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INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTs) IN EDUCATION: QUALITY INDICATORS

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Abstract

A documentary review was carried out on producing and publishing research papers related to the study of the variables ICTs, Education and Quality. The bibliometric analysis proposed in this document was to know the main characteristics of the volume of publications registered in the Scopus database from 2017-2022, identifying 154 publications. The information provided by the said platform was organized employing tables and figures categorizing the information by Year of Publication, Country of Origin, Area of Knowledge and Type of Publication. Once these characteristics were described, a qualitative analysis was used to refer to the position of different authors on the proposed topic. Among the main findings of this research, Spain was the country with the highest number of records in Scopus, with 26 publications on the analysis of the impact of ICT on quality indicators in education. The area of knowledge that made the most significant contribution to the study variables was Social Sciences, with 86 published documents, and the type of publication that was most used during the period mentioned above was reviews, which accounted for 50% of the total scientific production.

Keywords: ICTs, Education, Quality Indicators.

1. Introduction

Information in all areas of today's society, mainly based on technology, is used significantly to improve people's quality of life. Technological and information means have changed the world; today man is in a context of urbanization and a great civilization, typical of a capitalist culture based on production and consumerism. The development of information and communication technologies (ICT) has led many sectors of the world, and especially educational systems at all levels, to confront the traditional levels of teaching and instill new paradigms within the teaching and learning processes, managing to modify the classic educational model and alternating a new concept of classrooms. The methods of how teachers of the XXI century relate to their students in the classroom went from implementing a simple

transmission of knowledge. These technologies became part of the life and development of high quality for different educational levels.

Within education, the use of ICT has led to the improvement of educational quality since teachers and pedagogical groups of educational and university institutions must be aware of the importance of implementing these technologies in the classroom and be at the forefront of their use in order to adapt to the demands of the global world and those of their students.

The Educational Trends Information System considers ICT as a means of improvement in education, generating new pedagogical paradigms to improve the quality of the learning-teaching process and hand in hand with innovation in educational systems. It is important, therefore, to recognize that educational innovation goes hand in hand with technological innovation to highlight educational quality in the teaching processes for students in this era of the fourth technological revolution. For this reason, this article describes the main characteristics of the compendium of publications indexed in the Scopus database related to the variables ICTs, Education and Quality, as follows. As the description of the position of certain authors affiliated with institutions between the years 2017 and 2022.

2. General Objective

To analyze from a bibliometric and bibliographic perspective, the production of research papers on the variable ICTs, Education and Quality published in high-impact journals indexed in the Scopus database during the period 2017-2022.

3. Methodology

Quantitative analysis of the information provided by Scopus is performed under a bibliometric approach to the scientific production related to the study of Covid-19 variables and the results of literature reviews from Latin American institutions. Also, from a qualitative perspective, examples of some research papers published in the area of the study mentioned above are analyzed from a bibliographic approach to describe the position of different authors on the proposed topic.

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

3.1 Methodological design

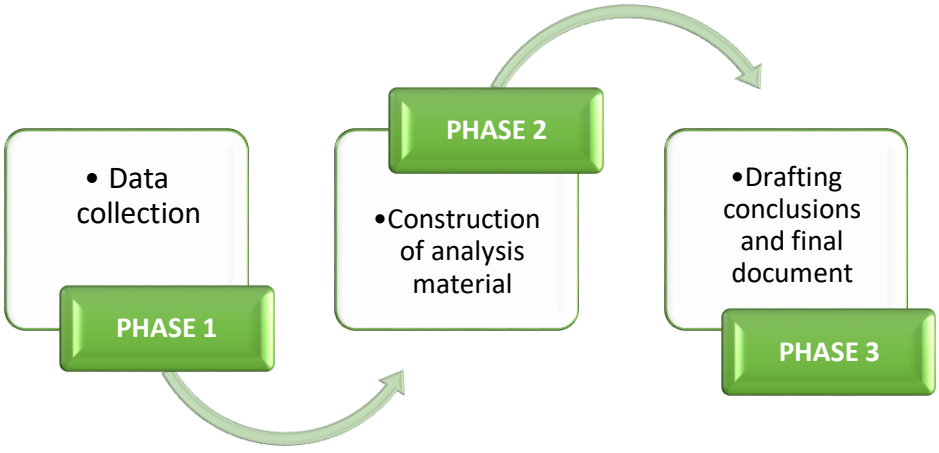

Figure 1. Methodological design

Source: Own elaboration

3.1.1 Phase 1: Data Collection

The data collection was carried out using the Scopus web page search tool, by which a total of

154 publications were identified. For this purpose, search filters were established consisting of:

TITLE-ABS-KEY (icts, AND education, AND quality) AND (LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2017)))

✓ Published papers whose study variables are related to the study of ICTs, Education and Quality.

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

✓ Word co-occurrence.
✓ Year of publication
✓ Country of origin of the publication.
✓ Knowledge area.
✓ Type of Publication

3.1.3 Phase 3: Drafting conclusions and final document

After the analysis in the previous phase, the study proceeded to draft the conclusions and prepare the final document.

4. Results

4.1 Co-occurrence of words

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

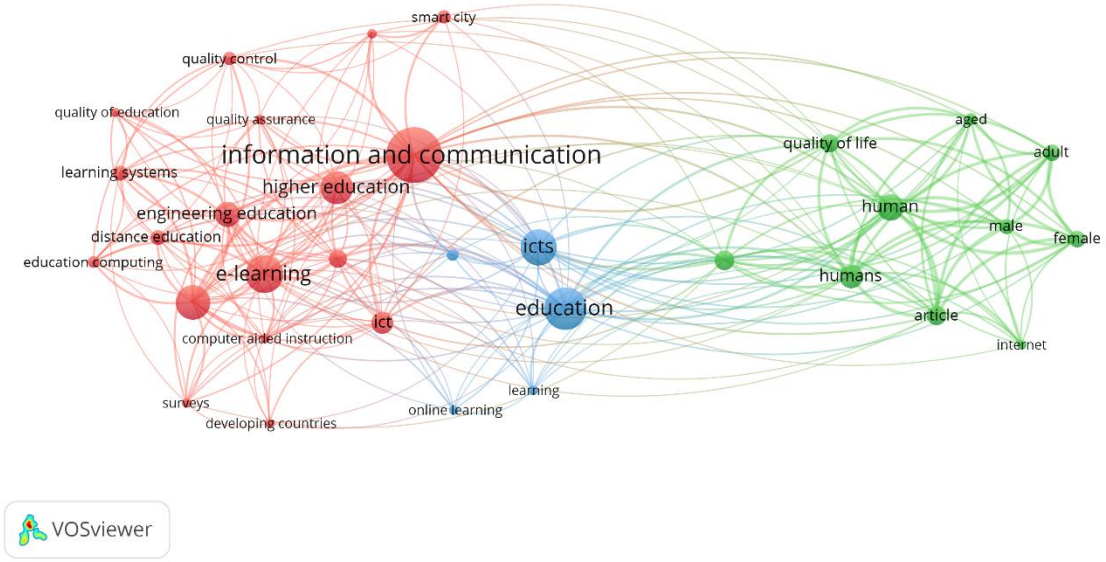

Figure 2. Co-occurrence of words

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

Within the study of the research reported by the Scopus platform, referring to the variable of ICTs, Education and Quality, the object of this scientific debt, the incorporation of ICTs in educational processes helps the implementation of coverage in higher education, improving the quality of preschool education, helping to improve the quality of education at all educational levels. It is for this reason that through the interpretation of Figure 2, it is possible to determine as key words of the publications reported in Scopus, Education, Information and Communication, Distance Education, learning to improve the quality of education today with the use of ICT has a great impact on pedagogical practice, as it adapts to current needs and generates new paradigms in the ways of teaching and learning. Expanding access to new learning opportunities, improving teaching achievements and educational quality by incorporating new teaching methods, and promoting new reforms in traditional educational systems.

4.2 Distribution of scientific production by year of publication.

Figure 3 shows how the scientific production is distributed according to the year of publication, considering that the period from 2017 to 2022 is taken.

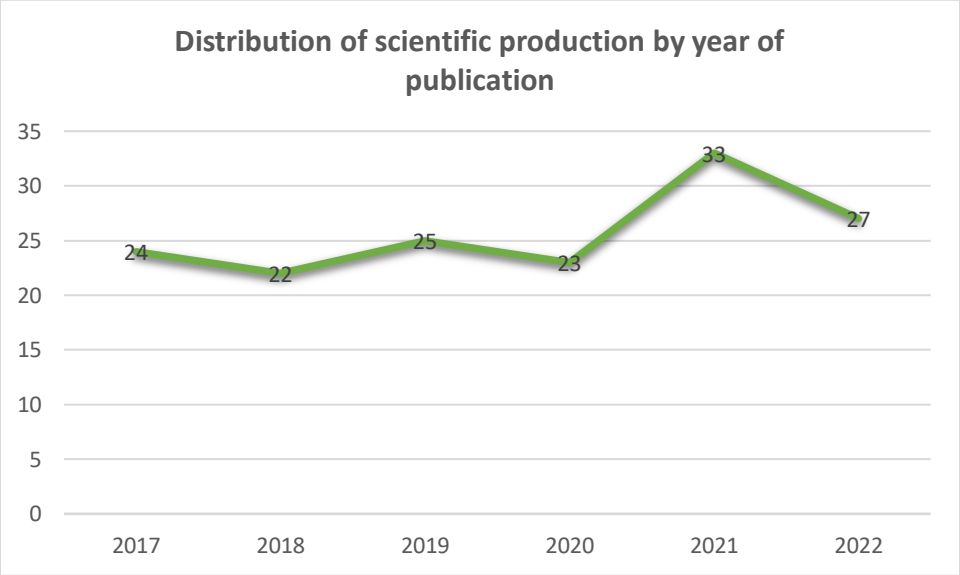

Figure 3. Distribution of scientific production by year of publication.

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

Figure 3 shows the scientific production around the variable of ICTs, Education and Quality in the period between 2017 and 2022, where the increase in the volume of production in the year 2021 is evidenced, with a total of 33 publications related to the keywords, among which the article entitled "Skills and Experiences of Students in the Use of Information and Communication Technologies in Distance Physical Education Classes" stands out (Rutkauskaite, 2022), whose aim of this research was to determine the relationship of Lithuanian students in grades 8-12 with information and communication technologies and to reveal students' experiences of participating in remote physical education lessons. A total of 268 students selected by the convenience sampling method completed a questionnaire consisting of four blocks with 53 closed and 4 open-ended questions divided by themes. The relationships between physical activity during quarantine and its

predictors were evaluated by linear and hierarchical regression analysis. Students' computer literacy skills were estimated to be slightly above average and students' positive attitudes toward ICT in the educational process would prevail. In remote physical education lessons, students exercised independently or together using a video communication program. Students' expectations for remote physical education lessons included playing sports, interesting and active challenges, and the opportunity to be independent. Older students and students who spent more time with ICT and had fewer computer skills were less physically active and fit. During quarantine, students' physical activity and fitness decreased.

4.3 Distribution of scientific production by country of origin.

Figure 4 shows how the total number of publications registered in Scopus is distributed according to the country of origin of the Latin American institutions.

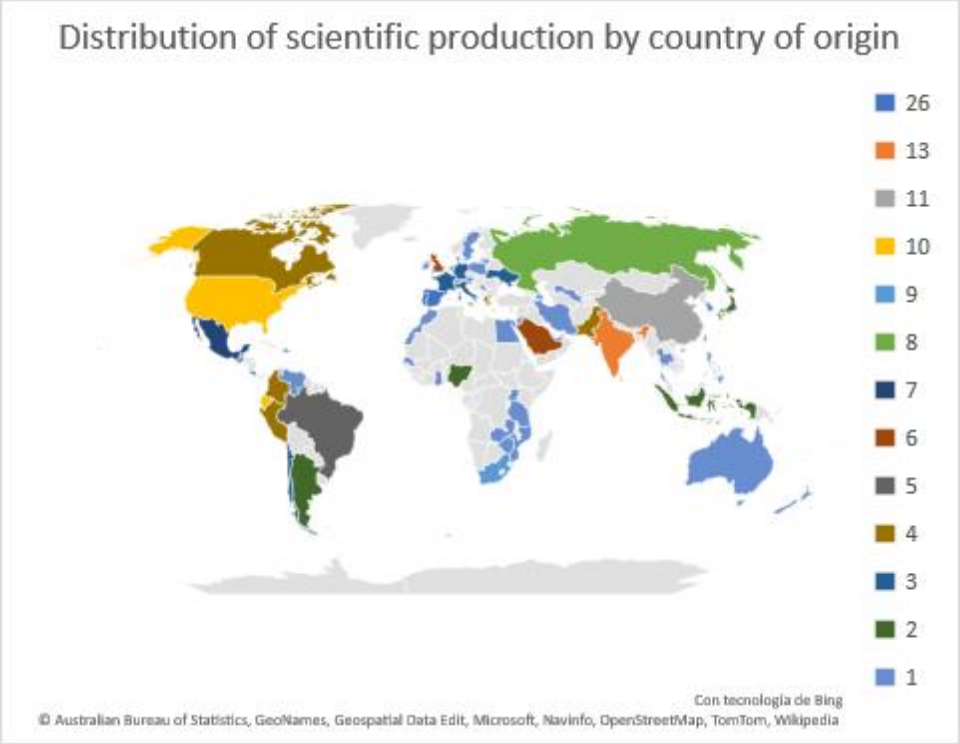

Figure 4. Distribution of scientific production by country of origin

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

Spain had the highest number of publications registered in Scopus referring to the study ICTs, Education and Quality period 2017-2021 with 26 publications, followed by India with 13 records and China with 11. Of the latter, the article entitled "Promise and reality: the use of ICTs to reduce the gap between rural and urban areas in China in education" is noteworthy (Luo, 2022), whose object of study employed the extended case method to critically evaluate longitudinal changes in four rural schools since implementing ICT initiatives in 2014. Our study revealed that ICT acted as an external force that altered the status quo of rural education in terms of pedagogical and curricular norms, classroom structure and dynamics, school identities, and perceived

teachers, and induced positive changes such as higher academic achievement, social and emotional development for neglected children, and professional development for rural teachers. The study also provided theoretical information on the socioeconomic factors that hinder the sustainable development of ICT-supported rural education. The research findings can contribute to developing educational equity, educational quality, and social justice theories and inform policies to renew rural education in China.

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.

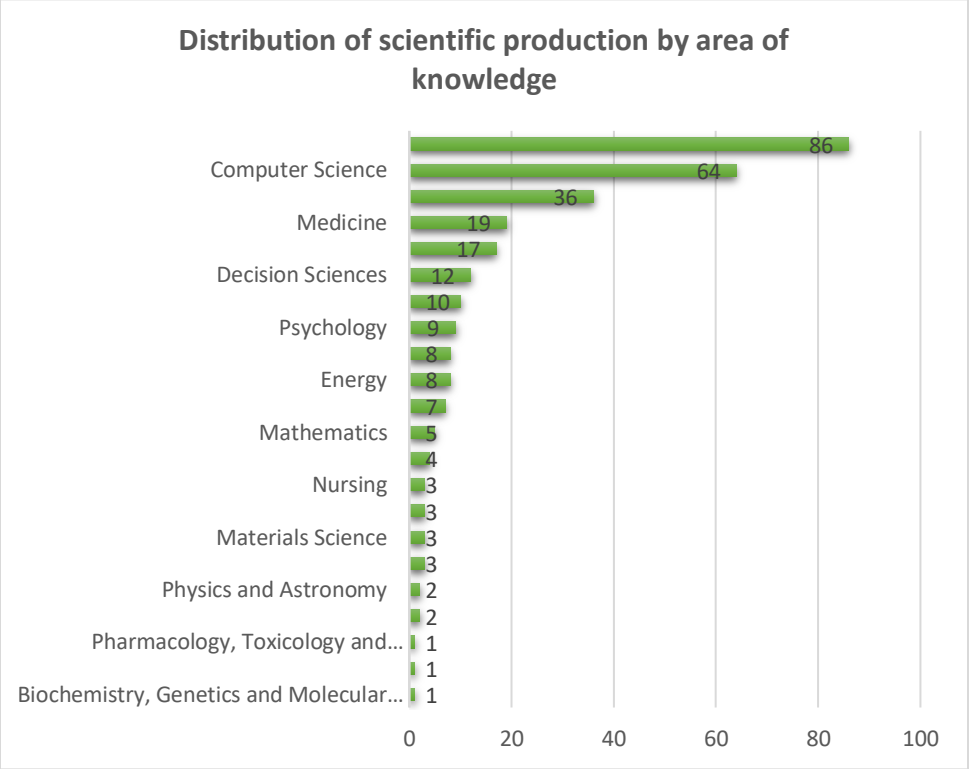

Figure 5. Distribution of scientific production by area of knowledge.

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

Social Sciences was the area of knowledge with the highest number of publications registered in Scopus, with 86 documents that have based their methodologies on the impact of ICTs, Education and Quality. In second place, Computer Science, with 64 papers. The above can be explained thanks to the contribution and study of different branches. The article with the highest impact was registered by the Social Sciences area, entitled "Exploration of the factors that influence the use of teachers' instructional data with electronic data systems" (Luo, 2022). This study investigated the factors influencing teachers' instructional data use involving electronic data systems. A total of 243 teachers from twelve high schools in northern China participated in this study. Our findings reveal that to promote teachers' instructional data use with ICT, schools should pay proper attention to performance-based accountability policies, cultivate supportive relationships among teachers, and develop teachers' positive attitudes toward data use; meanwhile, it is important to improve the

accessibility of data systems and enhance teachers' data literacy and ICT literacy.

4.5 Type of publication

Figure 6 shows how the bibliographic production is distributed according to the author's chosen publication type.

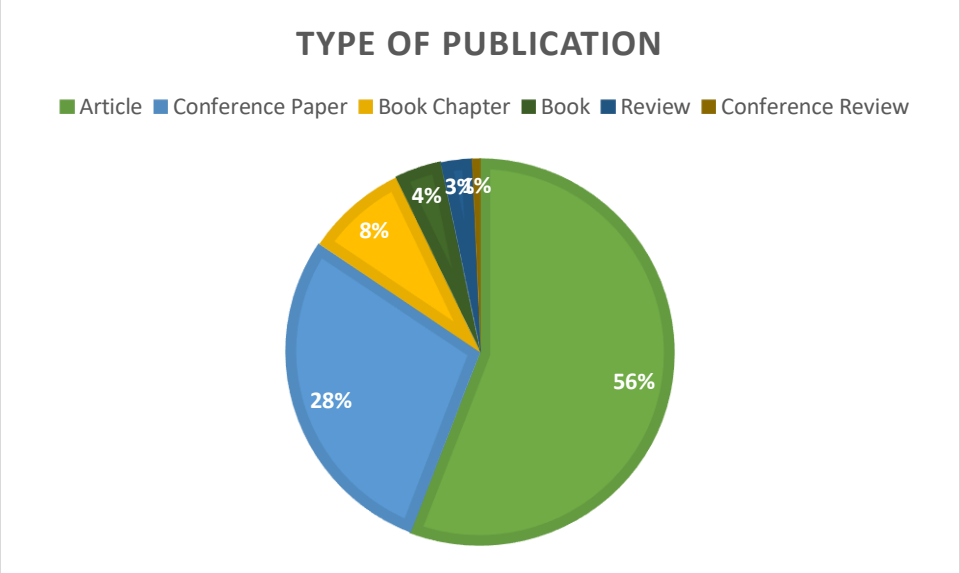

Figure 6. Type of publication

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

The type of publication most frequently used by researchers was the article; 56% of the scientific production corresponds to this type of document. In the second place, Section Papers with 28% and Book Chapters with 8%. In this last category, the one entitled "La innovación en la gestión educativa: actores y procesos" (Innovation in educational management: actors and processes) stands out. (Palacio Sprockel, 2022). This research aimed to analyze innovations in educational management from the perspective of actors and processes. Methodologically, it is a theoretical study guided by mental operations to produce explanations of social phenomena. The results point to: a) transformations in the roles of actors in educational management, (b) new actors bursting onto the educational management scene that constitute a visible entry of the private sector into public education, c) control processes centered on people and quantitative evaluation of content; d) strategies that project innovation in communication in education. The conclusions point out the instrumentalization of the teaching profession. ICTs are a means and not an end for achieving equitable and quality education, for which we bet on humanizing technology.

5. Conclusions

Through the bibliometric analysis carried out in this research, it was possible to establish that Spain had the largest number of published records facing the variables ICTs, Education and Quality, with 26 publications in the Scopus database during 2017-2021. Similarly, it was established that the application of theories framed in the area of Social Sciences was the most frequently used in measuring the impact generated by the implementation of ICTs in the educational field for the improvement of quality in academia in both developed and developing countries. However, the

use of ICT must be appropriated in the educational context with much responsibility since it is not only a matter of addressing equipment and infrastructure to schools and universities. The commitment must be addressed by all the actors of the educational systems, which highlights the guidelines, teachers, students and parents to be aware and competent to get the most out of these communication tools that can contribute to the construction of new knowledge and society. This article talks about the evolution of ICT, highlighting the impact of the XXI century society, and looks at the educational impact and the role of teachers. New studies regarding ICT in different countries in Latin America and the rest of the world allow recognizing how these have advanced in terms of implementation and coverage, in addition to verifying the compliance of different nations to offer society a better quality education.

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