

## Bibliometric Study of Scientific Production on ICT in Peru (2010-2017)

### Estudio bibliométrico de la producción científica sobre TIC en Perú (2010-2017)

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## Summary

The objective of this research is to evaluate Peruvian scientific production in Information and Communication Technologies (ICTs). It is a cross-sectional descriptive study through the bibliometric analysis of articles published in journals indexed in SciELO Peru between 2010 and 2017. Authorship, type of article, main themes, and institutional productivity were analyzed. It was found that between 2010 and 2017, 19 articles on ICT were published, 26.4% of them are publications in the Peruvian Journal of Experimental Medicine and Public Health, and 30.8% of authors indicate that their main affiliation is with the National University of San Marcos. The main theme in the set of publications was virtual teaching (26%). We can conclude that technological development is contributing to the scientific publication of the country; however, it is necessary to continue strengthening these studies in other databases.

**Keywords:** Scientific Production; ICT; SciELO Peru.

## Resumen

La presente investigación tiene como objetivo evaluar la producción científica peruana en las Tecnologías de Información y Comunicación (TIC). Es un estudio descriptivo transversal mediante el análisis bibliométrico de los artículos publicados en revistas indizadas en SciELO Perú entre el año 2010 y 2017. Se analizaron autoría, tipo de artículo, ejes temáticos, y productividad institucional. Se encontró que entre los años 2010 y 2017, se ha publicado 19 artículos sobre TIC, de los cuales el 26.4% son publicaciones en la Revista Peruana de Medicina Experimental y Salud Pública, y el 30.8% de los autores indican tener como afiliación principal a la Universidad Nacional Mayor de San Marcos. El principal eje temático en el conjunto de publicaciones fue la enseñanza virtual (26%). Podemos concluir que el desarrollo tecnológico viene contribuyendo con la publicación científica del país; sin embargo, es necesario seguir fortaleciendo estos estudios en demás bases de datos.

**Palabras clave:** Producción científica; TIC; SciELO Perú.

## Introduction

Information and Communication Technology (ICT) and its implication in research have gone through several stages in which there have been changes in research problems contemplated and the methodology used. The increase of work production (in the form of collective books, articles in journals, electronic documents in the Network, communication to Congresses, research reports, etc.) is a palpable fact. (Vidal, 2006; Morales Trujillo & Raso, 2015).

In Peru, the integration process of the new ICTs into the education system is generated through the Huascarán Project and currently, through the Management of Educational Technologies, which defines three capacities that must be implemented in the educational context 1) Information.- The acquisition of information, where students do more and better research with ICTs; 2) Communication.- Team work with ICTs, where students consolidate cooperative and efficient work in each one of the curricular areas and 3) Production.- The development of learning strategies through the production of educational material with ICT (Larrauri, 2009; Rivoir, 2016).

In the world, from the technological evolution and boom in the information sciences, great changes are taking place in current society. In the context of scientometrics, the visibility studies are often conducted with the objective of determining the presence of scientific production

of a country in one or several international databases of great prestige and recognized utility, in one or several disciplines (Cañedo et al., 2014) becoming the fundamental core of the assessment in the research activity (Giménez-Toledo, 2015). This has led universities to worry about observing the increase in their publications in the last years (Gonzales-Argote, García-Rivero and Dorta-Contreras, 2016).

Scientific journals are undoubtedly the main channels of communication and dissemination of research results and the social institutionalization of science in most fields of knowledge. The need for communication between researchers is one of the reasons that keeps these means in constant evolution, with scientific articles being the main bargaining chip, since they reflect the symbolic capital held by researchers (Kreimer, 1998).

The objective of this research work was to describe the development of the scientific production on ICTs conducted in Peru. This will help to know the strengths, capacities and limitations of this research variable in our environment.

## Method

A bibliometric study was carried out and it consisted in the search, extraction and analysis of scientific publications framed within the ITs, which will have at least one author with affiliation to one Peruvian institution or institution that involves Peruvian population during the 2010-2017 period. The search was conducted in the SciELO PERÚ database. Search was conducted in title, abstract and key words using search term, adding a filter for the period 2010 to 2017. Nineteen publications of journals indexed in SciELO Perú were recovered.

## Results

As for the number of publications per year, it is observed an equity of contributions, keeping an average from 1 to 2 articles per year, and it is also evident an increase in publications in 2015 (n=9), see Figure 1.

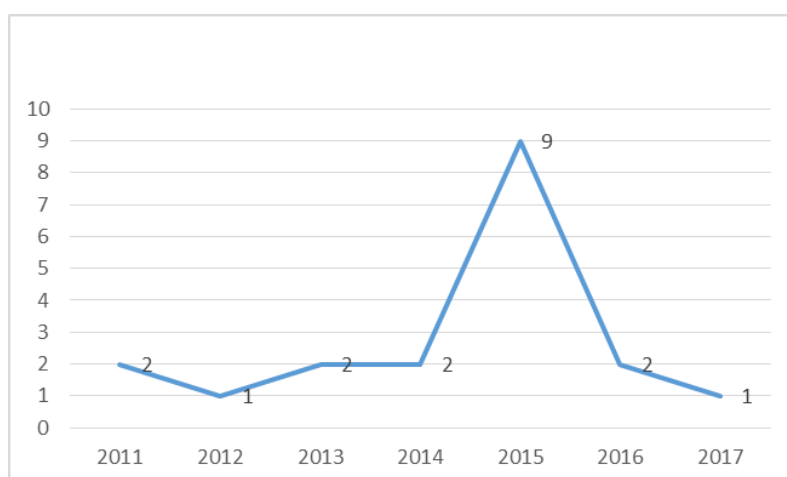


Figure 1. Estimation of publications per year.

Articles analyzed were published in 10 journals. Table 1 shows the journals in which articles with reference to ICTs have been published, 26.3 % of publications are found in the

Peruvian Journal of Experimental Medicine and Public Health, followed by the Herediana Medical Journal and the Journal of Psychology (PUCP) (15.8%), see Table 1.

**Table 1.**

*Journals in which scientific articles on ICT are published.*

<b>Journals</b>	<b>N</b>	<b>%</b>	<b>H Index SJR</b>
Peruvian Journal of Experimental Medicine and Public Health	5	26.3	14
Herediana Medical Journal	3	15.8	ND
Journal of Psychology (PUCP)	3	15.8	1
Annals of the School of Medicine	2	10.5	ND
Peruvian Journal of Gastroenterology	1	5.3	14
Acta Médica Peruana (Peruvian Medical Records)	1	5.3	ND
Comuni@cción	1	5.3	ND
Horizonte Médico (Medical Horizon)	1	5.3	ND
Peruvian Journal of Gynecology and Obstetrics	1	5.3	ND
Journal of Economics, Finance and Administrative Science	1	5.3	6

In 19 articles, authors with affiliation with national institutions could be identified, highlighting the National University of San Marcos (30.8%), followed by the Cayetano Heredia Peruvian University (17.9%). Table 2 shows the authors with affiliation to national institutions with publications on ICT.

**Table 2.**

*National institutions that have published articles on ICT.*

<b>Institutions</b>	<b>N</b>	<b>%</b>
National University of San Marcos	12	30.8
Cayetano Heredia Peruvian University	7	17.9
Pontifical Catholic University of Peru	4	10.3
The Peruvian Society of Obstetrics and Gynecology	2	5.1

José Faustino Sánchez Carrión National University	2	5.1
National Institute of Neoplastic Diseases (INEN, by its Spanish initials)	1	2.6
Social Health Insurance, EsSalud	1	2.6
National University of the Altiplano	1	2.6
Cayetano Heredia National Hospital	1	2.6
National Council for Science, Technology and Technological Innovation (CONCYTEC, by its Spanish initials)	1	2.6
Scientific Society of Students of the Cayetano Heredia University's Medical School	1	2.6
University of Sciences and Humanities	1	2.6
Grau Emergency Hospital III	1	2.6
United Nations Office for Project Services (UNOPS).	1	2.6
Health Care Consulting S.A.C.	1	2.6
ESAN University	1	2.6
San Martín de Porres University	1	2.6

In addition, 26 % of articles corresponded to variables related to “virtual teaching” (26%), followed by medical education and public health with a 21%, respectively. See Figure 2:

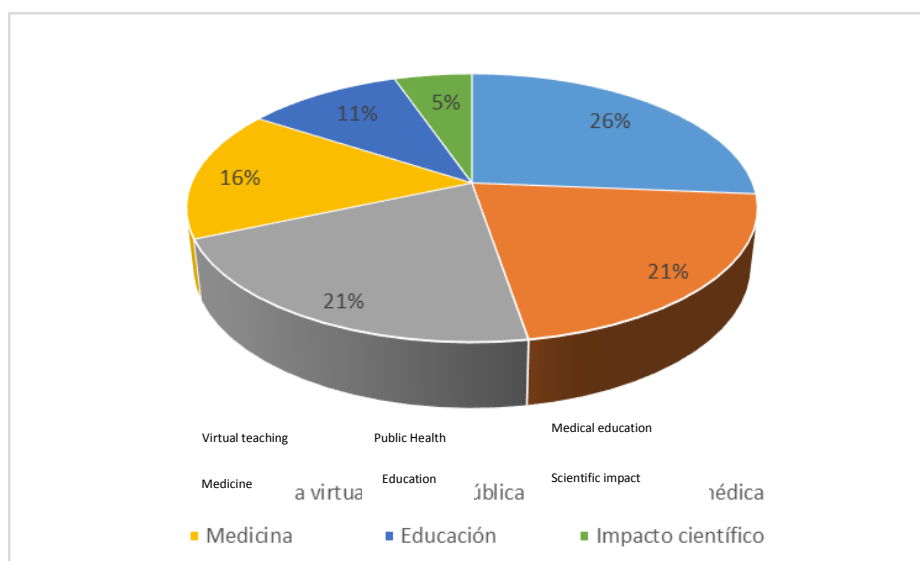


Figure 2. Topics of more impact in publications on ICTs.

## Discussion

The evaluation of the ICTs impact is one of the main topics to be discussed in the following decades (Gargallo et al., 2004). It is necessary to strengthen the research works contextualized in the different study fields (Linares-Pons, Verdecia-Martínez, & Álvarez-Sánchez, 2014).

This article is a descriptive analysis on publications about ITCs in Peru between 2010 and 2017. It has been observed a sustained increase in the literary production and in the year 2015, there was a marked increase in the scientific production on ICT. However, in total production, the number of publications on ICT in Peru is much lower than that described in Spain (Buceta, Martínez & Páramo, 2016; Aznar, Trujillo & Romero, 2018), Colombia (Muñoz, Bolívar & Hernández, 2017).

Potential limitations of the study are related to the databases used, existing other research works that have been published in other international journals indexed in other databases. However, we consider the importance of being able to review the national publications in national journals, which would show the participation of researchers of our environment in making the results of their research works public in the local environment.

Despite the limitations (number of authors and co-authors; if they were undergraduate, graduate or professional students, impact factor of publications), it is considered that the obtained findings contribute to a better knowledge of the scientific production in sport sciences.

Although the scientific production on ITC has been increased in the last years, the production volume in Peru is low compared to developed countries and other developing countries (Mominó, & Sigalés, 2017). The research done basically covers the field of education through virtual teaching-learning. The participation of national institutions is an example since it shows us the existing differences between universities, hospitals, consultancy firms that has implemented research on ICT for last 10 years. And it is recommended that bibliometric studies should be conducted in other continents and to consider intervals of years greater than or equal to this study, as well as to analyze the applications available through ICTs (Buitrago, García, & García, 2016).

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