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Research Article

Theoretical perspectives of virtual and distance education in Ibero-America

Lucio Torres-Romero[1]; Daniel Patricio Vinueza López[2]; Alex Dueñas Peña[3]; Tania Fernández-Gines[4]; Beliña Herrera Tapias[5]

[1]Facultad de Ingeniería Civil y Arquitectura, Universidad Nacional Hermilio Valdizán, Huánuco, Perú
ltorres@unheval.edu.pe
https://orcid.org/0000-0002-9988-0153
[2]danielp.vinueza@gmail.com
https://orcid.org/0000-0001-5060-3916
[3]Universidad-Colegio Mayor de Cundinamarca: Bogotá, Colombia
alex.duenas.pena@hotmail.com
https://orcid.org/0000-0002-2940-416X
[4]Universidad Nacional Hermilio Valdizan, Huánuco, Perú.
tfernandezgines@unheval.edu.pe
https://orcid.org/0000-0002-6318-4412
[5]Universidad de la Costa, Barraquilla, Colombia
bhrrrera3@cuc.edu.co

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Abstract

The phenomenon of distance education has generated in recent decades a large amount of scientific literature. These contributions, largely of empirical nature, have allowed the elaboration of theoretical proposals. Theories become necessary to guide good practices, at the same time that these nourish theoretical reflections. This paper proposes a theoretical contribution that intends to be global and integrating other previous ones. The proposal is based on considering distance education as a didactic dialogue mediated between the teacher (institution) and the student who, located in a different space from the teacher, learns independently and collaboratively. Dialogue as the basis of quality distance education is analyzed from different dichotomies, dialogues: real-simulated, synchronous-asynchronous, vertical-horizontal, unidirectional-multidirectional, structured-flexible. Therefore, the MOOC (Massive Open Online Course) method is defined as the main variable to analyze according to the theory that has been generated in this regard during the period 2015-2020 in Latin American countries, in order to know the position of different authors with respect to the methodologies of virtual and distance education, as well as the evolution and details of the bibliographical production of the subject under study.

Key words: MOOC, Virtual Education, Ibero-America.

1. Introduction

Virtual education was born as a response to the growth in technological and socio-political issues that increased the demand by those interested in pursuing higher education programs (García, 1999), which urged professional educational institutions to offer their academic programs based on strategies to take advantage of digital tools. Thus, arose in 2008 the MOOC (Massive Open Online Course), as a model proposed by Dave Cormirer and Bryan Alexander in Canada (Lopez-Meneses, Gomez-Galan, Bernal, & Vazques, 2020), breaking down the barrier imposed by geographical distances for example, and giving way to an inclusive, participatory, dynamic and pluralistic education that boosted a high sense of commitment in students who began to be formed under this modality.

Currently, higher education institutions are forced to guarantee the right to education through virtual media due to the pandemic generated by Covid-19, so the challenge of these institutions is to maintain the quality of their face-to-face programs

by migrating their pedagogical processes to a change never seen before. In 2019, the virtual modality was optional for students who demand this type of service, but due to the global situation, it became mandatory thanks to the measures of mandatory isolation (Banco Interamericano de Desarrollo, 2020) which forces not only students to adapt to a virtual training, but educational institutions to train teachers in all areas to efficiently use the different digital tools for the virtualization of their content (Artavia & Castro, 2019). It is worth highlighting the great advantages that education based on the use of ICTs has over traditional education which tends to be unidirectional. Therefore, the perspective provided by universities through virtual education covers three important aspects in academic training: the contents, both in training and research; the teaching model and the organizational model (Rodriguez, 2010).

For this reason, an analysis of the current literature on studies on MOOC strategy in Ibero-American countries during the period 2015-2020 is proposed in terms of volume of scientific production according to different aspects such as country of origin, year and type of publication, authors, among others. As well as an analysis of certain research works that will help to know the different proposals that authors have about virtual education.

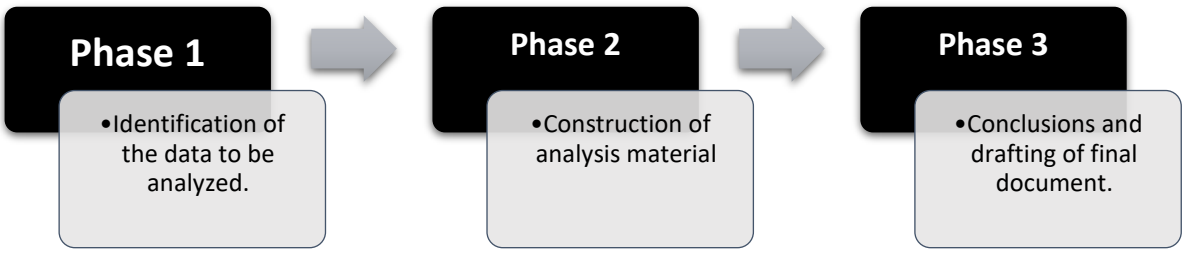
2. General Objective

The study set out to analyze from a bibliometric and bibliographic perspective, the production of high impact research papers of the MOOC variable, published during the period 2015-2020 in Ibero-American countries.

3. Methodology

A quantitative analysis is carried out on the data provided by Scopus regarding the production of research papers whose variable includes the study of the MOOC strategy in virtual education, and it is also analyzed from a qualitative approach by describing the position of different authors regarding this methodology. In order to achieve this objective, the present research is carried out based on the fulfillment of three phases explained as follows.

3.1 Methodological design



Graph 1. Methodological design.
Source: Own elaboration (2021).

3.1.1 Phase 1

Phase 1 consists of the collection of data through the execution of a specialized search under defined parameters with the purpose of focusing the analysis efforts on the current documentation on virtual academic programs.

The search profile is as follows:

- Research papers whose variable of study is MOOC, virtual higher education, published in high impact journals that have been indexed in Scopus database during the period 2015-2020 without distinction of type of publication and carried out in countries belonging to the Ibero-American community.

The information was collected through the Search tool available on the Scopus website, which yielded a total of 723 documents that meet the criteria to be classified through phase 2.

3.1.2 Phase 2

Through the execution of phase 2, the data are classified by means of graphs, figures and tables to facilitate both qualitative and quantitative analysis.

The classification will be done under the following parameters:

- Co-occurrence of keywords.
- Year of publication.
- Country of origin.
- Participating authors.
- Area of knowledge.
- Type of publication.

Their respective interpretation will lead to the fulfillment of phase 3.

3.1.3 Phase 3

Based on the analysis carried out in phase 2, the respective conclusions are drawn up and the final document is prepared.

4. Results

4.1 Bibliometric analysis.

In the first instance, the frequency with which key words coincide in the 723 research papers identified is analyzed. Figure 1 shows the co-occurrence of words, i.e., the frequency and relationship with which different keywords are mentioned in different publications.

It can be seen then how the relationship of the MOOC variable is closely related to research based on the study of Higher Education, Online Education, learning systems, and online learning, so it can be inferred that indeed all studies related to the virtualization of academic content have taken into account the MOOC strategy as a starting point as well as the pedagogical processes that propose the implementation of ICT within the educational system in both the public and private sectors, since both are regulated by governmental actors who ensure the fulfillment of a minimum of guarantees that seek quality in the training of future professionals.

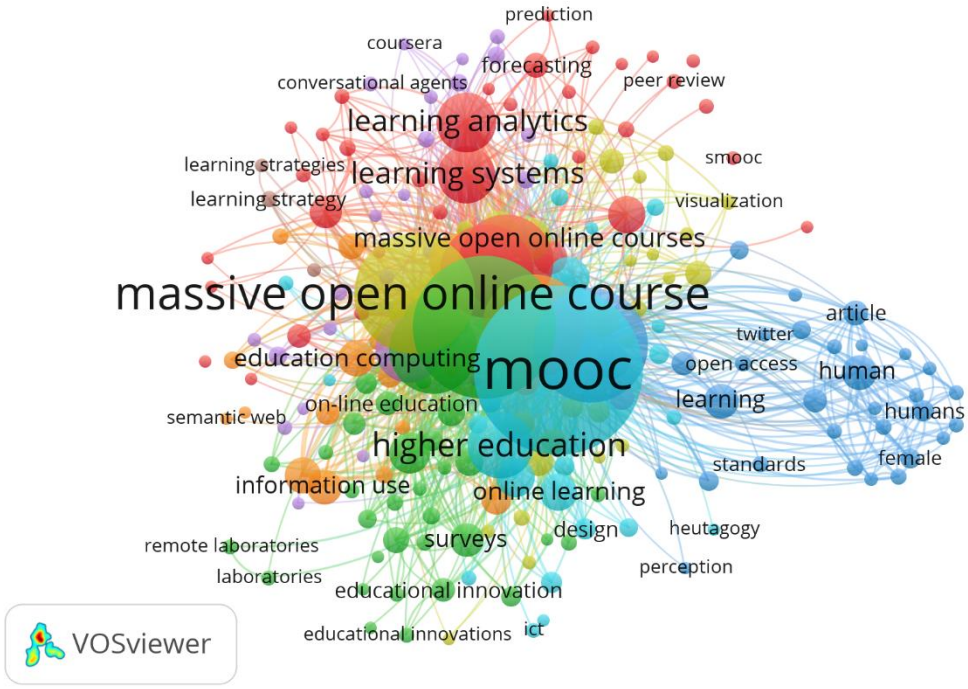


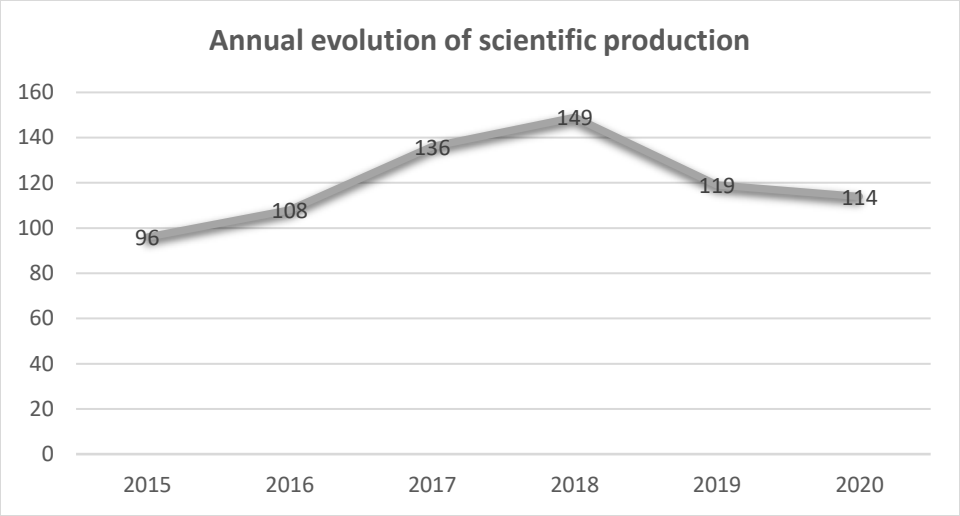
Figure 1. Co-occurrence of words.
Source: Own elaboration (2021); based on data provided by Scopus

Analytical learning systems are also part of this group of research works that are close to the theorization of MOOC strategies, as well as the use of social networks such as Twitter in the implementation of technological mechanisms in higher education in Latin American countries.

4.1.1 Historical evolution of scientific production on the MOOC variable

During the period 2015-2020 a sustained increase in scientific production is identified between the years 2015 and 2018 where it reaches its peak with a total of 149 published research papers within which one of the most outstanding articles is entitled "Understanding the perspectives of teachers that influence their innovative practices in MOOCs / SPOCs: a case study" (A. & J., 2018) which determines the main characteristics of any pedagogical process that implements the use of digital tools for the training of students, from the qualities that teachers must have within which are the flexibility and ability to adapt to change in methodologies to ensure quality in education. It also establishes a comparison between the perception of quality in the fulfillment of the right to education based on traditional methodologies and those generated by technological advances that are driven by the evolution in the needs of students.

After reaching the peak in production in 2018, the same begins a slight decrease reaching in 2019 and 2020 to 119 and 114 registered documents respectively. From 2020, the paper "Strengths and weaknesses of massive open online courses (MOOC) compared to other teaching models in socio-educational contexts" (E, J., C., & E., 2020) stands out, which aims to characterize the perception of students regarding the strengths and weaknesses of the MOOC method compared to other teaching models, concluding that the main advantage of MOOCs is that they are mostly free and that the most notorious disadvantage is the lack of training for teachers in the management of digital platforms.



Graph 2. Annual evolution of scientific production.
Source: Own elaboration (2021), based on data provided by Scopus.

Similarly, the paper "Use of interactive multimedia resources in the MOOC of the Universidad Técnica Particular de Loja (UTPL)" (M.A., D.I., & C.P., 2019) published through the conference "14th Latin American Conference on Learning Technologies, LACLO 2019, 30 October 2019 - 1 November 2019" aims to measure the impact that the use of digital resources has on the teaching process through the application of a survey to a sample of students of the Universidad Técnica Particular de Loja, demonstrating that the interactivity of students with technological platforms generates a positive impact on the appropriation of new knowledge shared by their teachers.

4.1.2 Distribution of scientific production by country of origin.

Figure 2 shows the interaction of countries in the development and publication of research papers on the variable under study, pertaining to digital methodologies in higher education institutions. Spain is shown as the main producer of research papers with emphasis on the use of MOOC strategies in university education, in partnership with authors of Portuguese and Mexican origin, countries that are within the Ibero-American community, but also with countries such as the United Kingdom, the United States and China. Example of these alliances in research, the article "Accurate effectiveness strategy to analyze the effectiveness of students with educational resources and activities in MOOCs" (P.J., J.A., C., M., & C., 2015) which has affiliations with Spanish and Chilean institutions and aims to measure the perception of students when using innovative methodologies based on ICT tools, revealing that the study creates solid bases for decision making in pedagogical processes in an efficient and close to the reality that future professionals live.

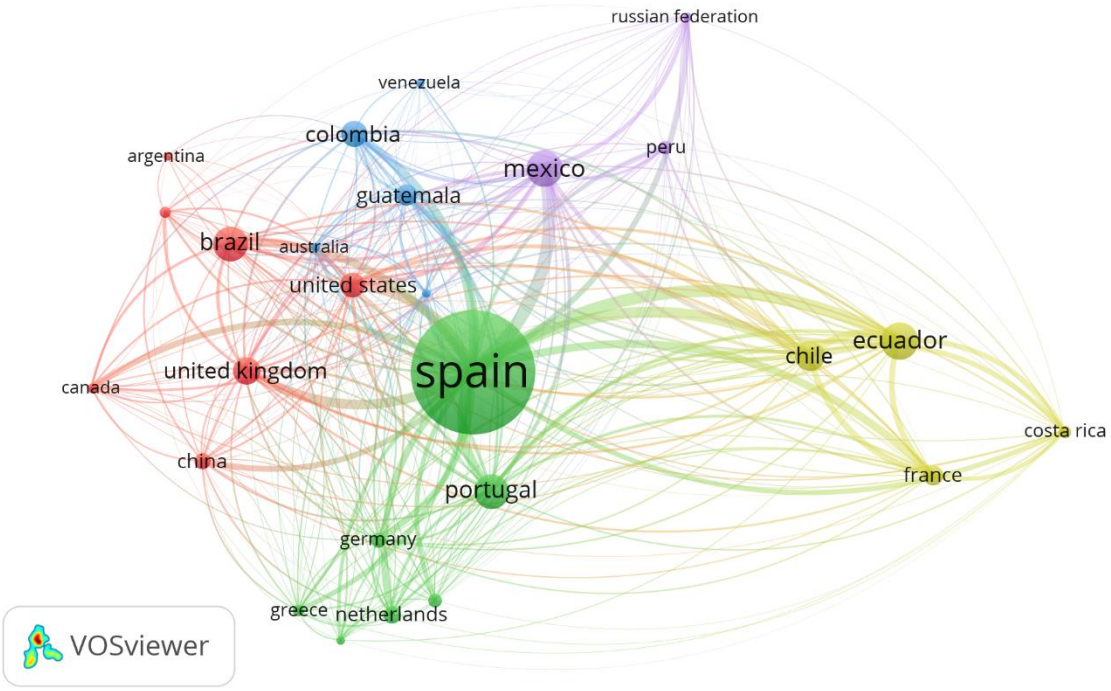


Figure 2. Countries participating in bibliographic production.
Source: Own elaboration (2021), based on data provided by Scopus.

Table 1 shows the total number of publications by Ibero-American countries, with Spain in first place with 459 documents, followed by Ecuador and Mexico with 66 and 64, respectively. It is worth noting that the same published article can contribute to two or more countries, if it has the participation of authors affiliated with institutions of different nationalities, as shown in the example above.

COUNTRY	DOCUMENTS	COUNTRY	DOCUMENTS
Spain	459	Costa Rica	12
Ecuador	66	Uruguay	10
Mexico	64	Argentina	5
Brazil	60	Venezuela	5
Portugal	60	Puerto Rico	3
Chile	46	Cuba	2
Colombia	38	Honduras	2
Guatemala	27	Bolivia	1
Peru	13	El Salvador	1

Table 1. Distribution of scientific production by country of origin.
Source: Own elaboration (2021), based on data provided by Scopus.

4.1.3 Distribution of scientific production by participating authors.

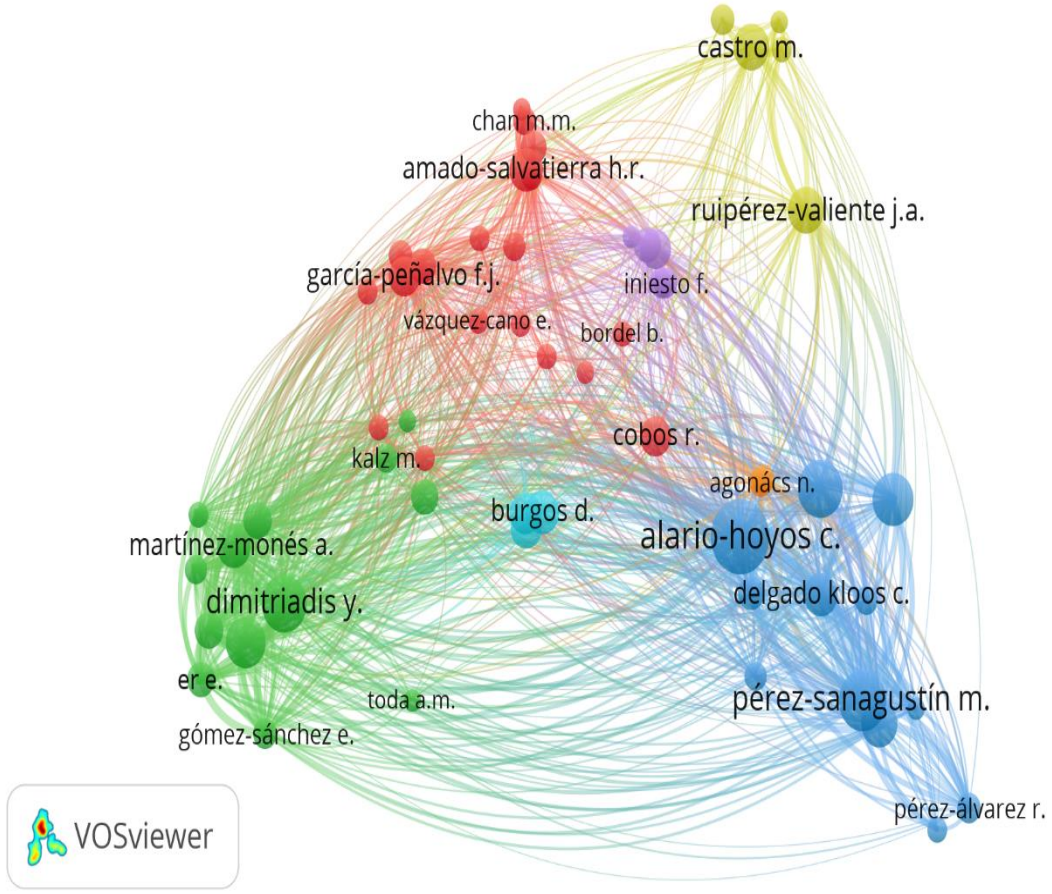
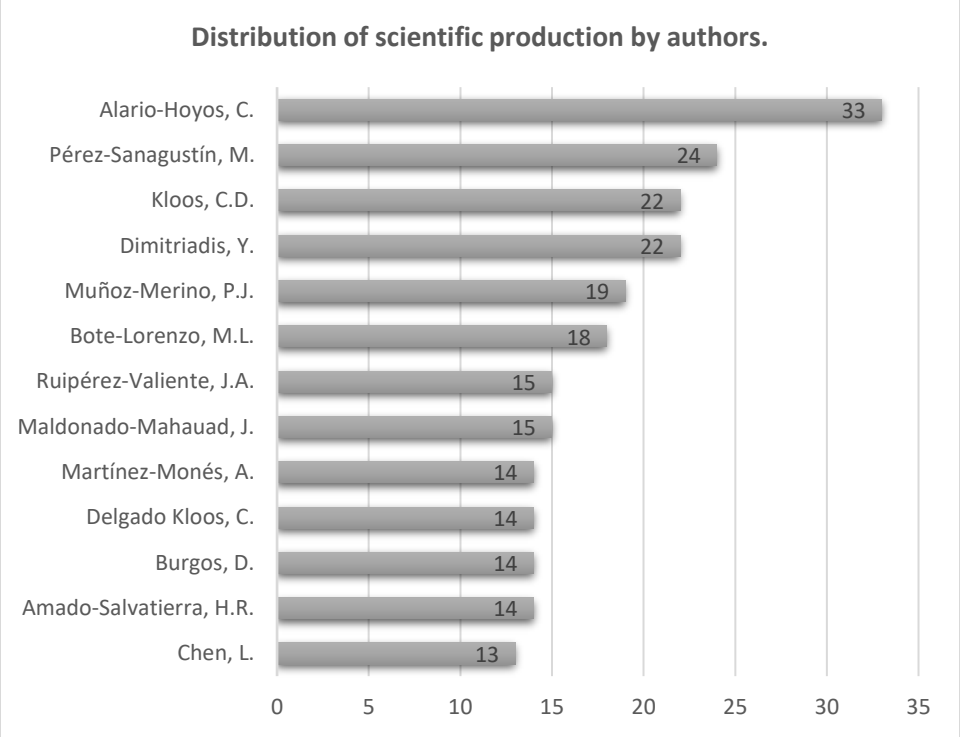


Figure 3. Author co-citations in scientific production.
Source: Own elaboration (2021), based on data provided by Scopus.

Figure 3 shows the frequency in the participation of authors in the same research, and evidences the presence of three main groups, led by the works of authors Alario Hoyos, Carlos; Delgado Kloos, Carlos; Pérez Sanagustín, Mar; Maldonado, Mahauad, Jorge; Estévez Ayres, Iria; Alonso Mencía, María Elena who participate in a significant number of publications among which is the review "Self-regulated learning in MOOCs: lessons learned from a literature review" (M.E., y otros, 2020) which highlights the self-regulation of students who are trained through MOOC strategies, and recognizes the autonomy in their learning processes. This article identifies a low bibliographic production regarding the methodology based on digital platforms that allow laying solid foundations on the basis of pedagogical theories that help teachers to perceive a scientific character in this methodology, a conclusion reached through a bibliographic and systematic review of the scientific production on articles related to the MOOC modality published until 2017. The results show that preparation based on MOOC strategies is beneficial for those who show real motivation and empathy with the virtual modality; however, the usefulness and impact of this modality should be further investigated in order to propose regulatory mechanisms to identify the effectiveness of online and distance learning.



Graph 1. Distribution of scientific production by authors.

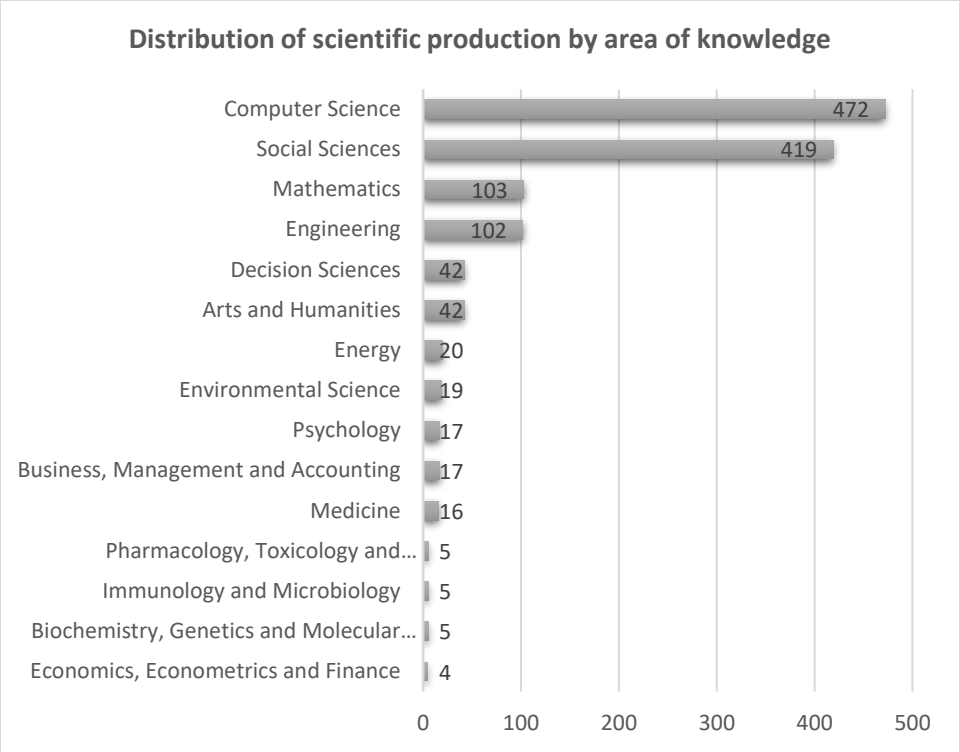
Source: Own elaboration (2021), based on data provided by Scopus.

Graph 3 confirms the first positions in terms of participation in scientific production by authors, with Alario Hoyos, Carlos being the main author with 33 publications referring to the study of virtual education, followed by Pérez Sanagustín, Mar and Delgado Kloos, Carlos with 24 and 22 published research papers.

In fourth place is the author of Spanish origin, Dimitriadis, Yannis A. also with 22 publications, among which stands out the article "To reward and beyond: analyzing the effect of reward-based strategies in a MOOC" (Y., y otros, 2019) which identifies that despite the quality of education received through MOOC strategies, these still continue to register high levels of attrition, which is why different incentives have been designed to avoid this phenomenon. However, the study reveals that these incentives lack efficient theoretical bases to measure whether they are really having a positive effect on students. In spite of this, the study also reveals that the students who have recently received these incentives as interchangeable badges are those who participate more actively in the different activities proposed by teachers in the different areas of knowledge.

4.1.4 Classification of scientific production by area of knowledge.

The different research papers registered in this study have different approaches and are categorized by Scopus according to the area of knowledge through which the research is conducted. Figure 4 shows how many documents are registered for each of the specific areas, taking into account that, as in previous cases, a single research work can be structured from multidisciplinary approaches, which means that it can be registered as a unit in areas such as Social Sciences and Economics, for example.



Graph 4. Distribution of scientific production by area of knowledge.
Source: Own elaboration (2021), based on data provided by Scopus.

As these are digital strategies for the training of students through technological tools, Computer Science occupies the first place in volume of records with 472 papers published in high impact journals indexed in the Scopus database, among which is the conference article "Analyzing event transitions to discover student roles and predict grades in MOOCs" (A., G., & E., 2017) which analyzes the traceability of students when interacting with the contents proposed in the subjects or programs that use MOOC strategies to interpret the role they play as the ones who self-manage their training in terms of time, perseverance, motivation, among others. Similarly, and based on the data collected in the interpretation of the use of the platform, the aim is to predict what their performance will be in terms of the grades obtained by students according to the use of the tools, since a student who constantly interacts with the proposed platforms is more likely to achieve better grades than those students who do not.

5. Conclusions

From the analyzed bibliography, it is concluded that Spain is the largest producer of research papers related to the MOOC strategy, and that such production had a greater boom in 2018, just a year before the global crisis caused by the Covid-19 pandemic was unleashed. Just as Computer Science also contributes the largest amount of scientific production, within which they focus on the design of evaluation mechanisms to measure the development of the training of students who carry their educational process through technological mechanisms offered by advances in ICT.

An important finding reached thanks to the analysis of the scientific production on the MOOC variable is the lack of training of the teaching staff in the use of digital tools, which greatly hinders the appropriation of these tools in the implementation of strategies by the institution and also generates a negative impact on students, so the studies suggest greater effort by the administration in the preparation of teachers in the virtualization of the programmatic contents that are delivered to students. As well as in the evaluation systems that are fed by the interaction they have at the time of performing the activities designed for the fulfillment of the objectives set out in each subject. This allows to monitor

the students' performance and motivate them to complete the virtual training and avoid desertion, which, as studies show, reaches high levels.

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