

PEDAGOGICAL DEVICES FOR QUALIFICATIONS IN HIGHER EDUCATION

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Summary

For the preparation of this document, a documentary review was carried out on the production and publication of research works related to the study of the variables Pedagogical Devices and Degree in Higher Education. The purpose of the bibliometric analysis proposed in this document was to know the main characteristics of the volume of publications registered in the Scopus database during the period 2018-2022, achieving the identification of 58 publications. The information provided by this platform was organized through graphs and figures categorizing the information by Year of Publication, Country of Origin, Area of Knowledge and Type of Publication. Once these characteristics have been described, the position of different authors towards the proposed theme is referenced through a qualitative analysis. Among the main findings made through this research, it is found that Spain, with 13 publications, was the country with the highest scientific production registered in the name of authors affiliated with their institutions. The Area of Knowledge that made the greatest contribution to the construction of bibliographic material referring to Pedagogical Devices and Qualifications in Higher Education were the Social Sciences with 29 published documents, and the Type of Publication most used during the period indicated above was the Journal Article with 42 documents of the total scientific production.

Keywords: pedagogical devices, higher education, degree.

1. INTRODUCTION

Like many aspects of our daily lives, Education has undergone multiple changes in the methodologies and tools it uses for the proper development of its processes. In a traditional way, teachers have shared their knowledge through the so-called "Pedagogical Devices" according to the preference of each one or taking into account the characteristic of the course to be directed.

It is possible to find various definitions of Pedagogical Devices, however, one of the most significant is that expressed by Foucault (Foucault 1984, as cited in Pardo Ramos & Viracachá Sandoval, 2019) in which the following is argued:

Pedagogical devices are all those mechanisms focused on promoting formal education while developing within it. In addition, they differ from the institutions themselves: institutions are characterized by discipline, the search for a certain concept of order, vigilance and the use of punishment and reward as elements of education, re-education, cure, rehabilitation or modification of non-normative behaviors and behaviors with the 26 objective of obtaining a homogenization of traits, conditions, or particular, alternative or divergent ways of acting, defined as dysfunctional or antisocial (Foucault, 1984); Institutions are the places where devices are applied and the place (physical and theoretical) from which they operate. While the devices are all those forms of organization or mechanisms that induce the population to reproduce the social order established and accepted by each society generating subjectivities, that is, differentiated ways of appropriating culture. (Pardo Ramos & Viracachá Sandoval, 2019)

Likewise, the Central University defines them as those devices "that allow to specify the scope that the different ways of arranging the educational activity can have depending on the degree of autonomy and empowerment of the reflective thinking that is intended to be (Central University, n.d.)achieved". These can be classified into traditional which are part of master classes, exhibitions, workshops, seminars among others that have been used for years for the transmission of knowledge and emerging as the inverted class and gamification that have resulted from the transformation of the environment and its needs. For all the above, we seek to verify with this article the relationship between the variables Pedagogical Devices and Degree in Higher Education through the description of the main characteristics of the set of publications attached to the Scopus database, as well as the description of the position of certain authors affiliated with various institutions during the period between 2018 and 2022.

2. GENERAL OBJECTIVE

Analyze from a bibliometric and bibliographic perspective, the elaboration of works on los Pedagogical Devices for the Degree in Higher Education during the period 2018-2022.

3. METHODOLOGY

This article is carried out through a mixed orientation research that combines the quantitative and qualitative method.

On the one hand, a quantitative analysis of the information selected in Scopus is carried out under a bibliometric approach of the scientific production corresponding to the study of the Pedagogical Devices and Degree in Higher Education.

On the other hand, examples of some research works published in the area of study indicated above are analyzed from a qualitative perspective, starting from a bibliographic approach that allows describing the position of different authors against the proposed topic. It is important to note that the entire search was performed through Scopus, managing to establish the parameters referenced in *Figure 1*.

3.1. METHODOLOGICAL DESIGN

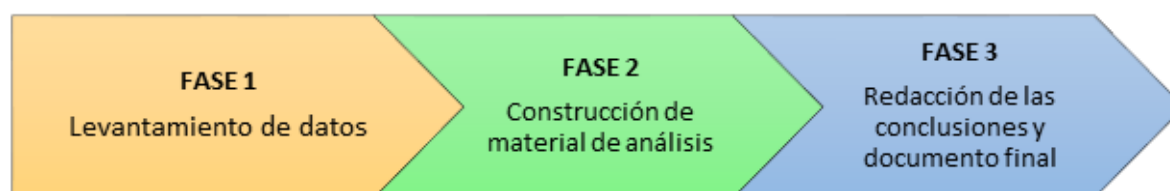


Figure 1. Methodological design
Source: Authors.

3.1.1 PHASE 1: DATA COLLECTION

Data collection was executed from the Search tool on the Scopus website, where 58 publications were obtained from the choice of the following filters:

TITLE-ABS-KEY (teaching AND devices AND degree AND in AND higher AND education) AND PUBYEAR > 2017 AND PUBYEAR < 2023

- ✓ Published documents whose study variables are related to the study of Pedagogical Devices and Degree in Higher Education.
- ✓ Limited to the years 2018-2022.
- ✓ No limit of countries.
- ✓ No publication area limit.
- ✓ Regardless of type of publication.

3.1.2 PHASE 2: CONSTRUCTION OF ANALYSIS MATERIAL

The information collected in Scopus during the previous phase is organized and subsequently classified by graphs, figures and tables as follows:



- Co-occurrence of words.
- Year of publication.
- Country of origin of the publication.
- Area of knowledge.
- Type of publication.

3.1.3 PHASE 3: DRAFTING OF CONCLUSIONS AND OUTCOME DOCUMENT

In this phase, we proceed with the analysis of the results previously yielded resulting in the determination of conclusions and, consequently, the obtaining of the final document.

4. RESULTS

4.1 CO-OCCURRENCE OF WORDS

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

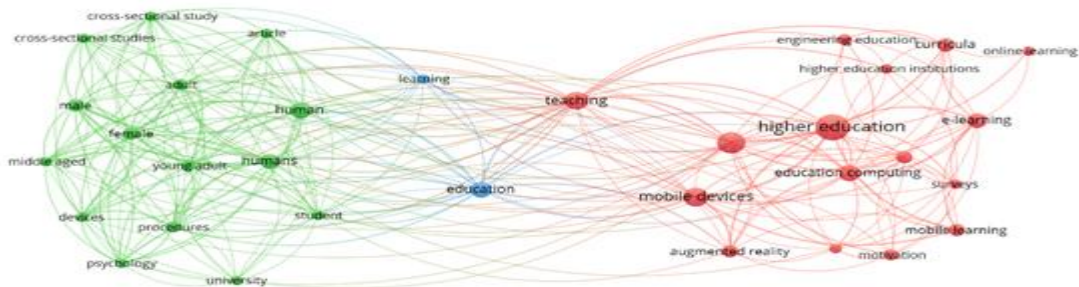


Figure 2. Co-occurrence of words

Source: Own elaboration (2023); based on data exported from Scopus.

The data in Figure 2, exported from Scopus, shows us our variables and their relationship corn other terms which we will explain below.

Education, mainly Higher Education, is in constant search of Pedagogical Devices and tools that allow it to reach its entire student community in order to meet its educational objectives and meet the needs of those who are part of the teaching-learning processes. It is no secret to anyone that with globalization and the recent crisis caused by COVID-19, it became necessary to implement digital platforms that facilitate the transmission of knowledge, as well as the evaluation of students in order to validate their passage to the next levels. That is why, in the graph we find words such as augmented reality, mobile devices, E-learning, online learning, among others that make up the new facets of Pedagogical Devices.

4.2 DISTRIBUTION OF SCIENTIFIC PRODUCTION BY YEAR OF PUBLICATION

Figure 3 shows how scientific production is distributed according to the year of publication.

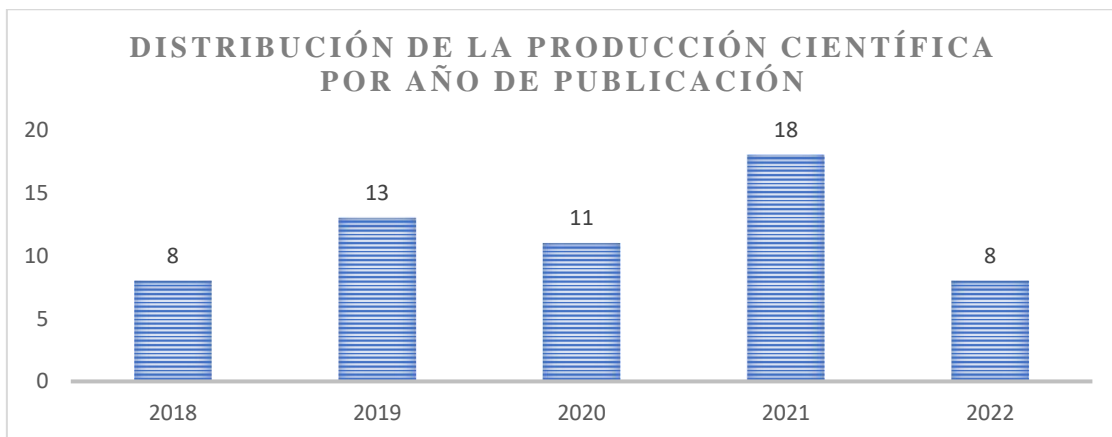


Figure 3. Distribution of scientific production by year of publication.

Source: Own elaboration (2023); based on data exported from Scopus

In Figure 3 we find the scientific production concerning the variables Pedagogical Devices and Degree in Higher Education. during the period between 2018 and 2022 which resulted in the publication of 58 documents, in the Scopus database, containing the keywords. Likewise, we observe that throughout the period there were several changes. We started with the year 2018 with 8 documents, a figure that increases the following year, decreasing again in 2020 achieving 11 publications. The highest figure was reached in 2021, the year in which 18 documents were published, however, the following year there was again a significant drop in the number of publications reaching 8 texts, as in the first year of the entire period analyzed.

The article entitled "Online learning during the COVID-19 emergency: a descriptive study of the experience of university students in Mozambique" published in 2021 analyzed the modifications made in the Teaching-Learning processes in higher education as a result of the pandemic. For this, 6,542 students from public and private universities in Mozambique were surveyed in order to obtain information on the experience lived through the use of digital platforms, concluding that most had a bad experience and therefore "would not continue with this modality of teaching". (Manjate, Martins, Matusse, Siteo, & Tinga, 2021) Overall, "themost used platforms were WhatsApp, email and Google Classroom, with around 64% reporting an unsatisfactory level of proficiency and just over three-quarters having some sort of difficulty." (Manjate, Martins, Matusse, Siteo, & Tinga, 2021)

4.3 DISTRIBUTION OF SCIENTIFIC PRODUCTION BY COUNTRY OF ORIGIN

Figure 4 shows how scientific production is distributed according to the nationality of the authors.

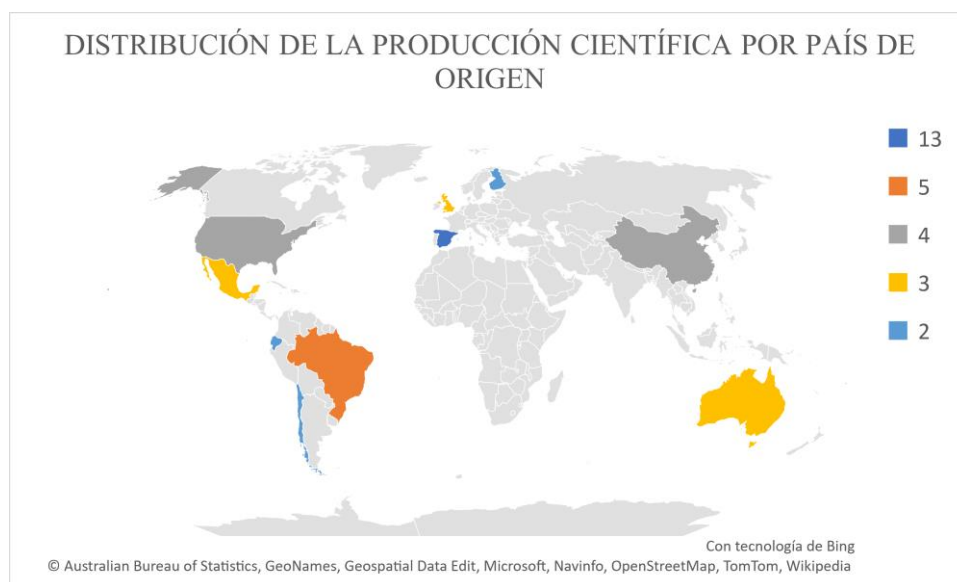


Figure 4. Distribution of scientific production by country of origin.
Source: Own elaboration (2023); based on data provided by Scopus.

In the study of Pedagogical Devices and Qualifications in Higher Education, Spain published the list of documents published with a total of 13 records each in the Scopus database during the period of the years 2018-2022, followed by Brazil with 5 documents and China and the United States, with 4 documents each.

"Mobile Learning in Higher Education: Model of Structural Equations for Good Teaching Practices"(Aznar-Díaz, Gómez-García, Hinojo-Lucena, & Romero-Rodríguez, 2021) is the title of one of the most outstanding articles in which "the degree of implementation of the mobile learning methodology in Spanish universities and check the sociodemographic factors that influence the development of good teaching practices in mobile learning" was analyzed(Aznar-Díaz, Gómez-García, Hinojo-Lucena, & Romero-Rodríguez, 2021). Through a model of structural equations it was established that "the degree of implementation of mobile devices was almost 73% of the population surveyed". (Aznar-Díaz, Gómez-García, Hinojo-Lucena, & Romero-Rodríguez, 2021) Likewise, some of the factors that impacted good teaching practices were determined, such as: "teacher status; type of institution; research in educational technology; implement pedagogical



innovations on a regular basis; agree that mobile devices are appropriate; belief in the expansion of mobile learning."(Aznar-Díaz, Gómez-García, Hinojo-Lucena, & Romero-Rodríguez, 2021)

4.4 DISTRIBUTION OF SCIENTIFIC PRODUCTION BY AREA OF KNOWLEDGE

Figure 6 shows the distribution of the elaboration of scientific publications from the area of knowledge through which the different research methodologies are implemented.

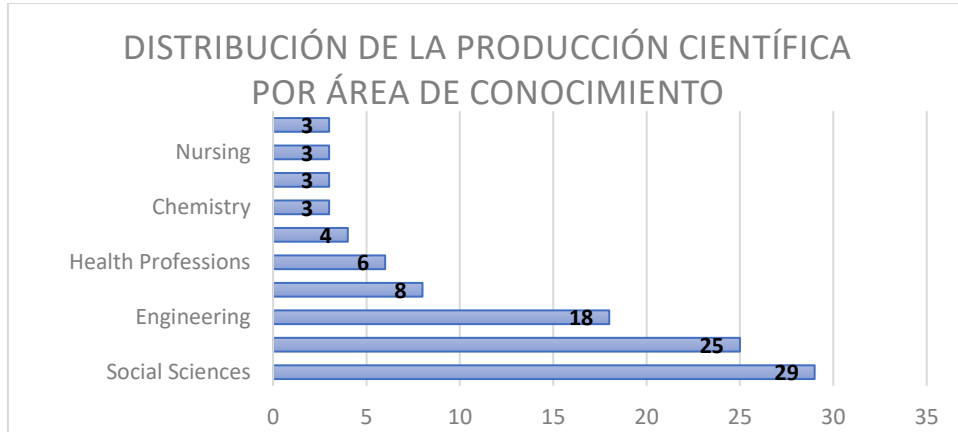


Figure 6. Distribution of scientific production by area of knowledge. Source: Own elaboration (2023); based on data provided by Scopus.

Figure 6 shows the distribution of the elaboration of scientific publications from the area of knowledge through which the different research methodologies are implemented.

Because pedagogical devices are of utmost relevance for the development of any subject, it is not strange that most of the publications found in the Scopus database, on these are made from the Social Sciences leading the publication of documents. Additionally, studies are carried out from other areas such as Computer Science as well as Engineering that have contributed to the study of these variables, managing to publish 25 and 18 documents respectively.

Although in figure 6 we can see that the variables object of this study are relevant in various areas, it is very noticeable that their study is carried out mainly from the areas that are directly related to education and the use of technological platforms, which reaffirms the interest of Higher Education institutions to improve the implementation of Pedagogical Devices considered emerging.

4.5 TYPE OF PUBLICATION

In the following graph, you will observe the distribution of the bibliographic finding according to the type of publication made by each of the authors found in Scopus.

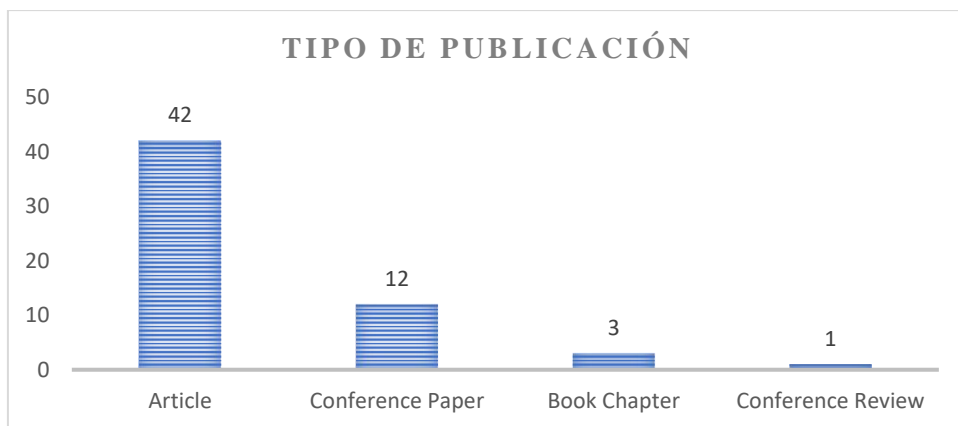


Figure 7. Type of publication. Source: Own elaboration (2023); based on data provided by Scopus.



Figure 7 clearly shows that the predominant type of publication in the study of Pedagogical Devices and Qualifications in Higher Education was the journal article with a total of 42 documents, followed in second place by the conference proceedings with 12 documents.

Among the 42 articles found, is the one entitled "Teaching with Hapkit: Enabling online haptic courses with practical laboratories" (Blikstein, Davis, Morimoto, Okamura, & Orta Martinez, 2021) in which it was sought to "understand the feasibility, benefits and challenges of including a low-cost haptic device and a degree of freedom (1-DoF) as a practical laboratory component of two online courses" (Blikstein, Davis, Morimoto, Okamura, & Orta Martinez, 2021). As we know, online learning has become relevant, even more so after everything experienced with the COVID-19 pandemic, therefore, Institutions try to adapt their curricula without leaving out tools that facilitate the practice of the knowledge acquired. The results and feedback on the practical laboratories have been positive, which motivates further development in this area. (Blikstein, Davis, Morimoto, Okamura, & Orta Martinez, 2021)

5. CONCLUSIONS

From the bibliometric analysis carried out in the present research work, it was established that Spain was the country with the highest number of records published in relation to the variables Pedagogical Devices and Degree in Higher Education with 13 publications in the Scopus database during the period 2018-2022 and that the area of knowledge with the greatest contribution was rum TheS Social Sciences with a total of 9 publications.

There is no doubt that the number of documents found is significant, so we can assume that the study of Pedagogical Devices and their implementation in Higher Education continues to be important for authors belonging to various scientific institutions around the world. Due to the changes that have been experienced at a general level, it is not surprising to find many documents related to the so-called emerging Pedagogical Devices such as gamification and the inverted class. On the contrary, it is possible to observe that teachers, as well as Higher Education Institutions have been in constant search of new technologies that allow them to adapt their pedagogy and thus capture the attention of students with the aim of maximizing their performance and the use of information.


Similarly, it is possible to affirm that today the authors maintain great interest in knowing the experience and perception that the student has about the new ways in which these Pedagogical Devices are used, which has allowed them to establish which have been the positive and negative points of all the changes experienced and therefore have the starting point to continue improving in the process. That is to say that an advance has been achieved in research on these topics compared to previous years as expressed by Eduardo Langer, Karen Maza and Sandra Roldán in their conference proceedings "Pedagogical devices and school trajectories of students in the context of social inequality":

In the field of pedagogy and educational research, studies on pedagogical devices are vast, especially as far as the history of education is concerned. However, this is not the case with respect to the study of these devices and their reconfiguration in the present. Likewise, studies in the field are few in terms of the articulation of education and inequality, marginality or poverty in Santa Cruz. These situations, in a context that coincides with the reconfiguration of education, as well as with the growth of inequality, as a result of the successive crisis situations that our country has experienced so far. (Langer, Roldan, & Maza, 2011)

Taking into account all of the above and with the sole objective of continuing to raise awareness of the importance of guaranteeing access to this type of information in a transparent manner by anyone, we hope to encourage with this article the participation of scientific communities in the study of these variables from any scientific profile and area of knowledge always seeking to provide more alternatives that contribute to the investigation of topics of general interest. texts.

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