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Scientific And Technological Production And The Use Of The Internet In Latin America

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Abstract

A documentary review was carried out on the production and publication of research papers related to studying variables on scientific and technological production and Internet use in Latin America. The bibliometric analysis proposed in this document was to know the main characteristics of the volume of publications registered in the Scopus database during 2016-2021, identifying 262 publications. The information provided by the said platform was organized using tables and figures, categorizing the information by Year of Publication, Country of Origin, Area of Knowledge and Type of Publication. Once these characteristics were described, a qualitative analysis was used to refer to the position of different authors on the proposed topic. Among the main findings of this research, it is found that Brazil, with 84 publications, was the Latin American country with the highest scientific production registered in the name of authors affiliated with institutions of that country. The area of knowledge that made the greatest contribution to the construction of bibliographic material referring to the study of scientific and technological production and the use of the Internet in Latin America was Computer Science, with 140 published documents, and the type of publication that was most used during the period mentioned above was the journal article, which represented 56% of the total scientific production.

Keywords: ICT, Internet, Latin America

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1. Introduction

With society's growth today, new technologies have become more present in Latin America, so it has grown exponentially, allowing wireless networks more frequently. There has been a technological transformation that grows exponentially and determines the progress of the new metropolis. That is why it motivated the use of the Internet in Latin American countries, taking into account that it is used not only for communication purposes such as social networks but also in the elaboration of scientific material since, through ICTs, it is possible to have access to research platforms in Latin America. As new technologies arise, Latin American countries increasingly use them and implementing information and communication technologies allows for expanding research in this territory. This technological innovation is also due to industry 4.0, which systematizes all processes making it much easier for us with higher quality in less time; the same happens with the university 4.0 since this is a transforming entity of society and place of formation of future professionals must obey what the labor market demands, forming integral people who have both the necessary knowledge and skills to generate social awareness, giving them the tools to perform in a specific position. All this is also in the research component, which allows access to a greater number of scientific publications, laying the foundations in the continent to obtain quality information on Latin American countries' social and epistemological development. For this reason, research such as this one seeks to carry out bibliographic reviews to determine the flow of production in Latin America in recent years and how ICTs are increasingly being integrated into these processes.

2. General Objective

To analyze from a bibliometric and bibliographic perspective, the production of research papers on the variable variables on scientific and technological production and the use of the Internet in Latin America during the period 2016-2021.

3. Methodology

Quantitative analysis of the information provided by Scopus under a bibliometric approach on the scientific production related to the study of the variables on scientific and technological production and the use of the Internet in Latin America is performed. Also, from a qualitative perspective, examples of some research papers published in the area of the study mentioned above are analyzed from a bibliographic approach to describe the position of different authors on the proposed topic.

The search is performed through the tool provided by Scopus, and the parameters referenced in Figure 1 are established.

3.1 Methodological design

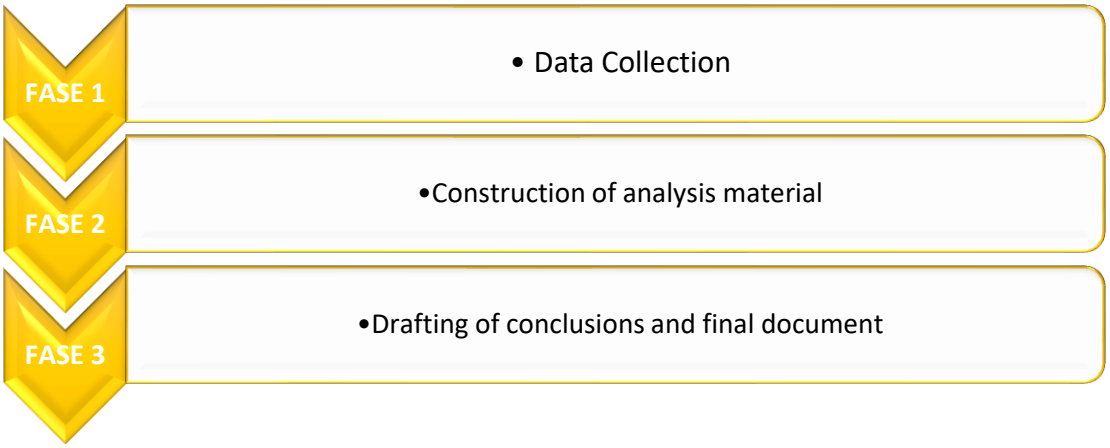

Figure 1. Methodological design
Source: Own elaboration

3.1.1 Phase 1: Data Collection

The data collection was carried out using the Scopus web page search tool, through which a total of 38 publications were identified. For this purpose, search filters were established consisting of:

- ✓ Published papers whose study variables are related to the study of the prevalence and incidence of Human Papillomavirus.
- ✓ Limited to Latin American countries.
- ✓ Without distinction of area of knowledge.
- ✓ Without distinction of type of publication.

3.1.2 Phase 2: Construction of analysis material

The information identified in the previous phase is organized. The classification will be made through graphs, figures and tables based on data provided by Scopus.

- ✓ Word Co-occurrence.
- ✓ Year of publication
- ✓ Country of origin of the publication.
- ✓ Knowledge area.
- ✓ Type of Publication

3.1.3 Phase 3: Drafting conclusions and final document

After the analysis carried out in the previous phase, we proceed to the drafting of the conclusions and the preparation of the final document.

4. Results

4.1 Co-occurrence of words

Figure 2 shows the co-occurrence of keywords within the publications identified in the Scopus database.

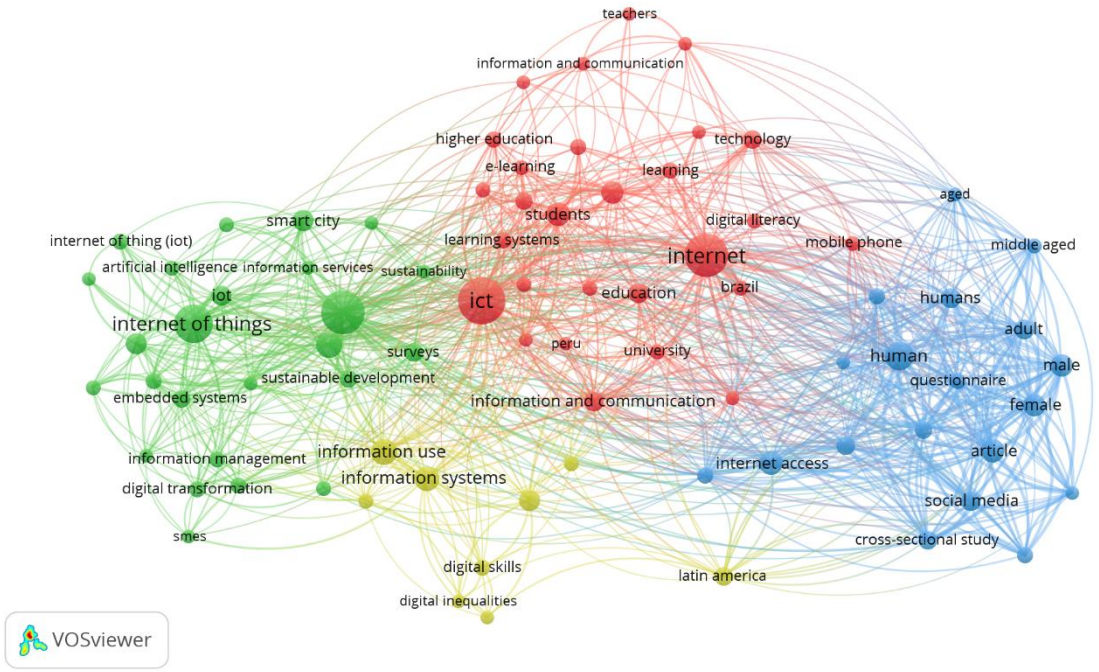

Figure 2. Word co-occurrence
Source: Own elaboration (2022); based on data provided by Scopus.

As shown in Figure 2, the most used keywords are ICT and Internet, which refer to the mobile networks that are currently the most used and that, in recent years, have begun to determine the innovations that are made in society, both in the business market, such as education to the way to communicate, so that information and communication technologies are currently present in every aspect of people´s lives, having as main objective to facilitate and systematize everyday processes. In addition, there are keywords such as sustainable development, digital transformation, internet access and social networks, which give light on the main objectives of the use of the Internet, and are intended for communication and interactions at a distance, mainly using social networks and also a way to exercise social responsibility helping to make everyday processes more sustainable by implementing ICT having better results with fewer resources and time invested. This helps to have a better quality of life and social growth without neglecting the need to protect the resources that allow access to a large amount of information and promotes scientific dissemination and the creation of academic material to advance research in specific areas of knowledge.

4.2 Distribution of scientific production by year of publication.

Figure 3 shows how the scientific production is distributed according to the year of publication, taking into account the period from 2017 to 2021

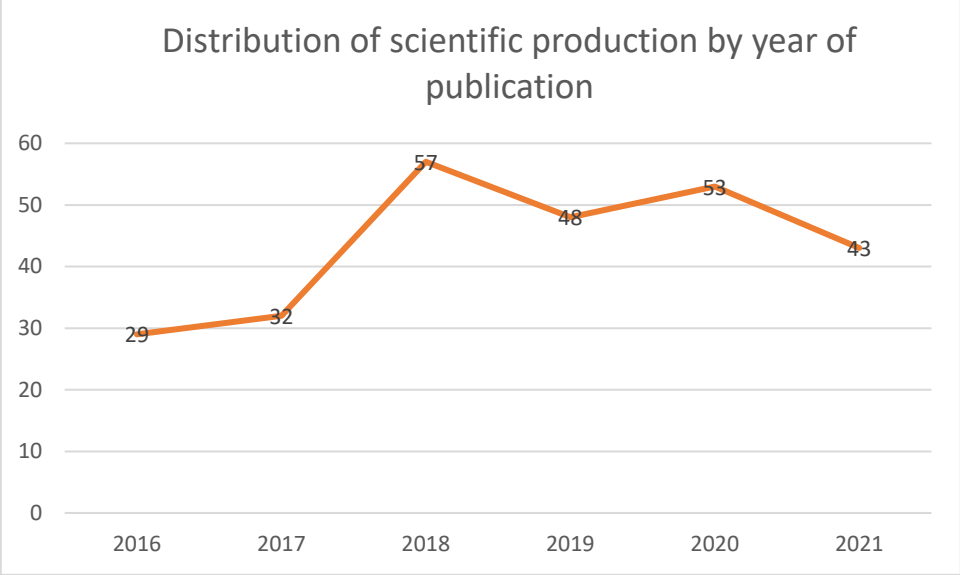

Figure 3. Distribution of scientific production by year of publication.
Source: Own elaboration (2022); based on data provided by Scopus.

2018 is the year with the highest number of publications related to the variables under study, presenting 57 documents within which we can find "Impact and use of information and communication technologies in higher education" (Alcibar et al., 2018). The main objective of this research is to analyze the use of information and communication technologies (ICT) and their impact on higher education. The study of a higher education institution determined that students use these networks as a means of consultation for curricular activities, with computers as their preferred tool allows them to have a more significant influence on positive learning.

In second place is 2020, with 53 documents, among which is the paper entitled "Challenges and possibilities of ICT-mediated assessment in virtual teaching and learning processes" (Torres-Madroñero, & Botero, 2020). This document analyzes the meanings of ICT-mediated assessment, establishing what types of knowledge are appropriate for this assessment and the challenges and possibilities of virtual tools. All this due to the boom it has had because of the pandemic and how this modality has come to stay, so through questionnaires, it was determined that ICT educational platforms and new technologies demand new skills for all educational actors, such as digital literacy.

4.3 Distribution of scientific production by country of origin.

Figure 4 shows the distribution of scientific production according to the nationality of the authors.

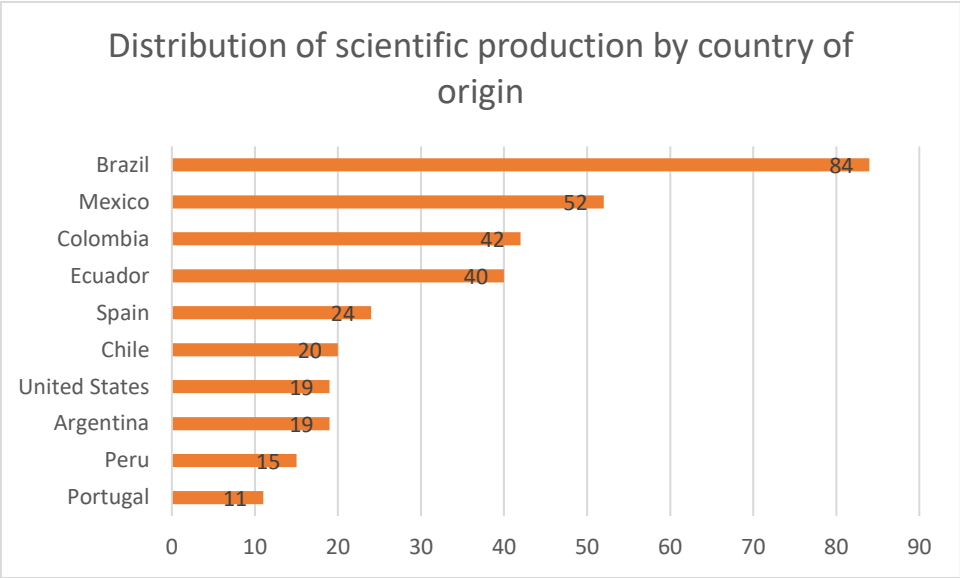

Figure 4. Distribution of scientific production by country of origin.
Source: Own elaboration (2022); based on data provided by Scopus.

Brazil is the Latin American country with the highest scientific production in the period 2016-2021, presenting 84 papers related to the variables under study within which is the title "The contributions of public libraries to the development of smart cities" (De Barros Cianconi & De Barros Cianconi, 2021). This document studies the feasibility of the development of smart cities taking a holistic view of the urban system, considering its dimensions: Technology (infrastructure), people (education) and institutions (governance) that allow having a city with superior technological advancement, so they conducted a literature review where they managed to determine the contributions of libraries, concluding that these have the potential to be a public space that enables citizen participation and community development.

At this point, it should be noted that the production of scientific publications, when classified by country of origin, presents a special characteristic and that is the collaboration between authors with different affiliations to both public and private institutions, and these institutions can be from the same country or different nationalities so that the production of an article co-authored by different authors from different countries of origin allows each of the countries to add up as a unit in the overall publications. This is best explained in Figure 4, which shows the flow of collaborative works from different countries.

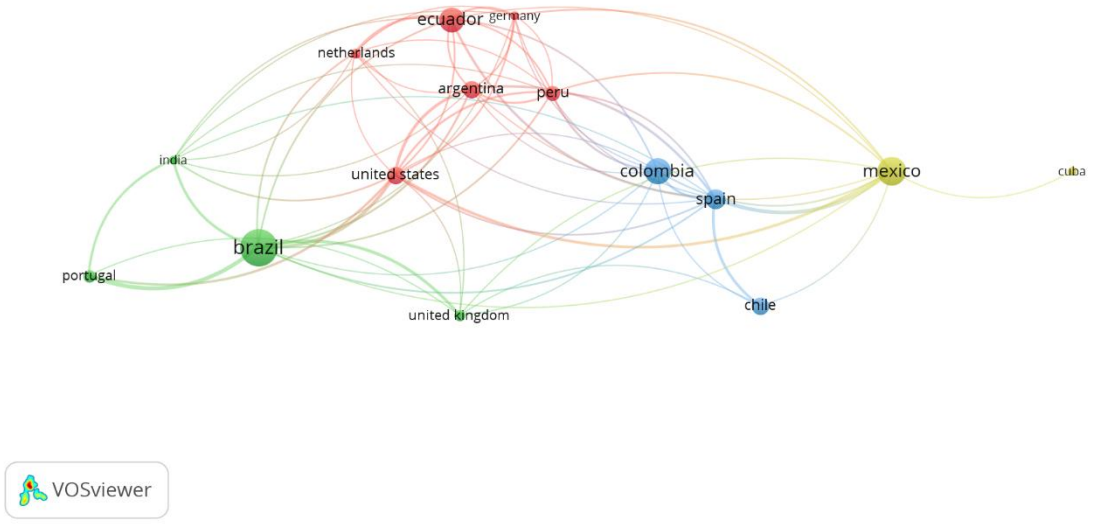

Figure 5. Co-citations between countries.
Source: Own elaboration (2022); based on data provided by Scopus.

As mentioned above, Brazil is the country with the greatest contribution to research related to the variables under study, having research with countries such as the United Kingdom and the United States in order to complement research depending on the experience due to the characteristics of each territory. In second place is Mexico, with 52 documents and numerous collaborations with different countries. These publications include the title "Educational Innovation with ICT in Latin American Universities: Multi-Country Study" (Deroncele-Acosta et al., 2021), to evaluate the Institutional Conditions to promote Educational Innovation with ICT (CIIETIC) from the teachers' perspective, taking into account the need for training and methodological adaptations to this new modality. For this process, 154 university professors were surveyed, and three important aspects were highlighted: participation in professional ICT learning communities; training and permanent updating in ICT; implementation and equipment of laboratories with Internet access in universities that allow for this technological transformation in classrooms and that can contextualize the updating, access, learning, innovation and use of ICT in higher education.

4.4 Distribution of scientific production by area of knowledge

Figure 5 below shows how the production of scientific publications is distributed according to the area of knowledge through which the different research methodologies are executed.

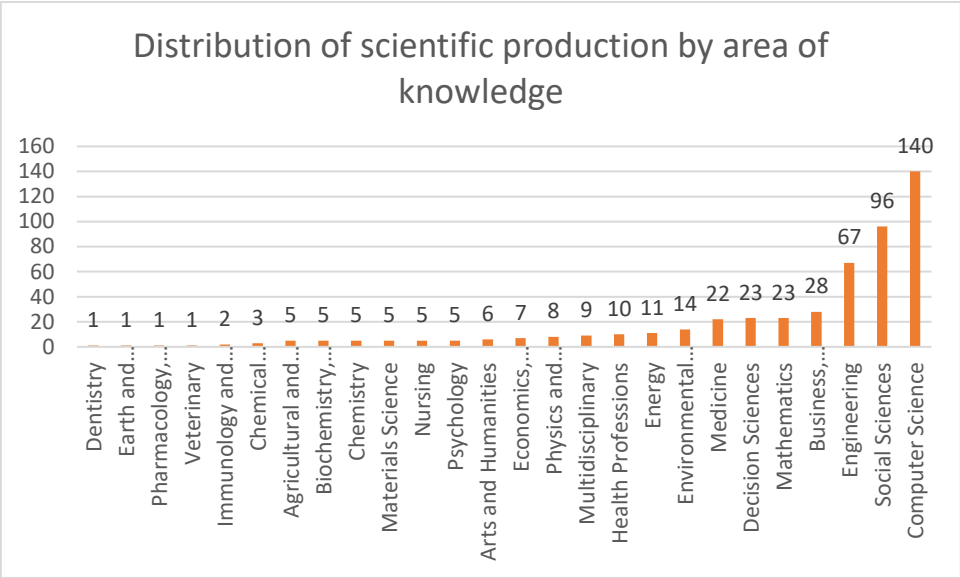

Figure 6. Distribution of scientific production by area of knowledge.
Source: Own elaboration (2022); based on data provided by Scopus.

Computer Science was the area of knowledge with the most significant influence at the time of carrying out research concerning the study of scientific and technological production and the use of the Internet in Latin America, presenting 140 publications, among which is the paper named "Analysis of the digital competence of university students using latent classes" (Burgos-Videla et al. 2021). This document aims to characterize the Latent Classes that arise from analyzing the level of digital competencies, use and consumption of applications and services through the Internet. In this study, 4672 university students participated, and it was possible to determine how much they used the Internet for academic and personal purposes for entertainment and communication purposes. This highlights how ICTs are now indispensable in everyday life.

4.5 Type of publication

Figure 7 shows how the bibliographic production is distributed according to the author's chosen publication type.

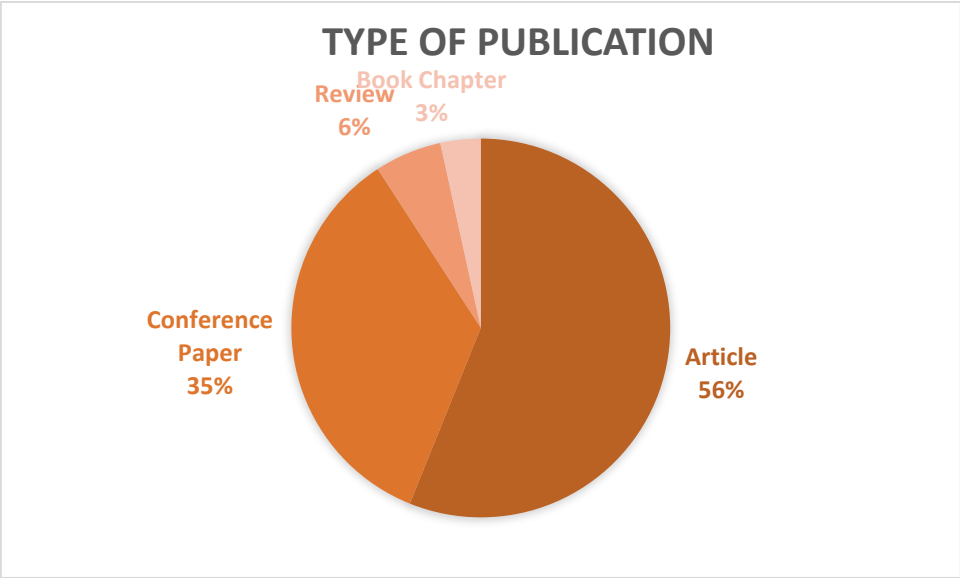

Figure 7. Type of publication
Source: Own elaboration (2022); based on data provided by Scopus.

As shown in Figure 7, within the different types of publications, 56% of the total number of documents identified through Phase 1 of the Methodological Design correspond to journal articles, among which is the one entitled "Digital practices of Honduran university students: A case study" (Cruz García & Zorrilla Abascal, 2021). Through an analysis conducted through interviews with students, this document sought to determine and identify and characterize students' digital practices outside and within the school context. As a result, it was found that students primarily use the most used social networks, preferred resources and applications for learning activities, reading habits, and areas in which they express themselves. For this reason, it is necessary to deepen these types of research to determine and understand students' trends in using technological tools for educational innovation.

5. Conclusions

Thanks to the bibliometric analysis carried out in this article, it is possible to determine that within the main characteristics in the volume of scientific production concerning the study of scientific and technological production and the use of the Internet in Latin America has a good research flow, so it is established that Brazil, was the Latin American country with the highest number of reports through its institutions to Scopus with a total of 84 documents registered during the period 2016-2021. Due to the nature of the study, which seeks to Determine scientific and technological production and the use of the Internet in Latin America, it is established that Computer Science was the area of knowledge with the most significant influence on the research identified since 140 of the 262 publications related to the present analysis, actively participate with theories framed in that area of knowledge. Similarly, following the nature of the study and the educational component, social sciences also played a fundamental role in the execution of 96 publications. It is worth noting that within the analysis presented regarding the position of different authors for the study of the topic

proposed in this research, it can be concluded that information and communication technologies are tools that are here to stay and that help our social growth by being implemented in every part of our lives. In bibliographic production, networks help access more information and research, making the works and projects much better known. In Latin America, although there is a certain backwardness in terms of connectivity as opposed to the large metropolises, in recent years, this digital transformation has had a boom that has helped to interconnect remote areas allowing the use of networks not only academically or commercially but also in a personal way. This is why educational programs are increasingly important in developing research projects that show how technology has helped scientific production in Latin America grow. This is why educational entities are increasingly opting for the realization of projects that determine the factors that influence scientific and technological production and Internet use in Latin America. However, it is expected that from bibliographic and bibliometric reviews such as the one proposed in this document, the current situation of the literature on the subject will be taken into account and that educators and the educational and health community will help in the generation of new knowledge on the subject in order to have more scientific material that determines scientific and technological production and the use of the Internet in Latin America.

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