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## SCIENTIFIC PUBLICATIONS AND THEIR IMPACT ON THE RESULTS OF PROFESSIONAL TRAINING

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**SCIENTIFIC PUBLICATIONS AND THEIR IMPACT ON THE RESULTS OF PROFESSIONAL TRAINING--Palarch's Journal Of Archaeology Of Egypt/Egyptology 17(7), 13041-13053. ISSN 1567-214x**

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### ABSTRACT

This scientific article arises from the disadvantage that researchers have in not publishing with Scientific disclosures frequently occur, one of which is the lack of financial resources that influences the production and dissemination of academic texts and scientific knowledge. The objective of this research is to analyze the impact that publications have on the results of professional training, social, educational and scientific development in Ecuador. In this research, the methodology is deductive and analytical in nature, it is supported by descriptive research using the desk research method, which made it possible to collect information from studies and research already carried out and that have published their results. This study focuses on making a comparative analysis of how scientific publications behaved in the period 2015 to the present. Results are obtained from the scientific production of the platform *web of Science* for the periods 2015-2020 in some countries such as: Ecuador, Colombia, Peru and Venezuela. A comparative analysis was carried out to differentiate the records of scientific production prior to the university evolution of the country in 2015 with the current ones. Ecuador is in position 7 on the list, presenting 4.68% of the total number of records in terms of publications to date. The Scimago website, in its ranking, places the Pontificia Universidad Católica del Ecuador in third place as one of the best universities in the country. Scientific production in Ecuador has had a positive influence, these figures can be improved by changing the educational paradigm, so that scientific writing is taken as a transversal axis from the first years of formal education.

### INTRODUCTION

Scientific publications, today are considered as opportunities to improve professional performance and not as a requirement, therefore it is substantial to highlight the importance of publications, being one of the main channels of communication and propagation of the results of research whose results are

published, favoring the dissemination of knowledge and promoting its expansion. Indexed disclosures have become a requirement for universities to achieve quality accreditations.

Universities must leave their cloisters and put themselves at the service of society (Jaramillo A., 2006) cites that science must leave the laboratory and be taught in a democratized way, to achieve that the results must be disseminated, congresses or other activities (seminars) that society gives its place, its legitimacy. Universities have within their imperatives the germination of new knowledge, which must be made available through substantive activities such as teaching, linking and research; in addition to effective instruments, such as scientific journals, where academics can publish their inquiries, in the form of a scientific article or books.

The scientific world has a validation system made up of researchers who ratify, reject, correct, provide feedback or refute the results of their research, it can be complemented that the articles effectively represent original results, which go through a blind peer review process, who are experts in the topics being covered, which provide greater reliability of the ideas they present. The role of scientific publications may vary, in the beginning they were born out of the need to share knowledge, currently financial incentives affect the dissemination and scientific production, as there are no strategies that support the universities of some countries where the publications are financed of the researchers (Origi&Ramello, 2015).

University education has the duty to make students develop their skills in research, allowing them to be professionals with integrity and moral values in an effective way. The educational system for years has insisted on the need to strengthen teacher training, considering that the teacher is the fundamental axis of all the changes that education requires, becoming the factor of development and improvement.

According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), scientific publications are fundamentally prevalent in countries such as the United States, part of the European Union and Asia, where the number of universities that respond to these areas influences geographic. Asia is likely to become the dominant continent in science in the coming years. The Ministry of Education of the Japan Science and Technology Policy Research Institute conducted a study of the technological and scientific activity of all countries in the world.

According to the report The Institute for Policy Research in Science and Technology of the Ministry of Education, 2020, China leads the list globally for the first time and surpassed the United States in the publication of academic articles of natural sciences, one of the indicators to measure capacities of development and research of the countries. Japan fell one position from the previous 2010 edition and placed fourth, preceded by Germany. The Report demonstrates the heterogeneity of science and technology in the world, highlights the inequality in the creation of knowledge worldwide. In the Ibero-American region, there are network countries such as

Scimago that have strengthened databases, where universities are marking in level publications.

Ecuador has benefited from international collaboration in science and technology since the early sixties, traditionally low scientific results have been produced in the form of publications (Mora. & E., 2015). (Hoof, 2015) indicates that very few Ecuadorians have a doctorate or a similar degree, there is a high level of academic inbreeding in universities and historically, research has not been a priority in these institutions.(Alvarez-Muñoz & Pérez-Montoro, 2015) carried out an analysis of the production and scientific visibility of Ecuador in comparison with other Andean countries, used information from SCImago to identify production indicators and growth rates of Ecuador in the period 2000- 2013.

The impacts of scientific research and technological development on the economic progress of countries are recognized, involving activities and interactive efforts that provide benefits among scientists, based in institutes located in different regions that share a common objective (Solarin& Yen, 2016). In recent years, the Ecuadorian government has promoted an increase in scientific production through the dissemination of laws, improvements in universities, incentives to obtain postgraduate degrees, the creation of science and technology transfer programs and the provision of funds to finance inter-institutional research projects at the national and international level (Medina, and others, 2016).

Today, all Ecuadorian universities have a repository of journals that enhance the impact of recent initiatives by the Ecuadorian government to strengthen science and technology in the country.The current complexity of the higher education environment in Ecuador is driven by contemporary reforms, but does not show statistical data analysis. One of the best summaries on the current situation in Ecuador, based on bibliometric data, is the UNESCO Scientific Report (Johnson, 2017; Rinarta et al., 2017:2018).

Several years ago, in most countries, university education has been changing massively, being more inclusive,responding to new demands of the population.The objective of this article is to reflect on the need of scientific production for the educational and scientific progress of the country, using the data obtained from the Web of Science platform.The present investigative work aims to analyze the impact that scientific publications have on teacher professional training, inquiring about new and updated information on the production of research in Ecuador 2015-2020, through the examination of bibliometric data and analysis of current trends in international collaboration and how it has impacted the country's scientific production.

## **MATERIALS AND METHODS**

A scientific study was carried out, as it is a rational, logical, systematic process, starting from the definition and delimitation of the problem, it determines its objectives, collecting reliable and pertinent information. The methodology used was the deductive and analytical method: deductive because it allows to present the concepts, definitions and assertions,

synthesizing them to demonstrate the investigated scientific part; it is analytical, due to the analysis of the results as the scientific basis and support of this research.

The type of research is descriptive, it seeks to describe how scientific publications are seen as opportunities to improve the professional performance of the teacher, allowing the obtaining of data that relates the researcher to reality, without controlling or manipulating the variables, according to the objectives set to reach the conclusions of the research.

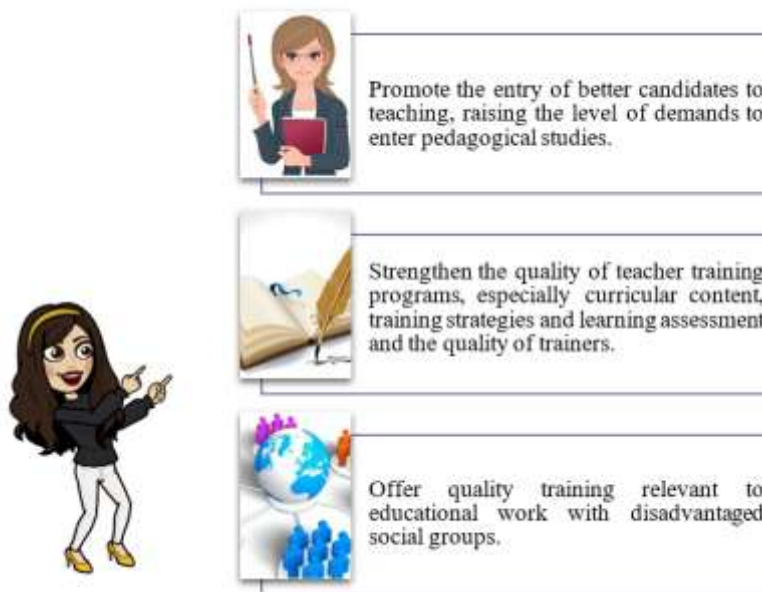
The desk research method was used, which allows collecting information from studies and research already executed and that have published their results. This study focuses on making a comparative analysis of how scientific publications behaved in 2015 to the present. The material that was used was a survey in Google Forms, this instrument was applied to 25 teachers, in order to collect information on the impact that scientific publications have on professional training.

## **ANALYSIS AND DISCUSSION OF RESULTS**

### **Vocational**

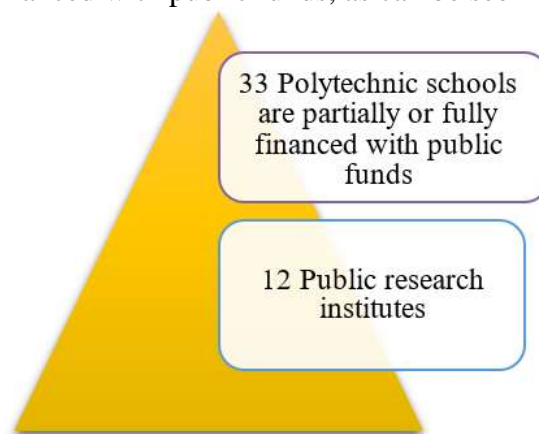
The vocational training, has the responsibility to prepare young people and adults so that they live up to the demands the labor market. It cannot be restricted to currently verifiable qualification requirements; Rather, it is necessary to prepare apprentices in such a way that they meet the conditions set by the labor system within two or three years with critical, innovative and pedagogical attitudes. University education seeks to train quality specialists with management capacity, links with the community and research, which are the substantive activities of the higher education process, developing didactic research, with an educational, intercultural and inclusive approach that seeks to positively influence the quality of fourth level educational institutions.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) presents some criteria and provisions that educational systems must take into account for the development of public policies in vocational training. Figure 1 shows which are the most necessary (Unesco, 2013).



**Figure 1.** Educational System  
Source: (Unesco, 2013).

It is necessary that the role of teachers in the educational process improves, both in their initial training and in their working conditions. Ecuador has not lagged behind in this regard, creating the National University of Education (UNAE), which is dedicated to training quality teachers, with a country teaching project. There is little scientific research that has been developed mainly in universities, but also in national scientific institutes, polytechnic schools, financed with public funds, as can be seen in figure 2.



**Figure 2.** Analysis of the scientific production of Ecuador  
Source: (Van Hoof, 2015).

The Pontificia Universidad Católica del Ecuador in 2020, provides international professional training opportunities to teachers through scholarships or exchanges among them are the following (Pontificia, 2020).

- International Journal of Engineering Science Technologies (IJOEST), aims to disseminate innovative scientific research and eminence in knowledge. It is an open access and peer-reviewed journal that provides the publication of articles in all areas of Engineering, Science and Technologies.
- Scholarships offered by the Deutscher Akademischer Austauschdienst (DAAD), aimed at university professors and scientists, of architecture and

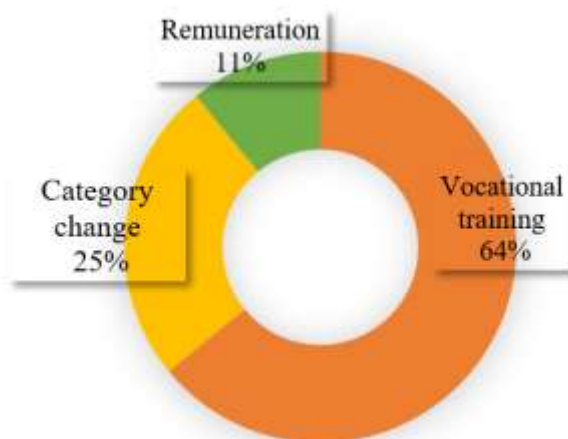
artistic disciplines, who are interested in carrying out research stays in Germany, with a duration of minimum 1 month and maximum 3 months, at any university or research center.

- Gates Cambridge Scholarship 2021-2022, Scholarship program for foreigners open to all fields at the Master's and Doctorate level at the University of Cambridge. The program is one of the most prestigious and competitive in the world and seeks students and professionals with academic excellence, leadership potential, and social commitment.

- The French Ministry for Europe and Foreign Affairs, with the Eiffel Excellence Scholarship Program, seeks to attract the best foreign students to undertake master's and doctoral programs, coming from developing and industrialized countries.

The main purpose of the Pontificia Universidad Católica del Ecuador (PUCE) is to promote and articulate internationalization processes, through the management of international instruments, networks and projects that allow obtaining academic cooperation in favor of institutional strengthening and the university community. In this space you will be able to find relative information such as agreements, programs, networks, associations and other international opportunities in which the PUCE participates, aimed at the development of teachers, administrators, students and the general public.

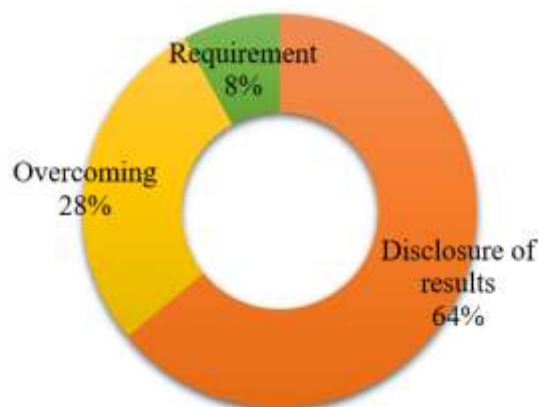
Teachers today no longer see publications as a requirement, but as an opportunity to improve their professional training. It can be seen in the results of the survey that is shown in figure 3.



**Figure 3.**Objective of scientific publications

Source: Masters of the Pucem

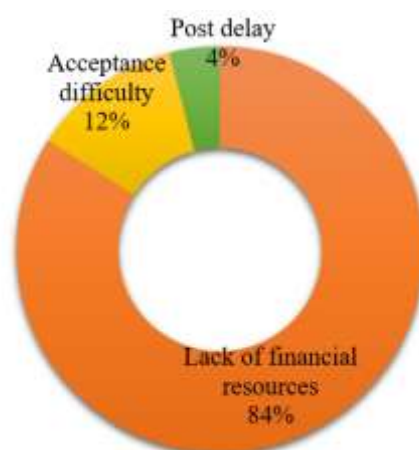
As can be seen in the answers given by the teachers, the objective sought with scientific publications is vocational training with 80%, while 16% do so due to a change in category. Considering the respondents their training as the first element to validate their publications. It is important to analyze how currently, researchers consider making scientific publications, as shown in Figure 4, 64% do so by disclosure of the results, while 28% by overcoming.



**Figure 4.** How do you consider making scientific publications?

Source: Masters of the Pucem

One of the great difficulties that many research teachers have today is the lack of resources, which does not allow them to publish more frequently, since the economy that Ecuador is going through is one of the great factors that affect many inquirers, it can be seen in Figure 5 that 84% of teachers do not publish more frequently due to lack of financial resources, while 12% do not do so due to the difficulty of acceptance and 4% for delay of publication.



**Figure 5.** Does a factor prevent you from posting more frequently?

Source: Masters of the Pucem

The Ministry of Education has established a different procedure for the continuous training of teachers, thus training them in their academic field. The “Si Proffes” Program was terminated, which gave multiple options for professional updating and was executed through agreements and commitments signed with national universities (Ministry of Education, 2015). Currently they offer an estimated 10,000 scholarships for Ecuadorian teachers to obtain their specializations and master's degrees through agreements signed with several universities in Spain and several American countries, as shown in figure 6.



**Figure 6.** Universities that offer scholarships to the Ministry of Ecuadorian Education

Source: (Ministry of Education, 2015).

### Scientific dissemination Scientific

Scientific production seeks to find new ways that allow information to have extensive coverage. The speed of science and technology have generated an unprecedented expansion, creating the need to seek new paths, where writing becomes one of the tools to disseminate knowledge through magazines, books and articles, as well as web pages and forums. These must be disclosed and transmitted through different communication channels, being of a formal and informal nature (Piedra-Salomón&Martínez-Rodríguez, 2007).

Between 2008 and 2014, the number of scientific articles included in the scientific citations index of the Thomson Reuters 'Web of Science' platform increased by 23%, from 1,029,471 to 1,270,425 (UNESCO, 2015). There are problematic factors in Latin America, which scientific production is reduced in most of these countries, these problems are complicating the production of academic articles.

Ecuador is a country with low economic resources, considering itself an emerging economy due to economic stability, which is mostly sustained by oil exploitation and production, the economic level that the country is going through is a necessary factor that influences the production and dissemination of academic texts and scientific knowledge. The universities of Ecuador are striving to place themselves on the map of countries that produce knowledge of efficiency and quality. Despite the economic, social, and cultural difficulties that the country experiences and that is observed in other Latin American countries, it is necessary to maintain a continuous scientific production that works as a measure to solve the conflicts that arise in the disclosure of the results (Álvarez& Pérez, 2015).

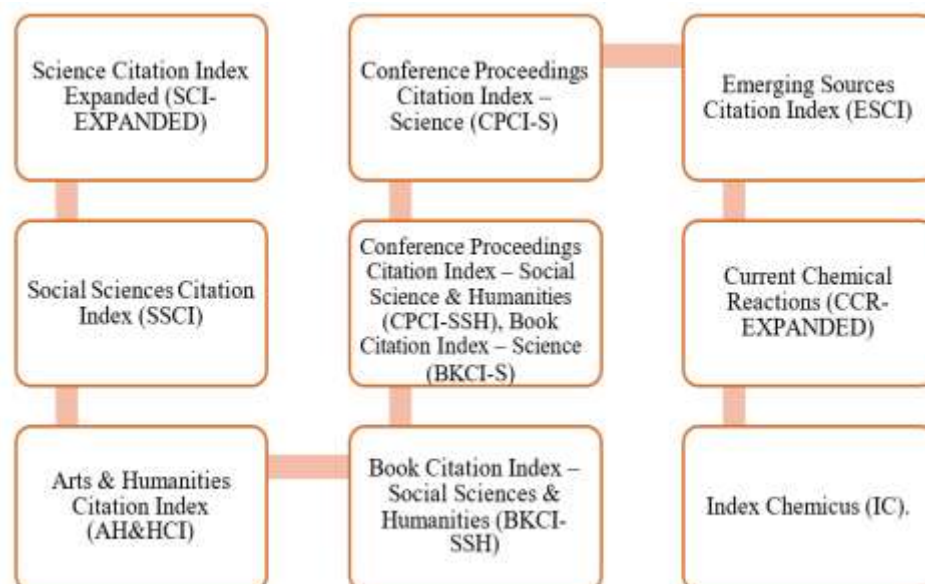
The Organic Law of Higher Education (LOES), perceives a clear interest in teaching work, in the percentages of research and scientific publications that they must have in terms of the academic field. The law states that all



university professors must have at least a master's degree and 70% must have a doctorate in research universities, which plays a significant role in the country's scientific production index (Castillo & Powell, 2019). The Secretary of Higher Education, Science, Technology and Innovation (SENESCYT), stated that the process of teachers has been improving, thanks to the accreditation of universities and the policies stipulated by the State that have allowed the increase in publications of academic articles in the country (Castillo & Powell, 2019).

The incentive of this increase helps teachers to strive to update their credentials and improve publication rates in order to achieve adequate professional training in their work and economic life. At the beginning, teachers do it with the intention of improving their lifestyle, but in the end, they end up doing it due to the growth of the percentages of academic production at the national and international level (Castillo & Powell, 2019).

The Web of Science (WOS) database is a first-level platform from the Clarivate Analytics company, which is in charge of storing bibliographic references and citations of scientific publications of any discipline of knowledge. It was formerly known as ISI Web of Knowledge and owned by the Institute of Scientific Information, later obtained by Thomson Reuters (Library, 2019). The platform has access to different databases for the purpose of comparing information, this shows a more equitable number of records, in order to avoid the repetition of articles that appear in different databases, which makes it possible to find information regarding to various subjects. The main collection of *Web of Science* Data is stored in, which is made up of ten indexes that contain information collected from thousands of books, academic journals, collections, reports and conferences, among many other sources (Clarivate, 2019), shown in the figure 7.

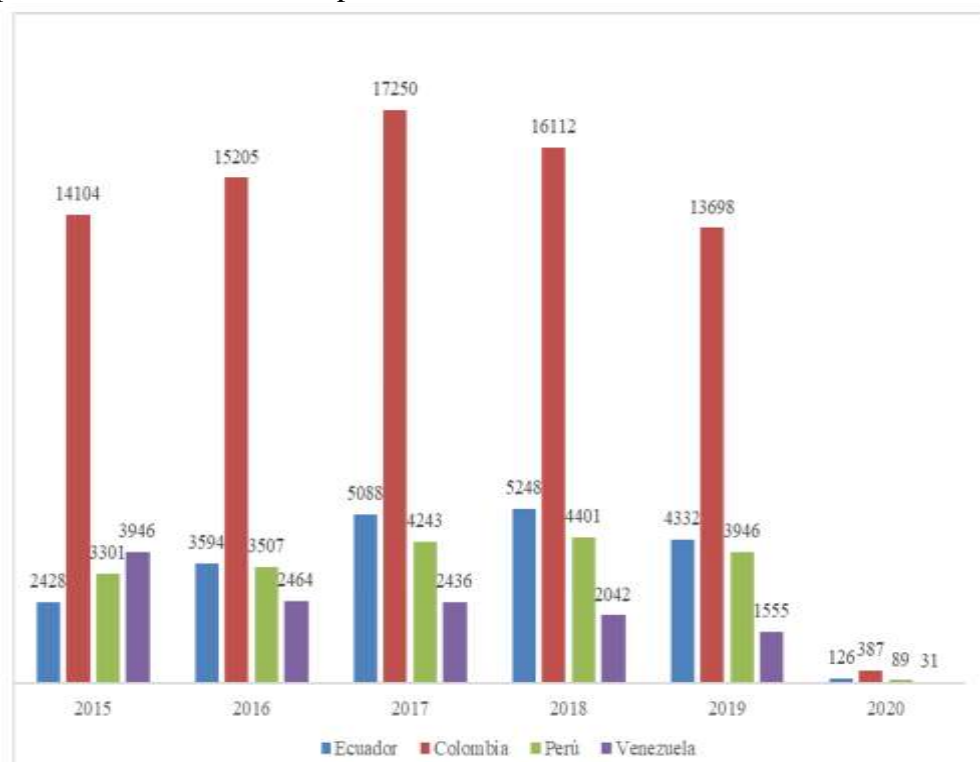


**Figure 7.** Quality information indexes

Source: (Clarivate, 2019).

These indexes contain quality information on the research process in the world, these repertoires help to improve scientific production and the

development of humanity. In Figure 8, the list shows several countries including Ecuador, Chile, Colombia and Venezuela, in descending order in terms of scientific production from the number of records obtained from the Web platform of Science of the period 2015 - 2020.



**Figure 8.** Scientific production during the period 2015-2020

Source: (Clarivate, 2019).

During the period 2015 - 2020, Ecuador is in position 7 on the list, presenting 4.68% of the total number of records, this shows that academic production is present in the different databases, Ecuadorian scientific or academic publications. They are being disseminated and used in other research worldwide and are part of international databases. Through the database obtained in the Web of Science platform, Ecuador is in position 6 in the records of the MainCollection relation to the other 19 Latin American countries *Web of Science*, in position 7 in *Current Contents Connect*, in position 7 in *MEDLINE*, position 8 in *SciELO Citation Index*, position 6 in *Korean Journal Database*.

### **Impact of the publications of Ecuador 2020**

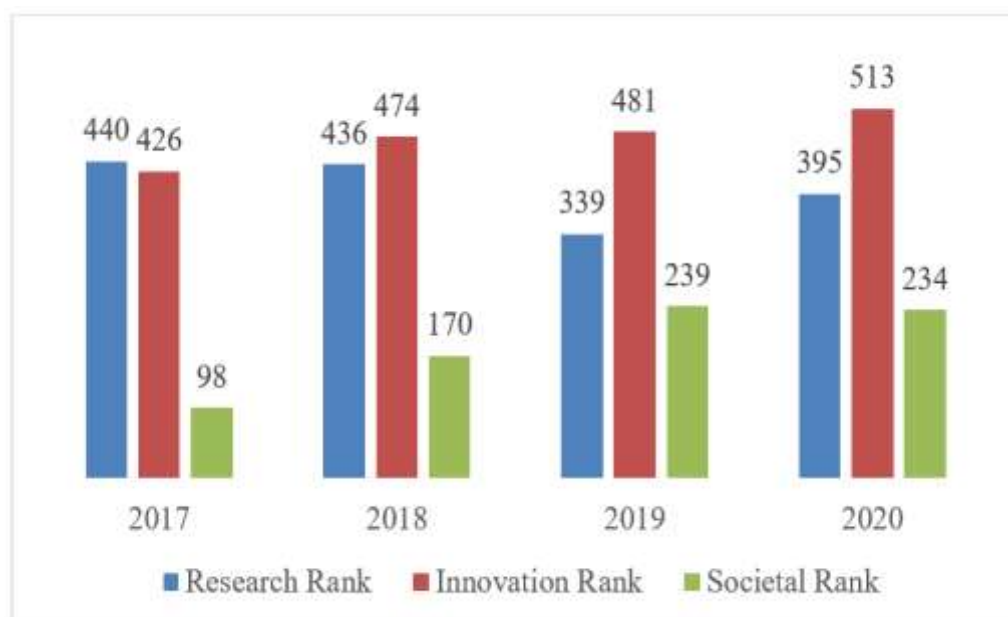
The **publication** of articles in Scopus indexed journals and their impact factor make up an indicator of the performance of research activity in the educational field. The 2020 annual report of the Ibero-American Ranking of Higher Education Institutions classifies them according to the number of articles indexed in Scopus and their impact. To carry out the ranking, three fundamental components are taken into account: research, innovation and social impact.

The Pontificia Católica del Ecuador (PUCE), occupies the first place in the general classification among all the universities of Ecuador in the Scimago

2020 Ranking. It is among the 3 best universities in the country in the web ranking of universities, standing out in the indicator related to the number of scientific citations and publications. In the *Times Higher Education (THE)Ranking 2020*, PUCE ranks first in Ecuador in all pontifical universities in Latin America, for standing out in the good performance and quality of its publications indexed in Scopus (Scimago Institutions Rankings, 2020).

Quacquerelli Symonds, presented the list of the best universities in the world. The San Francisco de Quito University (USFQ), in the 751-800 category, occupying 65th place. The National Polytechnic School (EPN) with 801-1000, achieved 106th place and the Pontificia Universidad Católica del Ecuador (PUCE) with in the same category, in position 109, these are the three higher education centers that the leading company *in* the analysis of international education Quacquerelli Symonds (QS) placed in its Ranking of 2021. The list was published this Tuesday, June 9, 2020 (The trade, 2020).

According to the list published on Wednesday, November 11, 2020, on the *website* QS, the regional ranking uses five basic criteria: impact and productivity of research, teaching commitment, employability, online impact and internationalization (El Comercio, 2020). In figure 9, it will be shown how scientific publications have had an impact on the ranking of the 2017-2020 period at the Pontificia Universidad Católica del Ecuador.



**Figure 9.** PUCE ranking of publications for the period 2017-2020  
Source: (Scimago, 2020).

The Pontifical Catholic of Ecuador in the ranking of the Scimago website, it can be seen that the impact that the PUCE has had in the 2020 period has increased in level in terms of publications, unlike in previous years that the level has been lower that nowadays. Looking at the percentages for each year, the university continues to achieve and climb in every aspect to give professionals a quality education.

## CONCLUSIONS

Teachers consider that publications have an impact on scientific preparation, contributing to the improvement of professional training, being also a factor that helps to share their experiences with other colleagues from different places, study areas deepening the levels of knowledge and being able to reproduce ideas that are novel published by other authors. The dissemination of the results has met the objectives planned in the results of the Pontificia Universidad Católica del Ecuador, being one of the best universities in Ecuador. The Pontifical Catholic University of Ecuador, occupies the first place in the general classification among all the universities in the Scimago 2020 Ranking. It is among the 3 best universities in the country in the ranking *web* of universities, standing out in the indicator related to the number of citations. Scientific studies and publication of articles in Scopus indexed journals constitute the performance of the research activity of a higher education institution, there is an urgent need for the rest of Ecuadorian universities to achieve outstanding levels in high impact publications.

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