

Quantitative and qualitative studies of science and technology in Latin America

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Science, technology and innovation (ST&I) are fundamental for the progress and wellbeing of any nation. Developed countries have prioritized them in budgets and policies, and for a long time have collected statistics and indicators of ST&I activities to measure their contribution to development, and to enhance the design and improve the accountability of public policies. Moreover, these indicators have been useful to determine and compare the contribution and relative position of countries in the production of new knowledge.

Even though these indicators have shown to be useful guidelines for developing countries, ST&I in developing countries face different challenges; among them is that most of their activities are financed with public funds, and resources are scarce. There is also an increasing debate regarding the perceived performance of the national systems of innovation of these countries. Thus, special quantitative and qualitative analyses, that consider these particularities, are at prompt.

The idea of this special issue came about at the 1st Latin American Symposium on the Metric Studies of Science and Technology, held in Mexico City on August 28th-30th, 2019. At that seminar, Latin American researchers, policy makers and scientific policy makers came together to share experiences and research advances on the development of improved and more accountable indicators of ST&I, from the perspective of bibliometrics, informetrics, scientometrics and webmetrics. The symposium led to a community-wide agreement that measuring ST&I activities and assessing their impact in Latin America required a range of interdisciplinary approaches that needed to be enhanced. This special issue consists of 11 papers that present a sample of current research relative to the production and impact of ST&I in Latin America. All the papers use extensive panel databases of publications and citations, mostly from Web of Science and Scopus, in a wide range of fields of knowledge. Each paper has its own theoretical and empirical contribution, and they all provide an addition to the advancement of our understanding regarding the different aspects that scientometrics reveal about the creation and evolution of new knowledge, and the impact that this new knowledge has for a country, a region and the world. This special issue also reveals that there are ample opportunities for more research in many other areas of knowledge in the region.

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López-Olmedo and Gutiérrez Serrano conducted a transdisciplinary bibliometric study to identify and analyze the participation of social actors in the publications on mainstream journals with a Mexican affiliation during 2015. They found that even though most of the production of knowledge is created by academics, there are areas of knowledge, like Health and Life Sciences, in which non-academics are contributing significantly to the production of new knowledge.

Gutiérrez-Maya, Collazo-Reyes, and Vega y Ortega Baez make a historical analysis of the scientific production in the Latin America and Caribbean region during the 19th century, showing the expansion of the European imperial science to America.

Tapia-Pachecho, Villa-Vázquez and Pérez Angón study the production of knowledge related to access to drinking water in Mexico City. The analysis of coauthors suggest that the interinstitutional and international collaboration is relatively low. They also found that, even though it is a critical problem in the city, most of the research is not related to proposing solutions.

Mugnaini, Fraumann, Tuesta and Packer analyze the use of digital object identifiers (DOIs) in the cited references of articles written by Brazilian researchers. They found that the use of DOIs could be useful as identifiers for citation analysis.

Herrera-Vallejera and Gorbea-Portal study publications, patents and citations in the field of Pharmacology and Pharmacy at the international level, to analyze the behavior of leading institutions. They found that leadership in the field is not determined by highly productive institutions.

Luna-Morales, Luna-Morales and Perez-Angón analyze Mexican publications and citations in the area of metric studies of science and technology. They found that collaboration is mainly local, and collaboration with other countries is relatively low.

Gonzalez-Brambila and Olivares-Vazquez analyze the evolution of publications and coauthorship in Social Sciences in Mexico, highlighting that, for almost 30 years, the mean of coauthors per paper has been almost flat, and international collaboration is still relatively small.

Avila Rodrigues, Machado Fidelis do Nascimento and Messias Bittencourt analyze, throughout scientific publications, the integration of public policies, family agriculture production, and food and nutrition security. The study emphasizes the Brazilian contributions in this topic.

Barud, Araujo de Oliveira, Simões Gomes, Manzolillo Sanseverino dos Santos Barcelos and dos Santos make a bibliometric study to create maps of authors networks and keyword clusters, and present a literature review of lean manufacturing applied to information technology departments or companies.

McManus and Baeta Neves characterize all the products of research for all postgraduate courses in Brazil. The analysis shows that there is a wide range of products, from patents to materials for divulging scientific activities or for educational purposes. The importance of these products varies among fields of knowledge.

Galbán-Rodríguez, Torres-Ponjuán and Arencibia-Jorge use a multidimensional approach to compare Cuban scientific output with other Latin American and Caribbean countries. The analysis shows that the ranking in the Latin American and Caribbean region has been quite stable, and that the emphasis of the type of contribution varies among the countries.