

Public Policies in Science and Technology in Latin American Countries with Universities in the Top 100 of Web Ranking

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Abstract: The present research characterizes the main public policies of Latin American countries that present universities in the top 100 of the web ranking of universities. As a determining governmental policy in the universities best positioned in the group studied, there is support for the training of doctors and the management of funding programs for research projects, to a lesser extent the influence of accreditation programs on researchers, research groups and scientific journals to the positioning of universities.

Key words: Web ranking, research groups, scientific journals, lesser extent, determining governmental

INTRODUCTION

Although, universities are known for their teaching role, they are also recognized by the results of their research. In this sense, the research function is one of the most precious, not only for this type of institutions but for society in general as it is attributed to generate social welfare and the development of countries. In addition, a new role has been included in universities which is to reflect their activity on the Web so as to guarantee intellectual property and the dissemination of knowledge, without editorial intermediaries and at a lower cost (Davila, 2006) with the use of Information and Communication Technologies (ICT) networks and academic networks.

The stimulation and visibility of university research is usually defined in the policies of each institution but guidelines are also observed associated with the public policies of the country in which it is located. Institutional policies include the development of skills for the presentation of scientific publications, the management of open access repositories, scholarships or grants for postgraduate studies, the definition of lines of research and stimuli, in general. At the same time, countries have defined public policies that encourage research in the same way such as the accreditation of researchers or groups, calls for project funding and the definition of lines of research that contribute to the development of the country.

As institutional policies are treated in various materials, the purpose of this study is to present the importance of public policies in the promotion and recognition of university research. As a sample we have taken a group of countries associated with the universities of the top 100 rankin web Latin American,

published in January 2017. This ranking is carried out according to the visibility of the research function. Since 2004, it is published two times a year, one at the end of January and the second at the end of July. For the publication of January 2017, 11,996 universities were classified worldwide.

In the top 100 of the Latin American Universities in the web ranking are the countries Argentina, Brazil, Chile, Colombia, Cuba, Jamaica, Mexico, Trinidad and Tobago, Peru, Puerto Rico, Uruguay and Venezuela.

MATERIALS AND METHODS

Development: The university comparison or ranking is not new, referred to as one of its beginnings in the USA, in some statistical reports of United States Bureau Education in 1870 and is not since 1983 with the publication of the US News and Word Report (USNWR) which begins to be as we know it today (Malea *et al.*, 2010). The idea of the ranking is to evaluate the university quality through the use of indicators of bibliometric nature (currently, *cienciometricos*) that allow to classify them in an order. The evaluation of the university quality through measuring its production and documentary use is not recent. The measurement of bibliographic citations and study in paper journals begins to be used in various media. However, the massive use of the Web brings additional advantages such as measuring the number of queries and word documents and evaluating their presence and visibility through their web domain (Aguillo *et al.*, 2007).

The identification of factors that increase the quality and efficiency of public and private research has become increasingly important and is a requirement for the design of public policies in science and technology (Torres *et al.*,

2010). Public policies are the set of programs or objectives that have a government in a field and should be oriented to political decisions and the management of resources and activities to achieve the proposed objectives. It is a course of action in response to social problems so that they reflect not only the most important values in society but also show the conflict between values and which of those values receive the highest priorities in a given decision. Some of the governmental policies published in the respective official web portals, regarding the research in science and technology are found:

- Support for the training of doctors
- Accreditation of researchers and research groups
- Accreditation of scientific journals
- Defining priority areas for research
- Individual funding programs or research groups

RESULTS AND DISCUSSION

According to Rivas, the training of researchers is carried out in postgraduates of universities where only the researcher can obtain the degree of doctor for that reason the importance of governmental support in the

training of doctors. On the other hand, scientific accreditation is a voluntary process through which the agencies in charge of science and technology recognize the scientific quality of researchers, groups, journals, institutions and others, according to the requirements defined at the national level. And framed in the priority research areas of each country. In each country, the public authorities responsible for defining public policies for this purpose are in charge of promoting public policies to promote science and technology as well as formulating, guiding, directing, coordinating, implementing and implementing policy in the areas mentioned. This is why the generation of science and technology requires national infrastructures for knowledge development, intermediation structures, research products as well as mechanisms for stimulating, building and strengthening technical and scientific capacities and skills which contribute to social development (Artigas *et al.*, 2017). Table 1 shows a review of the government policies of a group of Latin American countries which are publicly accessible through their institutional web portals (MCTI, 2012; AGENCIA, 2016; CONICYT, 2017; CONCYTEC, 2016; MST, 2005), respectively. Table 2 presents the priority research areas.

Table 1: Government policies in science and technology in Latin American Countries

Latin America country	Position 1st university at top 100 latinoamerica	Position 1st university at top 100 latinoamerica	A	B	C	D	E	F	Agree (%)
Brasil	1	43	Yes	Yes	Yes	Yes	Yes	Yes	100
Mexico	2	16	Yes	Yes	Yes	Yes	Yes	Yes	100
Chile	5	12	Yes	No	No	No	Yes	Yes	50
Argentina	6	11	Yes	No	No	Yes	Yes	Yes	67
Colombia	16	6	Yes	Yes	Yes	Yes	Yes	Yes	100
Peru	41	2	No	Yes	No	Yes	Yes	Yes	67
Venezuela	60	3	No	Yes	No	No	Yes	No	33

A: Support doctors training; B: Accreditation of researchers; C: Accreditation research groups; D: Accreditation of scientific journals; E: Definition research areas and F: Project financing programs

Table 2: Priority research areas in science and technology in Latin American countries

Brazil	Mexico	Chile	Argentina	Colombia	Venezuela	Peru
Biotechnology and Nanotechnology	Information and communication technologies	Social security system	Health	Health	Oil, gas and energy	Health
Technology of the information and communication	Biotechnology	Living place	Energy	Energy	Sovereignty	Energy
Supplies for health	Advanced materials	Innovation and entrepreneurship	Agroindustry	Food safety	and food security	Foods
Biofuels	The design and manufacturing processes	Education	Social development	Knowledge, exploitation and conservation of biodiversity	Environment and habitat	Aerospace and defense
Electric Power, Hydrogen and Renewable Energies	Urban and rural infrastructure and development, including its social and economic aspects		Environment	Agriculture and agribusiness	Sustainable development and biodiversity	Water
Oil, Gas and Mineral Coal			Industry	Aquaculture, fishing and livestock	Endogenous development	Biomass and Bio-economics
Agribusiness	Innovations to care for women, people with disabilities, indigenous groups and migrants			Use of non-renewable natural resources and mining	Information and Communication Technologies	Social sciences and technologies
Biodiversity and Natural Resources				Environmental sustainability	Public health	Weather
Amazon and semi-arid				Cleaner production	Public management	Digital economy and society
Meteorology and Climate Change				Green Markets	Education	Convergent and enabling technologies
Space Program				Biotechnology	Visibility and scientific culture	
Nuclear program						
National Defense and Public Security						

Government Institutions of Science and Technology (MCTI, 2012; AGENCIA, 2016; CONCYTEC, 2016) (<http://www.colciencias.gov.co>)

CONCLUSION

The public policies of the countries reviewed make it possible to derive some appreciations regarding their relationship with the visibility and positioning of their universities as a result of the work of their researchers and research groups. The present study allowed to observe that universities ranked favorably in the web ranking correspond to countries with government policies for the training of doctors as well as the management of financing for research projects, considering the priority research areas.

On the other hand, governmental programs of accreditation to researchers and research groups as well as scientific journals, although they contribute to stimulate scientific production, appear as non-determining factors in the positioning of universities on the web.

It is necessary to expand the study base regarding the study variables, as well as to incorporate other Latin American countries to know their public policies in Science and Technology research and their impact on the positioning of their universities. The case of success of Chile shows differentiator with respect to the studied sample, reason why it would be advisable to identify other variables intervening in the positioning of its universities.

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