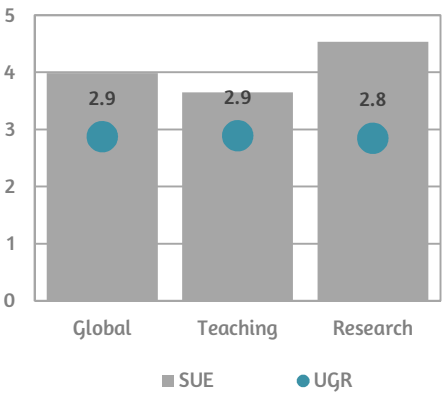
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE HUELVA

Year of foundation: 1993

Type of ownership: Public

Bachelor's degree students[1]: 9,902

Master's degree students[1]: 796

Faculty members[1]: 838

Administration and service staff[1]: 433

Budget[2]: 77,569,660€

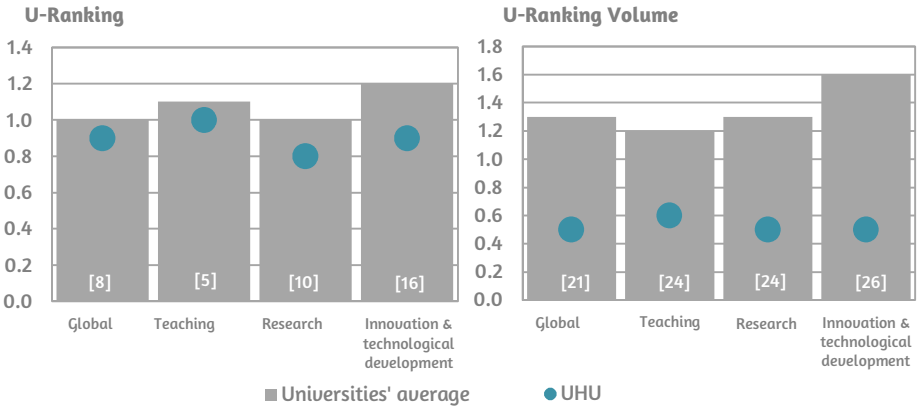
Bachelor's degrees[3]: 29

Master's degrees[3]: 39

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

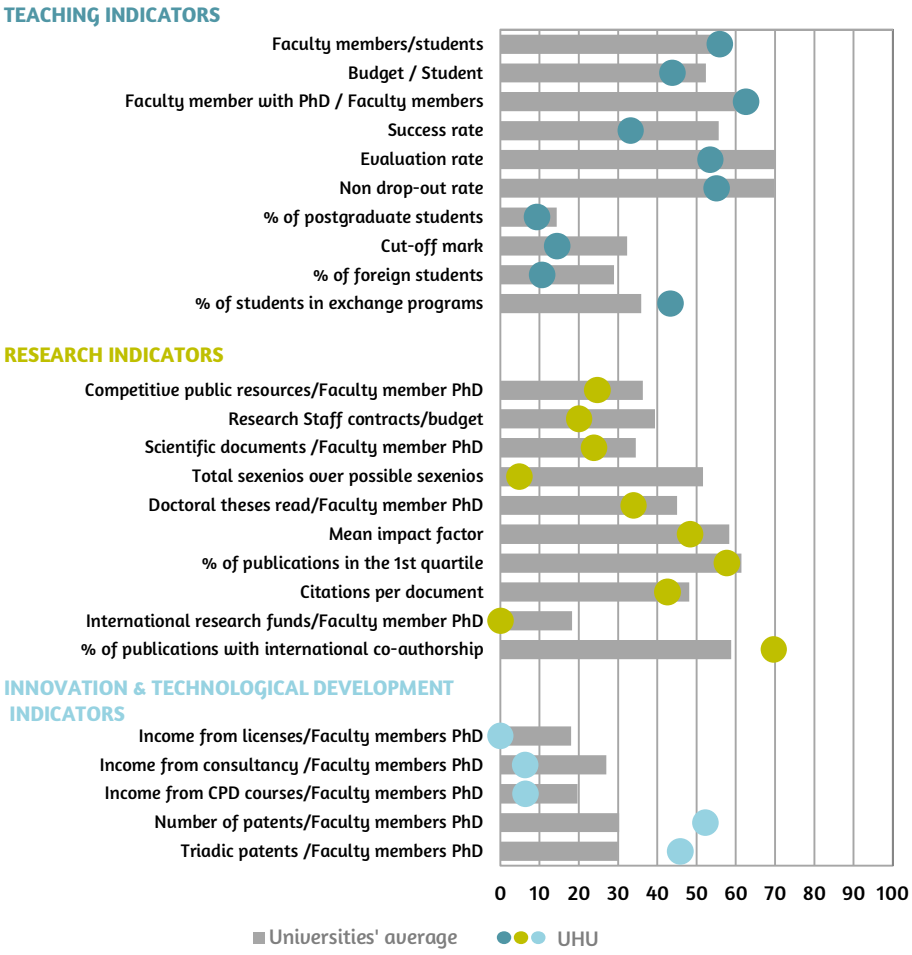
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



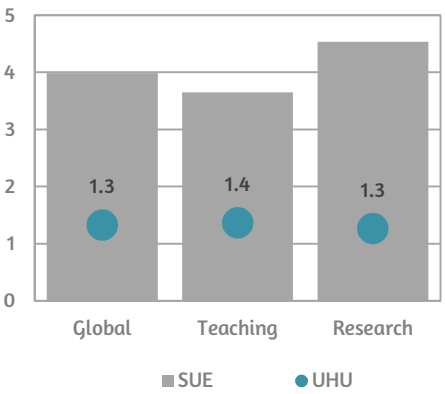
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE JAÉN

Year of foundation: 1993

Type of ownership: Public

Bachelor's degree students[1]: 12,560

Master's degree students[1]: 1,426

Faculty members[1]: 924

Administration and service staff[1]: 499

Budget[2]: 101,544,782€

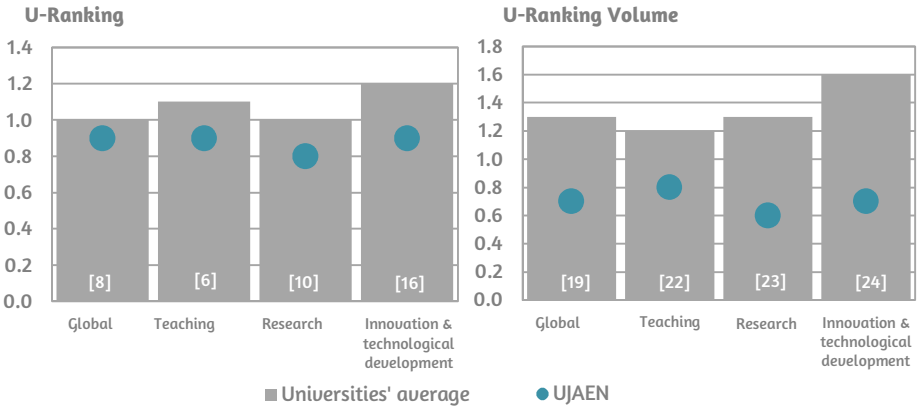
Bachelor's degrees[3]: 34

Master's degrees[3]: 42

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

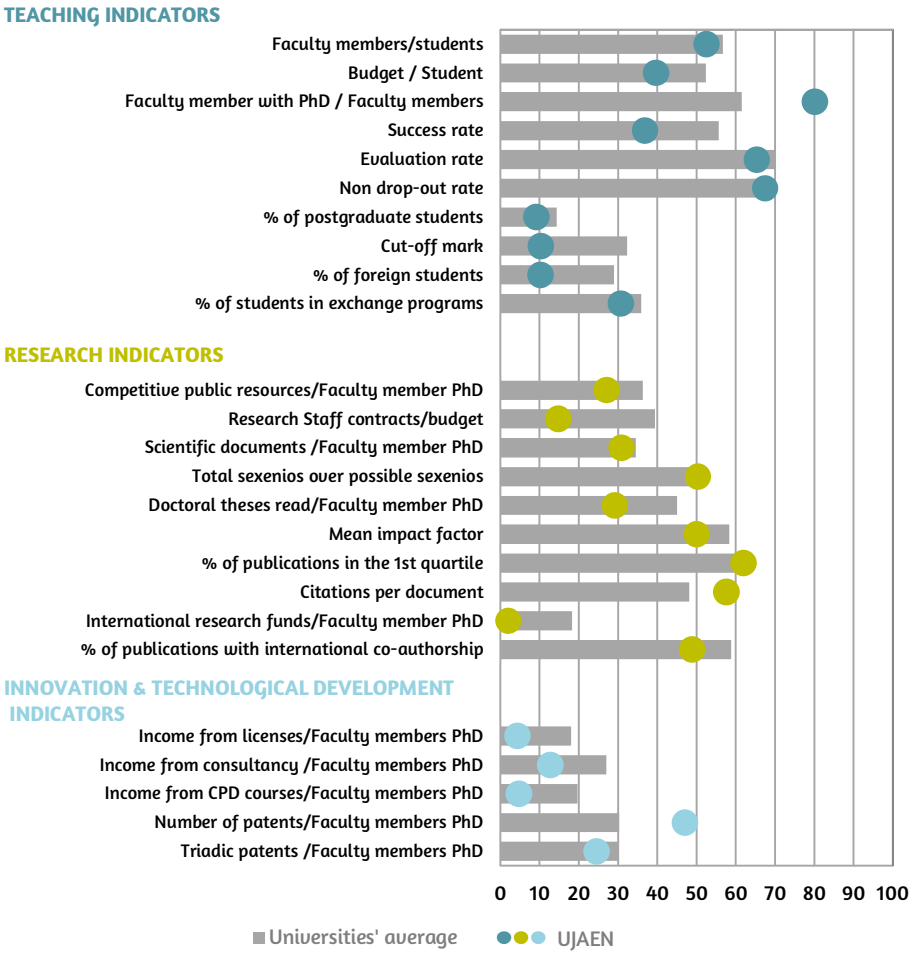
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



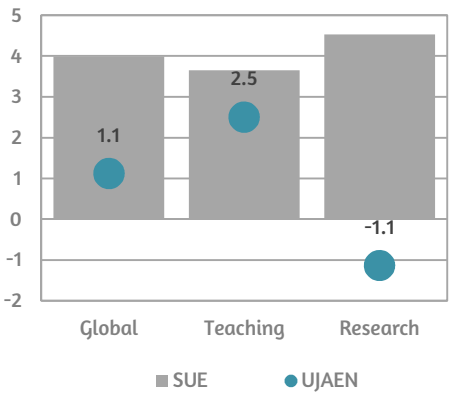
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE LA LAGUNA

Year of foundation: 1701

Type of ownership: Public

Bachelor's degree students[1]: 17,123

Master's degree students[1]: 1,003

Faculty members[1]: 1,570

Administration and service staff[1]: 843

Budget[2]: 149,450,350€

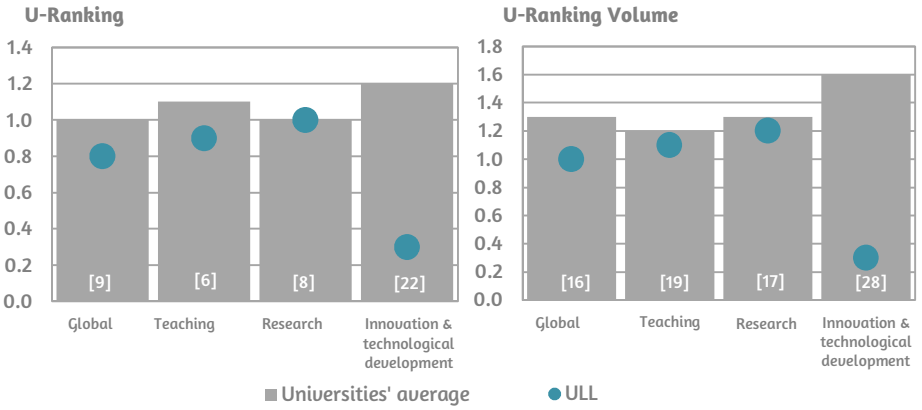
Bachelor's degrees[3]: 45

Master's degrees[3]: 32

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

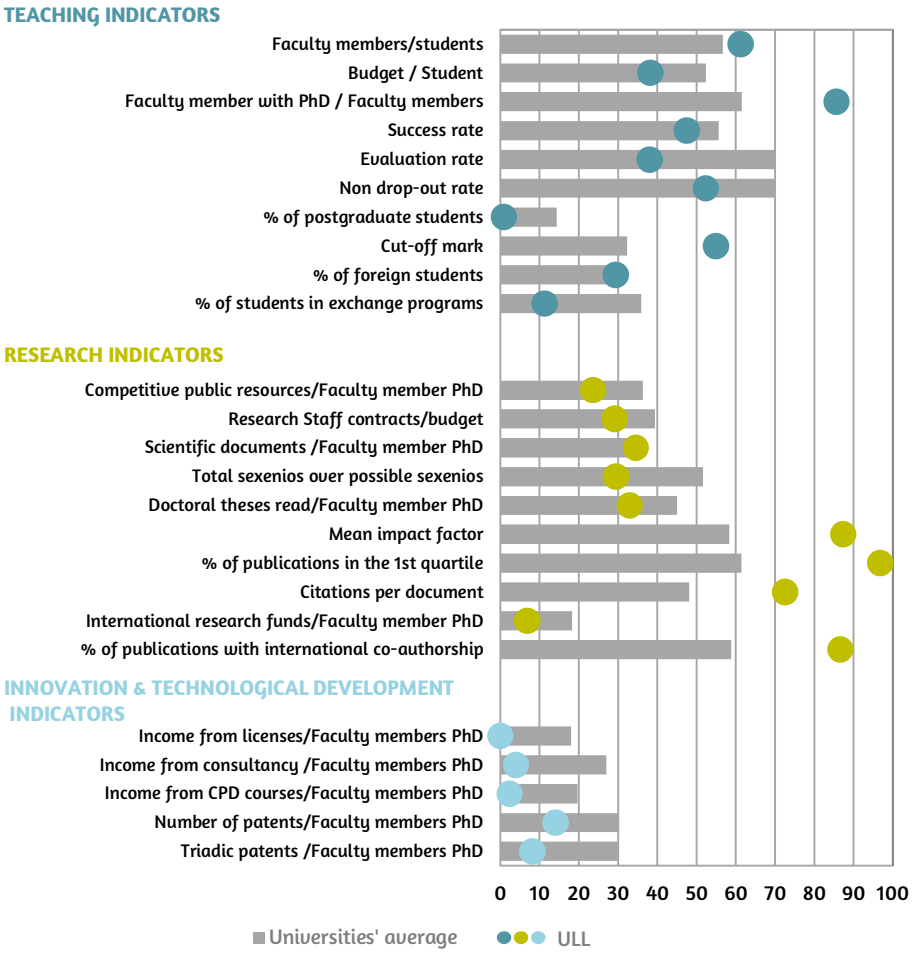
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



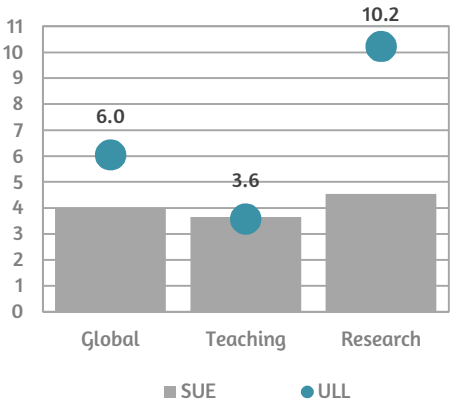
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE LA RIOJA

UNIVERSIDAD DE LA RIOJA

Year of foundation: 1992

Type of ownership: Public

Bachelor's degree students[1]: 3,331

Master's degree students[1]: 368

Faculty members[1]: 422

Administration and service staff[1]: 255

Budget[2]: 43,848,238€

Bachelor's degrees[3]: 18

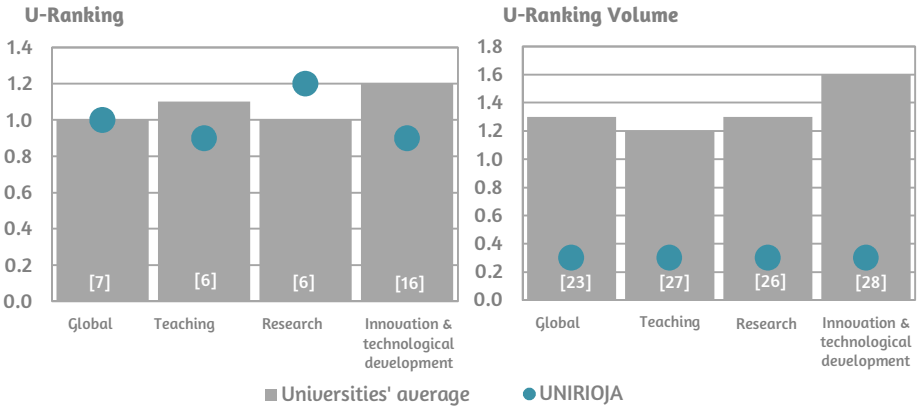
Master's degrees[3]: 12

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

U-Ranking

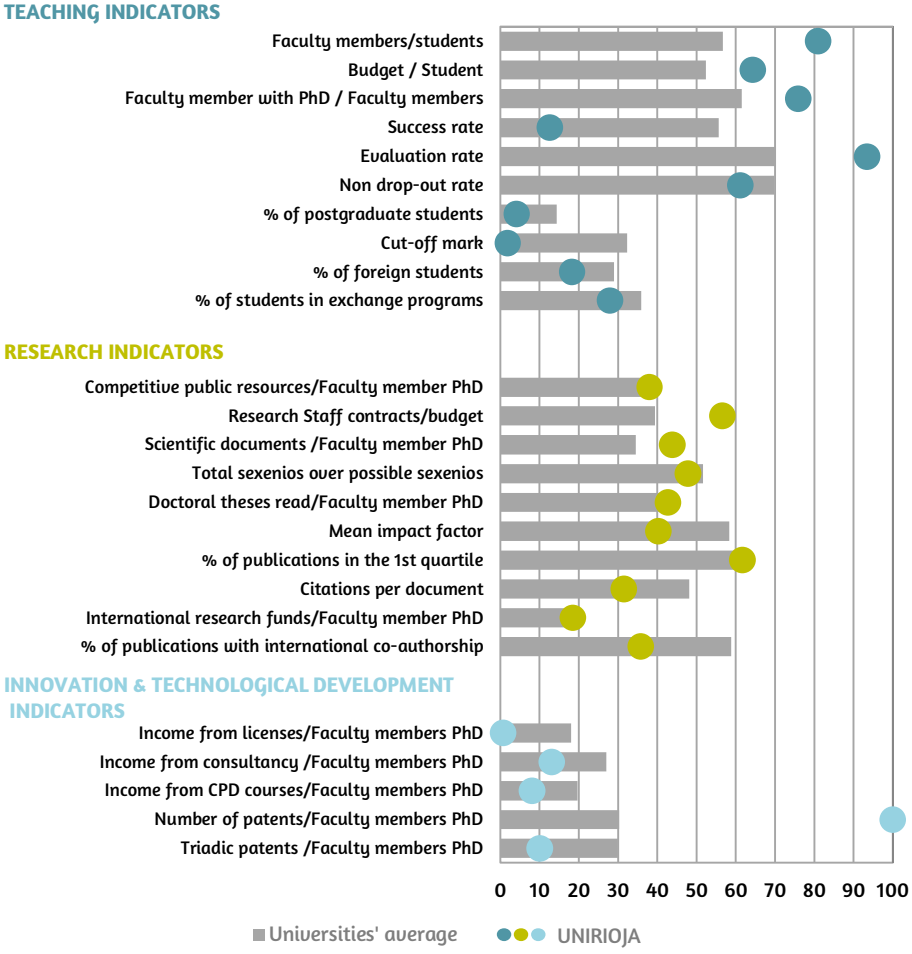
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



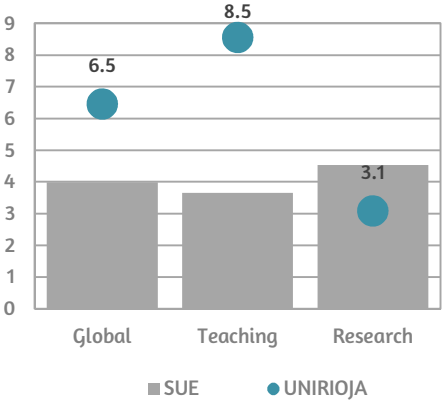
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE LAS PALMAS DE GRAN CANARIA

Year of foundation: 1979

Type of ownership: Public

Bachelor's degree students[1]: 16,600

Master's degree students[1]: 1,041

Faculty members[1]: 1,605

Administration and service staff[1]: 786

Budget[2]: 140,338,109€

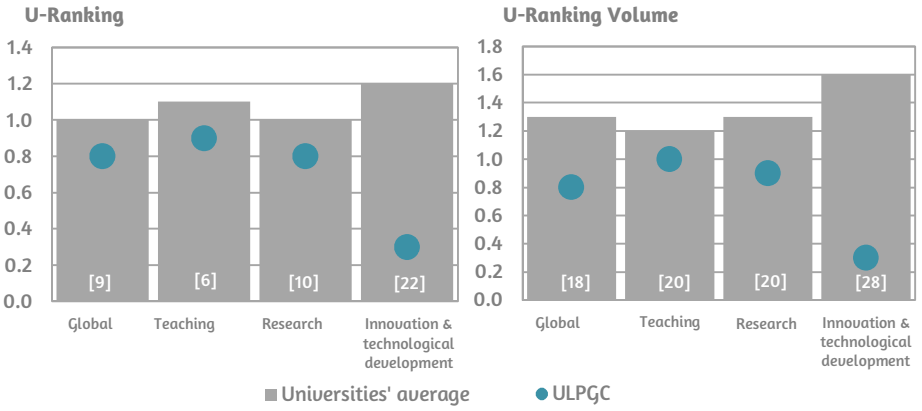
Bachelor's degrees[3]: 36

Master's degrees[3]: 37

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers. Source: Ministry of Education, Culture and Sport

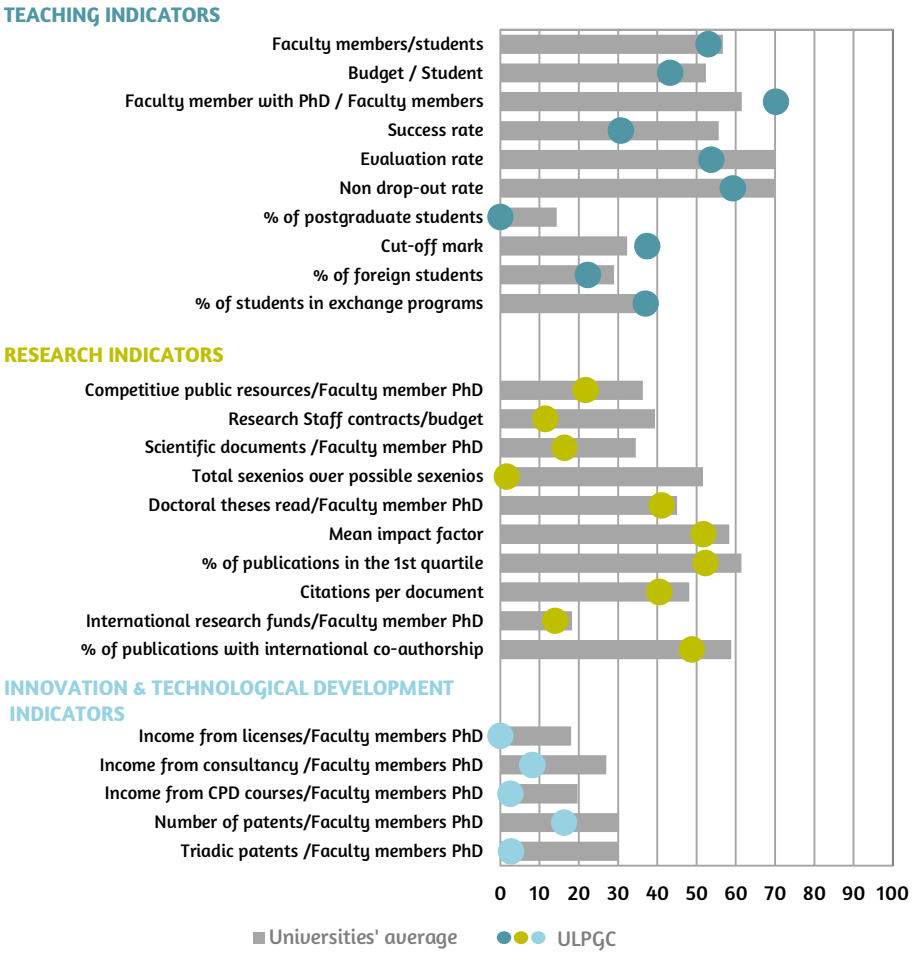
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



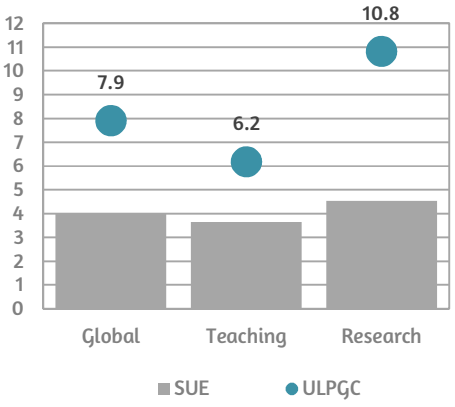
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE LEÓN

universidad de león

Year of foundation: 1979

Type of ownership: Public

Bachelor's degree students[1]: 9,680

Master's degree students[1]: 1,030

Faculty members[1]: 898

Administration and service staff[1]: 470

Budget[2]: 89,468,431€

Bachelor's degrees[3]: 38

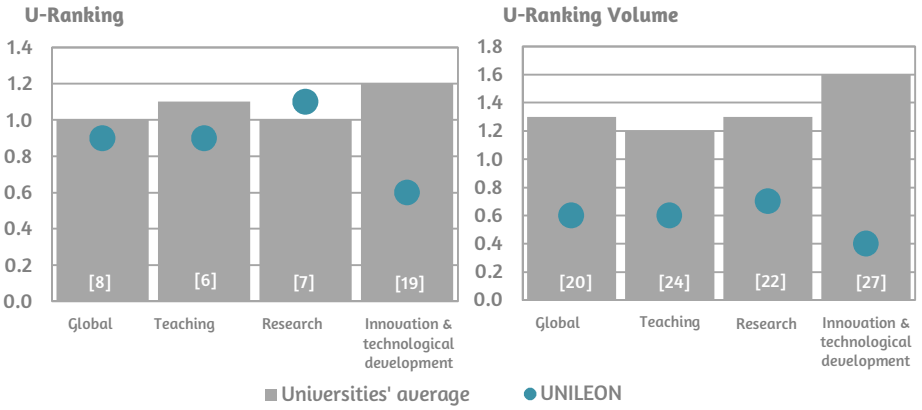
Master's degrees[3]: 38

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

U-Ranking

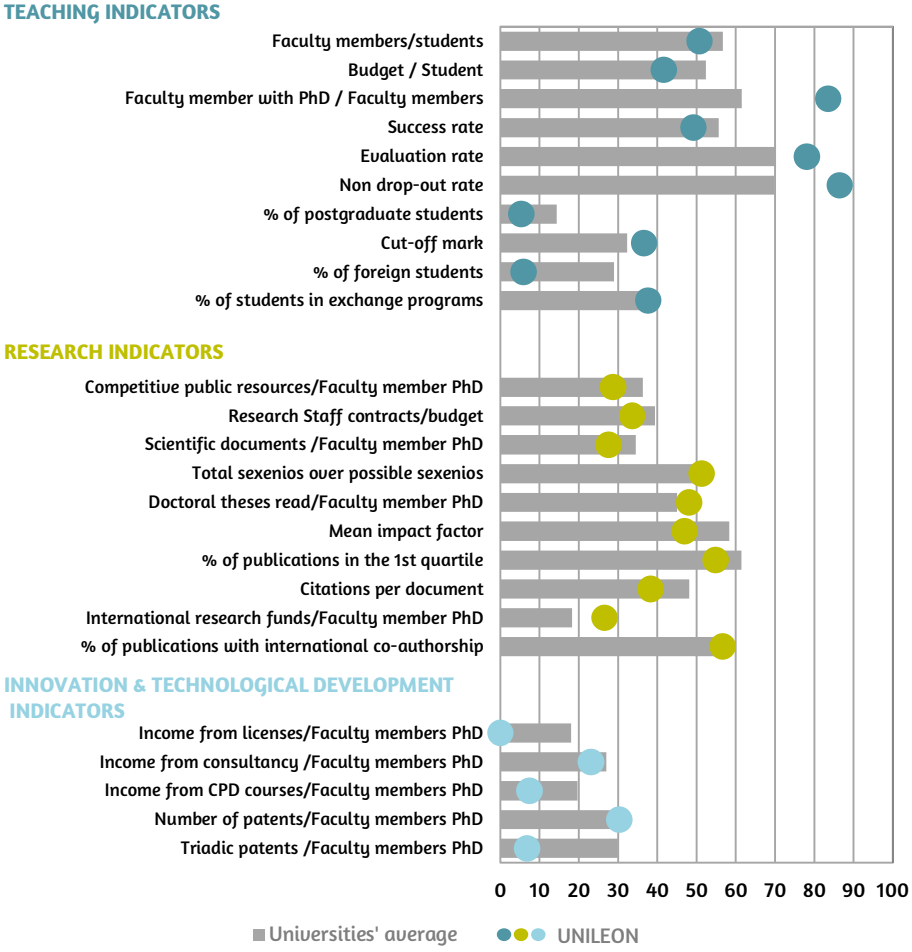
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



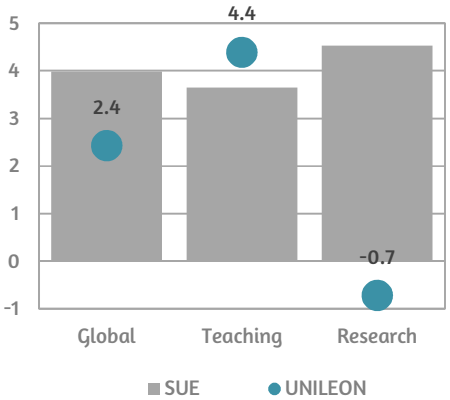
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE MÁLAGA

Year of foundation: 1972

Type of ownership: Public

Bachelor's degree students[1]: 31,464

Master's degree students[1]: 2,649

Faculty members[1]: 2,404

Administration and service staff[1]: 1,256

Budget[2]: 239,887,028€

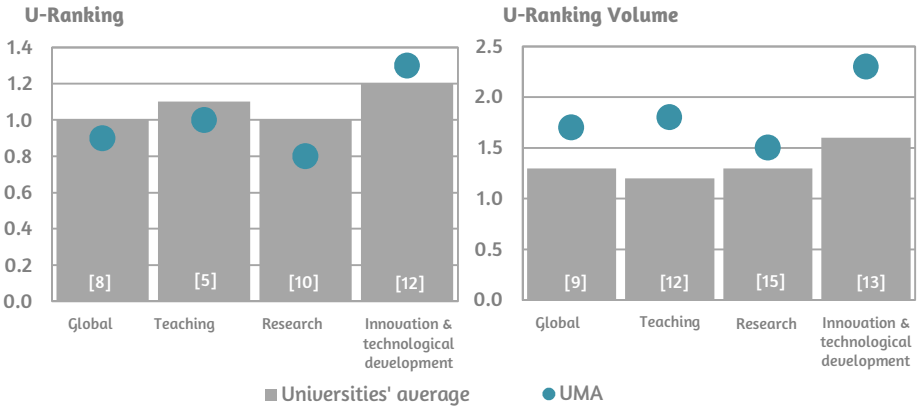
Bachelor's degrees[3]: 59

Master's degrees[3]: 72

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

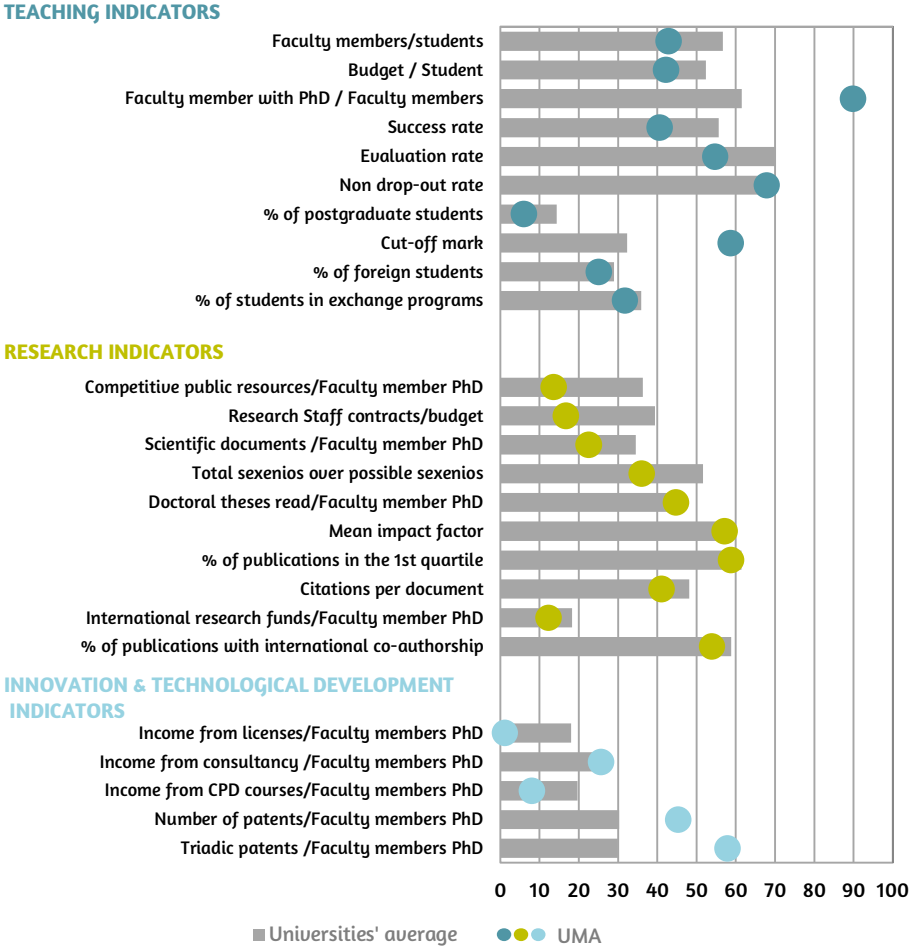
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



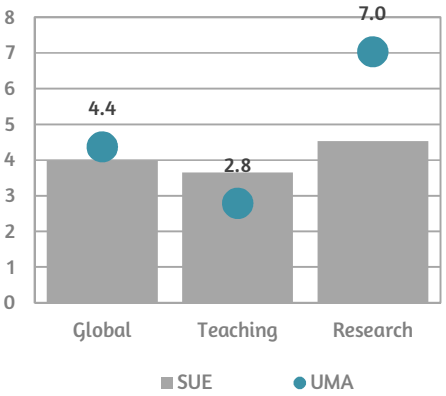
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE MURCIA

Year of foundation: 1915

Type of ownership: Public

Bachelor's degree students[1]: 26,832

Master's degree students[1]: 2,302

Faculty members[1]: 2,571

Administration and service staff[1]: 1,170

Budget[2]: 204,013,502€

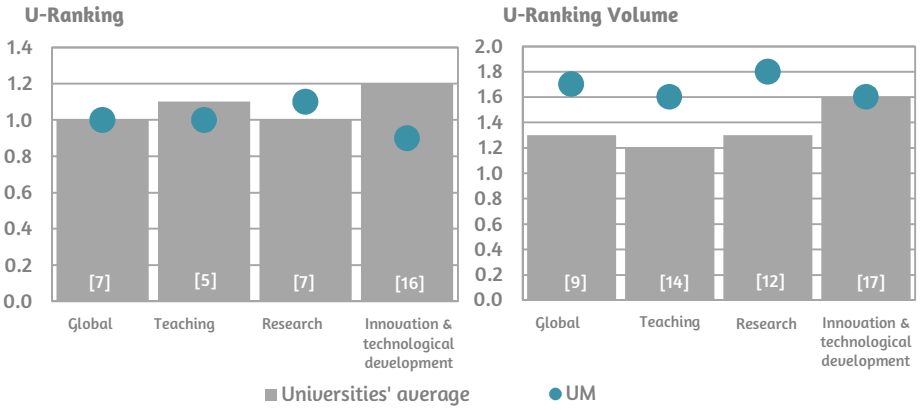
Bachelor's degrees[3]: 48

Master's degrees[3]: 75

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

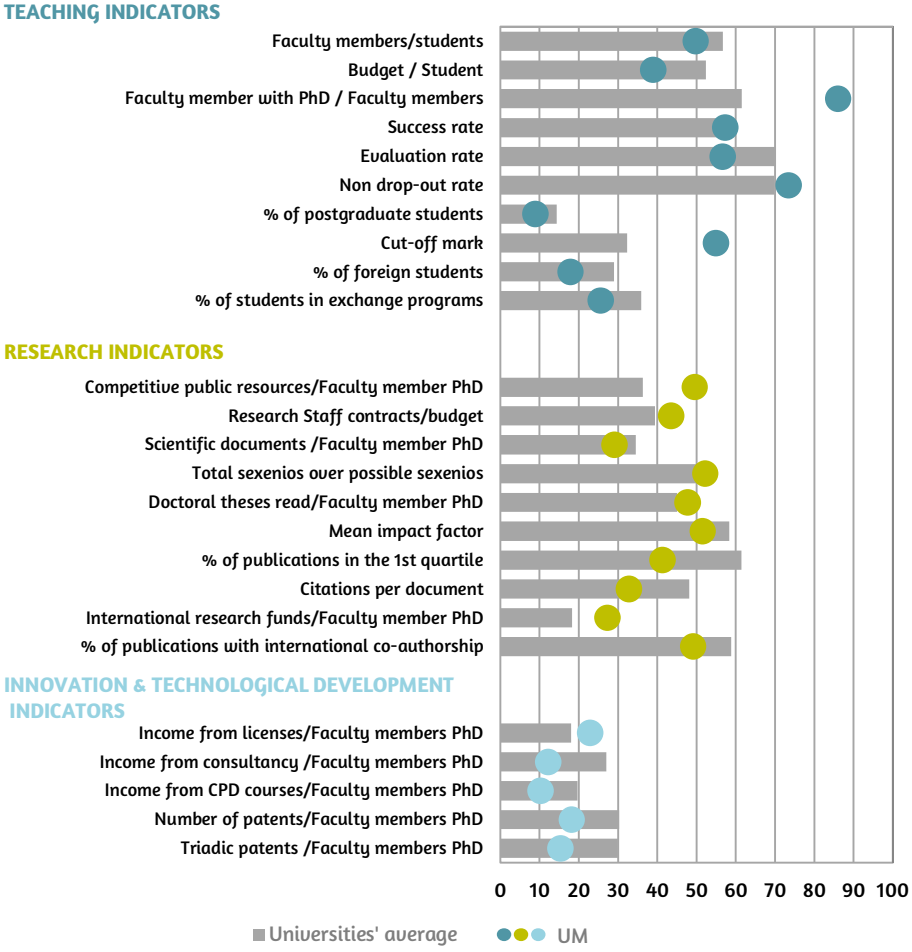
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



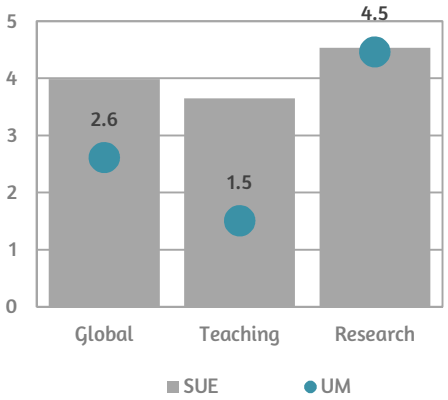
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE NAVARRA

Universidad de Navarra

Year of foundation: 1952

Type of ownership: Private

Bachelor's degree students[1]: 7,854

Master's degree students[1]: 2,144

Faculty members[1]: 1,360

Administration and service staff[1]: 1,275

Budget[2]: no disponible

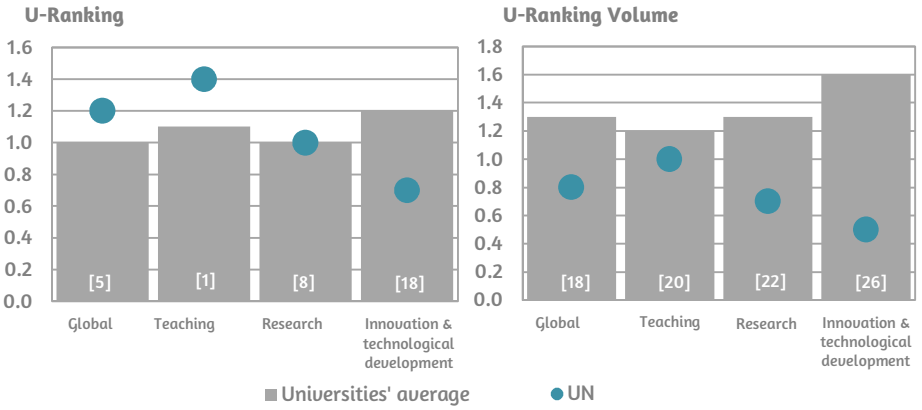
Bachelor's degrees[3]: 42

Master's degrees[3]: 36

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



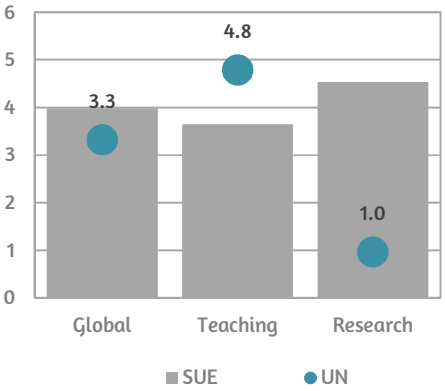
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100

*The "sexenios" indicator is not considered for private universities

Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE OVIEDO

Universidad de Oviedo

Year of foundation: 1604

Type of ownership: Public

Bachelor's degree students[1]: 17,646

Master's degree students[1]: 1,799

Faculty members[1]: 1,979

Administration and service staff[1]: 951

Budget[2]: 190,177,561€

Bachelor's degrees[3]: 51

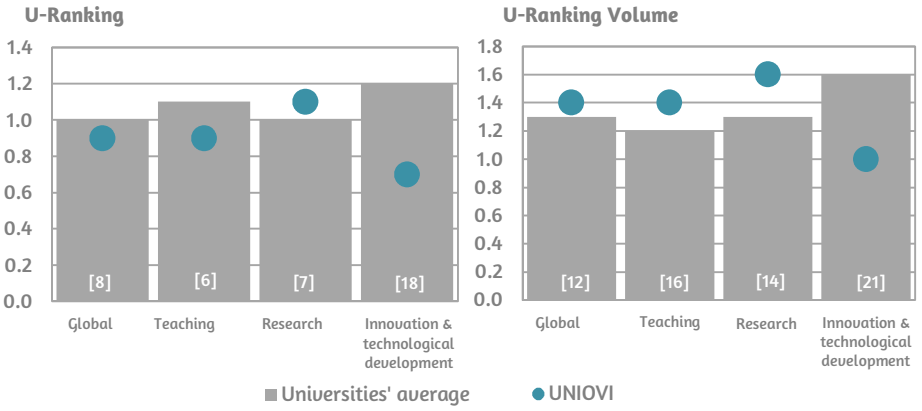
Master's degrees[3]: 60

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

Ranking

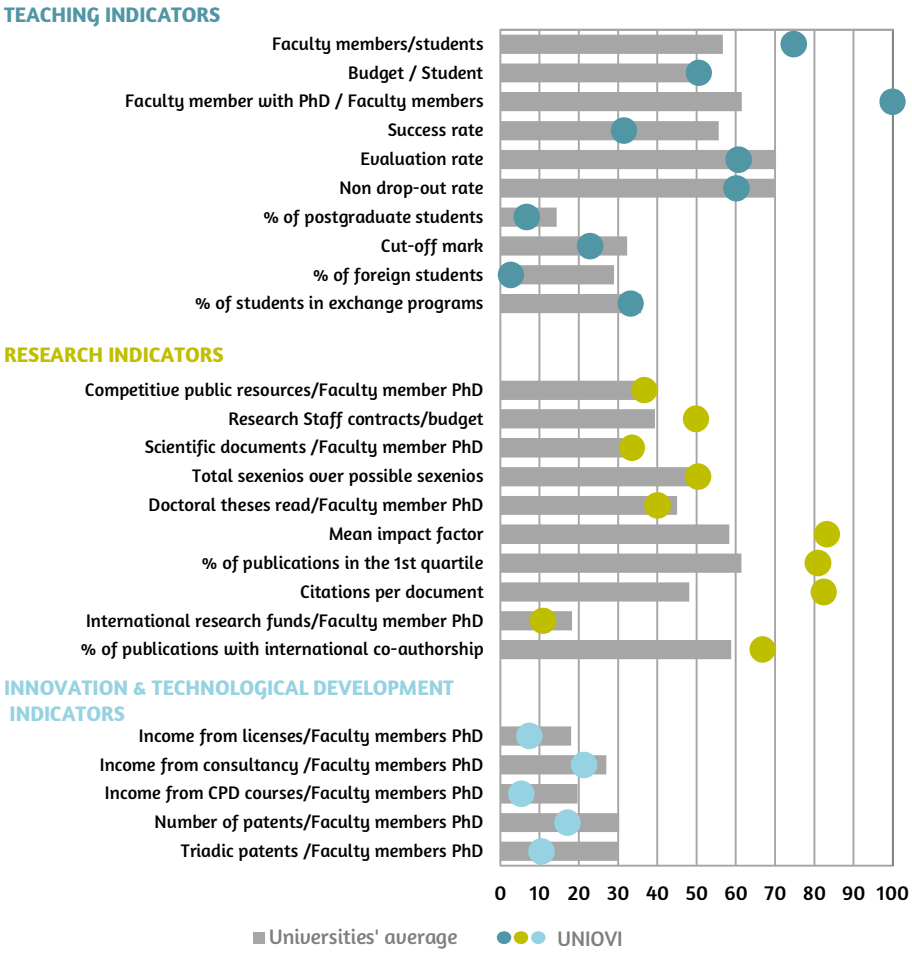
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



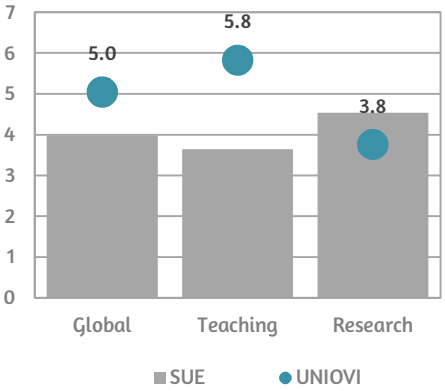
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE SALAMANCA

Year of foundation: 1218

Type of ownership: Public

Bachelor's degree students[1]: 20,457

Master's degree students[1]: 1,778

Faculty members[1]: 2,159

Administration and service staff[1]: 1,117

Budget[2]: 196,460,680€

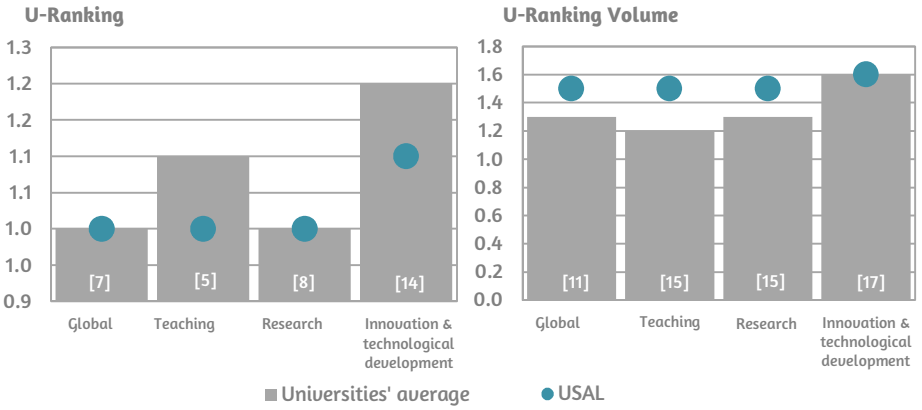
Bachelor's degrees[3]: 70

Master's degrees[3]: 77

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

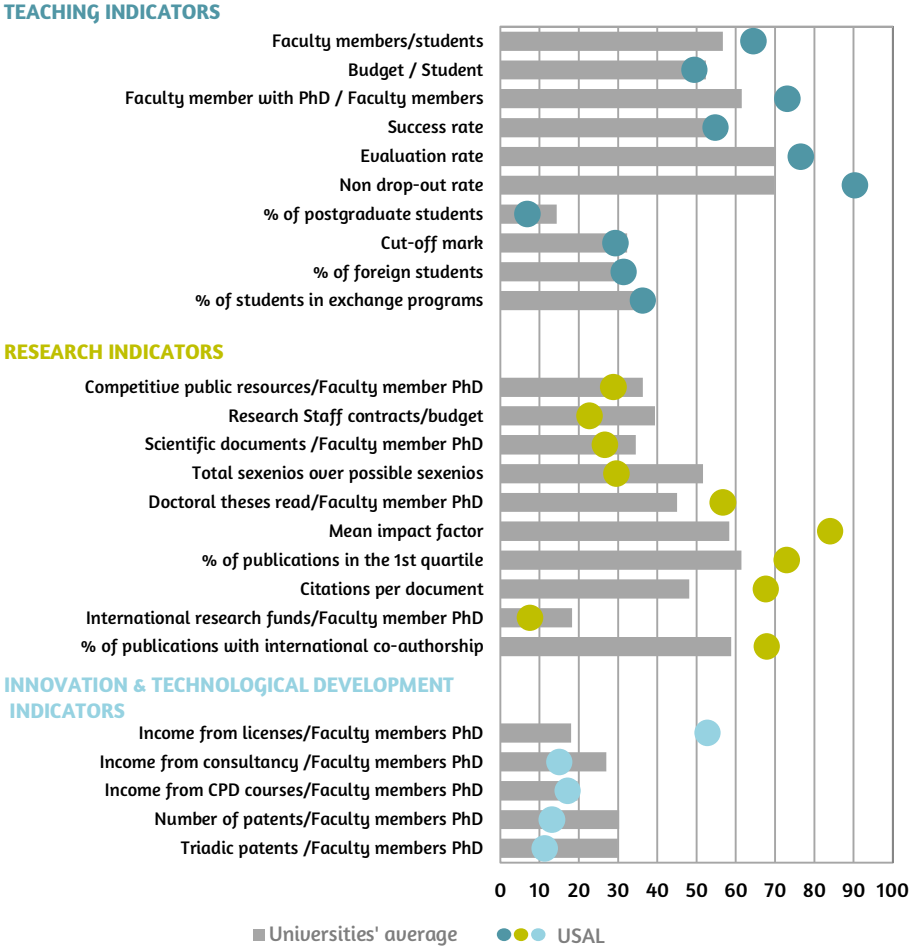
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



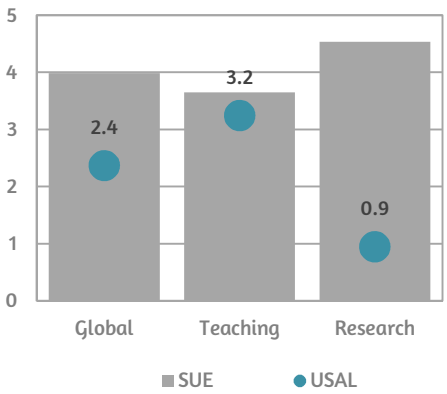
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE SEVILLA

Year of foundation: 1505

Type of ownership: Public

Bachelor's degree students[1]: 50,981

Master's degree students[1]: 4,425

Faculty members[1]: 4,163

Administration and service staff[1]: 2,554

Budget[2]: 400,935,237€

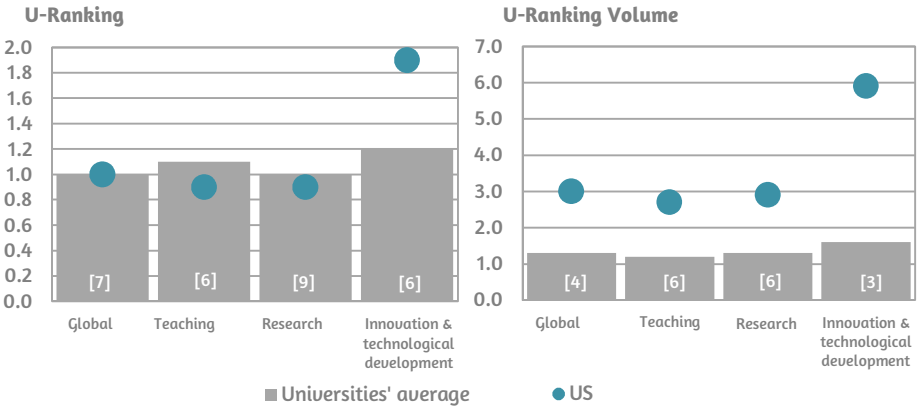
Bachelor's degrees[3]: 69

Master's degrees[3]: 121

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

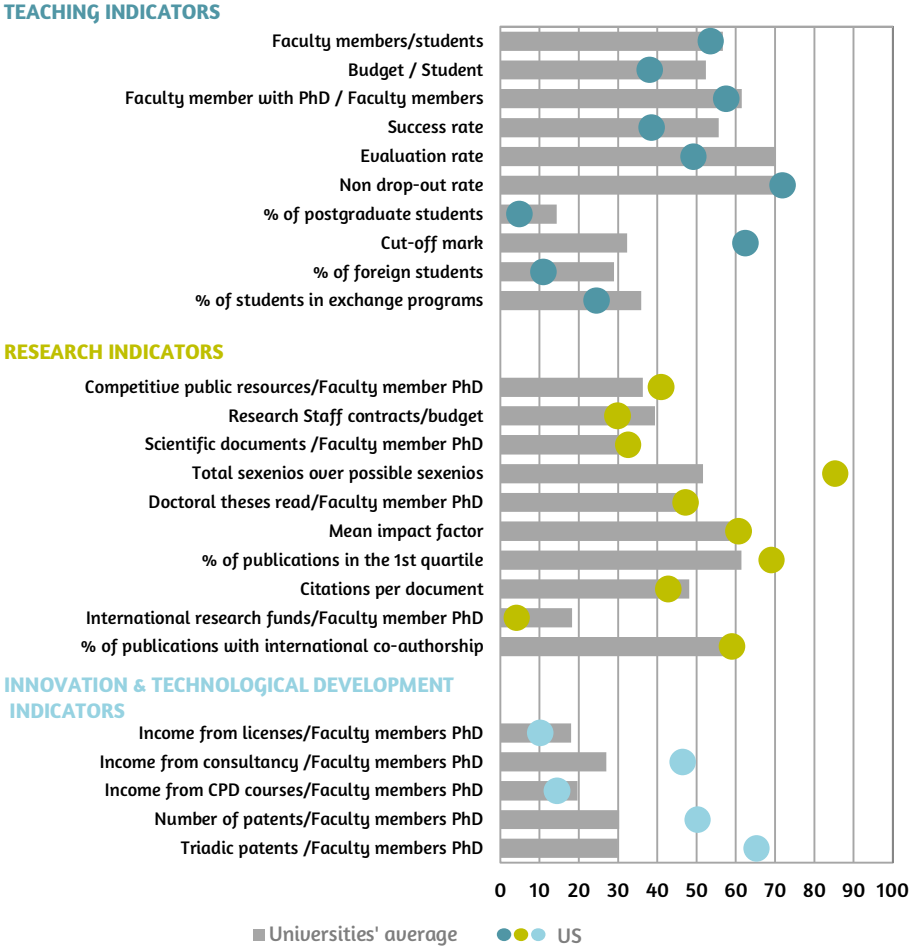
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



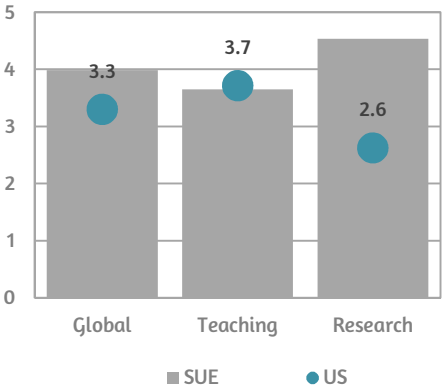
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE VALLADOLID

Universidad deValladolid

Year of foundation: 1346

Type of ownership: Public

Bachelor's degree students[1]: 19,369

Master's degree students[1]: 1,183

Faculty members[1]: 2,280

Administration and service staff[1]: 1,017

Budget[2]: 184,093,348€

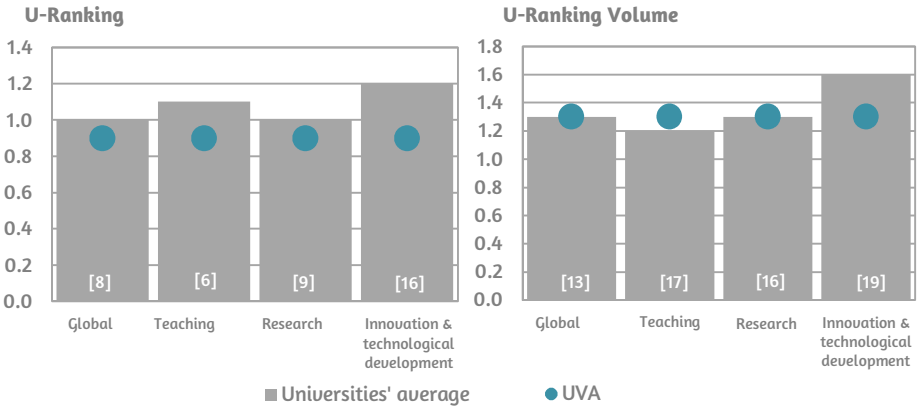
Bachelor's degrees[3]: 54

Master's degrees[3]: 59

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

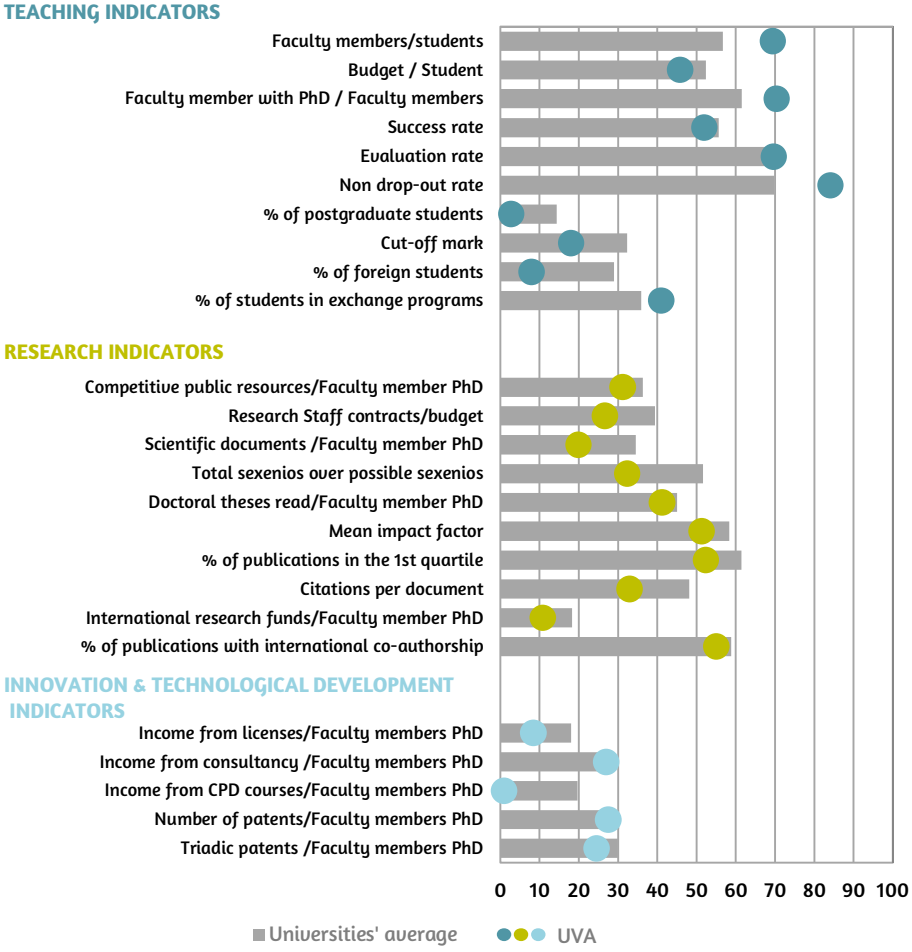
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



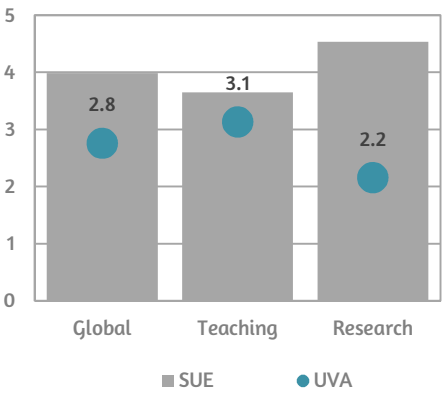
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DE ZARAGOZA

Universidad Zaragoza

Year of foundation: 1474

Type of ownership: Public

Bachelor's degree students[1]: 25,170

Master's degree students[1]: 2,151

Faculty members[1]: 3,615

Administration and service staff[1]: 1,524

Budget[2]: 274,995,193€

Bachelor's degrees[3]: 48

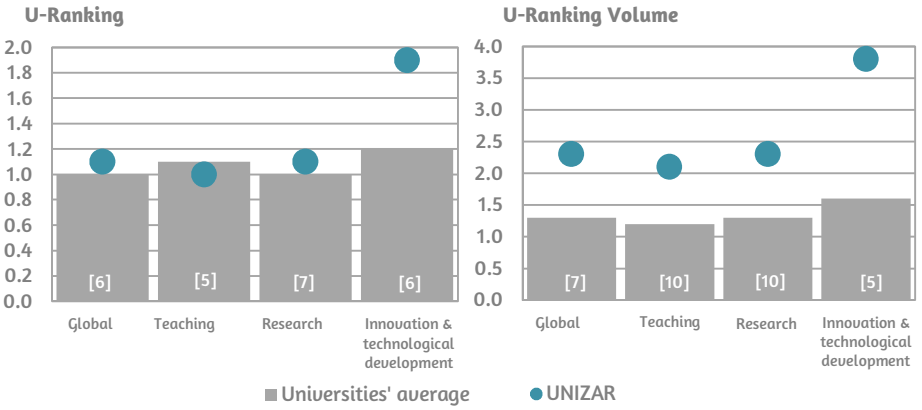
Master's degrees[3]: 52

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

Ranking

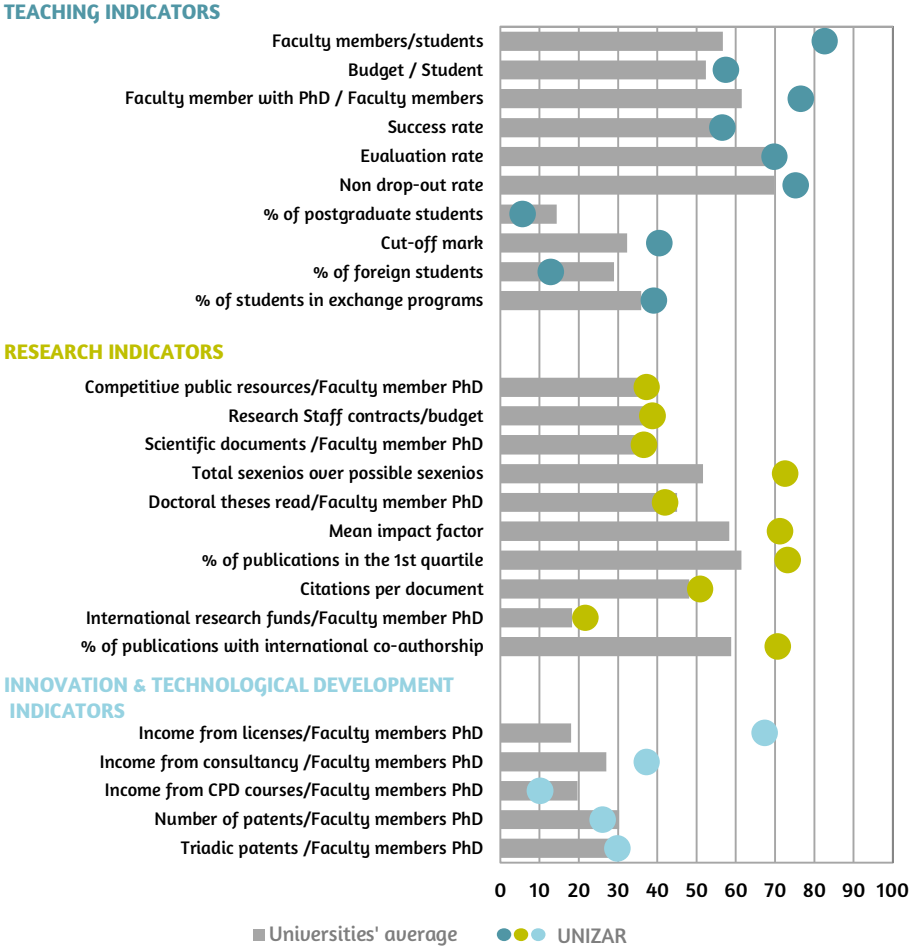
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



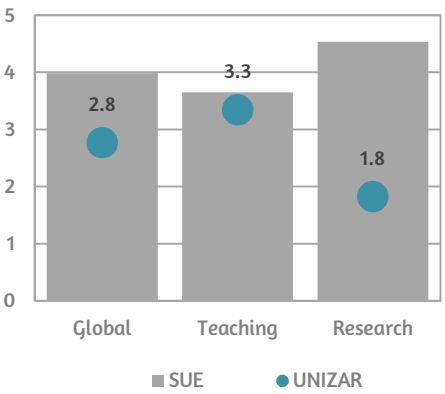
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD DEL PAÍS VASCO

Universidad del País Vasco · Euskal Herriko Unibertsitatea

Year of foundation: 1968

Type of ownership: Public

Bachelor's degree students[1]: 35,781

Master's degree students[1]: 3,199

Faculty members[1]: 4,383

Administration and service staff[1]: 1,879

Budget[2]: 408,630,880€

Bachelor's degrees[3]: 69

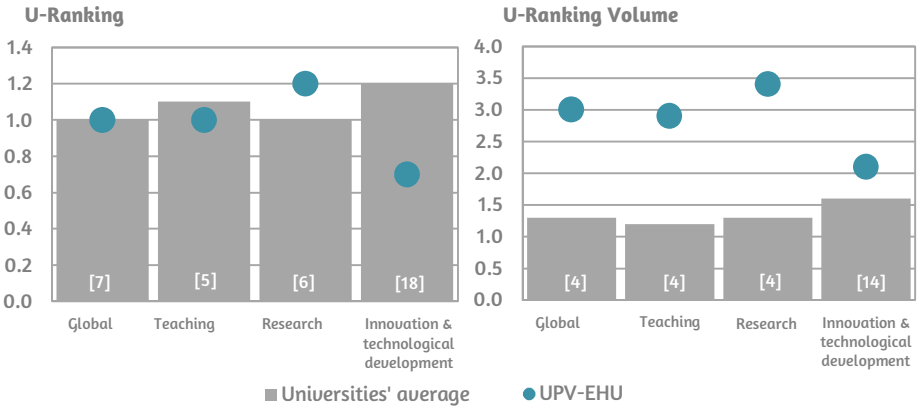
Master's degrees[3]: 102

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

U-Ranking

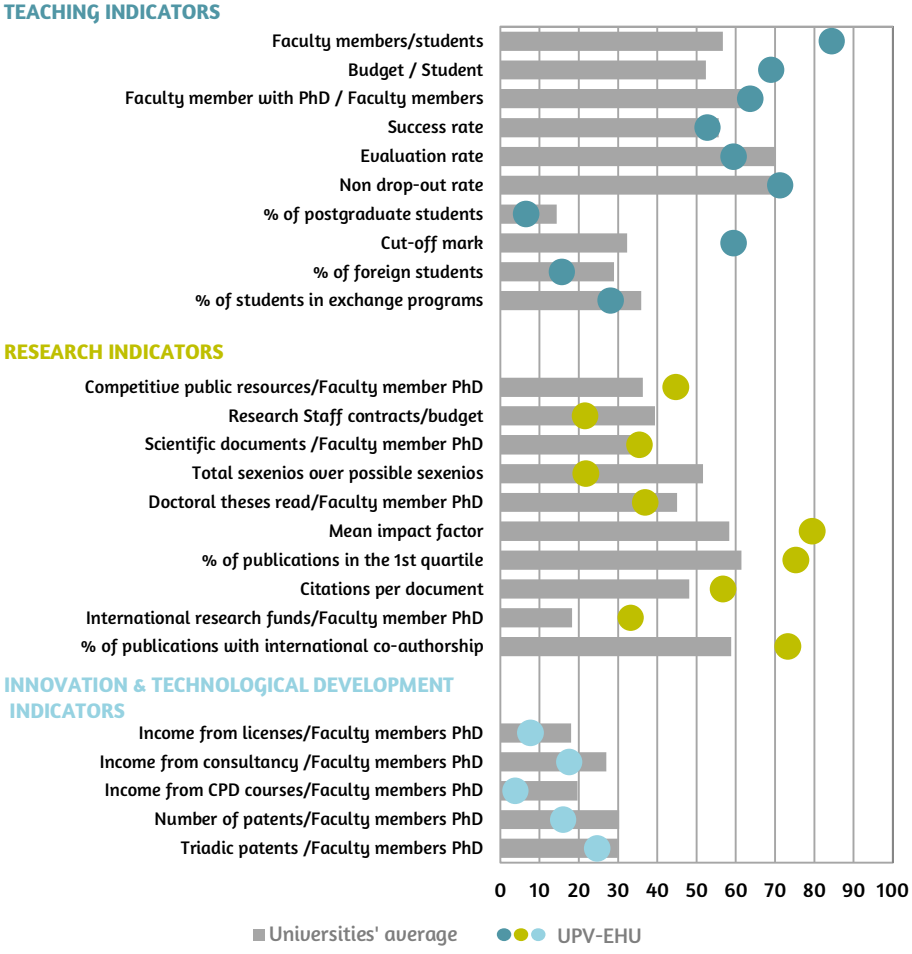
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



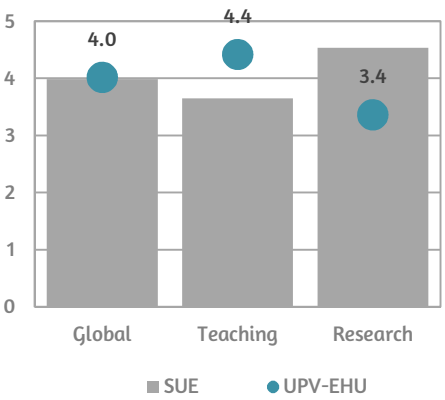
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD EUROPEA MIGUEL DE CERVANTES

Year of foundation: 2002

Type of ownership: Private

Bachelor's degree students[1]: 1,309

Master's degree students[1]: 216

Faculty members[1]: 203

Administration and service staff[1]: 86

Budget[2]: no disponible

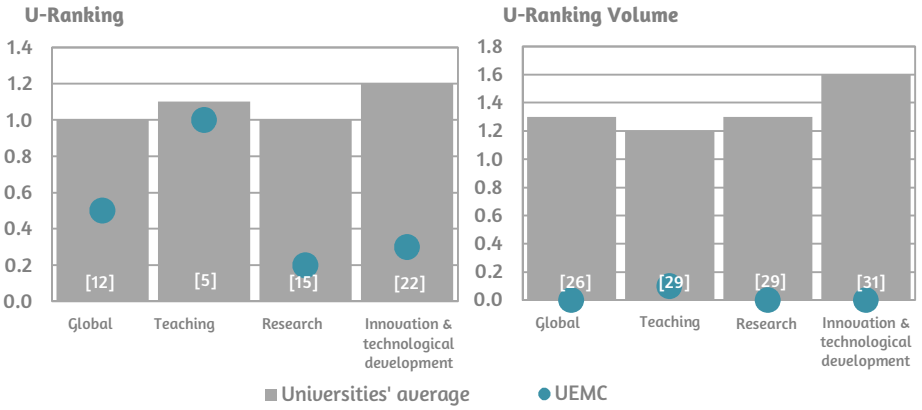
Bachelor's degrees[3]: 18

Master's degrees[3]: 6

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

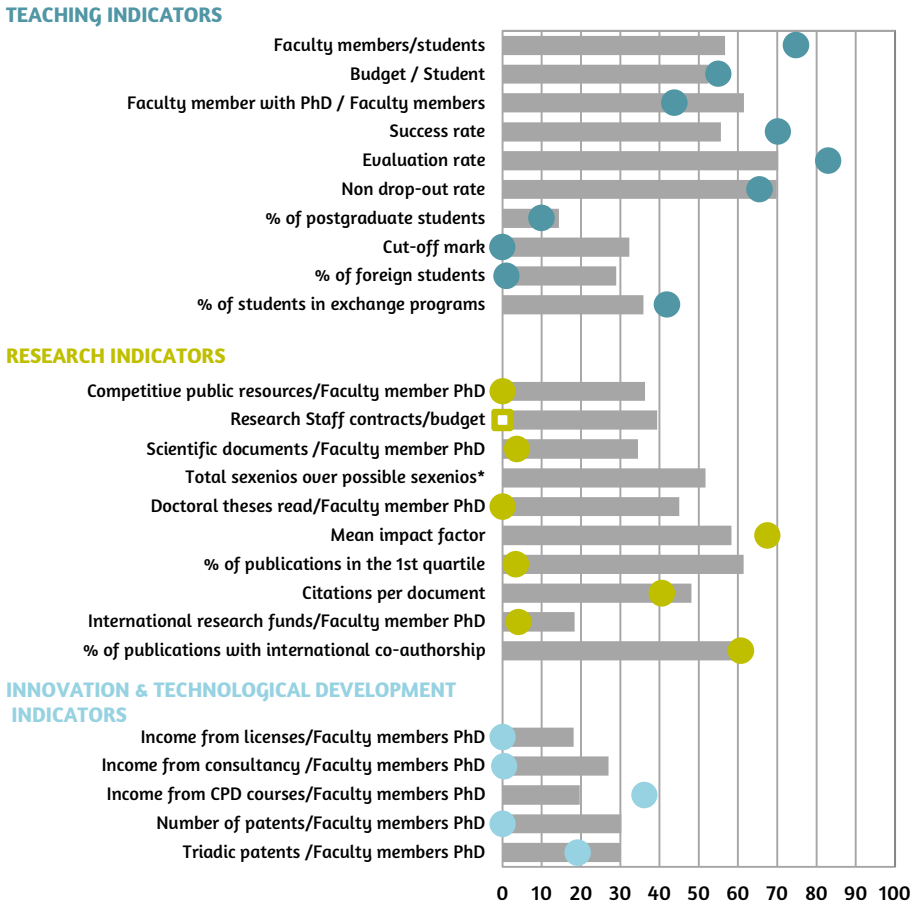
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



U-Ranking 2018 indicators

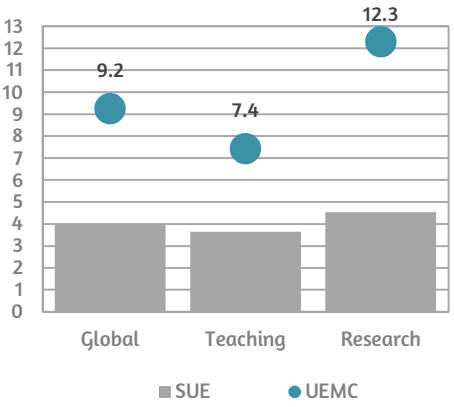
University with the minimum value=0; University with the maximum value=100



*The "sexenios" indicator is not considered for private universities

Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD MIGUEL HERNÁNDEZ DE ELCHE

Year of foundation: 1997

Type of ownership: Public

Bachelor's degree students[1]: 9,807

Master's degree students[1]: 2,226

Faculty members[1]: 1,080

Administration and service staff[1]: 461

Budget[2]: 102,369,614€

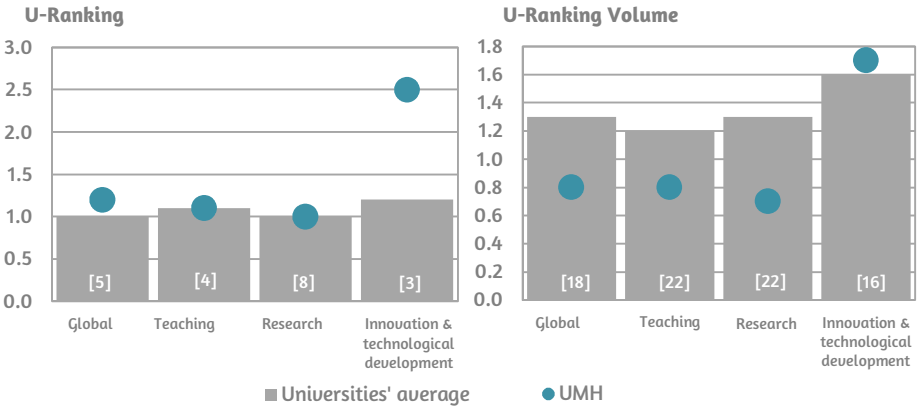
Bachelor's degrees[3]: 24

Master's degrees[3]: 49

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

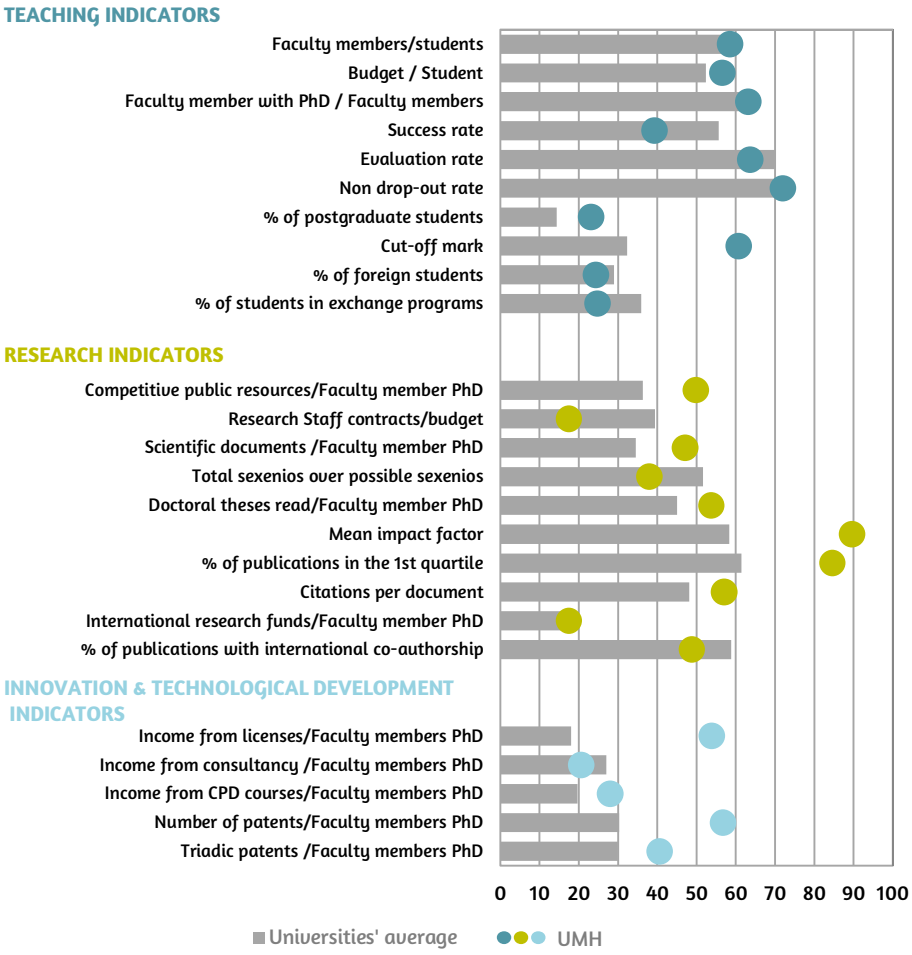
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



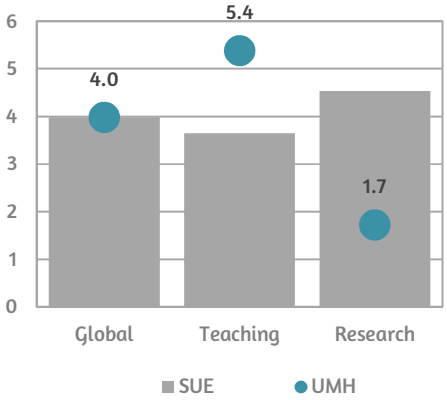
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD NACIONAL DE EDUCACIÓN A DISTANCIA

Year of foundation: 1972

Type of ownership: Public

Bachelor's degree students[1]: 136,757

Master's degree students[1]: 8,822

Faculty members[1]: 1,217

Administration and service staff[1]: 1,257

Budget[2]: 203,028,025€

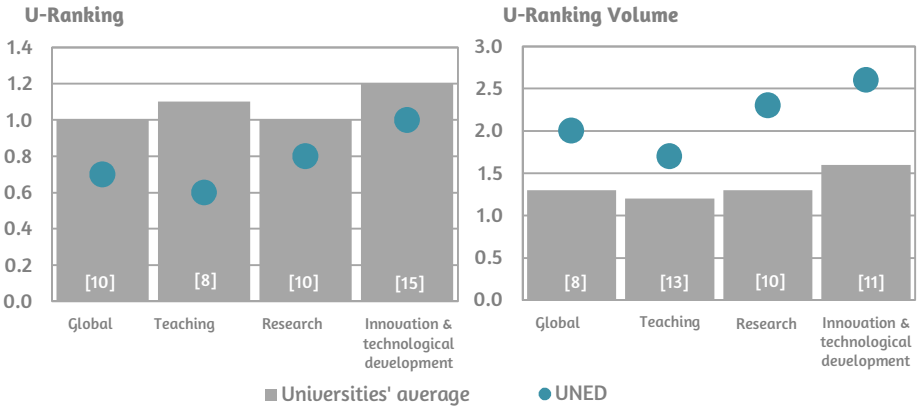
Bachelor's degrees[3]: 28

Master's degrees[3]: 75

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

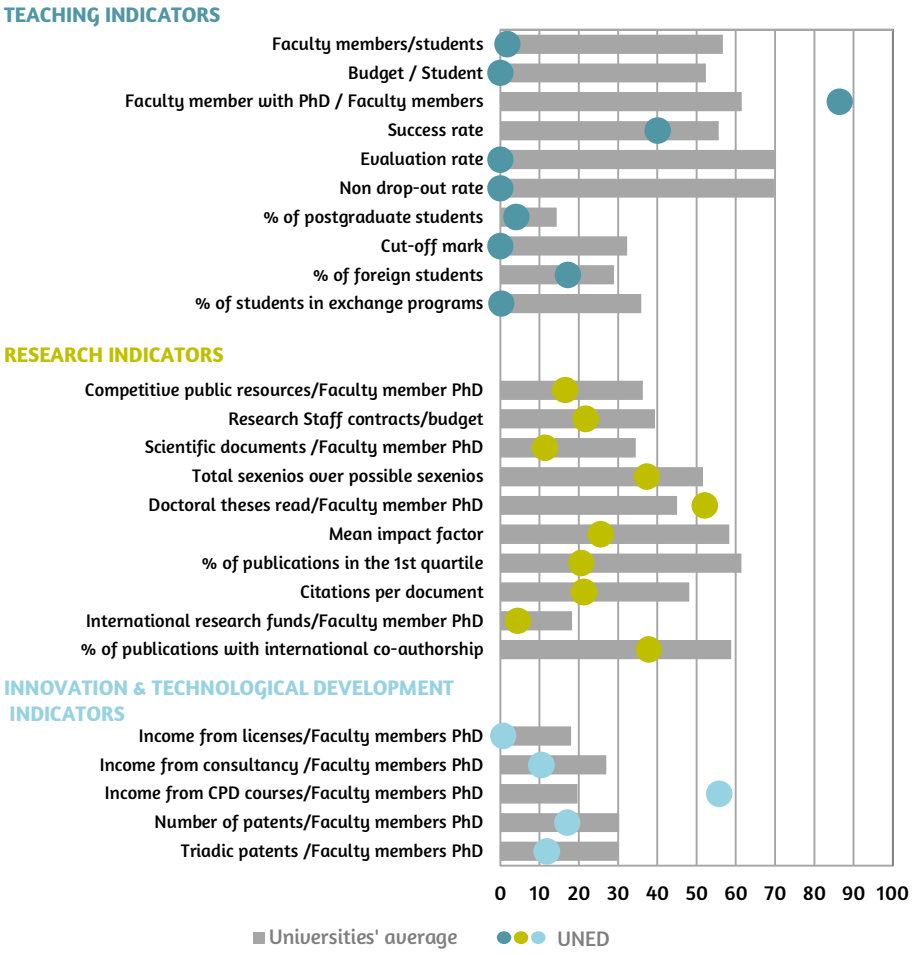
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



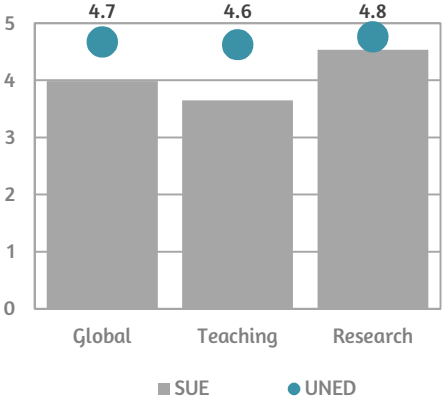
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD NEBRIJA

Year of foundation: 1995

Type of ownership: Private

Bachelor's degree students[1]: 2,866

Master's degree students[1]: 3,236

Faculty members[1]: 331

Administration and service staff[1]: 207

Budget[2]: no disponible

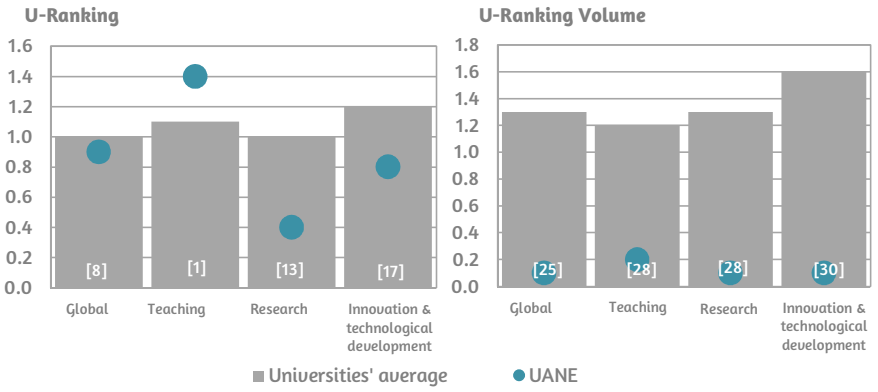
Bachelor's degrees[3]: 35

Master's degrees[3]: 38

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

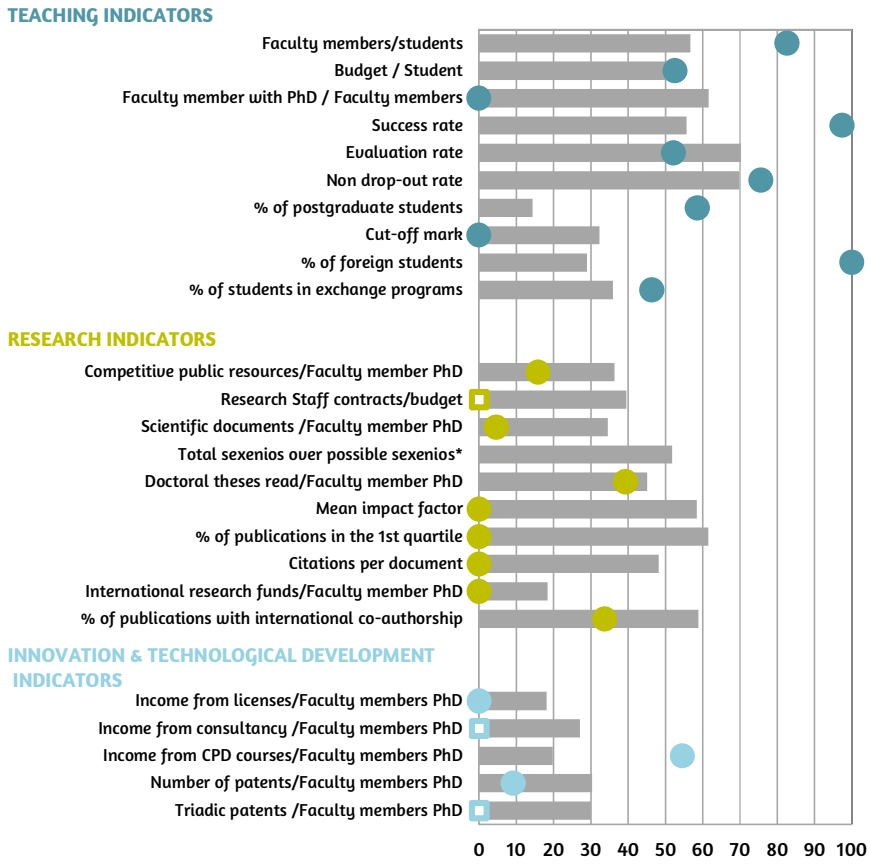
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



U-Ranking 2018 indicators

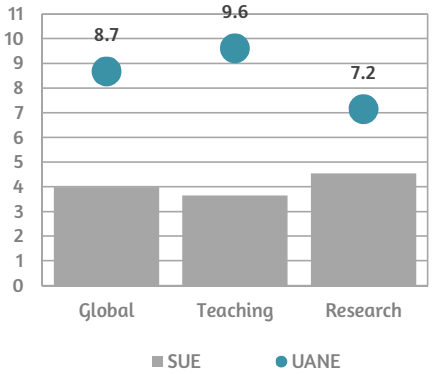
University with the minimum value=0; University with the maximum value=100



*The "sexenios" indicator is not considered for private universities

Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD PABLO DE OLAVIDE

Year of foundation: 1997

Type of ownership: Public

Bachelor's degree students[1]: 8,932

Master's degree students[1]: 1,389

Faculty members[1]: 1,035

Administration and service staff[1]: 344

Budget[2]: 75,963,828€

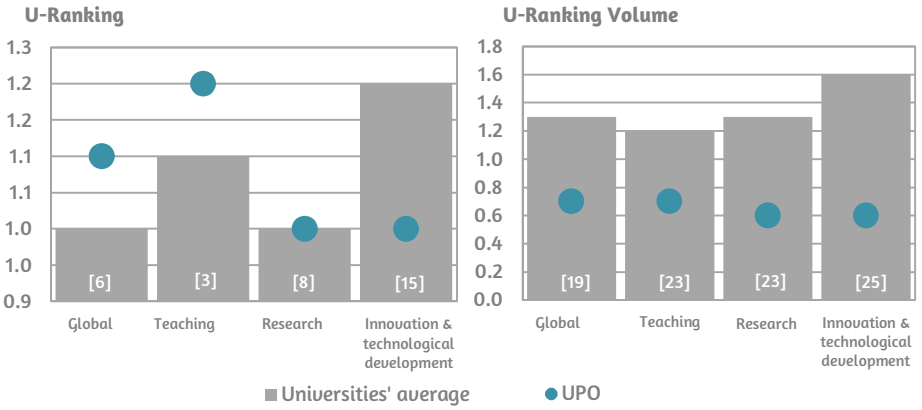
Bachelor's degrees[3]: 18

Master's degrees[3]: 39

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers. Source: Ministry of Education, Culture and Sport

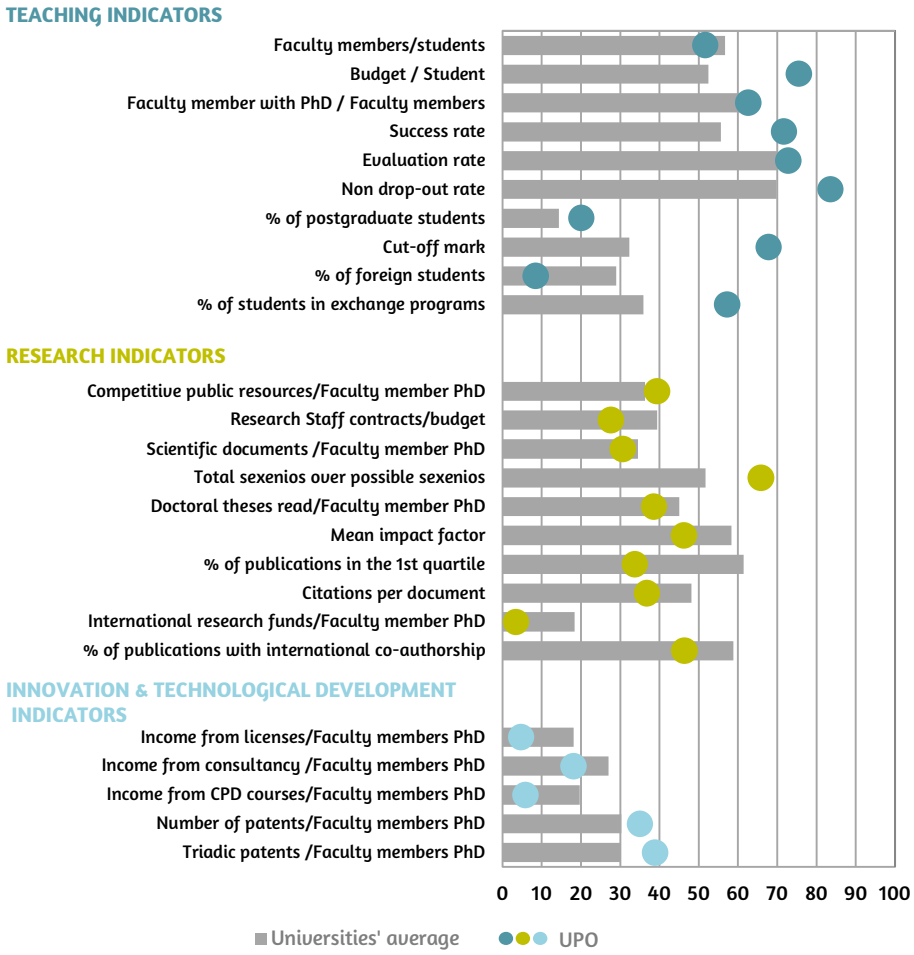
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



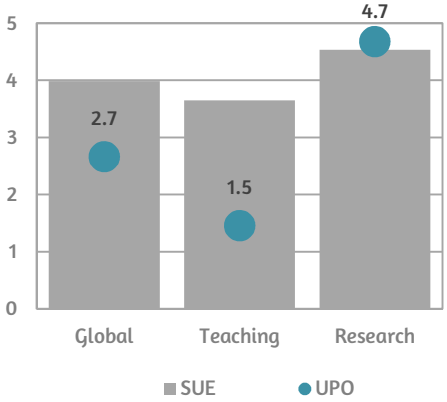
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD POLITÉCNICA DE CARTAGENA

Universidad Politécnica de Cartagena

Year of foundation: 1999

Type of ownership: Public

Bachelor's degree students[1]: 4,455

Master's degree students[1]: 485

Faculty members[1]: 584

Administration and service staff[1]: 361

Budget[2]: 56,794,545€

Bachelor's degrees[3]: 18

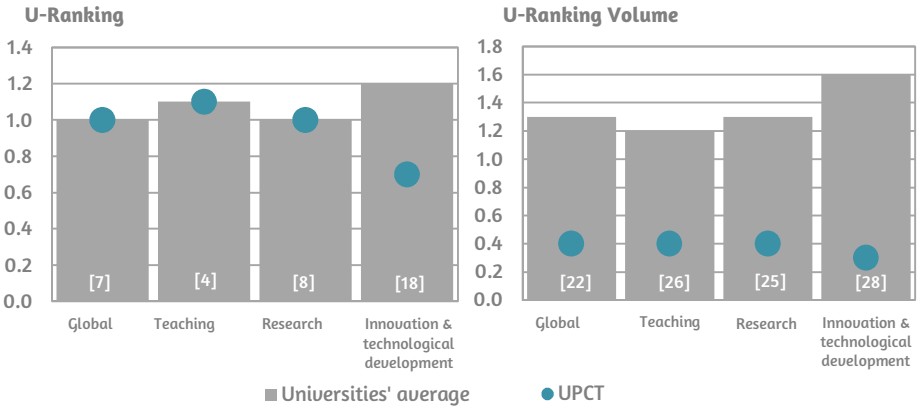
Master's degrees[3]: 21

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

Ranking

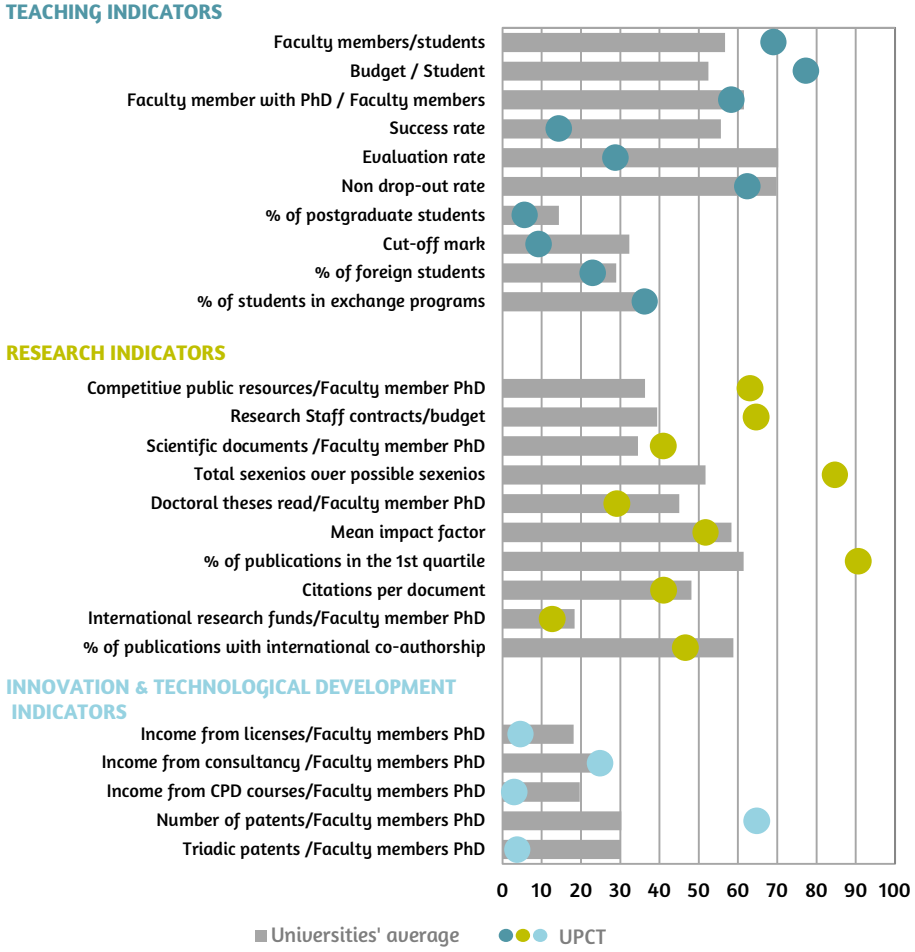
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



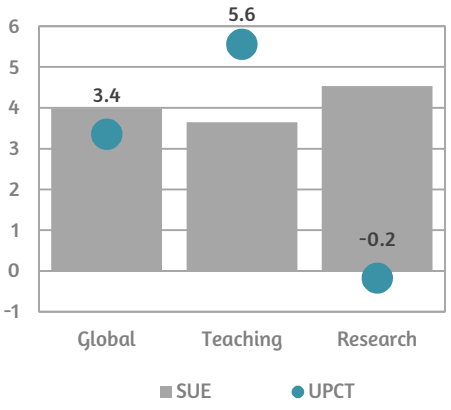
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD POLITÉCNICA DE MADRID

Year of foundation: 1971

Type of ownership: Public

Bachelor's degree students[1]: 31,157

Master's degree students[1]: 4,948

Faculty members[1]: 2,911

Administration and service staff[1]: 1,887

Budget[2]: 312,630,677€

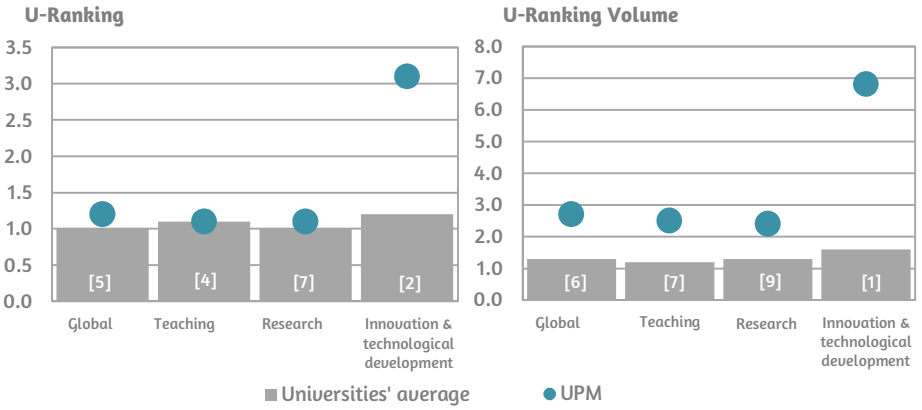
Bachelor's degrees[3]: 50

Master's degrees[3]: 78

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

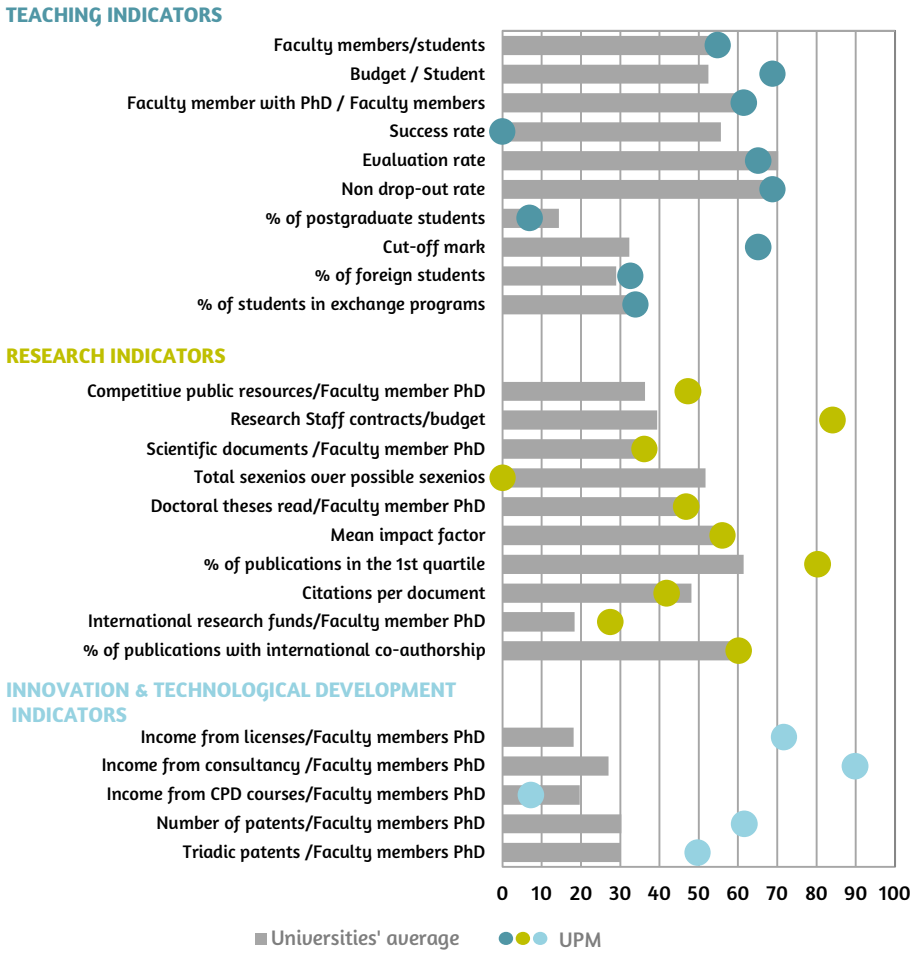
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



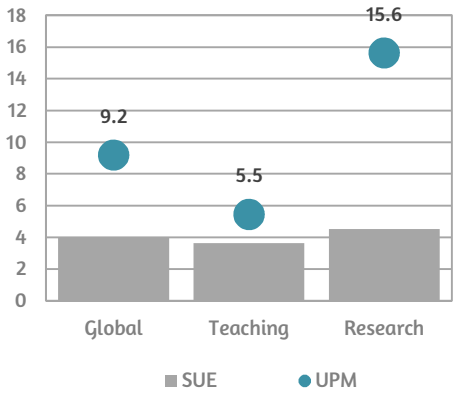
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD PONTIFICIA COMILLAS

Year of foundation: 1935

Type of ownership: Private

Bachelor's degree students[1]: 6,445

Master's degree students[1]: 2,098

Faculty members[1]: 1,346

Administration and service staff[1]: 318

Budget[2]: no disponible

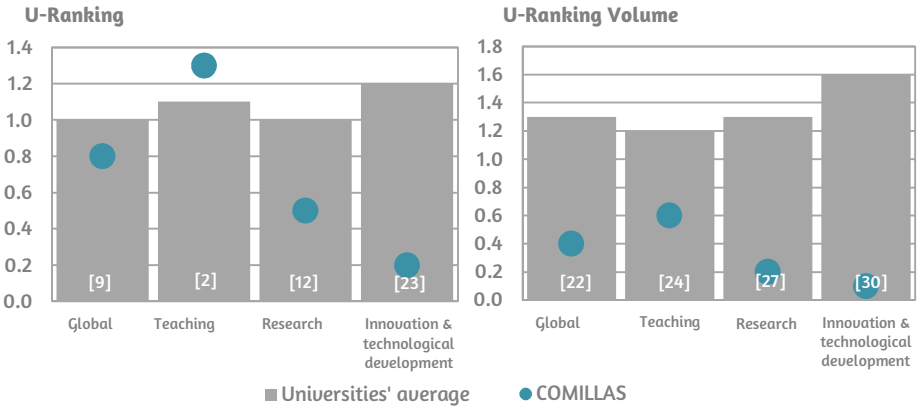
Bachelor's degrees[3]: 21

Master's degrees[3]: 28

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



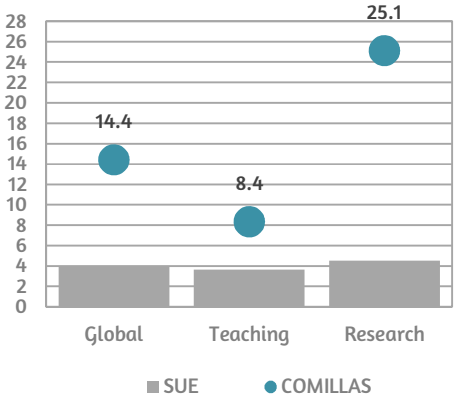
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100

*The "sexenios" indicator is not considered for private universities

Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD PÚBLICA DE NAVARRA

Year of foundation: 1987

Type of ownership: Public

Bachelor's degree students[1]: 6,929

Master's degree students[1]: 753

Faculty members[1]: 885

Administration and service staff[1]: 456

Budget[2]: 72,459,604€

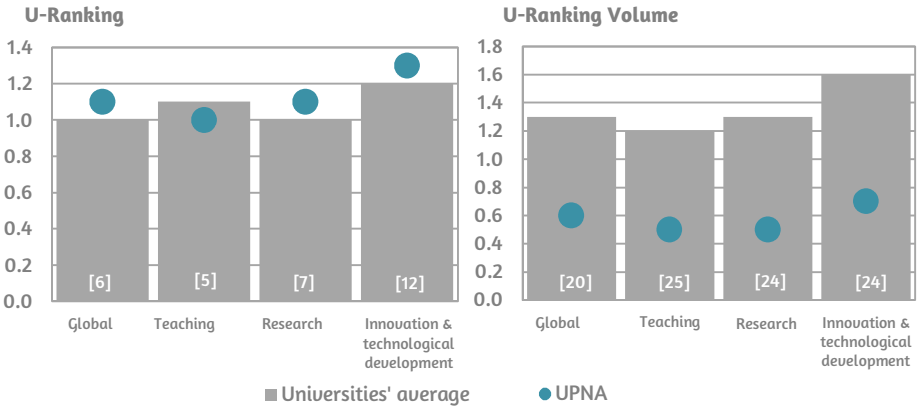
Bachelor's degrees[3]: 18

Master's degrees[3]: 28

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

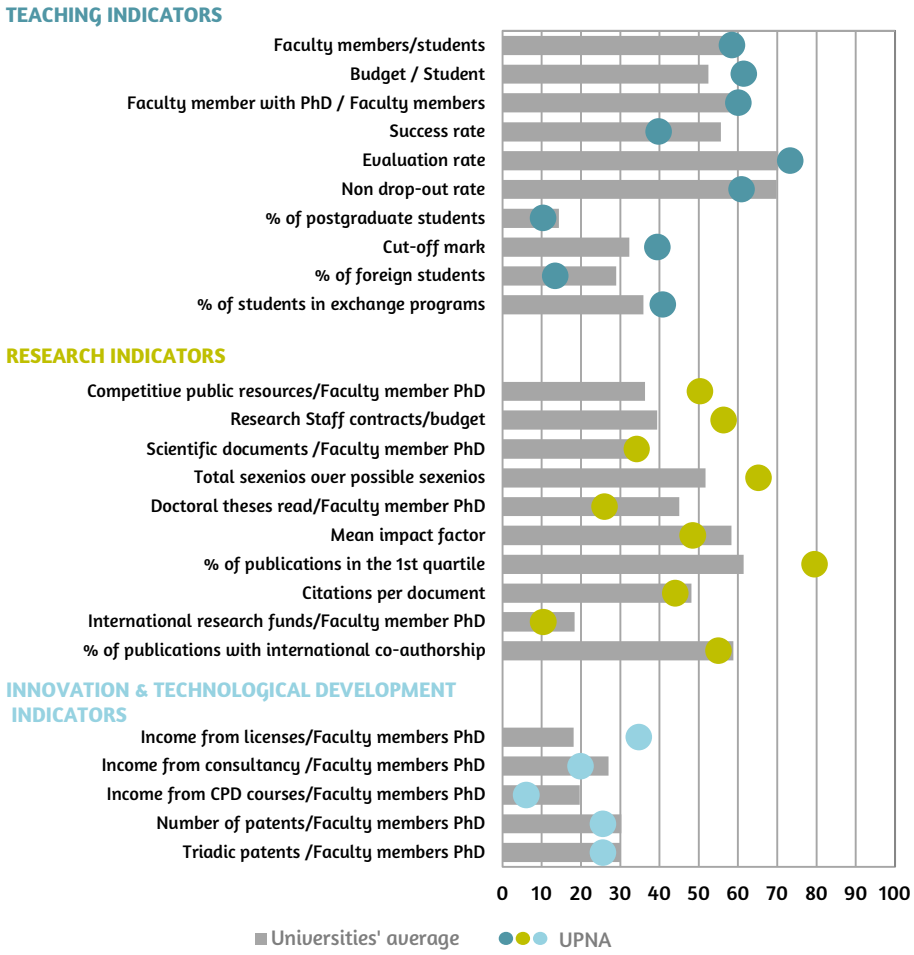
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



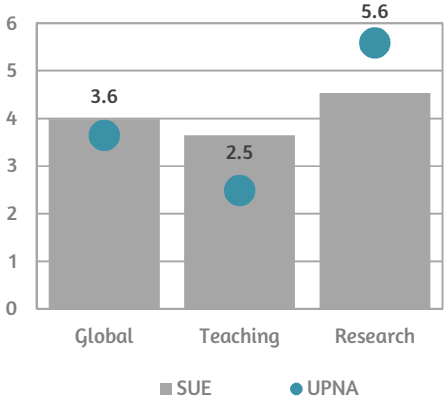
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD REY JUAN CARLOS

Universidad Rey Juan Carlos

Year of foundation: 1997

Type of ownership: Public

Bachelor's degree students[1]: 37,611

Master's degree students[1]: 6,641

Faculty members[1]: 1,523

Administration and service staff[1]: 617

Budget[2]: 148,320,635€

Bachelor's degrees[3]: 64

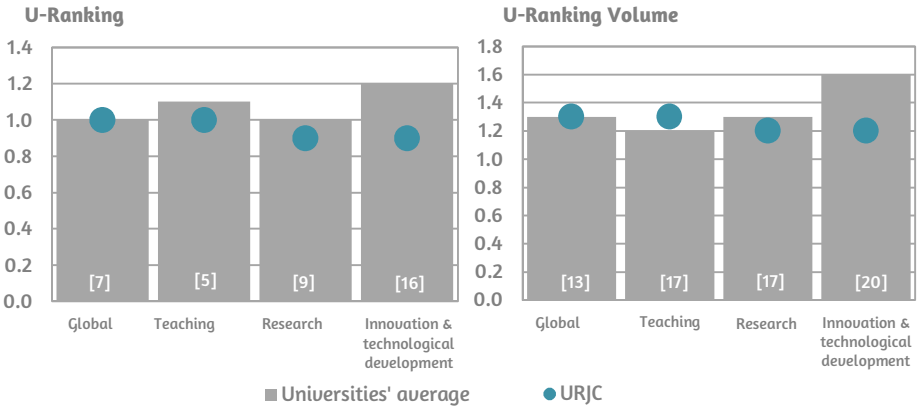
Master's degrees[3]: 84

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

U-Ranking

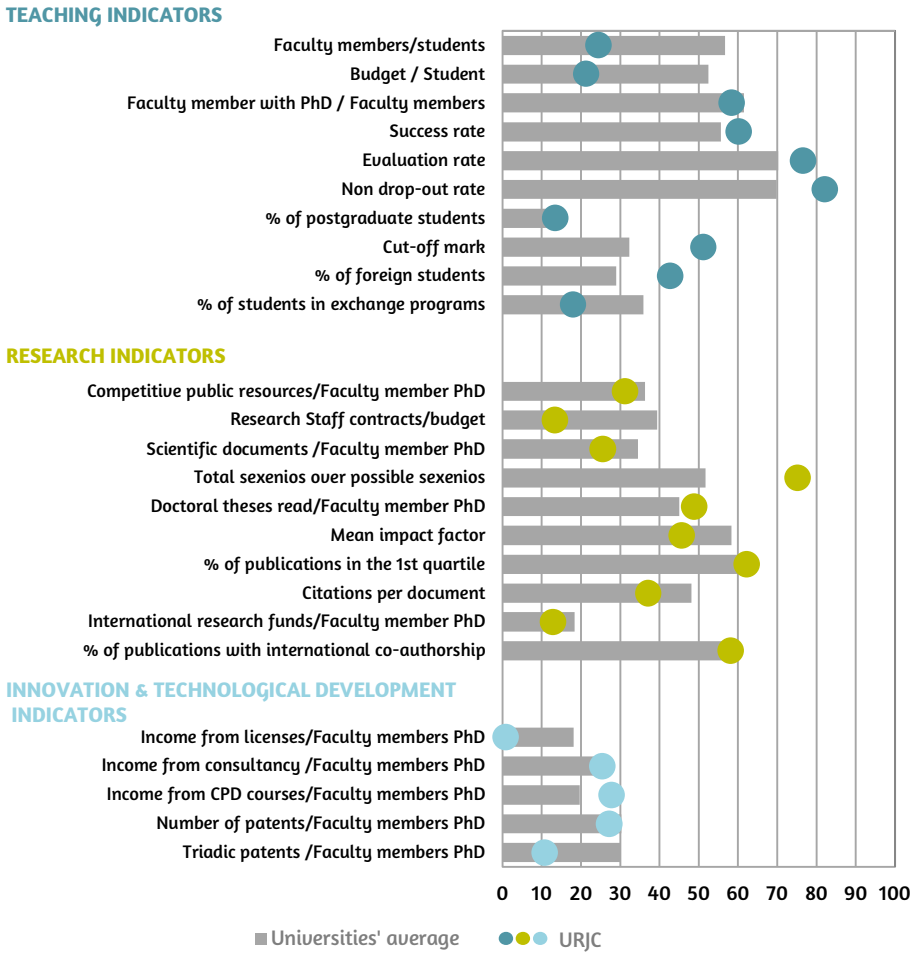
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



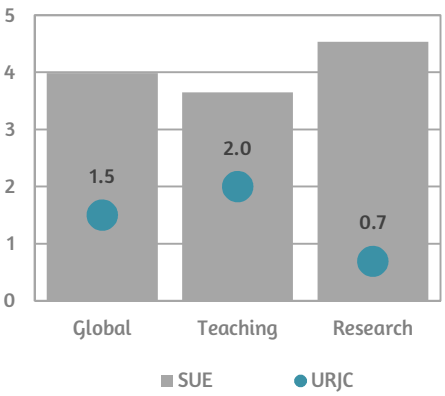
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDAD SAN PABLO CEU

Year of foundation: 1993

Type of ownership: Private

Bachelor's degree students[1]: 6,913

Master's degree students[1]: 1,488

Faculty members[1]: 926

Administration and service staff[1]: 262

Budget[2]: no disponible

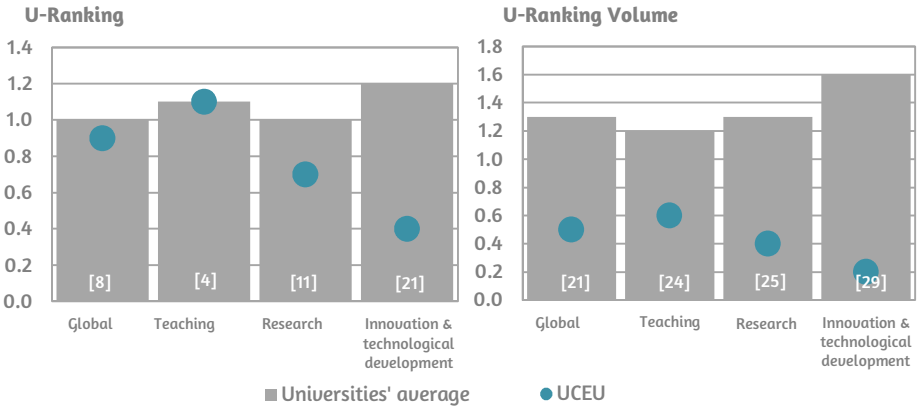
Bachelor's degrees[3]: 32

Master's degrees[3]: 39

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

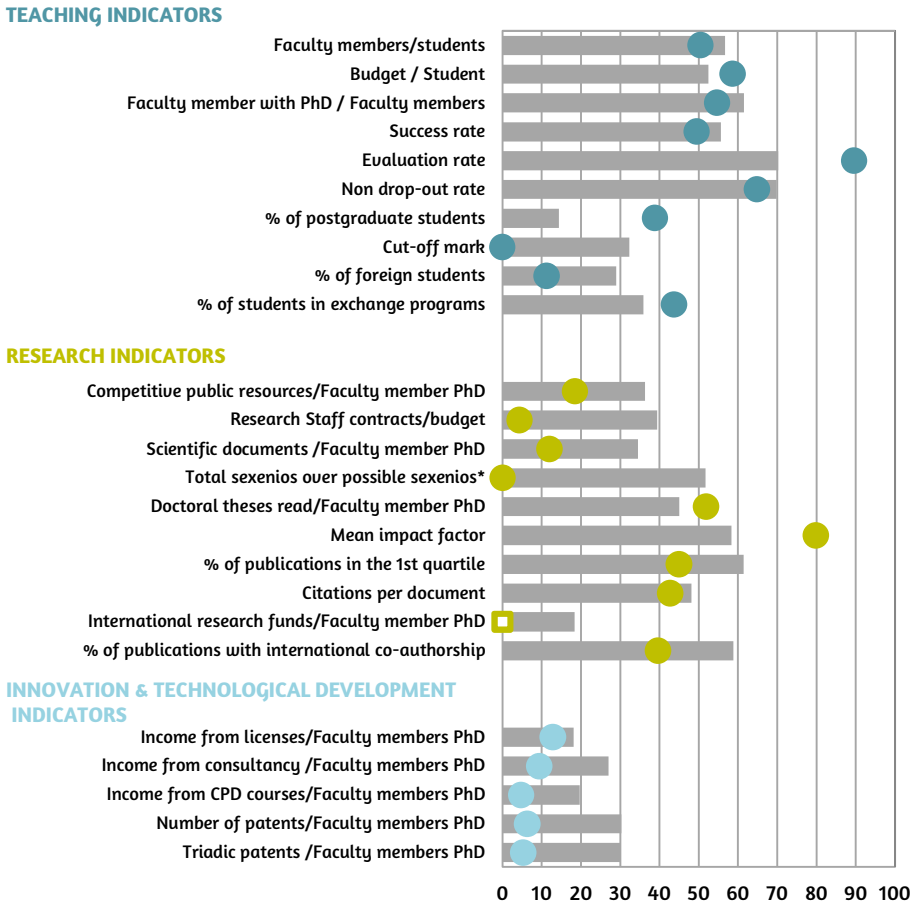
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



U-Ranking 2018 indicators

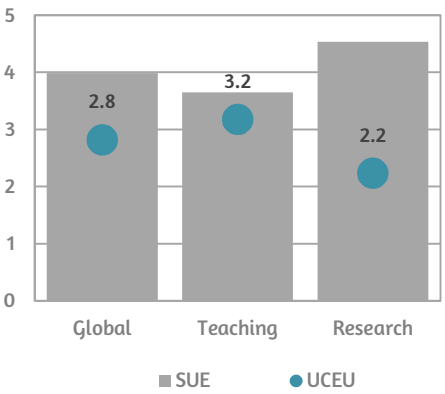
University with the minimum value=0; University with the maximum value=100



*The "sexenios" indicator is not considered for private universities

Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDADE DA CORUÑA

Year of foundation: 1989

Type of ownership: Public

Bachelor's degree students[1]: 13,710

Master's degree students[1]: 1,765

Faculty members[1]: 1,421

Administration and service staff[1]: 764

Budget[2]: 121,810,118€

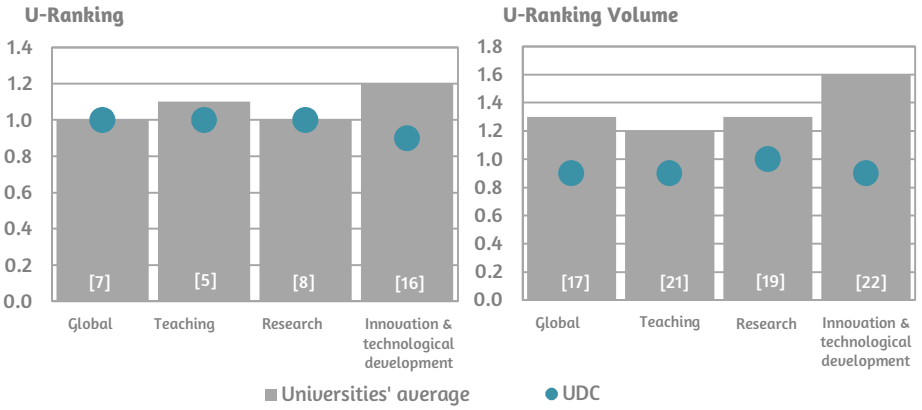
Bachelor's degrees[3]: 39

Master's degrees[3]: 56

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

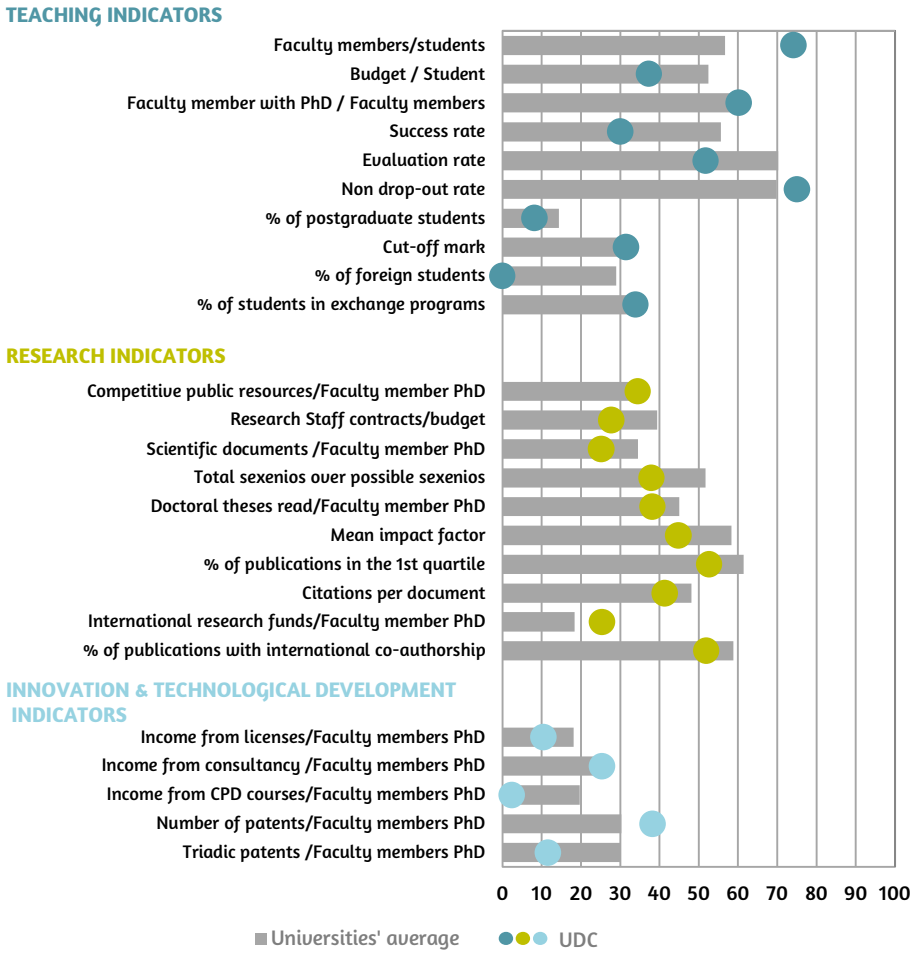
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



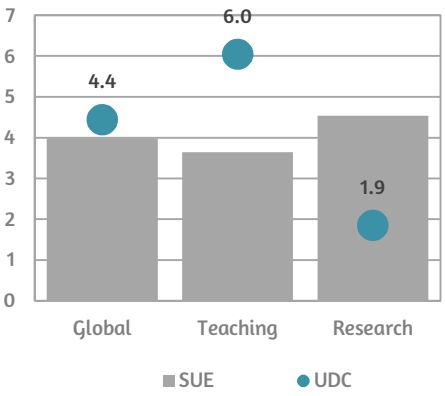
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDADE DE SANTIAGO DE COMPOSTELA

Year of foundation: 1495

Type of ownership: Public

Bachelor's degree students[1]: 19,167

Master's degree students[1]: 1,911

Faculty members[1]: 2,066

Administration and service staff[1]: 1,230

Budget[2]: 243,163,170€

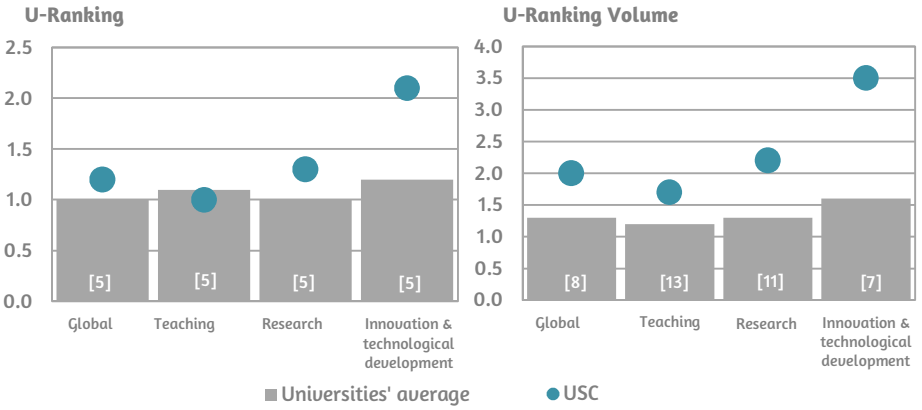
Bachelor's degrees[3]: 43

Master's degrees[3]: 63

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

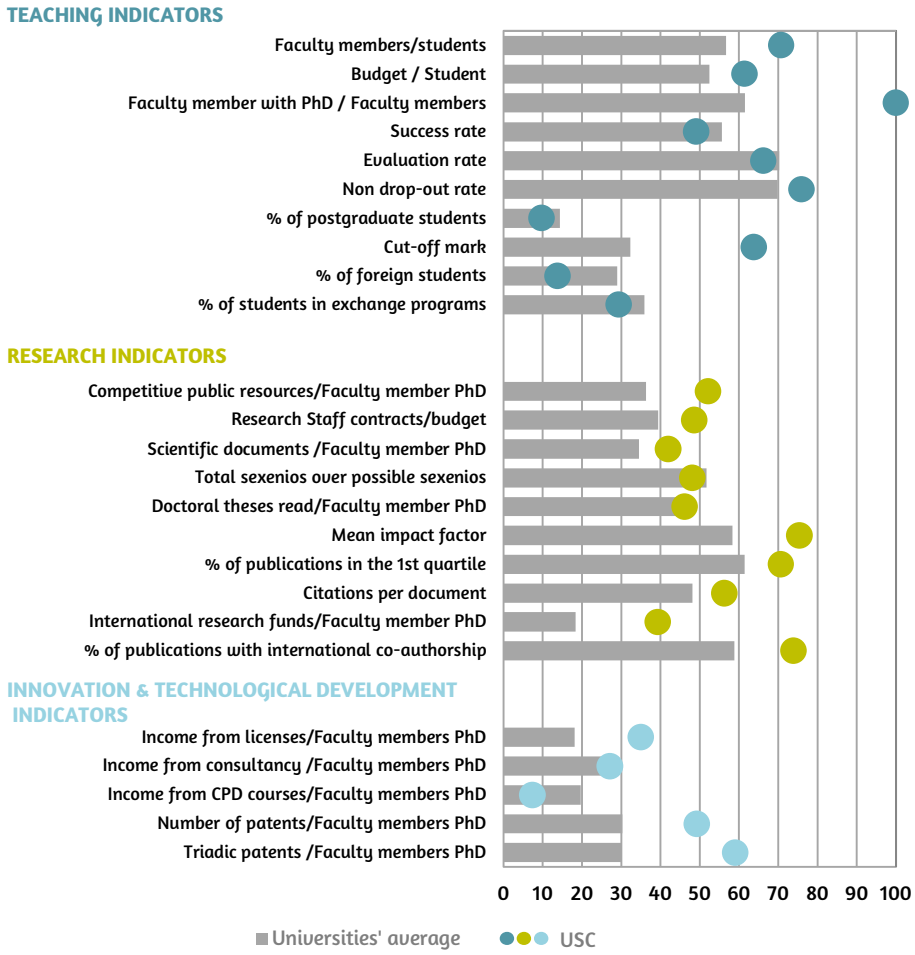
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



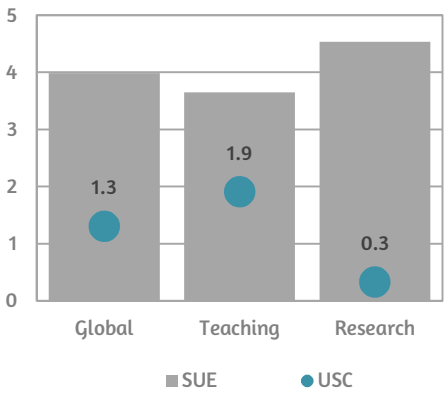
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSIDADE DE VIGO

Universidade Vigo

Year of foundation: 1989

Type of ownership: Public

Bachelor's degree students[1]: 15,174

Master's degree students[1]: 2,020

Faculty members[1]: 1,362

Administration and service staff[1]: 699

Budget[2]: 151,027,720€

Bachelor's degrees[3]: 40

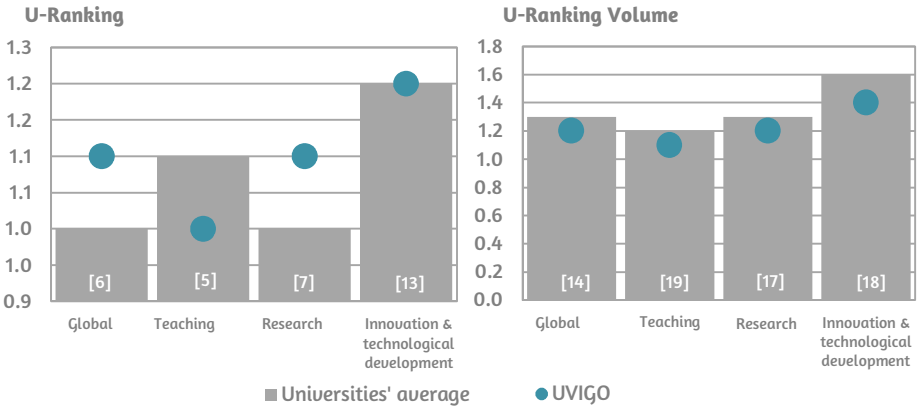
Master's degrees[3]: 56

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

U-Ranking

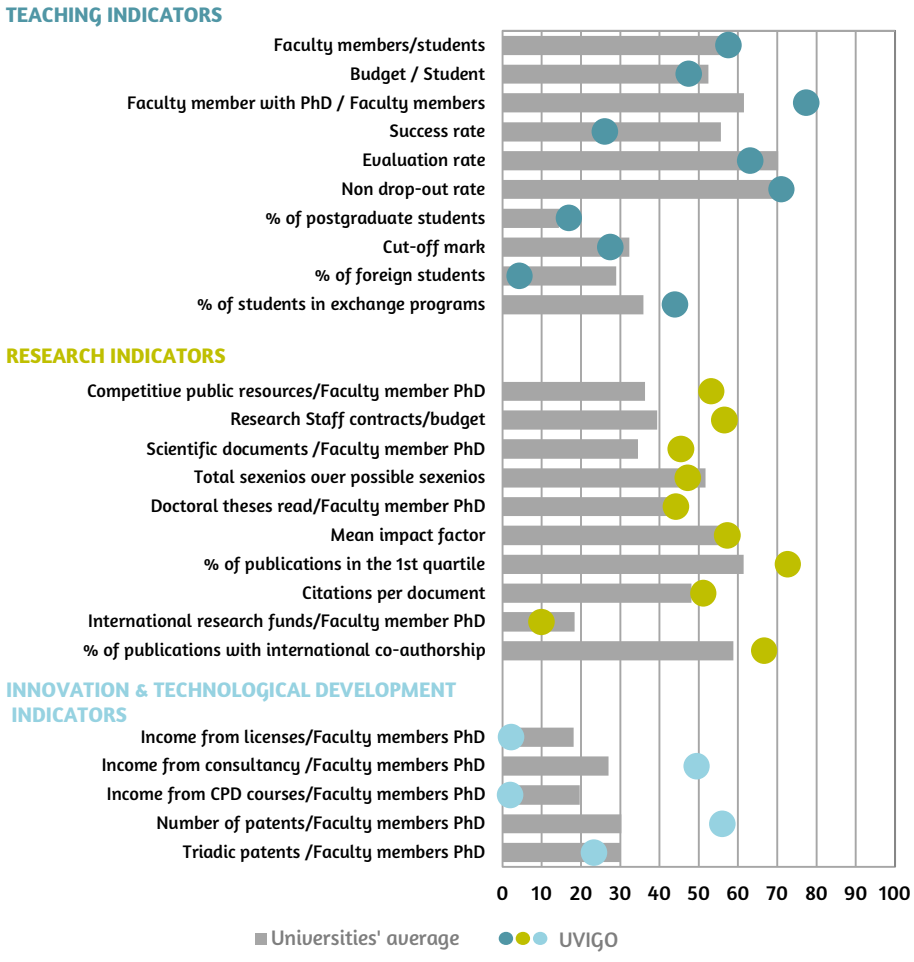
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



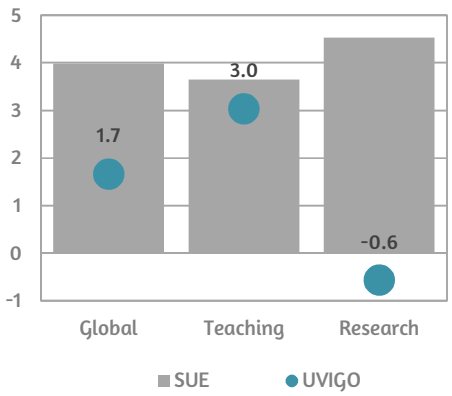
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSITAT AUTÒNOMA DE BARCELONA

Universitat Autònoma de Barcelona

Year of foundation: 1968

Type of ownership: Public

Bachelor's degree students[1]: 26,388

Master's degree students[1]: 3,741

Faculty members[1]: 3,532

Administration and service staff[1]: 1,748

Budget[2]: 312,687,781€

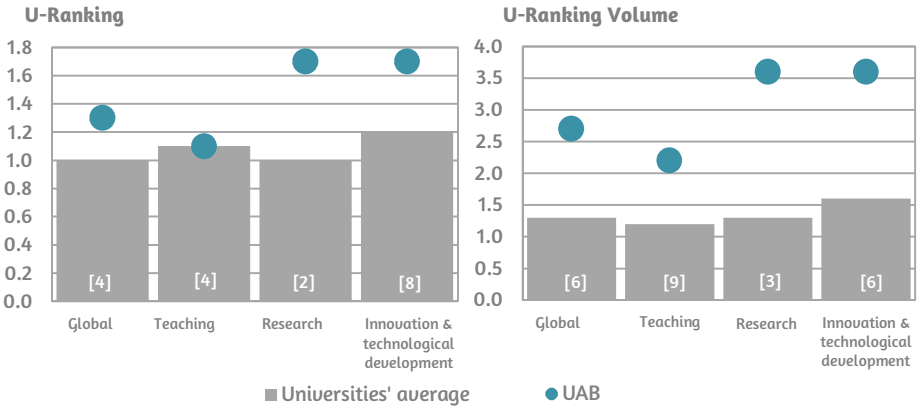
Bachelor's degrees[3]: 68

Master's degrees[3]: 166

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers. Source: Ministry of Education, Culture and Sport

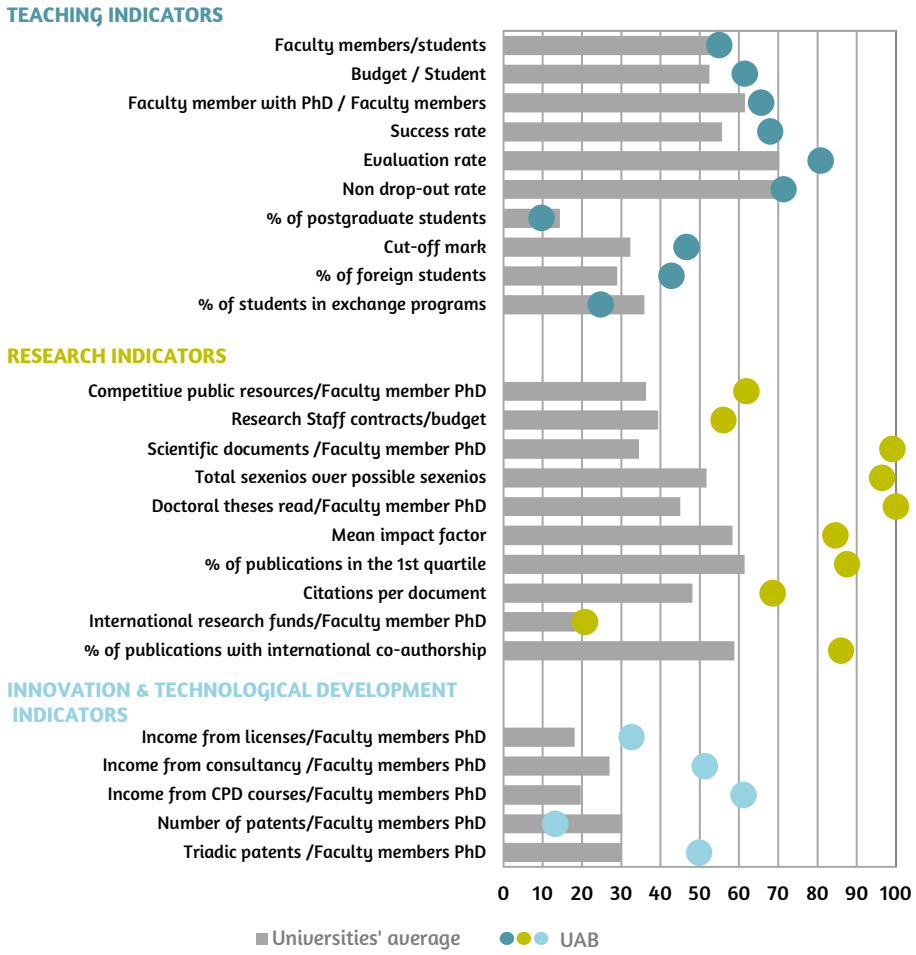
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



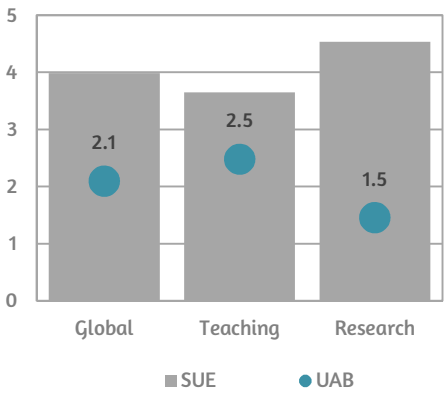
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSITAT DE BARCELONA

Year of foundation: 1430

Type of ownership: Public

Bachelor's degree students[1]: 41,080

Master's degree students[1]: 7,412

Faculty members[1]: 5,391

Administration and service staff[1]: 2,254

Budget[2]: 405,215,029€

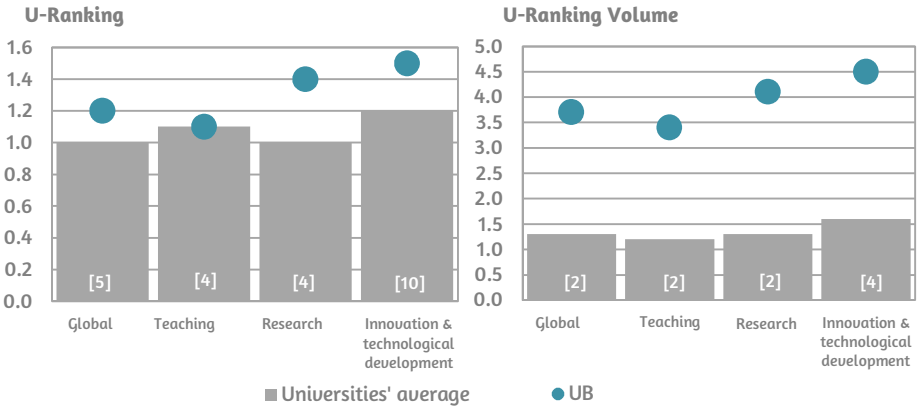
Bachelor's degrees[3]: 62

Master's degrees[3]: 195

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

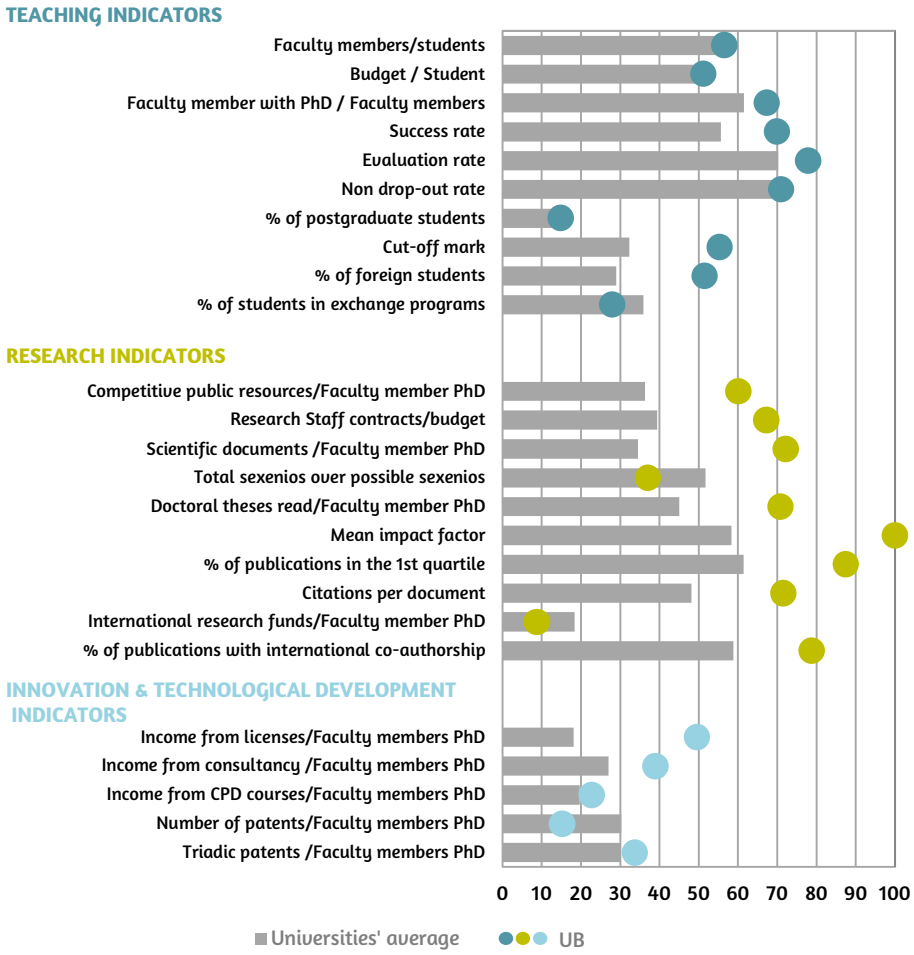
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



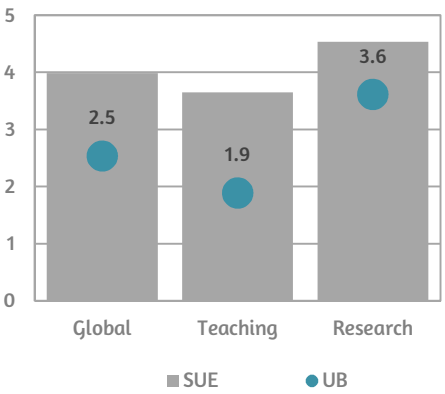
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSITAT DE GIRONA

Universitat de Girona

Year of foundation: 1992

Type of ownership: Public

Bachelor's degree students[1]: 10,210

Master's degree students[1]: 1,007

Faculty members[1]: 1,238

Administration and service staff[1]: 575

Budget[2]: 101,478,982€

Bachelor's degrees[3]: 43

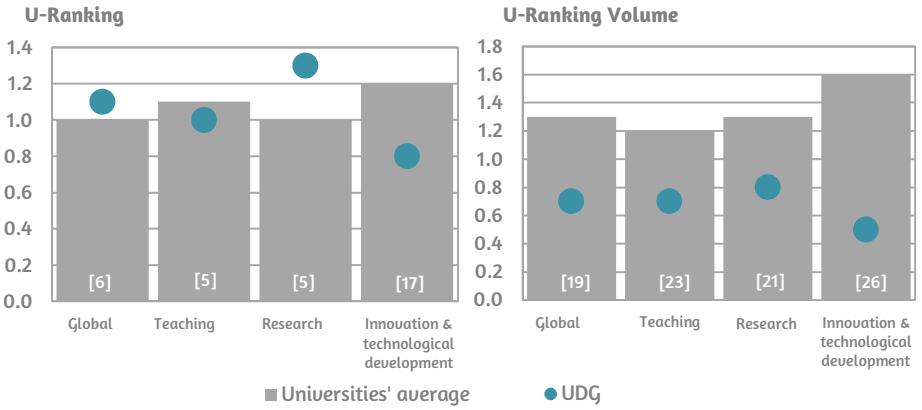
Master's degrees[3]: 42

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

Ranking

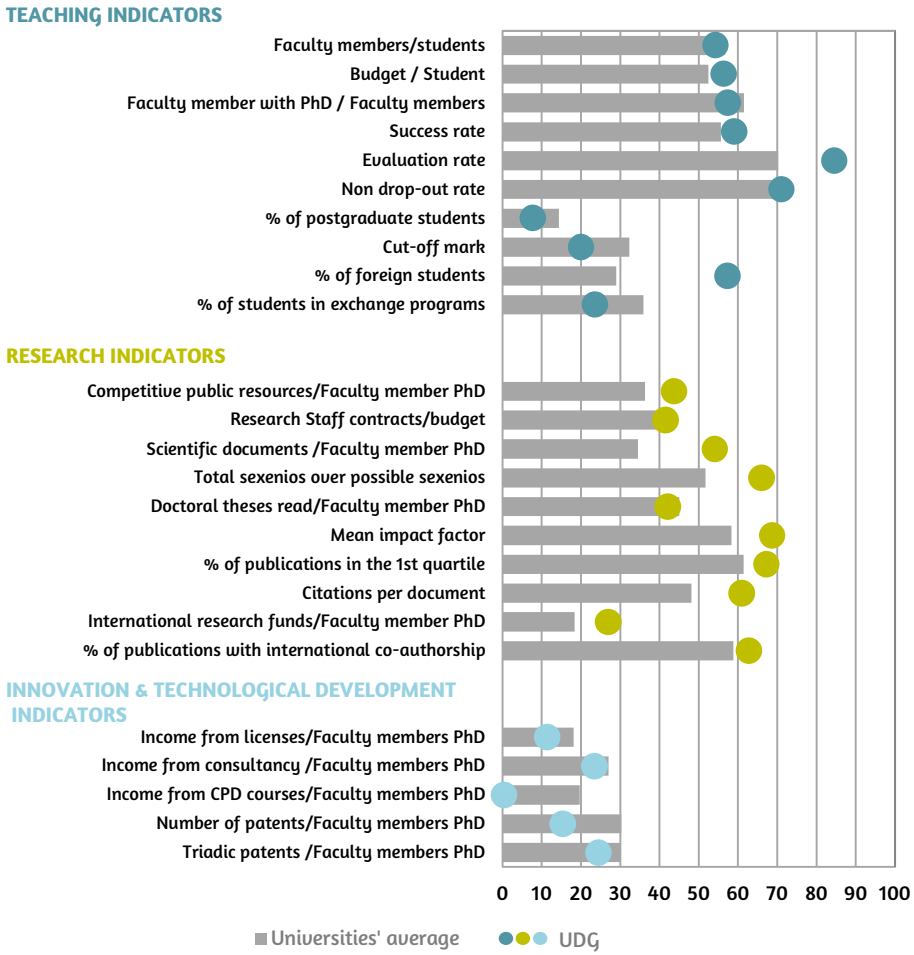
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



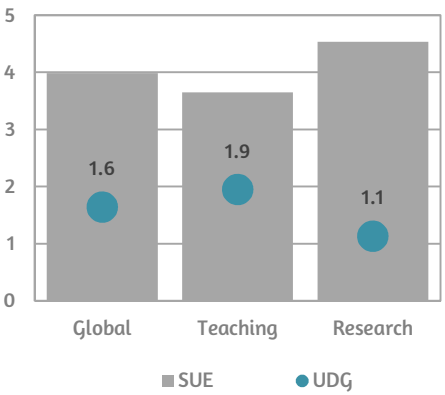
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSITAT DE LES ILLES BALEARS

Year of foundation: 1978

Type of ownership: Public

Bachelor's degree students[1]: 11,111

Master's degree students[1]: 1,324

Faculty members[1]: 1,334

Administration and service staff[1]: 546

Budget[2]: 88,508,290€

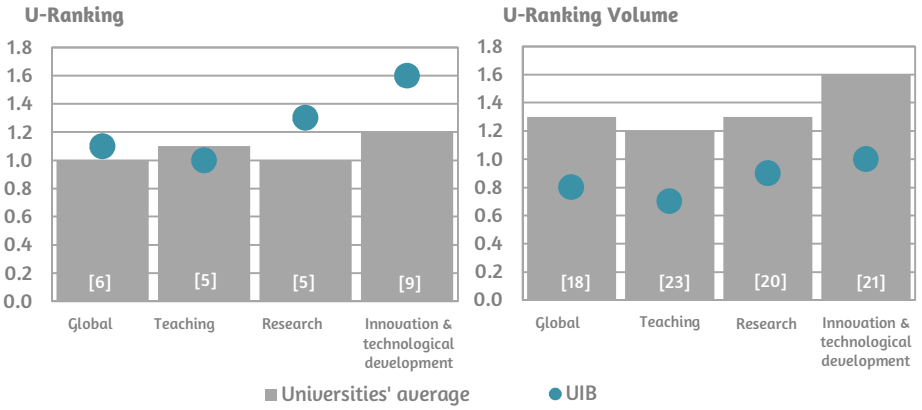
Bachelor's degrees[3]: 31

Master's degrees[3]: 35

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

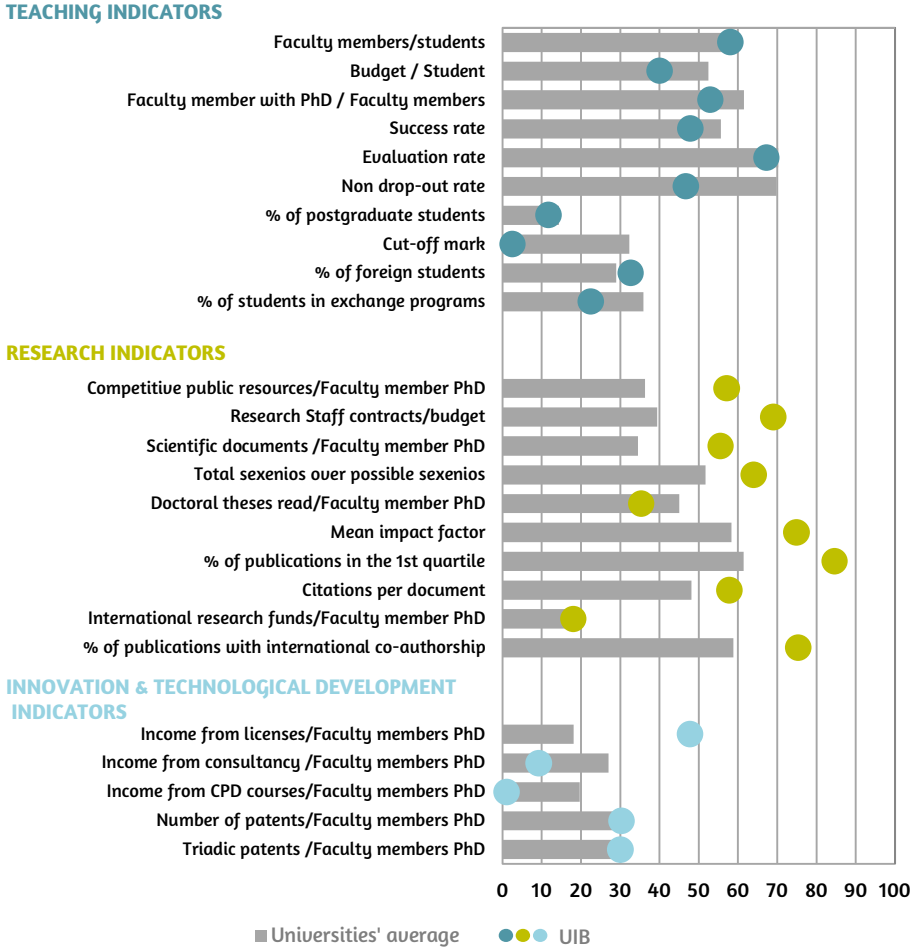
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



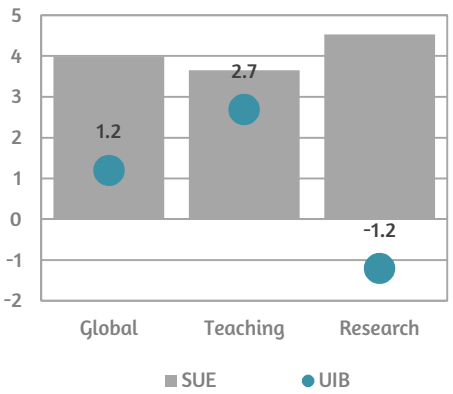
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSITAT DE LLEIDA

Universitat de Lleida

Year of foundation: 1992

Type of ownership: Public

Bachelor's degree students[1]: 7,743

Master's degree students[1]: 1,296

Faculty members[1]: 1,104

Administration and service staff[1]: 535

Budget[2]: 82,898,373€

Bachelor's degrees[3]: 44

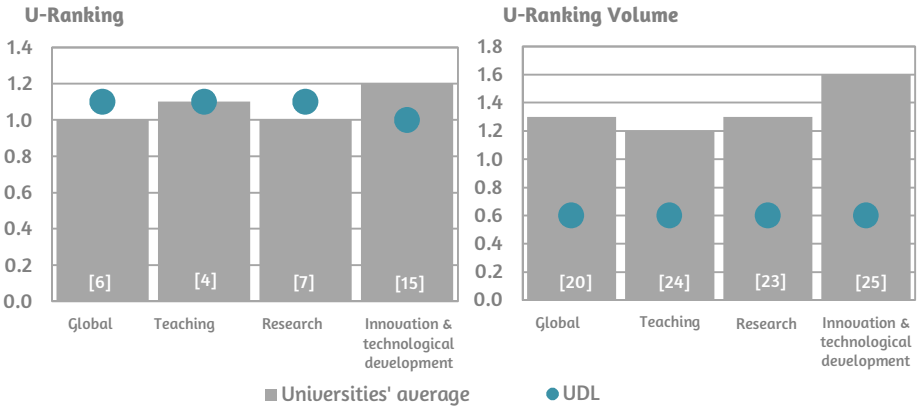
Master's degrees[3]: 41

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

U-Ranking

U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



U-Ranking 2018 indicators

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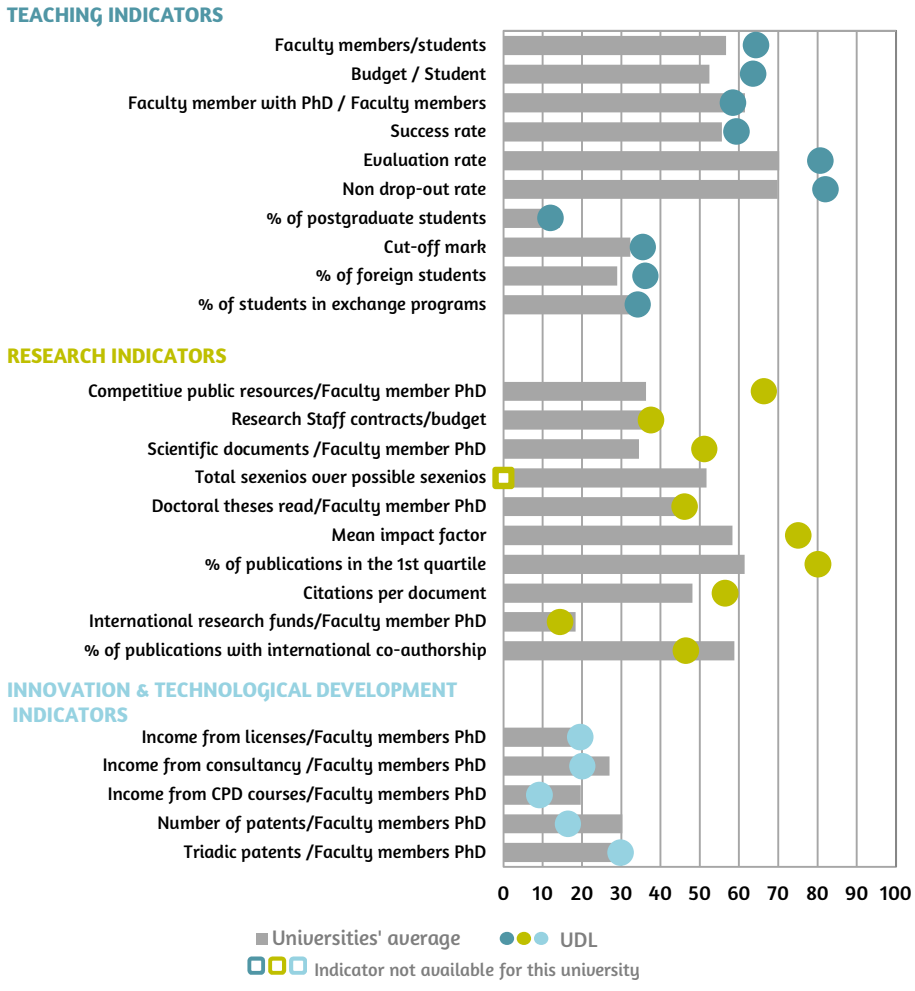
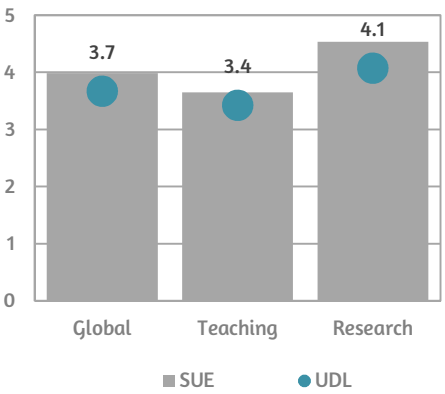


Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSITAT DE VALÈNCIA

Year of foundation: 1500

Type of ownership: Public

Bachelor's degree students[1]: 37,069

Master's degree students[1]: 5,703

Faculty members[1]: 4,186

Administration and service staff[1]: 1,784

Budget[2]: 366,854,001€

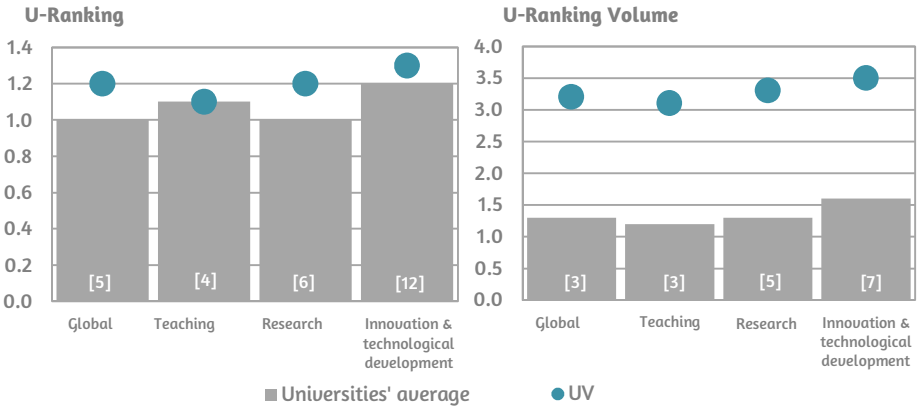
Bachelor's degrees[3]: 54

Master's degrees[3]: 117

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

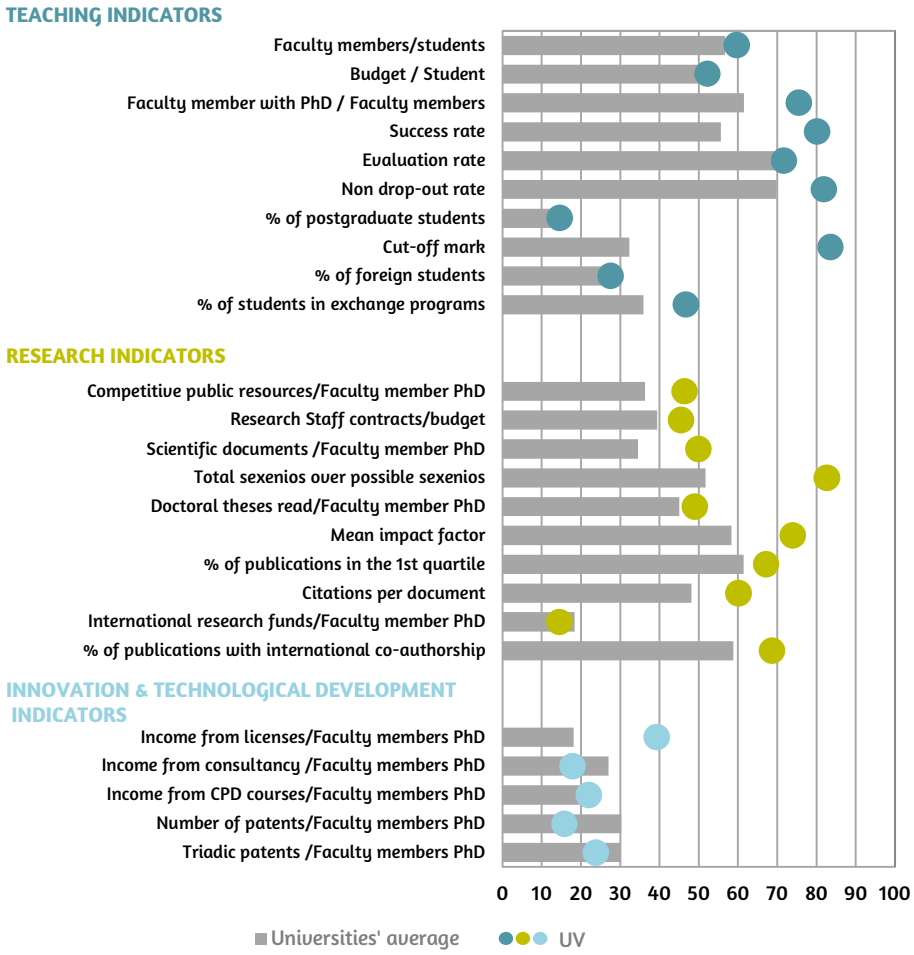
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



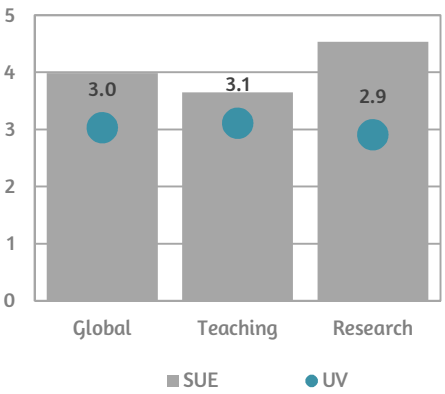
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSITAT DE VIC - U. CENTRAL DE CATALUNYA

UVIC
UNIVERSITAT DE VIC
UNIVERSITAT CENTRAL
DE CATALUNYA

Year of foundation: 1997

Type of ownership: Private

Bachelor's degree students[1]: 5,534

Master's degree students[1]: 644

Faculty members[1]: 602

Administration and service staff[1]: 301

Budget[2]: no disponible

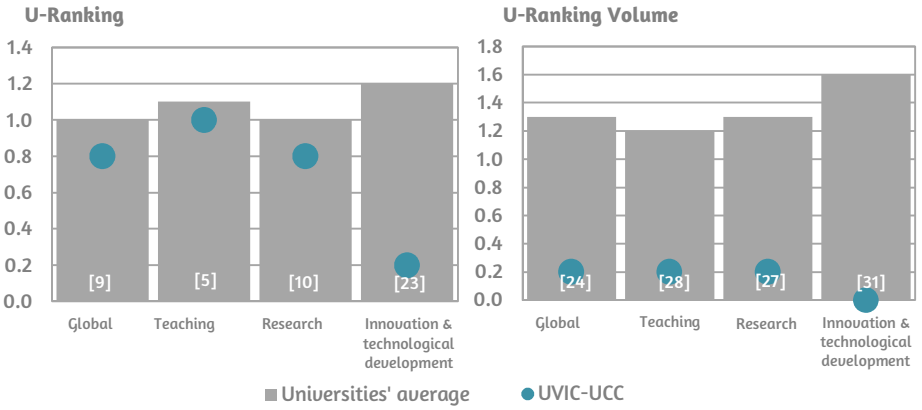
Bachelor's degrees[3]: 40

Master's degrees[3]: 20

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

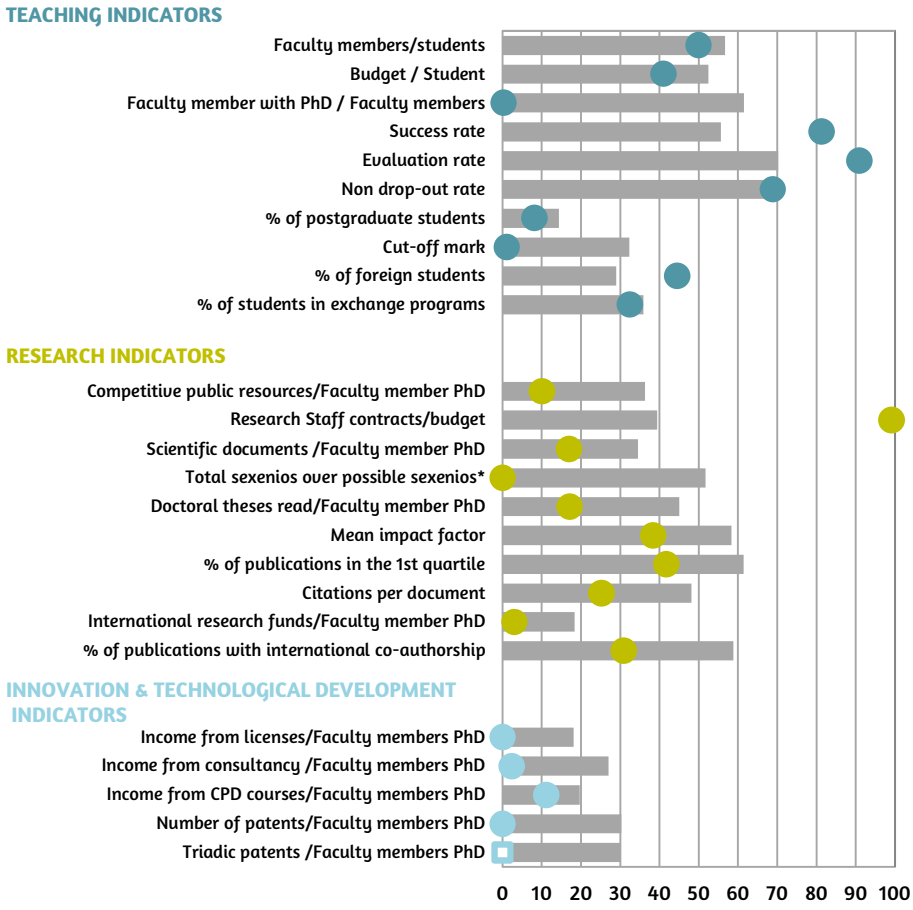
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



U-Ranking 2018 indicators

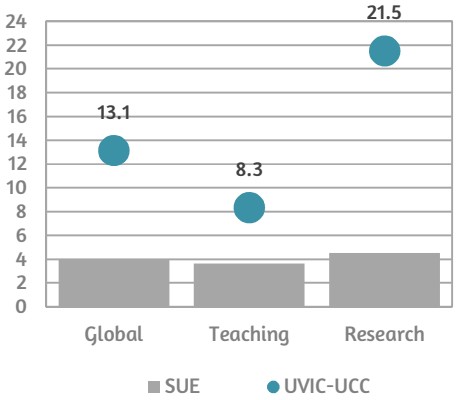
University with the minimum value=0; University with the maximum value=100



*The "sexenios" indicator is not considered for private universities

Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSITAT INTERNACIONAL DE CATALUNYA

uicbarcelona

Year of foundation: 1997

Type of ownership: Private

Bachelor's degree students[1]: 3,169

Master's degree students[1]: 353

Faculty members[1]: 476

Administration and service staff[1]: 268

Budget[2]: no disponible

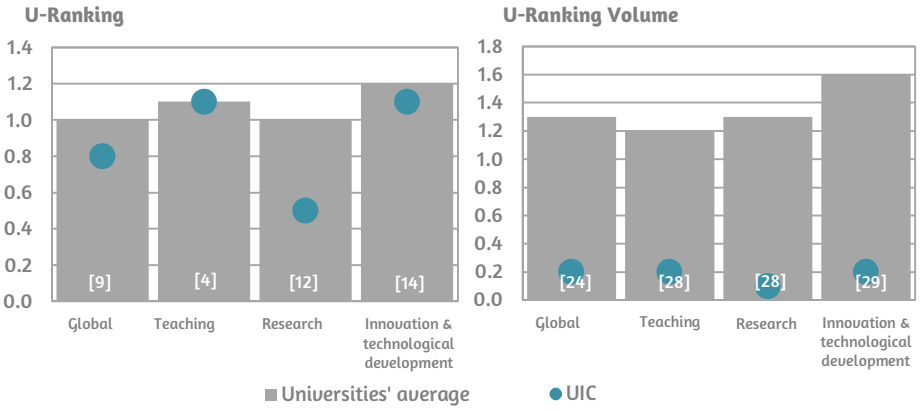
Bachelor's degrees[3]: 15

Master's degrees[3]: 17

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

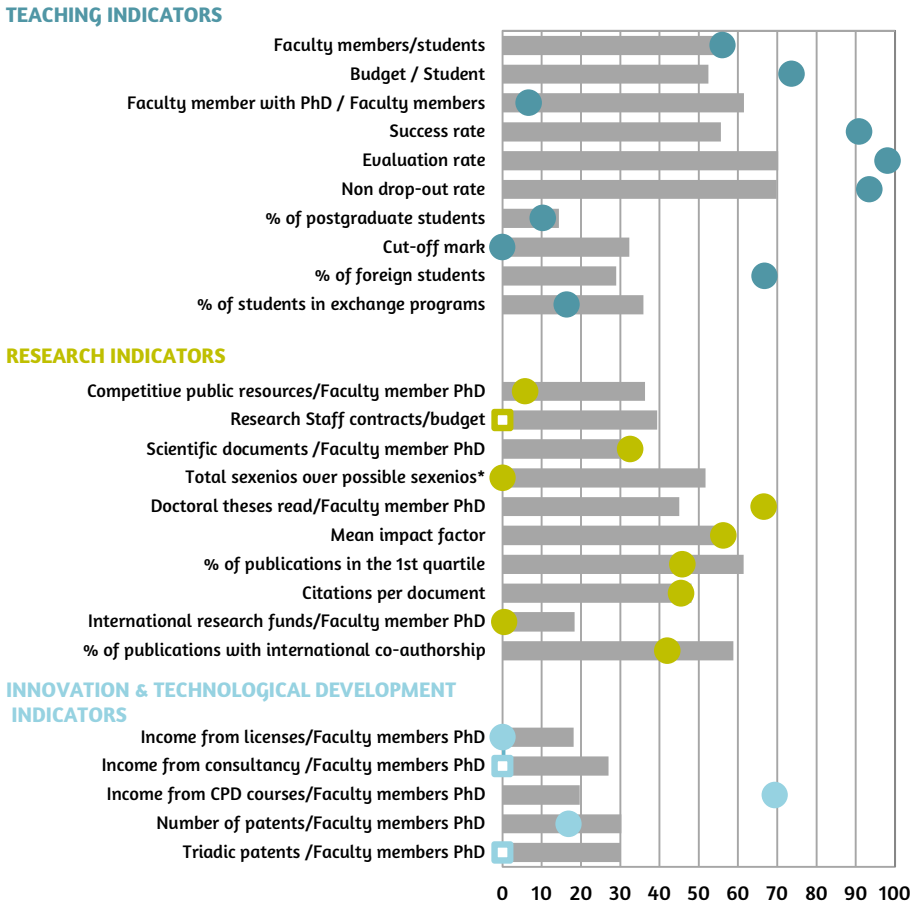
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



U-Ranking 2018 indicators

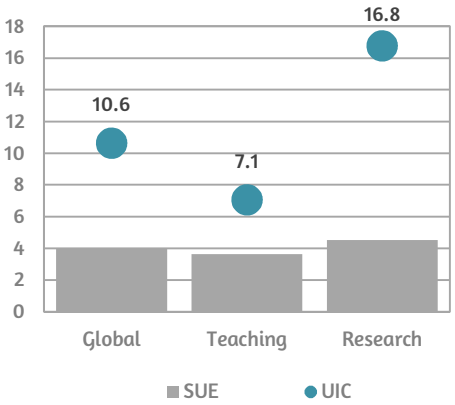
University with the minimum value=0; University with the maximum value=100



*The "sexenios" indicator is not considered for private universities

Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSITAT JAUME I

Year of foundation: 1991

Type of ownership: Public

Bachelor's degree students[1]: 11,741

Master's degree students[1]: 1,440

Faculty members[1]: 1,288

Administration and service staff[1]: 634

Budget[2]: 110,421,336€

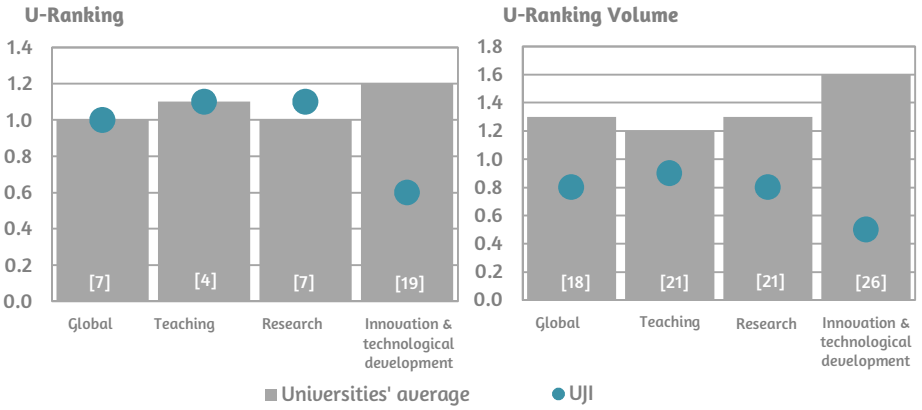
Bachelor's degrees[3]: 31

Master's degrees[3]: 46

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

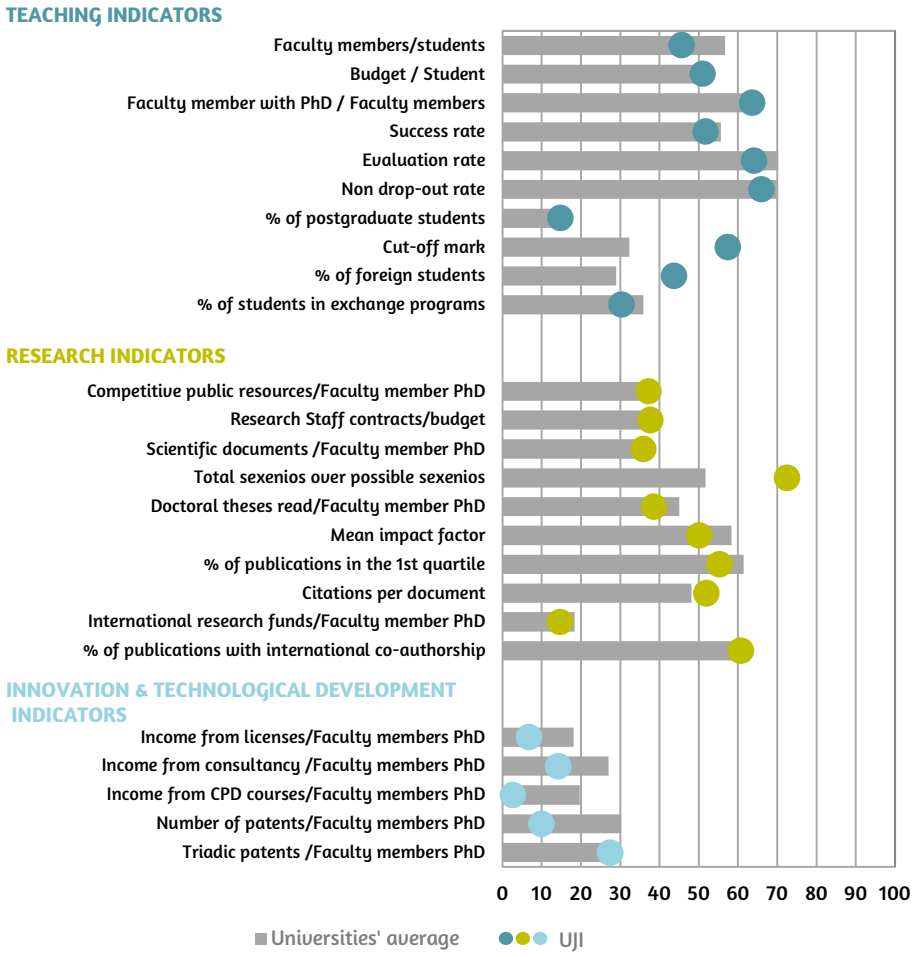
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



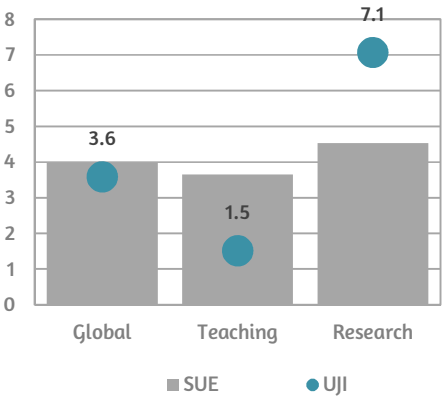
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSITAT OBERTA DE CATALUNYA

Year of foundation: 1995

Type of ownership: Private

Bachelor's degree students[1]: 35,411

Master's degree students[1]: 12,083

Faculty members[1]: 280

Administration and service staff[1]: 502

Budget[2]: no disponible

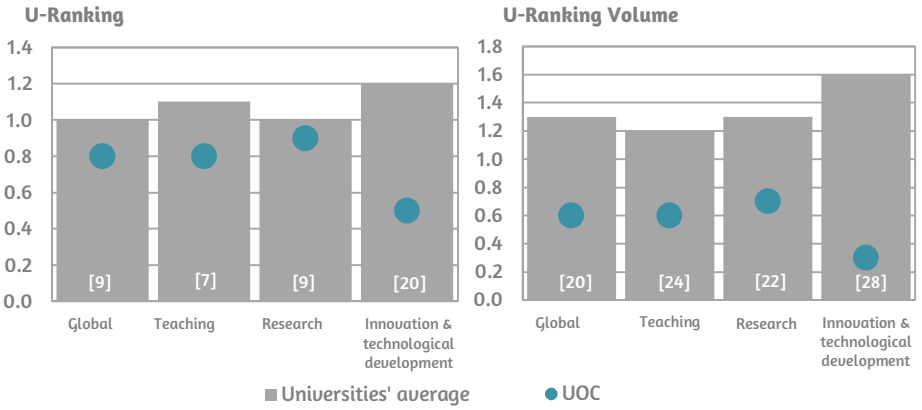
Bachelor's degrees[3]: 25

Master's degrees[3]: 44

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

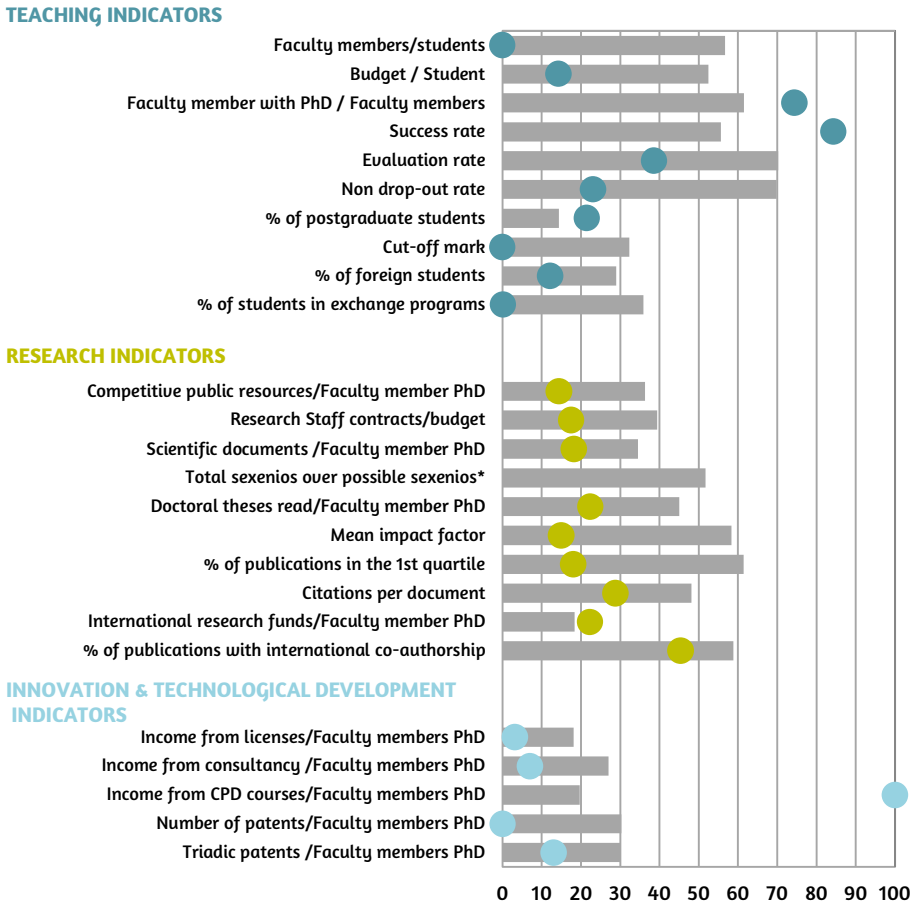
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



U-Ranking 2018 indicators

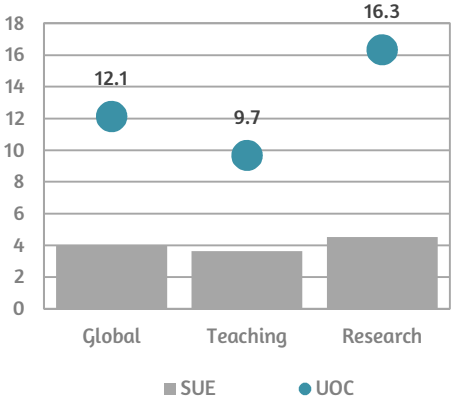
University with the minimum value=0; University with the maximum value=100



*The "sexenios" indicator is not considered for private universities

Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSITAT POLITÈCNICA DE CATALUNYA

Year of foundation: 1971

Type of ownership: Public

Bachelor's degree students[1]: 21,698

Master's degree students[1]: 5,469

Faculty members[1]: 2,643

Administration and service staff[1]: 1,438

Budget[2]: 339,187,958€

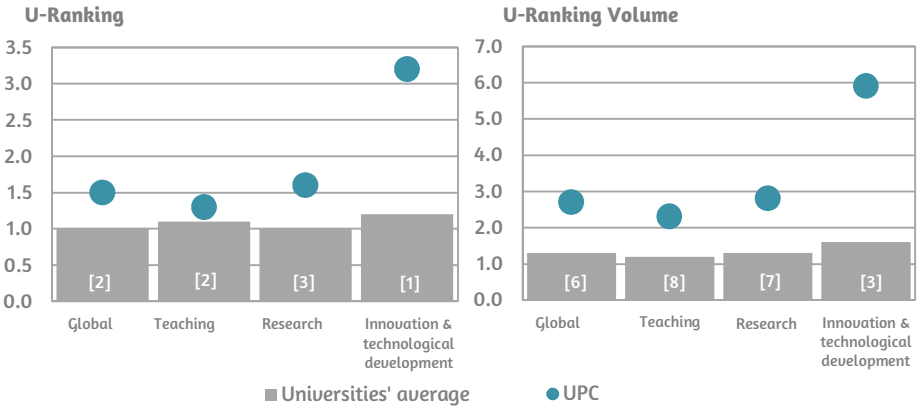
Bachelor's degrees[3]: 46

Master's degrees[3]: 73

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers. Source: Ministry of Education, Culture and Sport

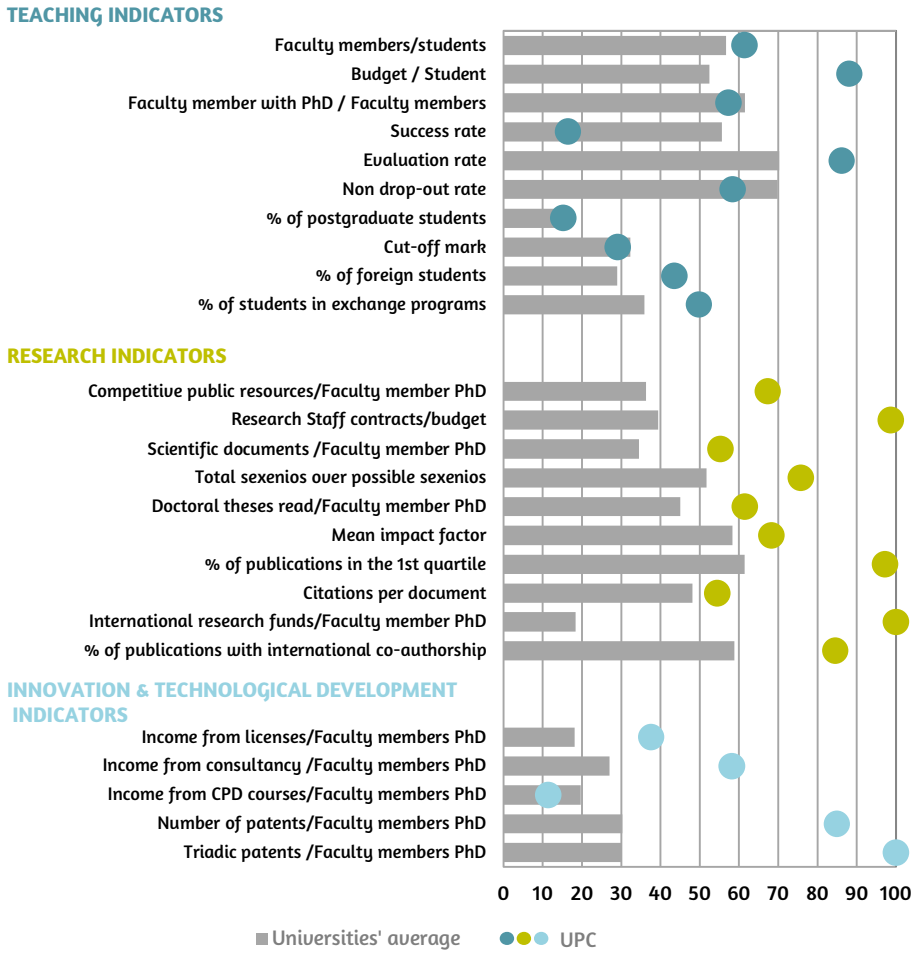
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



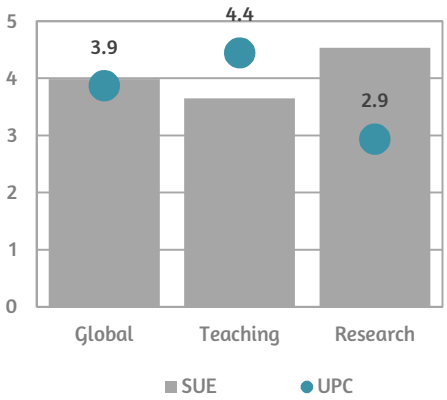
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSITAT POLITÈCNICA DE VALÈNCIA

Year of foundation: 1971

Type of ownership: Public

Bachelor's degree students[1]: 21,042

Master's degree students[1]: 4,198

Faculty members[1]: 2,598

Administration and service staff[1]: 1,404

Budget[2]: 316,416,971€

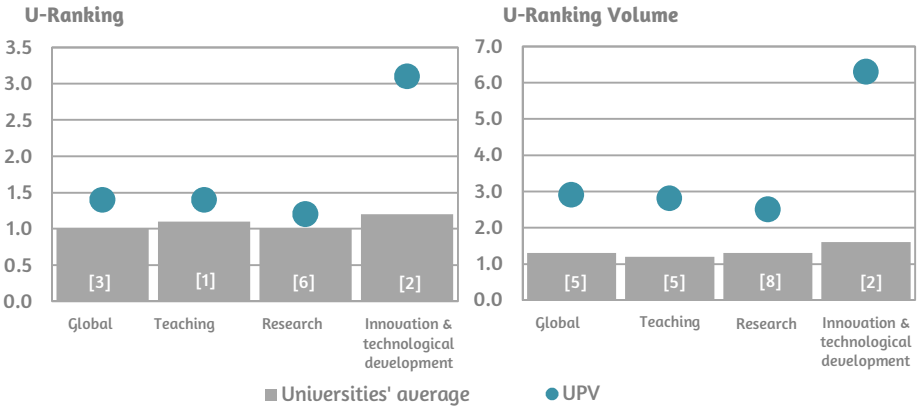
Bachelor's degrees[3]: 32

Master's degrees[3]: 80

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers. Source: Ministry of Education, Culture and Sport

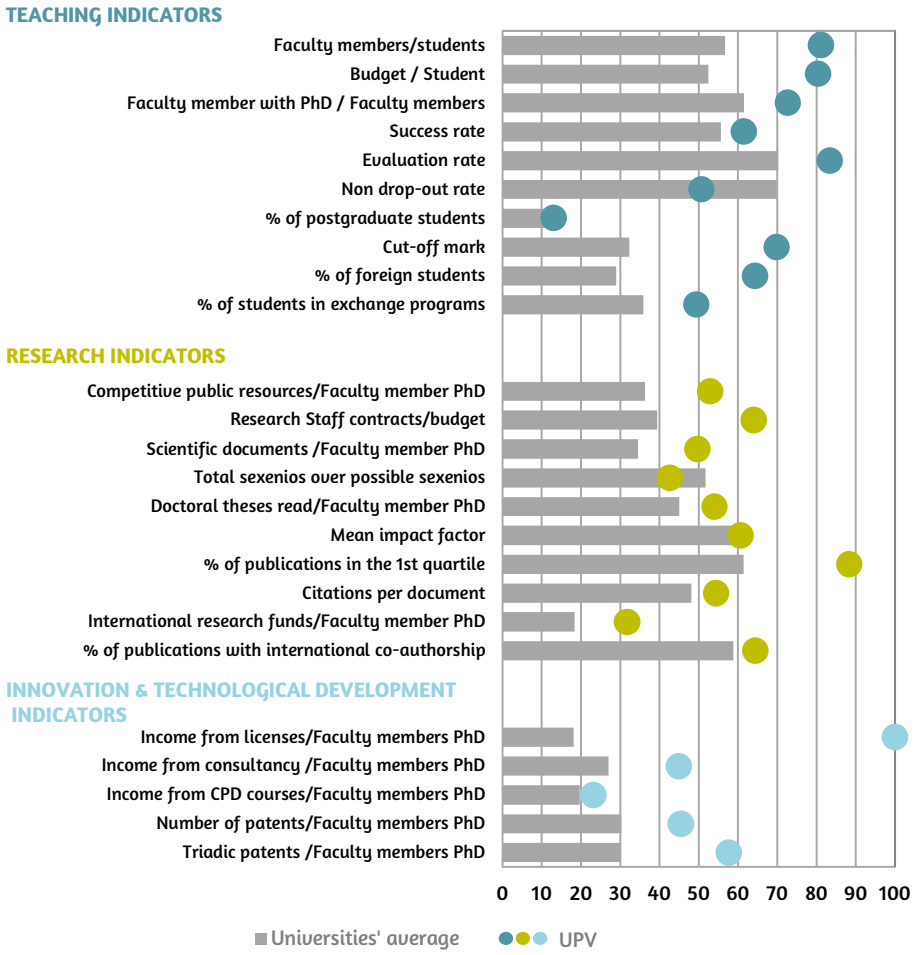
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



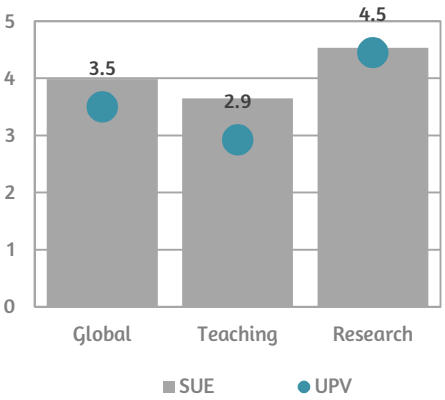
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSITAT POMPEU FABRA

Universitat Pompeu Fabra Barcelona

Year of foundation: 1990

Type of ownership: Public

Bachelor's degree students[1]: 10,134

Master's degree students[1]: 3,213

Faculty members[1]: 925

Administration and service staff[1]: 699

Budget[2]: 130,443,936€

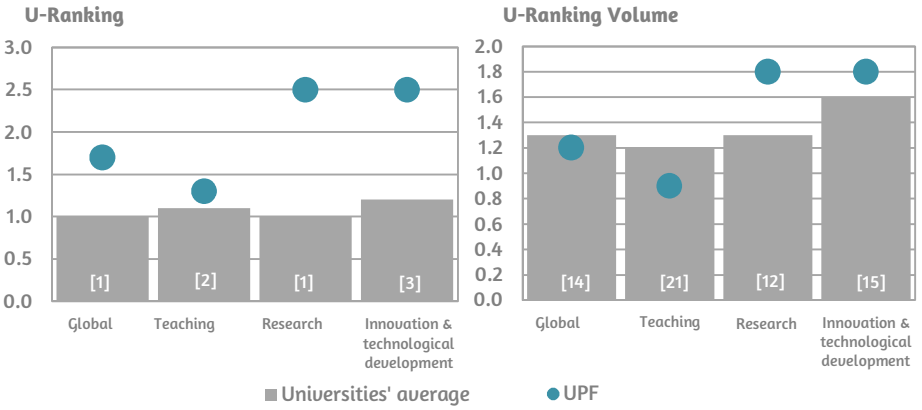
Bachelor's degrees[3]: 27

Master's degrees[3]: 60

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

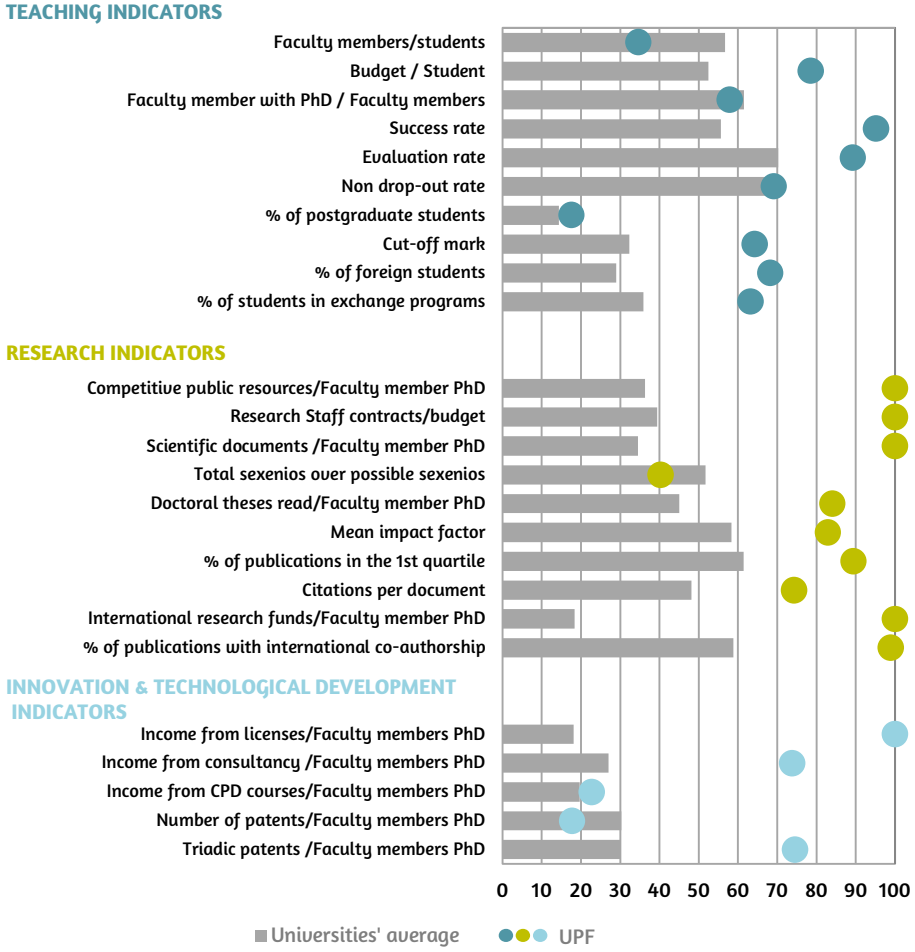
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



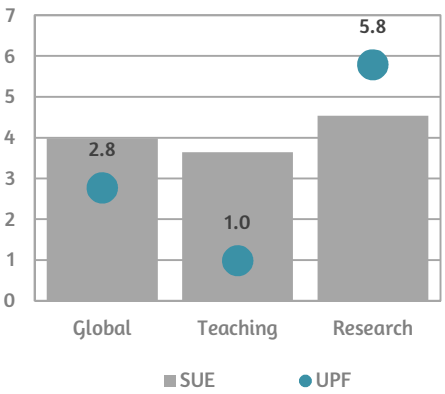
U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100



Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSITAT RAMON LLULL

Year of foundation: 1991

Type of ownership: Private

Bachelor's degree students[1]: 11,912

Master's degree students[1]: 3,261

Faculty members[1]: 1,098

Administration and service staff[1]: 743

Budget[2]: no disponible

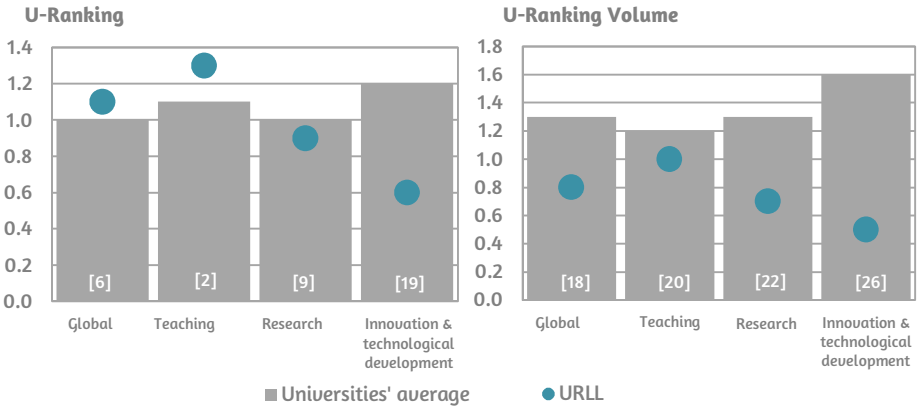
Bachelor's degrees[3]: 42

Master's degrees[3]: 68

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

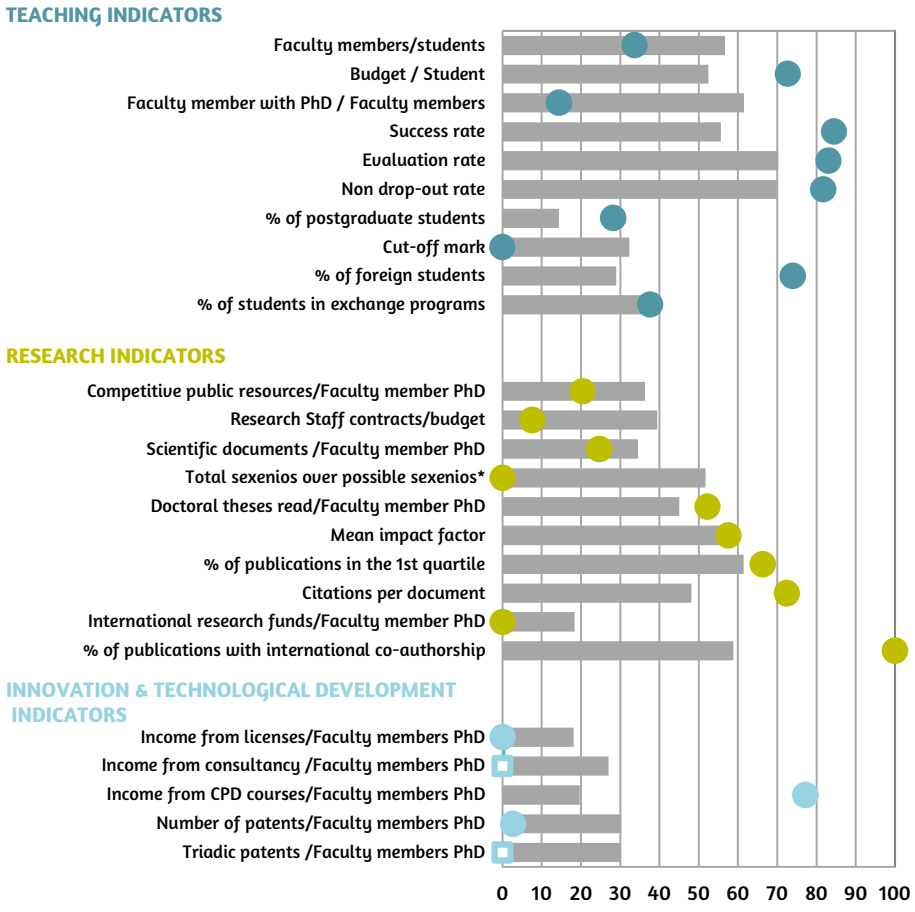
U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets



U-Ranking 2018 indicators

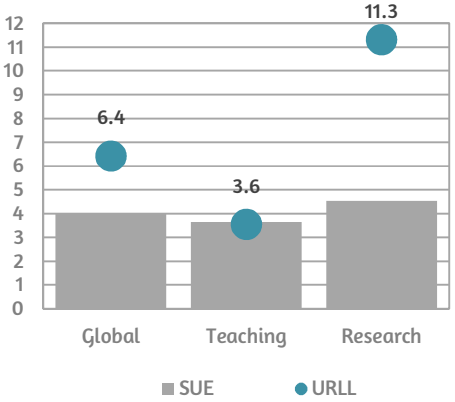
University with the minimum value=0; University with the maximum value=100



*The "sexenios" indicator is not considered for private universities

Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

UNIVERSITAT ROVIRA I VIRGILI

Year of foundation: 1992

Type of ownership: Public

Bachelor's degree students[1]: 11,332

Master's degree students[1]: 1,253

Faculty members[1]: 1,686

Administration and service staff[1]: 732

Budget[2]: 107,524,009€

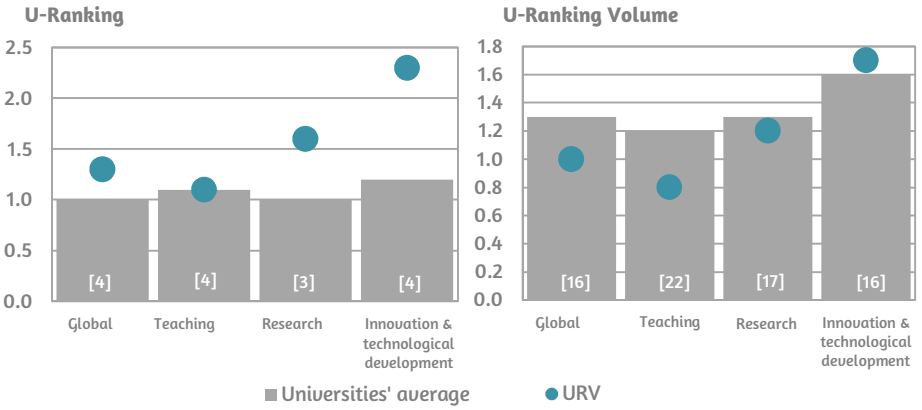
Bachelor's degrees[3]: 43

Master's degrees[3]: 56

[1]Course 2016-17; [2]2015; [3]Course 2017-18. Data referes only to centers belonging to the University. Master's degree data includes all centers.
Source: Ministry of Education, Culture and Sport

U-Ranking 2018 performance and volume indices

Index and postition in the ranking between brackets

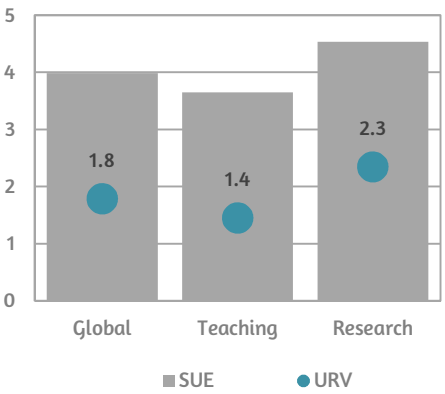


U-Ranking 2018 indicators

University with the minimum value=0; University with the maximum value=100

Annual average variation rate of university performance 2010-2016

Percentage



Please see www.u-ranking.es for methodological details on definition and calculation of the indicators and indices.

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