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Digital literacy in Sucre schools

John Arturo Buelvas Parra[1], William Niebles Nuñez[2], Donicer E. Montes Vergara[3]

[1] *Universidad de Sucre, Facultad de Ciencias Económicas y Administrativas, Colombia*
john.buelvas@unisucre.edu.co.
https://orcid.org/0000-0003-1894-3712
[2] *Universidad de Sucre, Facultad de Ciencias Económicas y Administrativas, Colombia*
williamniebles@yahoo.com.mx
https://orcid.org/0000-0001-9411-4583
[3] *Universidad de Sucre, Facultad de Ciencias Agropecuarias, Colombia*
donicer.montes@unisucre.edu.co
https://orcid.org/0000-0002-2860-0505
**corresponding author: john.buelvas@unisucre.edu.co.*

ABSTRACT

The present investigation explains the results of a descriptive bibliometric analysis on the field of study "Digital literacy in the schools of Sucre" aimed at identifying trends and methodology techniques used in this area of research. The period of the study was delimited from the years 2013 to 2023. The exploration of the information was carried out in the largest database of abstracts and citations of the peer-reviewed literature such as Scopus, from which a file with 846 records was downloaded in csv format, made up of manuscript, books, chapters of books, conference papers and conference abstracts, among others; The analysis of the data and the creation of graphs, tables and maps were carried out with the R-Studio integrated development environment, specifically with the Biblioshiny application from the Bibliometric library and with the Excel software. The results of this analysis allowed us to obtain a holistic view of this area of study and its evolution over time.

Keywords: Bibliometric analysis, digital literacy, schools, colleges.

1. INTRODUCTION.

Currently, society is immersed in a process of change and evolution based on 4.0 technologies, which not only accelerate contemporary globalization and have a direct impact on all sectors, from business, industrial, and educational (Samper et al., 2022). In this sense, education is in a constant process of change and modernization which, accelerated by globalization and the entry of new technologies, has a direct impact on educational quality and the same that it can offer to society. Within this framework, it is important to highlight that training processes benefit from information and communication technologies, which allow training work to be carried out from anywhere, either synchronously or asynchronously (Ramírez-Montoya et al., 2022).

This is how it is evident that the education sector has used new technologies to enhance the learning process, creating new learning environments, new tools or pedagogical strategies (Quintero, Ibáñez & Segura, 2020). The aforementioned is reinforced by the paradigmatic changes in the education sector, which have generated a change in perspective of the roles and goals that intervene in the pedagogical practice developed in the school (García, 2021).

Various studies show the positive impact generated by the use of technological tools for

[1] Administrador de Empresas- Abogado. Especialista en finanzas, Magister en Gestión de Organizaciones, Dr. En Ciencias Sociales Mención Gerencia. Docente Universidad de Sucre.
[2] Doctor en Ciencias Gerenciales, Docente de la Universidad de Sucre.

the development of the pedagogical work of teachers within schools, allowing to generate dynamism, innovation and improve learning results resulting from the work of teachers and students in mediated spaces. by the aforementioned technologies (Hernández-Sánchez et al., 2022). In the case of Colombia, it is important to mention that compared to other more developed countries, the process of implementation and standardization of technological tools in the educational field has been slower and less standardized. In this context, it has been possible to demonstrate how the technological and equality gaps present in the environment generate difficulties in the implementation of the aforementioned tools (Herrera et al., 2022).

From this, it is recognized that digital literacy is one of the variables most related to the aforementioned gap, where it is difficult for people to function within environments mediated by new technologies (Reyes & Avello-Martinez, 2021). The educational institutions then acquire the responsibility of not only taking advantage of these tools, but also of generating spaces aimed at the literacy of those who are part of this sector so that from this they can take advantage of its benefits and opportunities. In this way, the present study is directed towards describing the bibliometrix applications of the study of digital literacy in schools in Sucre.

2. METODOLOGÍA

The purpose of bibliometrics is the treatment and study of quantitative data from scientific publications. The first bibliometric studies date back to the beginning of this century, and consisted of manual counts of scientific publications. Bibliometric studies, despite their methodological limitations, are interesting tools for evaluating the social and scientific relevance of a given discipline or subject (Bordons & Zulueta, 1999). The Organization for Economic Cooperation and Development (OECD) referred to it as a tool through which the state of science and technology can be observed through the global production of scientific literature at a given level of specialization. (Okubo, 1997)

The objective of this study is to analyze the existing scientific production on the research topic "Digital literacy in the schools of Sucre" in order to identify high are the most relevant actors in this area (countries, institutions, authors and universities), qualities are the lines of research that make up this field and the evolution of scientific production over the years. For this purpose, a search was carried out in the Scopus abstract database, using key words and terms in relation to the subject of study, in a first exploration the following search string was obtained: (ABS ("digital literacy") AND ABS (school) OR ABS (college)), which resulted in 1014 documents in all areas of knowledge, with no time limitation and no language filter. After applying filters by language (English and Spanish) and by time (2013-2023), the equation was as follows: (ABS ("digital literacy") AND ABS (school) OR ABS (college)) AND PUBYEAR > 2012 AND (LIMIT-TO (LANGUAGE , "English") OR LIMIT-TO (LANGUAGE , "Spanish")), resulting in 846 documents, which were downloaded in a csv file and processed through the development environment integrated R-Studio with the bibliometrix library (Aria & Cuccurullo, 2017).

3. RESULTS AND DISCUSSION

As can be seen in Table 1, a total of 846 research papers from all areas of knowledge on the research topic "Digital literacy in Sucre schools" have been analyzed, the average number of citations per document was 5.89, The total number of authors that are part of this research was 2,101 and 217 of them worked on single-authored documents. Finally, it can also be observed that the number of co-authors per document was 2.8.

Table 1. General information

Description	Results
Period of time	2013-2023
Total documents	846

Average cites per document	5.89
Number of authors	2101
Single author documents	217
Co-authors per document	2.8

Source: own elaboration.

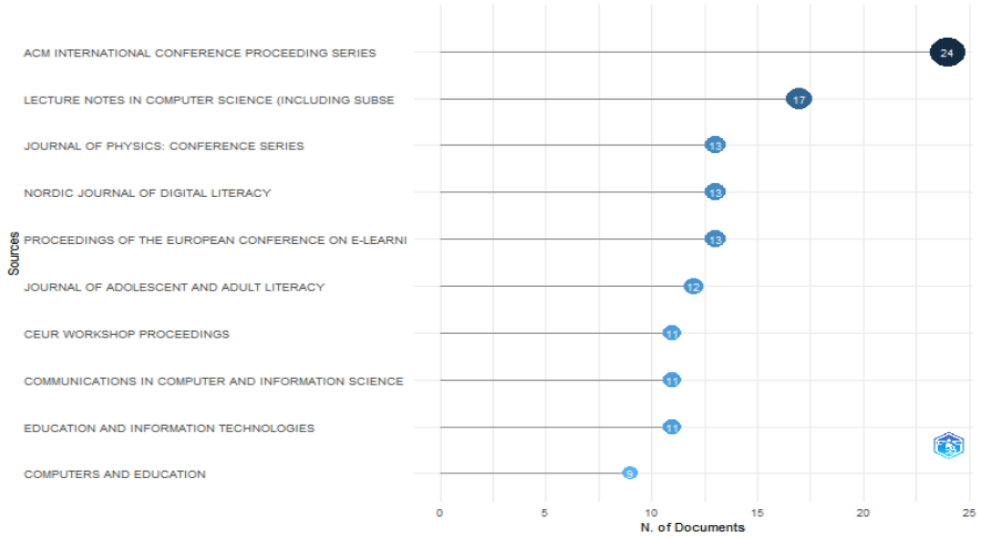

Figure 1. Magazines with more relevance

Figure 1 analyzes the top ten of the journals with the greatest number of investigations contributed to the field of study throughout the investigated decade, of which the most prominent are: ACM International conference proceeding series (24), Lecture notes in computer science (17), Journal of physics: conference series (13) and Nordic journal of digital literacy (13). A relevant article from the magazine that contributes the most, explains that "With the development and application of digital technologies such as artificial intelligence, big data and 5G, digital literacy has become the central element and important requirement of the literacy of University students. In today's digital age, strengthening the digital literacy cultivation of college students has its intrinsic value: it is the inevitable requirement for the survival and development of the digital society, the prerequisite for enhancing the digital literacy of all people is the inevitable option to realize the objective of strategic construction of digital China". (Dai, Tang, & Liu, 2022)

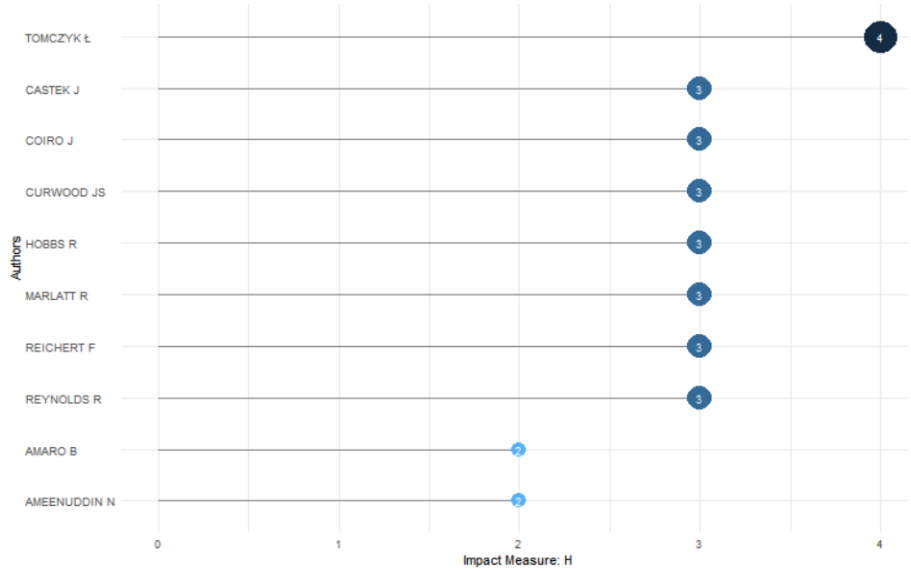

Figure 2. Authors with the highest H Index.

"The h-index has become one of the most widely used bibliometric indicators to estimate the success of the work carried out by a researcher and predict the impact of its production in the future. This is mainly due to two reasons. First of all, due to its simplicity, since it is a single indicator that combines production and impact, and can be easily determined by any researcher. Secondly, to eliminate the biases caused by the tails of the citation distribution". (Dorta-González & Dorta-González, 2010). To correct these biases, Hirsch (2005) proposes a new indicator. A researcher has an h-index when h of his publications have received at least h citations each, and the rest have h or fewer citations per paper. Taking the above into account, Figure 2 shows the 10 authors with the highest h factor, of which the most prominent is Potyrała, Katarzyna with an index of 4. Of this researcher, the article "has as objective to measure digital literacy among teachers of the third stage of education in Poland (lower secondary schools). The study was commissioned by the Ministry of National Education and was carried out in 2018 in Poland, and involved a group of 484 teachers. The objective of the research was to present the knowledge and skills of teachers related to digital threats in the areas of information reliability assessment, sexting, cyberbullying, intellectual property rights, protection of online images and protection against malware". (Potyrala and Tomczyk, 2021)

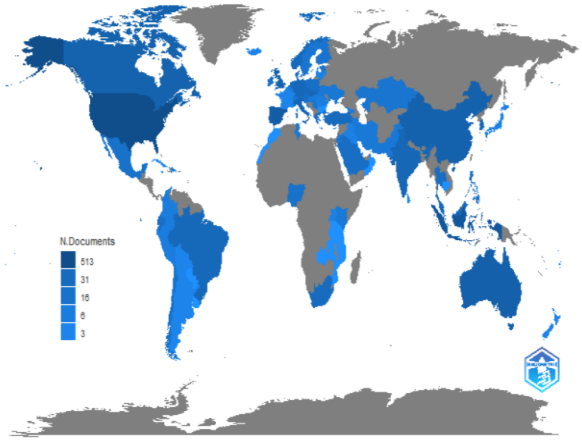

Figure 3. Scientific production by region

The regions with the greatest scientific production in this period are analyzed. As the map in Figure 1 visually shows, the 10 countries that stand out the most for their contribution in this field are: United States (513), Indonesia (200), Spain (219), Australia (88), China (77), UK (73), Canada (67), Italy 56, South Korea (53) and Slovakia (50). Of these, the most relevant work is in which "The authors introduce readers to three design features of the University of Rhode Island Summer Institute for Digital Literacy, a week-long, 42-hour professional learning experience in digital literacy. For educators, librarians, college professors, and other adult learners. The program is explicitly designed to promote reflection on one's motivations for advancing digital literacy, deepen appreciation for collaborative inquiry, and focus on how educators and learners (not machines) personalize learning. Evidence of how these themes are developed through practice illustrates the design philosophy that is embedded in the programme. Digital media platforms, texts, and technologies enable pedagogical practices that place students and teachers at the center of an increasingly interconnected social world, but these approaches also require respect for diverse perspectives, deliberative dialogue, and collaboration. collaborative research to incorporate them into conventional educational practice. of schools, libraries, universities and communities" (Hobbs & Coiro, 2019).

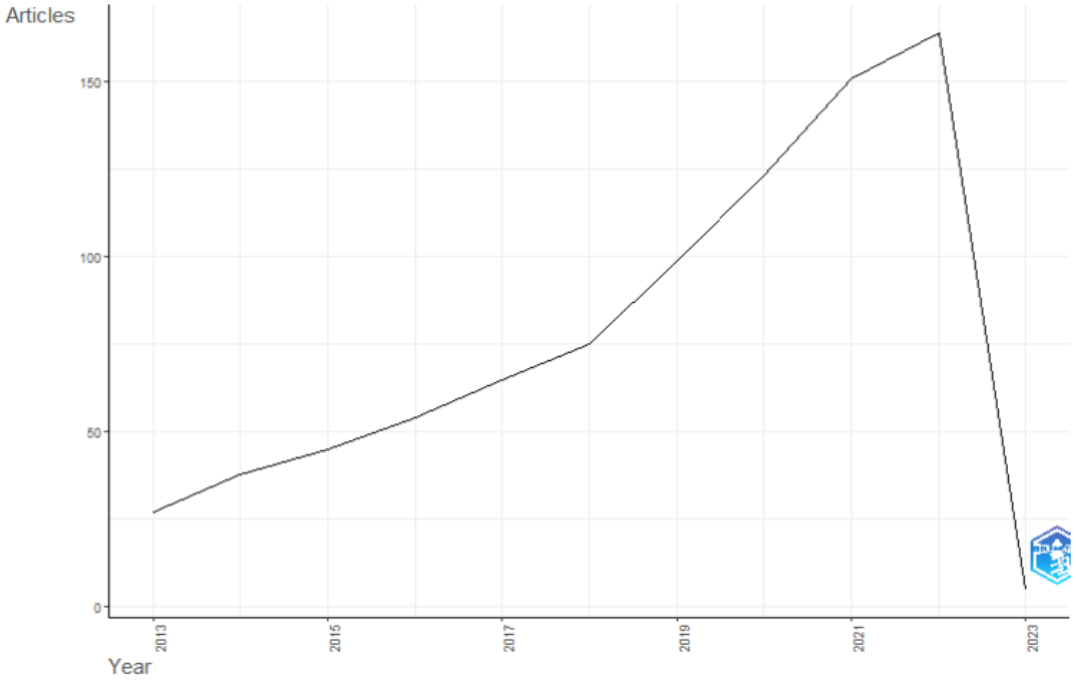

Figure 4. Temporal evolution of scientific production.

Next, the temporal evolution of scientific production is analyzed throughout the period studied, which is presented in Figure 4. Although over the years, a growing interest in the study of this subject can be observed, with a notable increase between the beginning of the period (2013- 27 documents) with the end of the previous year (2022- 164 documents), a very pronounced decrease can also be seen between 2022 and 2023 and it is logical, because this last year is just beginning and very surely If it follows the same trend as in previous years, it will very possibly surpass previous years in productivity.

Table 2. Most referenced documents of the analyzed manuscript.

References	N° of manuscript
Meyers, EM, Erickson, I. & Small, RV (2013). Digital literacy and informal learning environments: an introduction. Learning, Media and Technology, 38(4), 355–367.	160
Greene, JA, Yu, SB & Copeland, DZ (2014). Measurement of the critical components of digital literacy and their relationships with learning. Informatics and Education, 76, 55–69.	140
Lynch, J. & Redpath, T. (2012). 'Smart' technologies in early years literacy: a meta-narrative of paradigmatic tensions in iPad use in an Australian preparatory classroom. Early Childhood Literacy Journal, 14(2), 147–174.	85
Bekker, T., Bakker, S. & Scheltenaar, K. (2015). Teaching children digital literacy through design-based learning with digital toolkits in schools. International Journal of Child-Computer Interaction, 5, 29–38.	79
Porat, E., Blau, I. & Barak, A. (2018). Measuring digital literacies: secondary school students' perceived competencies versus actual performance. Informatics and Education, 126, 23–36.	72
Nedungadi, P. P., Menon, R. & Raman, R. (2018). Towards an inclusive digital literacy framework for digital India. Education + Training, 60(6), 516–528.	65
Toohey, K., Dagenais, D. & Schulze, L. (2015). "That Sounds So Cool": Childhood Tangles, Digital Tools, and Literacy Practices. TESOL Quarterly, 49(3), 461–485.	65
Rodríguez-de-Dios, I. & Igartua, J.-J. (2018). A study of the relationship between parental mediation and adolescents' digital skills, online risks and online opportunities. Computers in Human Behavior, 82, 186–198.	64
García, A., Mirra, N. and Scorza, D. (2015). The Youth Research Council: Critical Literacy and Civic Agency in the Digital Age. Reading and Writing Quarterly, 31(2), 151–167.	61
Van de Oudeweetering, K. & Voogt, J. (2017). Conceptualization and promulgation of 21st century competencies by teachers: exploring dimensions for new curricula. The Curriculum Journal, 29(1), 116–133.	58

Likewise, in order to answer the question: What are the documents analyzed that have had the greatest impact in this area? Table 2 lists those documents that have been most referenced after their publication by other studies in this or another field. In this item, the article with the most citations indicates that "New technologies and advances in the media are transforming the way in which people, groups and societies communicate, learn, work and govern. This new sociotechnical reality requires that the participants possess not only abilities and skills related to the use of technological tools, but also knowledge about the rules and practices of proper use. Being 'digitally literate' in this way encompasses issues of cognitive authority, security and privacy, creative, ethical, and responsible use and reuse of digital media, among other topics. The lack of digital literacy increasingly implies the full potential of being a competent student, an empowered employee or an engaged citizen. Digital literacy is often considered a school-based competence, but it is introduced and developed in informal learning contexts such as libraries, museums, social groups, online affinity spaces, not to mention the home environment. This article acknowledges and connects the ways and places in which we

might conceptualize and realize an expanded vision of digital literacy that fits today's changing reality".

Co-citation networks between authors

Once the descriptive analyzes were completed, we proceeded to use social network analysis techniques in order to answer the question: Who are the most representative authors in each line of research and with whom are other researchers related? For this, an analysis of co-citation between authors has been carried out. This type of analysis allows revealing the structure of a scientific field, revealing different schools of thought present in the field, as well as relationships between the different actors (Gálvez, 2018, taken from Del Valle & De la Rosa, 2022). *Bibliometrix* software was used to carry out these analyses.

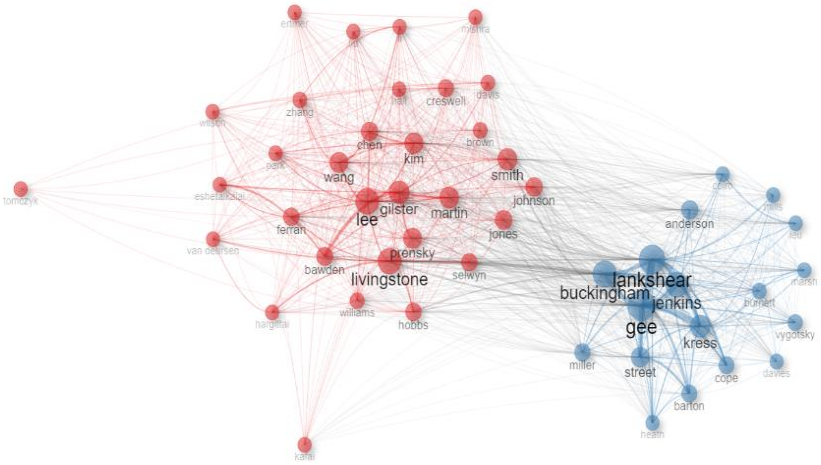

Figure 5. Map of citations between authors.

Taking the above into account, Figure 5 indicates that there are two groups of authors who follow a common line of research, related to the theme "Digital literacy in Sucre schools", it can be seen that from the red cluster the authors most relevant and with greater interaction are Livingstone, Lee, Martín, Glister and Prensky. And those in the blue cluster are Gee, Buckingham, Lankshear and Jenkins.

Finally, the thematic map of figure 6 is analyzed, which clearly indicates that as the main or motor theme (upper right part) we have the key terms, Digital media literacies and teachers, of this, the interpretation that can be made is that there is a theme focused on literacy in digital media oriented or with emphasis on teachers; As basic themes (bottom right) 5 key terms are observed, with greater force or that is presented more frequently this Digital literacy, followed by computational thinking, information literacy, technology integration and finally collaboration, these themes are considered to be transversal with the other terms that appear on the map and finally it can be affirmed that the terms that appear on the left, both at the top and at the bottom, are emerging or declining topics.

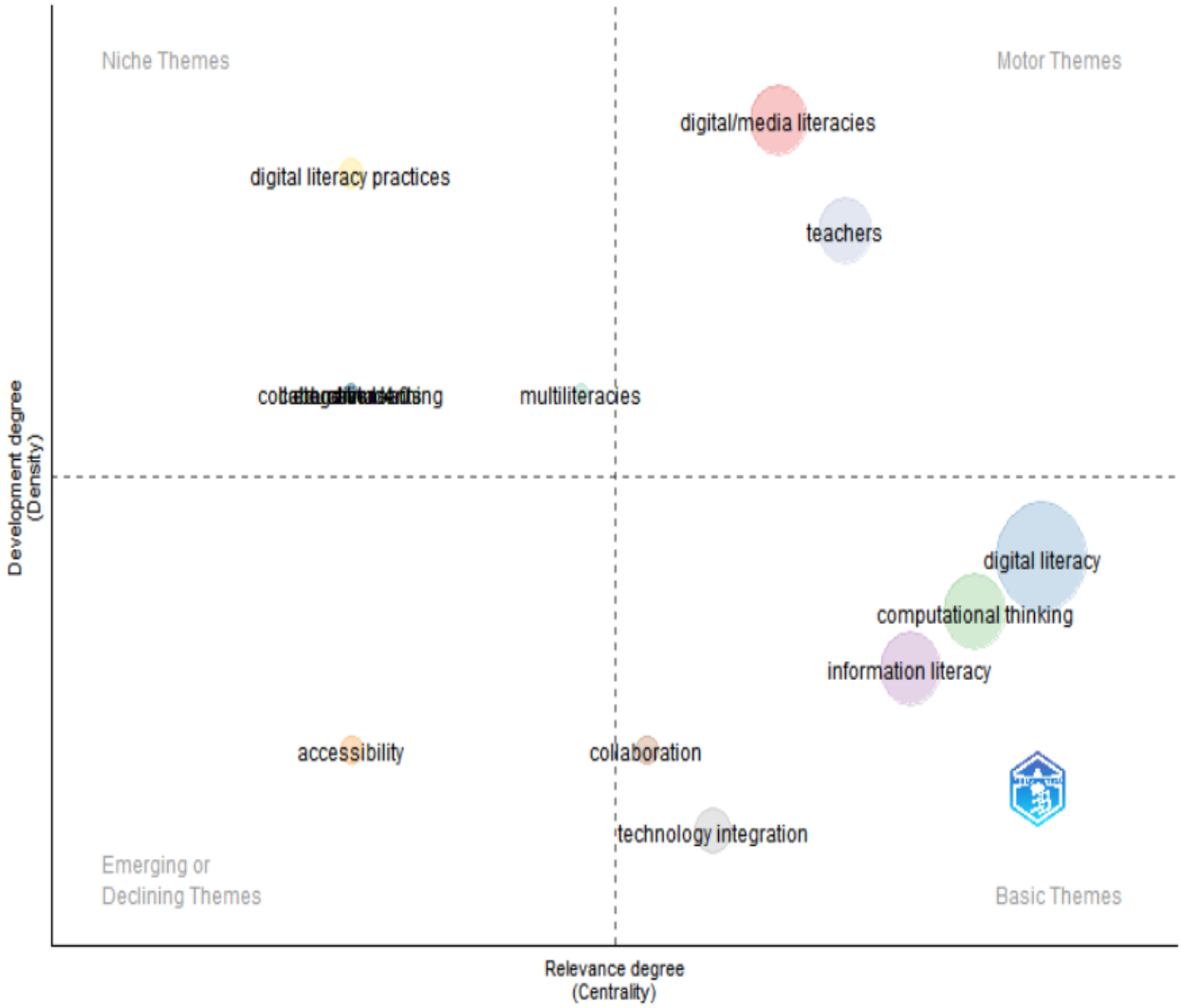

Figure 6. Theme map

4. CONCLUSIONS.

The bibliometric analysis implemented in the field of study "Digital literacy in Sucre schools" allows us to conclude that it is a strong topic worldwide, with an upward trend with each passing year (2013-2023) and that it is mainly worked on United States, as can be seen in figure 4, followed by Indonesia and in third place by Spain.

It is also evidenced with respect to the lines of research observed in the thematic map, that the main term "Digital literacy" despite being the most frequent is found in an area where it is not represented as a main theme, but as a basic theme. and transversal to the other themes found, the previous term is also associated with key research terms such as (Primary education, education, learning, secondary education and curriculum), all of them also related to the second keyword used in the search of the Scopus database (School or College). It is very striking that the terms "Digital media literacies" and "teachers" are the main topic in the research field, that is, that there is a theme focused on the teacher-oriented or teacher-focused digital media literacy.

Regarding the interactions between the authors shown in the co-citation map in Figure 5, two clusters are shown, one in red where the most relevant authors and with the greatest interaction are Livingstone, Lee, Martín, Glister and Prensky and those in blue are Gee, Buckingham, Lankshear and Jenkins. In this way, the results of the study allow us to observe a significant growth in the development of this area of knowledge, which is related to the important

findings of the application of new technologies for the generation and medication of strategies, tools and environments focused on the strengthening of the training work.

5. CONFLICT OF INTEREST

The authors declare that there are no potential conflicts of interest with respect to the research, authorship or publication of this article.

6. AUTHORSHIP CONTRIBUTIONS

All authors have jointly and equally contributed to the argumentation and writing of the manuscript.

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