Implementation of Technologies for Educational Inclusion: Potentialities and Obstacles in the Context of Diversity

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Abstract

A documentary review was carried out on the production and publication of research papers related to the study of ICT, Educational Inclusion and Diversity variables as online resources within the different study methodologies. 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 2018-2023 with respect to the study of the aforementioned variables, achieving the identification of 21 publications in total. 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 regarding the proposed theme is referenced through a qualitative analysis. Among the main findings made through this research, it is found that Spain, with 12 publications, was the country with the highest scientific production registered in the name of authors affiliated with institutions in that nation. The Area of Knowledge that made the greatest contribution to the construction of bibliographic material related to the study of Educational Inclusion supported by ICT resources was Social Sciences with 13 published documents, and the Type of Publication that was most used during the period indicated above was the Journal Article, which represents 71% of the total scientific production.

Keywords: ICT, Educational Inclusion, Diversity.

1. Introduction

The effects of globalization have resulted in cutting-edge systems in the technology sector, which, when incorporated into education, have resulted in a more inclusive education sector and multiple learning styles. This correlation between these two powerful forces holds enormous potential, a potential that has favored this sector, which has helped to close educational gaps, dismantle barriers both geographically and in terms of access to information, and respond in a timely manner to the needs that students may present.

In the digital era, which has shown how these advances in technologies have revolutionized the way knowledge is imparted to students, it is important to mention those resources such as virtual

classrooms, online forums, adaptive platforms and the future arrival of artificial intelligence and ChatGPT in schools, the same ones that have paved the way for a more versatile educational experience. dynamic and more accessible and equitable. However, it is important to mention that the benefits and use of these resources and inclusion in education are not exempt from presenting difficulties, especially considering the different multifaceted sectors of diversity.

It is important to mention the factors involved in educational diversity, ranging from the socioeconomic environment, cultural factors, learning styles, both physical and cognitive skills and their linguistic level that the student can have. While educators and education policymakers create learning environments where this diversity is reflected in future training classrooms, the same implementers of these policies for growth in education pose promising opportunities as obstacles represented by educational technology. In the first instance, the potential of this technological incursion into education presents enormous benefits. Online platforms, for example, allow students the ability to adapt to different learning styles, allowing a more inclusive and personalized teaching environment to address the diverse needs of students, this also breaks down geographical barriers allowing access to resilient and cutting-edge education.

Secondly, the difficulties in implementing these technological promises in educational inclusion present certain obstacles that must be exhaustively analyzed. The digitalization gap represents the epicenter with the most difficulties since there are still communities unaware of this factor and the socioeconomic factor makes it impossible to have technological devices, secure connections and digital literacy skills, these characteristics represent negative opportunities for education. As we investigate the complexities that exist if you want to incorporate educational technologies for diversity and inclusion, it becomes a challenge to achieve a joint balance with these two outs. When proposing future educational policies, considerations must be included on accessibility, cultural sensitivity, democratization in order to guarantee that the benefits of this innovation are equitably disaggregated to all students. For this reason, this article seeks to describe the main characteristics of the compendium of publications indexed in the Scopus database related to the variables ICT, Educational Inclusion and Diversity, as well. Such as the description of the position of certain authors affiliated with institutions, during the period between 2018 and 2023.

2. General objective

To analyze, from a bibliometric and bibliographic perspective, the production of research papers on the ICT, Educational Inclusion and Diversity variables registered in Scopus during the period 2018-2023.

3. Methodology

Quantitative analysis of the information provided by Scopus is carried out under a bibliometric approach on the scientific production related to the study of the variables ICT, Educational Inclusion and Diversity. Likewise, examples of some research works published in the area of

study indicated above are analyzed from a qualitative perspective, from a bibliographic approach to describe the position of different authors regarding the proposed topic.

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

3.1 Methodological design

Figure 1. Methodological design

Source: Own elaboration

3.1.1 Phase 1: Data Gathering

The data collection is carried out through the Search tool on the Scopus website, through which a total of 21 publications are identified. To this end, search filters were established that consisted of:

TITLE-ABS-KEY (ict, AND educational AND inclusion, AND diversity) AND PUBYEAR > 2017 AND PUBYEAR < 2024

✓ Published documents whose study variables are related to the study variables ICT, Educational Inclusion and Diversity

✓ Without distinction of country of origin.

✓ 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 by means of graphs, figures and tables based on data provided by Scopus.

✓ Co-occurrence of Words.

✓ Year of publication

✓   Country of origin of the publication.

✓   Area of knowledge.

✓   Post Type

3.1.3 Phase 3: Drafting of the conclusions and final document

After the analysis carried out in the previous phase, the conclusions are drafted and the final document is prepared.

4. Results

4.1 Word co-occurrence

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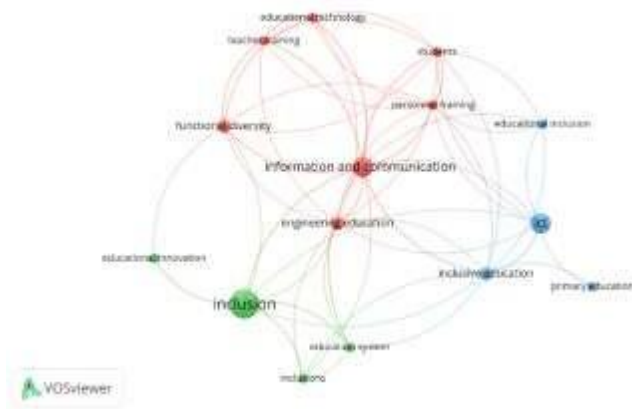

Figure 2. Word co-occurrence

Source: Own elaboration (2023); based on data provided by Scopus.

Information and Communication was the most frequently used keyword within the studies identified through the execution of Phase 1 of the Methodological Design proposed for the development of this article. Education is among the most frequently used variables, associated with variables such as Artificial Intelligence, Students, Digital Education, Learning System, Innovative Technology, Educational Systems, Digital Transformation. From the above, it is striking, the unique approach inherent in some technological solutions may inadvertently exclude certain learning styles or cultural nuances, leading to a possible marginalization of diverse groups. Language barriers, both in terms of instruction and technology interfaces, can also pose challenges for students from linguistically diverse backgrounds. This exploration of the intersection of educational technologies and diversity seeks to unravel the layers of potentialities

and obstacles, offering insights into how we can harness the power of technology to create truly inclusive educational landscapes. As we embark on this journey, it is crucial to recognize that the pursuit of educational inclusion is not a one-size-fits-all endeavor but a dynamic and ongoing process that demands adaptability, collaboration, and a commitment to leave no student behind.

4.2 Distribution of scientific production by year of publication.

Figure 3 shows how scientific production is distributed according to the year of publication, taking into account that the period between 2018 and 2023 is taken.
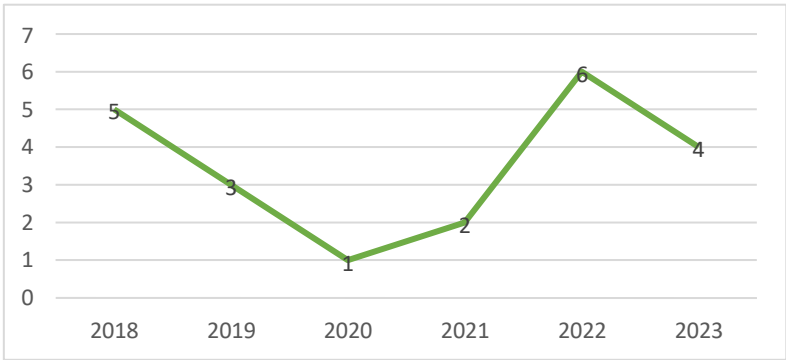

Figure 3. Distribution of scientific production by year of publication.

Source: Authors' elaboration (2024); based on data provided by Scopus.

Among the main characteristics evidenced by the distribution of scientific production by year of publication, a stability in the number of publications registered in Scopus during the years 2022 is notorious, reaching a total of 6 documents published in journals indexed on this platform. This can be explained thanks to articles such as the one entitled "Digital Literacy Inspection for School Improvement". The objective of this study was to determine the causal effect of gender and age on the dimensions of the instrument in the population of inspectors. Specifically, 118 inspectors from the Educational Inspection Service of Andalusia (Spain) participated, with an average age of 47.56 years (±5.70). In terms of gender, 30 were women (25.40%) and 88 men (74.60%). An instrument was developed specifically for this study to assess participants' views on the extent to which their work contributes to educational improvement. The results showed the relationship between the dimensions of the instrument: attention to members of the educational community (AMEC), supervision of guidance and tutoring action (SGTA), attention and inclusion of diversity (AID) and technological resources (TR) ($p. < 0.01$). Likewise, the multigroup model obtained good structural validity ($\chi2 = 68.180$; RMSEA = 0.078; GFI = 0.923; CFI = 0.959; IFI = 0.967). No significant differences were obtained in terms of gender, although the results were moderately higher among men compared to women.(Martínez-Serrano, 2023)

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.
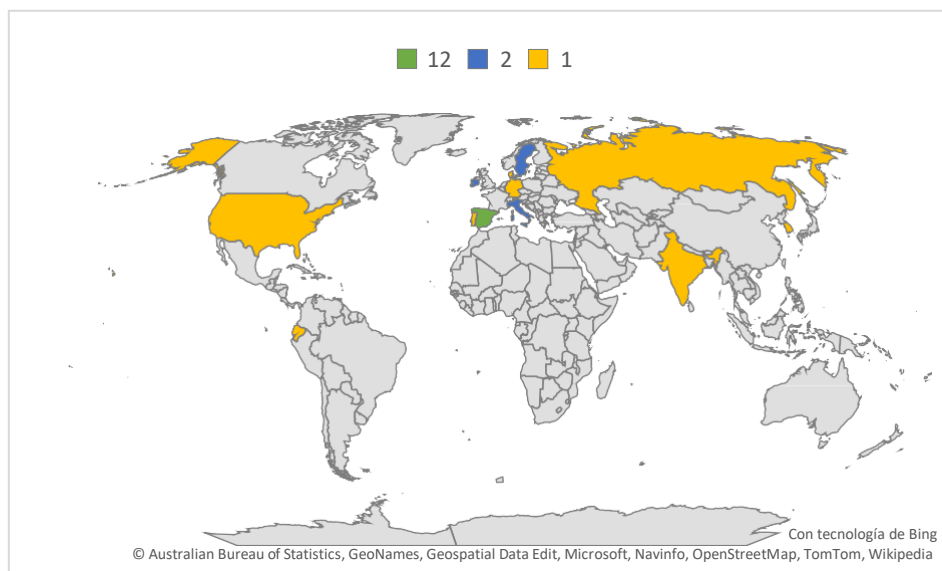
Figure 4. Distribution of scientific production by country of origin.

Source: Authors' elaboration (2024); based on data provided by Scopus.

Within the distribution of scientific production by country of origin, records from institutions were taken into account, establishing Spain as the country in that community with the highest number of publications indexed in Scopus during the period 2018-2023, with a total of 12 publications in total. In second place, Ireland, Italy with 2 scientific documents, and the United States occupying the third place presenting to the scientific community, with a total of 1 documents among which is the article entitled "Universal Design for Learning and ICT in the Area of Physical Education: design and validation of an intervention proposal" This work is proposed with the aim of designing and validating an intervention program for the area of Physical Education applying Information and Communication Technologies and Universal Design for Learning, to favor the inclusion of students with intellectual functional diversity in the fourth year of Primary Education, through an evaluative study. Research design. For the validation of the aforementioned program through expert judgment, an ad hoc instrument is designed. In the statistical treatment, the Kendall agreement index shows the existence of agreement among the evaluators, which allows favorably validating the proposed intervention. The conclusions reflect on the need to design programs in this area, which guarantee the participation of all students in educational processes.(López Ibáñez, 2023)

4.4 Distribution of scientific production by area of knowledge

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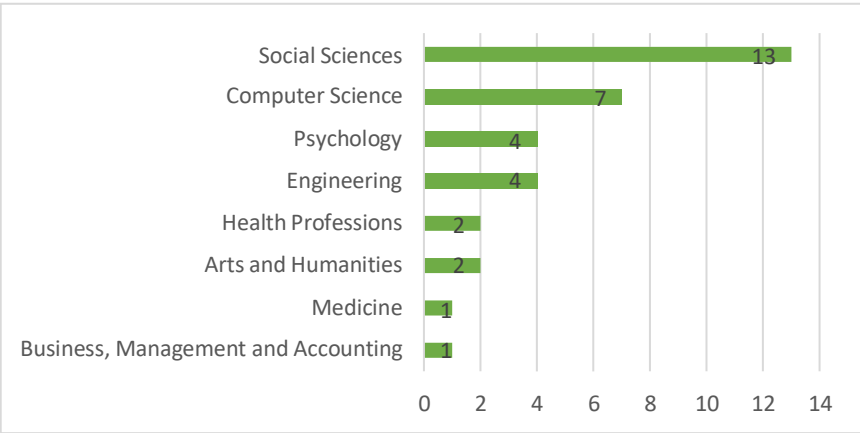
Figure 5. Distribution of scientific production by area of knowledge.

Source: Authors' elaboration (2024); based on data provided by Scopus.

Social Sciences was the area of knowledge with the highest number of publications registered in Scopus with a total of 13 documents that have based their methodologies ICT, Educational Inclusion and Diversity. In second place, Computer Science with 7 articles and Psychology in third place with 4. The above can be explained thanks to the contribution and study of different branches, the article with the greatest impact was registered by Social Sciences entitled "Promoting digital innovation through diverse leadership in ICT: a roadmap towards a better value system in computer algorithms" This article analyzes how diverse leadership in ICT is a moral imperative for our society, It emphasises the need to recalibrate and reshape our approach and highlights the benefits of harnessing the potential of women in the realms of social, digital and business transformation. This article aims to fill an "ethical gap" brought to light by the emerging technologies revolution, focuses on ethical and data governance aspects in digital innovation, and offers approaches to answer how diverse leadership can contribute to avoiding gender bias, optimizing inclusion, and further promoting crucial aspects of digital ethics in data-driven technologies, such as algorithmic bias, fairness, and transparency in AI.(Weber-Lewerenz, 2022)

4.5 Type of publication

Figure 6 shows how the bibliography production is distributed according to the type of publication chosen by the authors
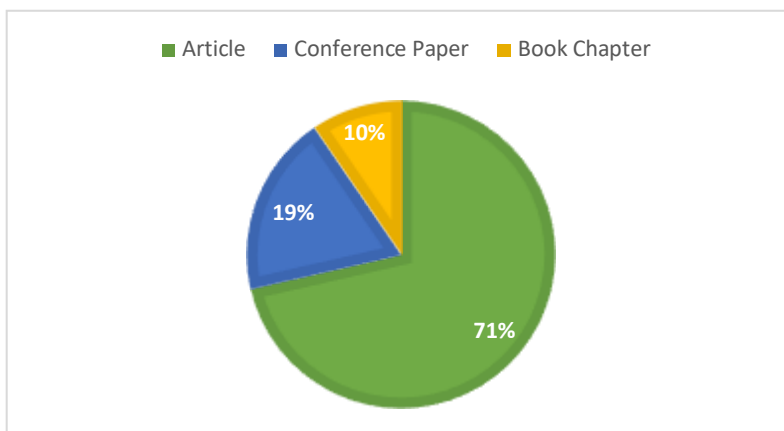
Figure 6. Post Type

Source: Own elaboration (2023); based on data provided by Scopus.

The type of publication most frequently used by the researchers referenced in the body of this document was entitled Journal Articles with 71% of the total production identified for analysis, followed by Session Paper with 19%. Chapter of the Book are part of this classification, representing 10% of the research papers published during the period 2018-2023, in journals indexed in Scopus. In this last category, the one entitled "The contribution of ICTs to inclusive choral practice" stands out. The objective of this study is to analyze the use and contribution of ICTs to the autonomous assimilation of repertoire by the members of these choirs. Based on a case study using three tools (an ad hoc questionnaire, a focus group and semi-structured interviews) we carried out a thematic analysis of the discourse, comparing and triangulating the information acquired from the sources analyzed. Results are presented regarding the use of technological resources for choirs, the objectives and benefits of their use, the evaluation of existing ICT resources and the proposal of new tools to reinforce the learning process. It is highlighted that technology is an essential resource for adequate choral evolution and serves as a complement to face-to-face (face-to-face) rehearsal sessions. Its potential for individual and autonomous study, its adaptation to the individual needs of each member of the choir, its ubiquity and ease of use, and the variability in the type of resources it offers and in the devices they can use are some of the most outstanding characteristics that allow its transfer to other educational and training contexts and realities. It is necessary to continue working in depth on this line of research so that inclusion is a reality in our society and to offer training that adapts to the characteristics and needs of each one. ICT can therefore be seen as tools with considerable potential for the future.(Serrano, 2022)

5. Conclusions

Through the bibliometric analysis carried out in this research work, it was possible to establish that Spain was the country with the highest number of published records for the variables ICT,

Educational Inclusion and Diversity. With a total of 6 publications in the Scopus database. In the same way, it was possible to establish that the application of theories framed in the area of Social Sciences, were used more frequently in the potentialities that lie in the incorporation of these new technologies for education, which seeks to have a more inclusive scenario, breaking geographical barriers and providing access to education of diverse origins without geographically depending on a specific place. These characteristics break down a resilient technological education that seeks adaptability over time since globalization brings with it great changes. One of the benefits that technologies use to make them more inclusive for students is their ability to offer students different learning methods such as online forums, digital platforms and access to educational content at hand, these advantages in search of the students' favor allows a more personalized learning method where each student shares their own educational interests and has the ability to distribute their time for education allowing autonomous learning. The use of artificial intelligence and data analytics in education opens up avenues to identify and address personal learning gaps These technologies can provide insights into student progress, allowing educators to tailor their instructional methods to meet the diverse needs of their students. These personalized tutorials in favor of the benefits among students allow them to be greatly adapted to the different rhythms, learning processes, teaching styles, methodologies of knowledge and with this it is sought that the student community feels heard and manages to promote a much more inclusive educational environment. In the midst of these potentialities, there are formidable obstacles that demand attention and resolution. One of the main challenges is the digital divide, where disparities in access to technology and the internet persist, disproportionately affecting marginalized communities. To be able to address these educational shortcomings and have more inclusion for the student requires an exhaustive task which seeks collaboration between government programs, development plan in education and commitment on the part of institutions so that technological resources are available to students and they can make use of these tools for a more sophisticated education. That is why it is important for institutions to be at the forefront of this new technology since this would facilitate access to education in an optimal way, to have an adequate and quality education. That is why it is important for institutions to train educators so that they can effectively integrate these technologies for the benefit of the diverse student population.

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