

Digital distance education in the pandemic COVID-19

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Abstract

A documentary review was made of the scientific production registered in the Scopus database regarding the study of Digital Distance Education in the COVID-19 pandemic worldwide, with the purpose of knowing the main characteristics of the generation of new knowledge on the aforementioned topic. The information to be analyzed is provided by Scopus through its *Search* tool, by means of which the data is filtered in such a way that a total of 1,069 papers published in high impact journals are obtained, referring to distance education during the COVID-19 pandemic. Due to its nature, the temporal delimitation is defined by the two semesters of 2020 and the first semester of 2021. The bibliometric review is performed on the basis of these data, which are classified according to their area of knowledge, country of origin and affiliation. Once the information is classified, certain papers are analyzed from a bibliographic perspective to know and define the position of different authors with respect to the proposed topic.

Key words: Distance Education, Virtual Education, COVID-19.

1. Introduction

The emergence of technology in the world of education opened up many opportunities for more people to have access to professional training. Online courses, originated in the decade of the 90's in the United States, Australia, New Zealand and United Kingdom, and since then it has begun a continuous race of updates that have allowed to make use of platforms designed exclusively for the teaching-learning process designed by educational software developers that have served as support in the implementation of strategies proposed by educational management (Nagles, Mejía, Chaparro, 2017).

Within the pedagogical processes contemplated by the universities, in view of the imminent change that distance education by digital means entailed, teachers have received constant support from the institutions, through continuous training in technological tools that facilitate the delivery of new knowledge and the interaction between students and teachers. Only through updates and constant training, a continuous improvement in the teaching processes is obtained (Education, 2016) .

On March 11, 2020, the World Health Organization alerted the whole world about the reality of the pandemic generated by the HIV/AIDS pandemic, which forced all people to a mandatory confinement decreed by the states in their eagerness to stop the rapid spread of the disease. Many sectors of the economy saw their processes affected, and education was no stranger to this, transforming its methodology from face-to-face to remote. What was traditionally an option (virtuality) for students, became an obligation for anyone interested in giving continuity to their training process, which undoubtedly, became an obligation for all those interested in giving continuity to their training process (Inter-American Development Bank, 2020) which undoubtedly became a challenge for management in education worldwide, always designing strategies that keep not only trained teachers in their area of knowledge, but in the use of digital tools for the implementation of the curriculum, additionally, maintain the motivation of both teachers and students to avoid high levels of desertion (Artavia& Castro, 2019). Precisely, the motivation and commitment on the part of teachers, constituted a major issue to be addressed by the administration of educational institutions, since only through the above, it can be ensured that the guidelines are followed correctly and all the necessary mechanisms for a successful teaching-learning process are applied (GarcíaAretio, 2020).

Therefore, it is important to know how has been the bibliographic production related to education during the pandemic generated by COVID-19 since its appearance in the world, so the present research work is developed with the purpose of answering the question: How has been the production of scientific publications related to distance education in times of pandemic during the two semesters of 2020 and the first semester of 2021 in the world?

2. General Objective

To analyze from a bibliometric and bibliographic perspective, the production of high impact research papers on the variable Distance Education during the COVID-19 pandemic during the year 2020 and first semester of the year 2021.

3.Methodology

Quantitative analysis of the information provided by Scopus under a bibliometric approach on the scientific production referring to Distance Education during the pandemic decreed by the massive contagions of COVID-19 at a global level is carried out. Likewise, it is analyzed from a qualitative perspective, examples of some research works published in the area of study mentioned above, from a bibliographic approach to describe the position of different authors on the proposed topic.

3.1 Methodological design

	PHASE	DESCRIPTION	CLASSIFICATION
PHASE 1	DATA COLLECTION	The data collection is carried out by means of the Scopus web page search tool.	Published papers whose study variables are related to Distance Education during the COVID-19 pandemic. Research papers published during the year 2020 and first semester of the year 2021. Limited to journal articles only. Without distinction of area of knowledge.
	CONSTRUCTION OF ANALYSIS MATERIAL	The information identified in the previous phase is organized. The classification will be made by means of graphs, figures and tables based on data provided by Scopus.	Country of origin of the publication. Area of knowledge. Affiliation
	DRAFTING OF 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.	
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Table 1. Methodological design.

Source: Own elaboration (2021)

4. Results

The execution of phase 1 of the methodological design allows the identification of a total of 1,069 published articles. 419 were published during 2020 and 650 during the first half of 2021. The following is an analysis of what were the most frequent keywords during the research related to Distance Education during the pandemic generated by COVID-19.

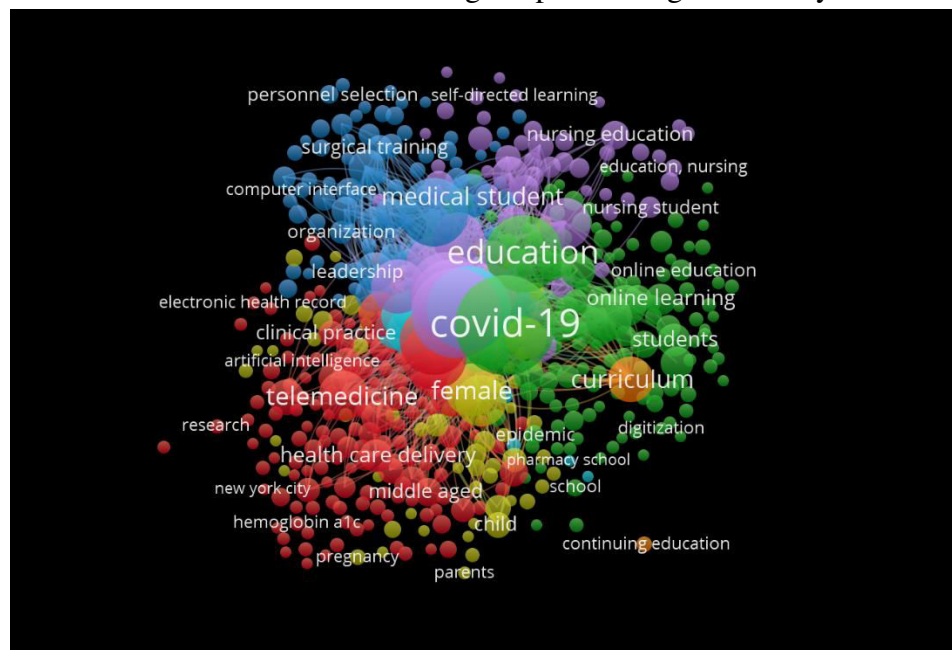


Figure 1. Co-occurrence of words

Source: Own elaboration (2021); based on data provided by Scopus.

Among the most frequent keywords in the study of the aforementioned subject, the variable COVID-19 is the most frequent among the 1,069 journal articles identified. Since this is a study related to Education, it is also frequently found in these articles. The relationship of these two variables with different areas of study allows identifying words such as Telemedicine, Online learning, Online education, Leadership, which allows inferring that once the mandatory social isolation was decreed, education immediately migrated its teaching processes to the virtualization of its contents, thus allowing to comply with the measures of the authorities without violating the right to education, making use of the different technological aids available for this purpose.

On the other hand, there is a frequent use of words such as Medical Student, Nursing Student, Clinical Practices, Health Care Delivery, which indicates in this case, that the area

of health education was one of the main authors of all the analysis material identified in the present research. Right in the middle of these two main groups of words identified, there are terms such as, artificial intelligence, computation, organization, management in education, which allows inferring that the main objective of the educational institutions that specialize in the area of health, was precisely the continuity of the pedagogical processes through digital platforms and the use of communication technologies.

Distribution of scientific production by country of origin.

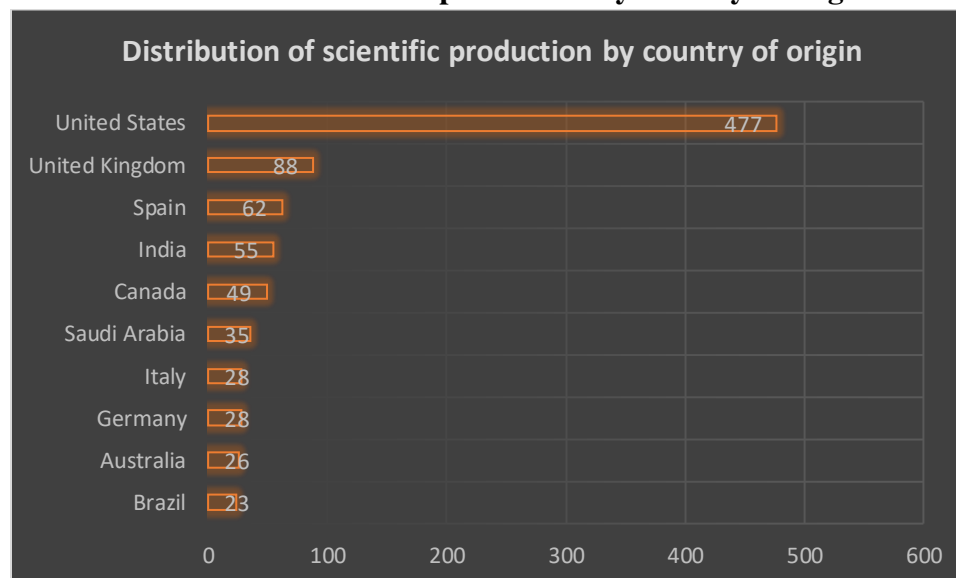


Figure 2. Distribution of scientific production by country of origin.

Source: Own elaboration (2021); based on data provided by Scopus.

The United States is the country with the highest number of journal article type publications published during 2020 and the first semester of 2021 regarding distance education during the pandemic generated by COVID-19 with a total of 477 documents registered in Scopus among which stands out the one entitled "An outpatient telehealth elective for displaced clinical students during the COVID-19 pandemic" (Weber, et al., 2021) which proposes, within the training of medical students, an elective course that specializes in teaching them the treatment of outpatients through teleconsultation, that is, remotely by technological means. This represents a benefit for the patients, since their treatments would be exposed to being interrupted by social isolation measures. But the training of the remote care of future healthcare professionals ensures that these patients are not missed by a physician within the time frame required for each treatment.

The United Kingdom, Spain and India are in second, third and fourth place with 88, 62 and 55 published papers, respectively. Among the articles registered by India is the one entitled "Significant applications of virtual reality for the COVID-19 pandemic", which reviews the current status of virtual reality tools to support areas such as medicine, education, education, health care, education and health care (Singh, et al., 2020) which reviews the

current state of virtual reality tools that support areas such as medicine, education, marketing, among others. This is important at times like those experienced by the COVID 19 pandemic because it reduces the need for physical contact between people when carrying out tasks derived from the aforementioned areas. And precisely the possibility of reducing person-to-person contact also reduces the chances of contagion and spread of the virus.

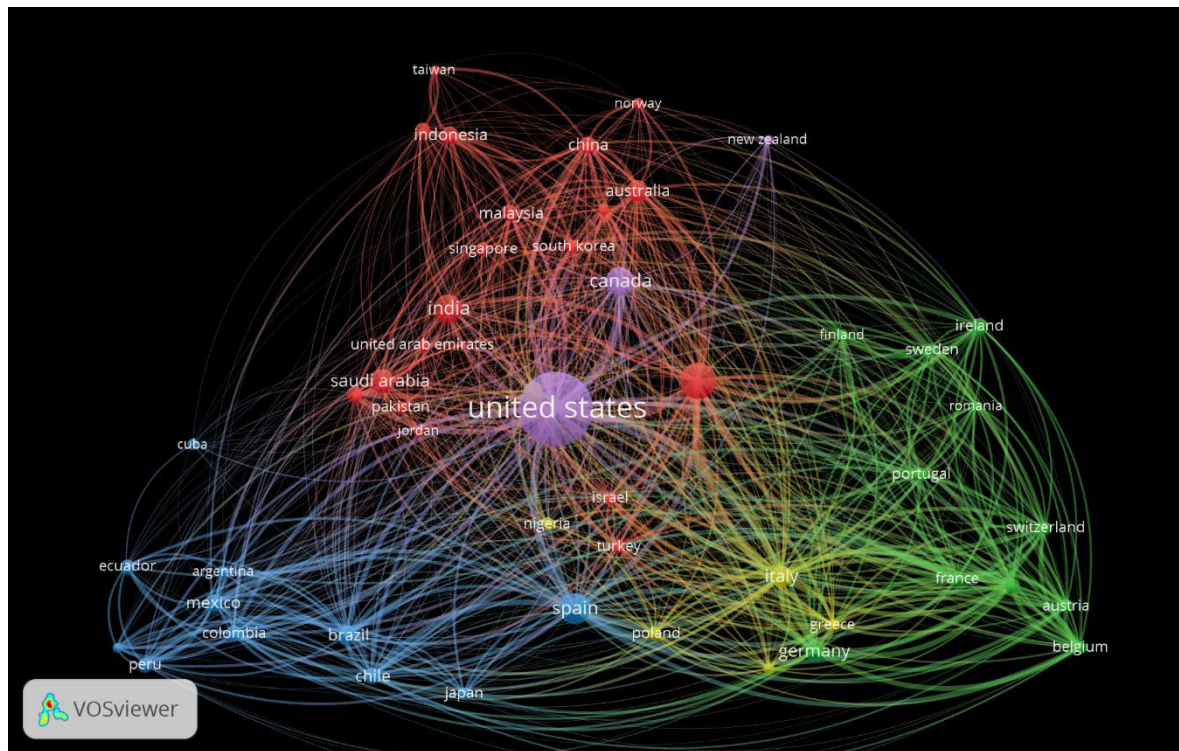


Figure 3. Co-citations between countries.

Source: Own elaboration (2021); based on data provided by Scopus.

Figure 3 shows the cooperation between authors of different nationalities in the preparation and publication of scientific articles related to the topic under study. The United States is shown as the central axis within the relations registered between countries, with greater cooperation between this country and Canada. Three large groups are evident in the figure: Latin American countries: Colombia, Mexico, Peru, Chile, Argentina, Cuba and Ecuador, which have published articles with authors from Japan and Spain. European countries; France, Switzerland, Austria, Belgium, Portugal, Ireland, Finland, Germany, have shown cooperation and co-citations between them through the institutions of each country. Finally, Asian countries; South Korea, Malaysia, Jordan, Saudi Arabia, India, Singapore, China, Indonesia, Taiwan, which in turn have also conducted research on education during COVID-19. An example of the above, the article entitled "COVID-19: Exploring the impacts of pandemic and confinement on the mental health of Pakistani students" (Baloch, et al., 2021). has cooperation between authors from Malaysia, Saudi Arabia and Bangladesh

and aims to measure the impact that mobility restrictions due to the COVID-19 pandemic have had on the mental health of Pakistani students, as they experience outbreaks of anxiety within the student community due to the confinement to which they have never been subjected before. Thus, the article concludes that once the COVID-19 pandemic has been overcome, it is necessary to work on mental health programs in order to avoid a pandemic generated by mental health affectations due to post-traumatic situations such as those experienced since the mandatory quarantine was decreed.

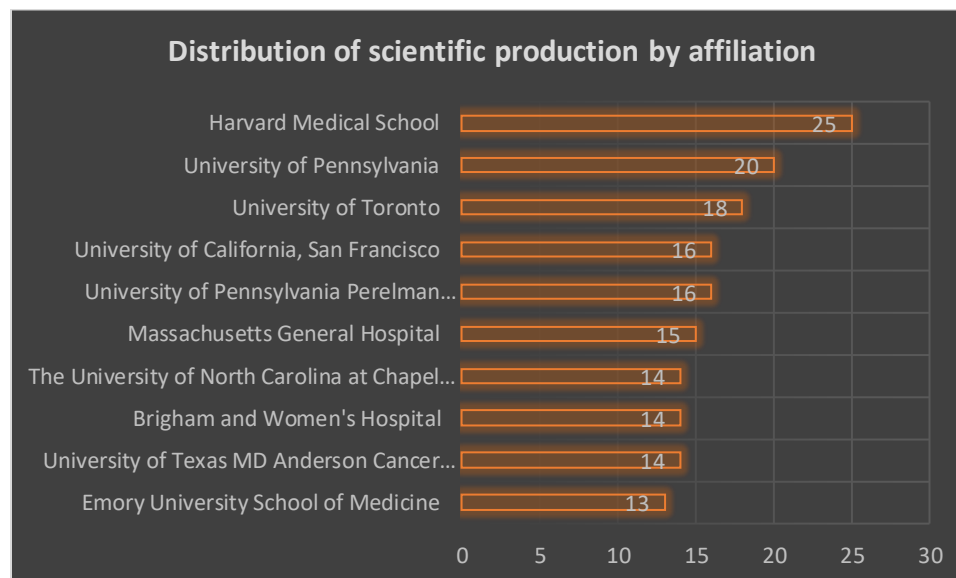


Figure 4. Distribution of scientific production by affiliation.

Source: Own elaboration (2021); based on data provided by Scopus.

Harvard Medical School, Boston, is the institution with the largest number of articles published by authors affiliated with that institution. 25 articles have been published by authors affiliated with Harvard Medical School, including the article entitled "Democratizing access to microsurgical medical education: national efforts in a training ground for medical students during the 2019 coronavirus disease", which analyzes the possibilities of access to medical training programs, specifically microsurgery, and the possibilities of access to medical training programs, specifically microsurgery (Thum DiCesare, et al., 2020). which analyzes the possibilities of access to medical training programs, specifically microsurgical, and the advantage that has meant the access to education by digital means, because in this way and thanks to the use of technological tools for direct communication and in real time, it is possible to advance in the pedagogical processes in the training of these professionals.

The University of Pennsylvania registers 20 published documents which places it in the second position as shown in Graph 2. Among its most outstanding publications is the article "Effect of the COVID-19 pandemic on the career perceptions of medical students: a

national survey study", the purpose of which is to analyze the mental health status of medical students by means of a nationwide survey, since the concern of experts is high in relation to the possible mental affectations that may result not only from the COVID-19 pandemic, but also from the possible mental health effects of the pandemic (Byrnes, Civantos, Go, McWilliams, & Rajasekaran, 2020). whose purpose is to analyze the mental health status of medical students by means of a nationwide survey, since the concern of experts is high regarding the possible mental effects that may result not only from the COVID-19 infection but also from the restrictive measures that the whole world had to comply with.

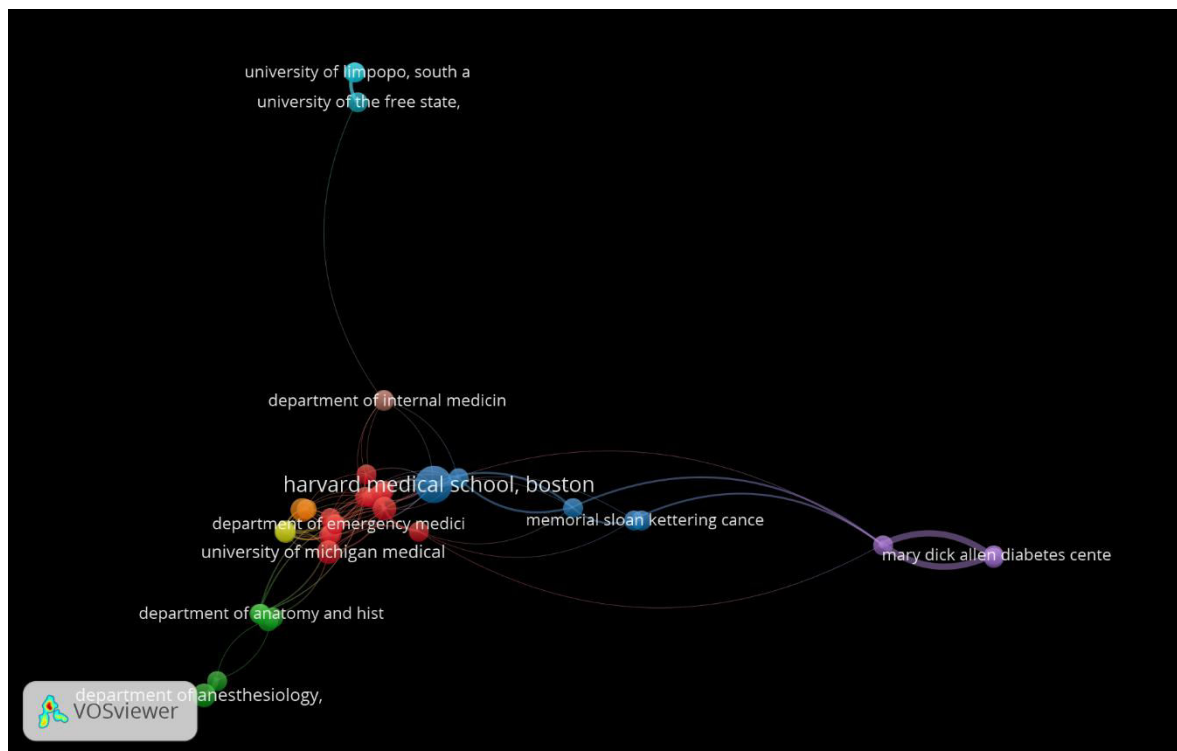


Figure 5. Co-citations between institutions.

Source: Own elaboration (2021); based on data provided by Scopus.

Figure 3 shows how the interaction between authors with different affiliation has been as in the case of the article entitled "A Paradigm Shift in U.S. Experimental Pharmacy Education Accelerated by the COVID-19 Pandemic" (Fuller, Heldenbrand, Smith, & Malcom, 2020) which aims to analyze the use of technological tools for the training of pharmacy students and how institutions and educational management have faced the paradigm shift motivated by the restrictions derived from the pandemic decreed by the high COVID-19 contagions. The University of Toronto (Canada) registers the article entitled "Education and Training in Social Work Practice during the Pandemic: Disruptions and Discoveries", which analyzes the impact of preventive isolation measures on social work practice, which was mitigated by the multiple possibilities of contact with patients through digital platforms

(Kourgiantakis & Lee, 2020) which analyzes the impact of preventive isolation measures on social work practice, which was mitigated thanks to the multiple possibilities of contact with patients through digital platforms, teleconsultation became a necessary trend and day by day more programs are designed with the purpose of fulfilling this task.

Throughout the present analysis, the dominance of studies related to the area of medicine has been evident, so it is worthwhile to know which are the areas of knowledge in which research on education during the pandemic has been conducted, and their contributions to the construction of bibliographic material. Graph 3 shows the total number of articles published under the different areas of knowledge.

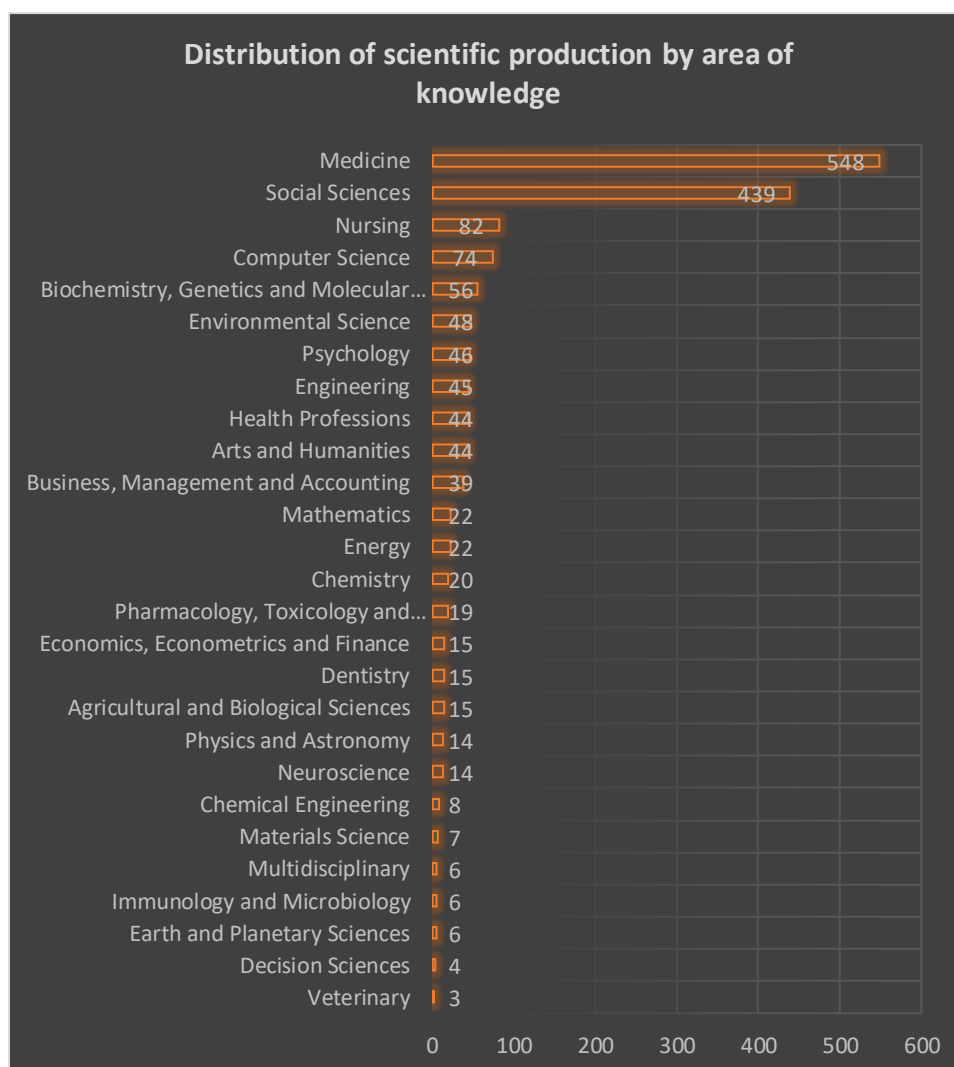


Figure 6. Distribution of scientific production by area of knowledge.

Source: Own elaboration (2021); based on data provided by Scopus.

Medicine, as mentioned above, represents the area of knowledge with the largest number of contributions to the publications on the subject under study with a total of 548 published articles, followed by Social Sciences with 439 documents, among which the article entitled "Inter-university virtual teamwork as a means of internationalization at home" stands out (Rauer, Kroiss, Kryvinska, Engelhardt-Nowitzki, & Aburaia, 2021). The purpose of this article is to present an international cooperation project of universal application to provide students with the possibility of carrying out their international exchanges without the need to expose themselves to the contagion of COVID-19, since it does not contemplate face-to-face attendance; on the contrary, it allows them to carry out activities shared by different universities in different countries from home, thus complying with the guidelines of the internationalization of contents in the training process. One of the strategies implemented in this project is the design of problem-type activities, which several students in different parts of the world must solve through teamwork by digital means.

5.Conclusions

Distance education ceased to be, thanks to the pandemic generated by the COVID-19, an option for students when choosing their mode of study, and became an obligation to reduce the possibility of contagion thanks to the crowds inside the classroom. As a result, universities around the world began to implement their pedagogical processes, using technological tools and applications developed to provide this service remotely. Teachers, likewise, were forced to update themselves in the management of platforms that allow virtual contact with their students and thus meet their academic objectives.

The United States is the country with the largest number of articles published on the education provided during this time of pandemic, thus being the country that has made the greatest contribution in terms of distance education in this period. Its models have been replicated by universities around the world, which today resort to the use of applications that allow managing a group of students in real time, all connected at the same time, receiving their professional preparation through activities and methodological strategies that facilitate the learning process under this modality. The commitment on the part of the organizations is also noticeable with the investment in developers who perfect applications suitable for this practice.

The area of medicine and social sciences has the highest production of scientific articles that can be the basis for other researches thinking about the future of education worldwide, since it is not a rumor that education has changed abruptly thanks to the measures adopted by the states to reduce the rate of infections and deaths due to the COVID-19. From the above it can be inferred that the interest of professionals in the health area is to continue training qualified personnel in patient care due to the care crisis in clinics and hospitals due to the high number of admissions and the low supply of doctors and nurses, in general all types of health professionals. It is vital to have trained personnel for the management of patients, most of whom cannot see their treatments interrupted, and who, thanks to the studies analyzed in this research work, have been able to give continuity to their medical

accompaniment through the use of telecommunications technology, receiving medical support by teleconsultation.

Thus, it is concluded that education worldwide underwent an unexpected change in the methodology used to achieve academic objectives, and that thanks to technology it has been possible to carry out the teaching and learning processes without major trauma. More studies are expected on the students' perception of the change in the study methodology.

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