

## RESEARCH ARTICLE

Dynamics of Brazilian scientific production in  
Communication journals in the Web of Science

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## ABSTRACT

**Introduction:** Taking into consideration that research activity in Communication has grown strongly in recent years, as indicated by previous studies, the present work aims to establish a survey in terms of scientific production in this area. **Objectives:** This paper analyzes the scientific production in the area of Communication, between 2007 and 2017, in journals indexed in the first quartile (Q1) and second quartile (Q2) of the Web of Science database, belonging to authors with affiliation in Brazilian institutions. **Methodology:** Communication journals in InCities (JCR) belonging to the first two quartiles were identified, then a search by journal title in WoSff was performed and subsequently the treatment and normalization of the data obtained. **Results:** A growth in scientific production in Communication is observed, in international projection, feeding a tradition in coauthorship with international networks. In the period from 2014 to 2017, they tended to publish mainly in English, against the usual collaborations that they had been maintaining with Spanish-speaking countries until 2014. **Conclusion:** We conclude, among other things, that the Capes evaluation system, quadrennial, may have influenced the scientific production in Communication in the studied interval.

## KEYWORDS

Communication. Scientific production. Communication journals. Web of Science. Brazil

Dinâmicas da produção científica brasileira em revistas  
da área de Comunicação na Web of Science

## RESUMO

**Introdução:** Tendo em consideração que a atividade de investigação em Comunicação cresceu fortemente nos últimos anos, como indicado por estudos anteriores, o presente trabalho visa estabelecer uma pesquisa em termos de produção científica nessa área. **Objetivos:** Esse artigo analisa a produção científica na área da Comunicação, entre 2007 e 2017, em revistas indexadas no primeiro quartil (Q1) e no segundo quartil (Q2) da base de dados Web of Science, pertencentes a autores com afiliação em instituições brasileiras. **Metodologia:** Foram identificadas as revistas de comunicação no InCities (JCR) pertencentes aos dois primeiros quartis, em seguida foi realizada uma busca por título de periódico na WoS e posteriormente o tratamento e normalização dos dados obtidos. **Resultados:** Observa-se um crescimento na produção científica em Comunicação, na projeção internacional, alimentando uma tradição em coautoria com redes internacionais. No período de 2014 a 2017, tenderam a publicar principalmente em inglês, frente às colaborações usuais que vinham mantendo com países de língua

espanhola até 2014. **Conclusão:** Conclui-se, entre outras coisas, que o sistema de avaliação da Capes, quadrienal, pode ter influenciado a produção científica em Comunicação no intervalo estudado.

**PALAVRAS-CHAVE**

Comunicação. Produção científica. Revistas de comunicação. Web of Science. Brasil.



JITA: BJ. Communication

## 1 INTRODUCTION

According to data from the Fundación Española para la Ciencia y la Tecnología (Fecyt) (2019), Brazil is among the top 30 countries in scientific production. Its excellence rate, which indicates that the percentage of a country's publications is included in the top 10% most cited in its field, is 8.7%. On the other hand, the country's scientific production in the Web of Science (WoS) database has been growing in recent years.

In 2018, Brazilian scientific production accounted for 53,837 articles, while the percentage of publications in high-impact (Q1) journals was 34.2% (FECYT, 2019). Taking into consideration that research activity in Communication has grown a lot in recent years, as indicated by previous studies (PARK; LEYDESDORFF, 2009; KOIVISTO; THOMAS, 2011; MONTERO-DÍAZ et al., 2018), the present work aims to establish a survey in terms of scientific production in this area, based on the identification of the first and second quartile journals present in WoS. The aim is to appreciate the temporal evolution of this production, to know the institutional affiliation of the coauthors, to see the topics covered, the language of publication and the international networks of coauthoring countries.

The hypothesis is that evaluation systems - by faculty merit - have been decisive in scientific production in Communication during the period studied (2007-2017), with production growing as these requirements increase in terms of reference databases, rankings and positioning quartiles. The increase in production that studies focused on the field of Communication within WoS presented, led to the creation of the specific category of Communication, which makes WoS a reference bibliometric tool in international scientific dissemination to analyze the current state of scientific production in Communication in Brazil. This is reinforced by the fact that it is a platform that collects references of the main scientific publications in any discipline of knowledge, scientific as well as technological, humanistic and sociological, from 1900 to the present (FECYT, 2019).

| 3

### *1.1 Impact of the evaluation system on scientific production*

The emergence of scientific journals in the area of Communication began in the 1990s, and it was from the year 2000 that they increased in number, although "their consolidation has been difficult due to the amateurism of their creators, the scarcity of economic resources and the limited bibliometric processes, the researchers who published their articles did so without knowing the value of publishing in one or another" (CASTILLO et al., 2014, p.628).

In the case of Brazil, the post-graduation evaluation is the responsibility of the Coordination for the Improvement of Higher Education Personnel (Capes), the institution in charge of evaluating the post-graduation programs in the country. Among the variables evaluated is the scientific production of the professors and teachers, researchers.

It is a system that has been in place for 40 years, although it was only after 1988 that greater emphasis was placed on the scientific production of professors. Capes pays attention to the criteria of scientific productivity that can serve for the selection of teachers by higher education institutions, and especially the impact of institutional assessments through the graduate programs, "according to a profile of productivity, definition of areas of concentration, lines of research, and produce effects of professional and social prestige that impact the map of academic power in institutions and the scientific community"(DIAS SOBRINHO, 2007, p.31).

Seventy percent of the final grade that a doctoral program can obtain depends on its scientific production. Some authors propose changes in a system that leaves aside more

qualitative aspects (CHEAP, 2019) and focuses only on quantitative methods to evaluate doctoral careers.

### *1.2 Importance of databases in teacher evaluation systems*

In the case of Brazil, the databases that structure and distribute the results of the research have acquired great importance in the evaluation systems of teaching staff, which was reflected in the scientific production present in the database of the Web of Science itself (HOPPEN; VANZ, 2019). These bases have studies focused for years on repositories (SANTOS, 2003), on bibliometric indicators of scientific production (MUGNAINI et al., 2004), on citation analysis of scientific communication (VANZ; CAREGNATO, 2003) and the evolution of trends in scientific research and production worldwide, taking as reference the main multidisciplinary databases: WoS and Scopus (DUDZIAK, 2010; DE FILIPPO; GARCÍA-ZORITA, 2020). In addition to the importance of data-driven science with studies focused on Scopus and Web of Science (BUFREM et al., 2016), the relevance of studies on scientific impact indicators of publications, such as the Hirsch h index (SILVA; GRÁCIO, 2017), should also be highlighted.

Studies focusing on the field of Communication have been gradually focusing on aspects such as scientific literature in the Information Sciences (MUELLER, 2007), scientific collaboration networks (BUFREM, 2010) and the relevance of the institutional setting (ARAÚJO; VALENTIM, 2019) and social networks in scientific dissemination (ALVES, 2011; PRÍNCIPE, 2013), as well as scientific production on gender studies in Information Sciences (SILVA, ZAPATA; OLIVERA, 2019; NEVES, 2018).

### *1.3 Research Objectives*

The general objective is to analyze the dynamics of research in the area of Communication, of authors with affiliation with Brazil, through the scientific production indexed in the Web of Science (WoS), during the period from 2007 to 2017.

The specific objectives are:

- a) to see the evolution of scientific production in the main journals in WoS (Q1 and Q2);
- b) to analyze the institutional affiliation of the authorships;
- c) identify international networks through coauthorship;
- d) to describe the main themes addressed in the area of Communication; and
- e) to know the journals and the language in which most of the scientific production studied is published.

## **2 METHOD**

First, we identified which journals in the area of Communication were present in the InCites Journal Citation Reports (JCR), belonging to the first two quartiles (Q1 and Q2), and that were ranked by Impact Factor (IF) in 2018. In total, 44 journal titles were retrieved, 22 of which belonged to Q1 and another 22 to Q2.

Subsequently, an advanced Web of Science search was performed, for which two search protocols were created: the first with the title of the 22 Q1 journals and the second with the title of the 22 Q2 journals. In both cases, the titles of the journals were linked using the

Boolean operator OR, which allowed the retrieval of articles present in all the journals listed. The formulas used in WoS to create the search corpus in March 2020 are detailed below.

The first search equation was used to retrieve the publications made in the 22 first quartile (Q1) Communication journals.

**Equation 1.** WoS search equation in Communication journals (Q1)

*SO=(Communication Monographs) OR SO=(Communication Research) OR SO=(Communication Theory) OR SO=(Communication Methods and Measures) OR SO=(Comunicar) OR SO=(Digital Journalism) OR SO=(Environmental Communication - A Journal of Nature and Culture) OR SO=(Human Communication Research) OR SO=(Information Communication & Society) OR SO=(International Journal of Advertising) OR SO=(International Journal of Press-Politics) OR SO=(Journal of Advertising) OR SO=(Journal of Communication) OR SO=(Journal of Computer-Mediated Communication) OR SO=(Journalism) OR SO=(Media Psychology) OR SO=(Mobile Media & Communication) OR SO=(New Media & Society) OR SO=(Political Communication) OR SO=(Public Opinion Quarterly) OR SO=(Public Understanding of Science) OR SO=(Science Communication)*

The second search equation was used to retrieve the publications made in the 22 second quartile (Q2) Communication journals.

**Equation 2.** WoS search equation in Communication journals (Q2)

*SO=(Convergence-The International Journal of Research into New Media Technologies) OR SO=(Discourse Studies) OR SO=(European Journal Of Communication) OR SO=(Feminist Media Studies) OR SO=(Games And Culture) OR SO=(Health Communication) OR SO=(Journal Of Advertising Research) OR SO=(Journal Of Broadcasting & Electronic Media) OR SO=(Journal Of Health Communication) OR SO=(Journal Of Social And Personal Relationships) OR SO=(Journalism & Mass Communication Quarterly) OR SO=(Journal Of Media Psychology-Theories Methods And Applications) OR SO=(Journal Of Public Relations Research) OR SO=(Journalism Practice) OR SO=(Journalism Studies) OR SO=(Media Culture & Society) OR SO=(Mass Communication And Society) OR SO=(Public Relations Review) OR SO=(Policy And Internet) OR SO=(Profesional De La Informacion) OR SO=(Research On Language And Social Interaction) OR SO=(Telecommunications Policy)*

From these search equations, the filters of temporality (2007-2017), document type (article) and country of origin (Brazil) were applied.

It is important to clarify that the filter offered by WoS 'country of origin', is the country of institutional affiliation of at least one of the authors of the publication. It should be taken into account that each article may have more than one author and that each author may have one or more institutions of attachment, as well as the country of origin.

### 2.1 Treatment of the retrieved data

The data retrieved in WoS were exported to the Excel spreadsheet editor, used in the cleaning, normalization and screening processes. The fields exported and used for this analysis were: authors, authors' affiliation, publication journals, year of publication, article language, and keywords.

From this, the following steps were performed:

- a) organization of columns and cells;
- b) cleaning of unused data;
- c) disaggregation of authors and keywords;

- d) listing and classifying data; and
- e) standardization of terms.

After the disaggregation of the authors' names, they were classified one by one for the definition of gender (male and female) from the name itself. Although subjective and with the possibility of mistakes, it was believed to be important to verify this data, especially for comparative analyses.

Then we proceeded to develop visual representations of the data. For this, two different tools were chosen: Excel and VOSviewer. The tables and graphs were developed in Excel. The graphs were generated from the VOSviewer software.

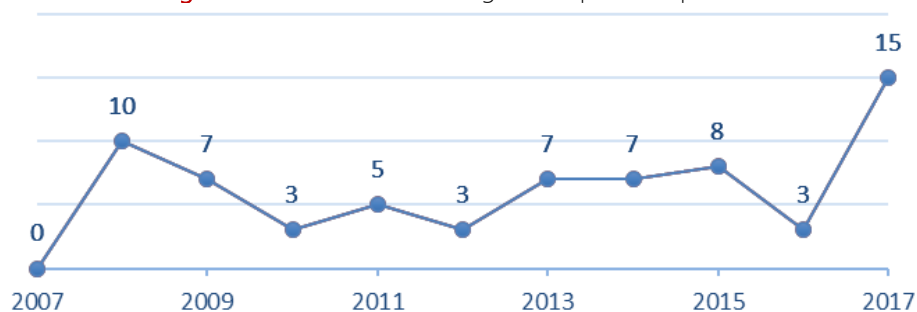
However, in the graph representing the keywords, the thesaurus was not used due to a large number of terms. In this case, the network is represented by the keywords retrieved directly from the WoS articles, and not by the standardized terms.

### 3 RESULTS

A total of 68 articles were retrieved, published in 25 different journals and with 177 authors involved.

#### 3.1 Evolution of scientific production

Figura 1. Quantidade de artigos recuperados por ano



Fonte: Dados da pesquisa, 2020

It is possible to consider that the years 2010, 2012 and 2016 marked important crises in Brazil and/or in the world that can justify the decrease in production in these years.

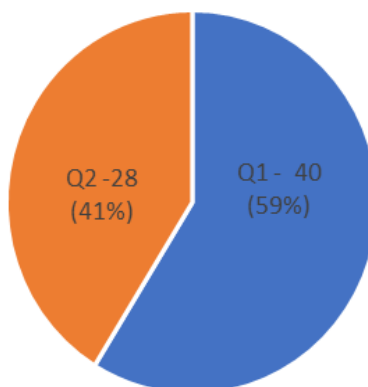
On the other hand, using the Brazilian post-graduation evaluations by Capes, in the years of the triennial or quadrennial evaluations, we can make some analysis with the volume of publications throughout the investigated decade. There was 'publication' of the triennial evaluations in the following years: 2007, 2010 and 2013, passing to 'publication' of the first quadrennial evaluation that occurred in 2017.

In the last two evaluations, there was an increase in production in the year of publication of the evaluations from previous years, so the increase in production visible in 2013 and especially in 2017 occur in the first years of the beginning of evaluative processes. However, the same logic did not occur in the previous years. As already mentioned, different scenarios of Capes policies and different political-economic scenarios may have strongly influenced the volume of publications.

3.2 Volume diffusion of articles Q1 and Q2

As can be seen in Figure 2, the number of articles in the first quartile (Q1) reached 59%, with 40 articles, compared to 41% in the second quartile (Q2), with 28 articles.

Figure 2. Number of retrieved articles - Analysis by quartile



Source: Research data, 2020.

Although with a shy number of publications, it is noted that the sample for the decade analyzed shows that the authors were successful in publishing mainly in the first quartile (Q1).

Figure 3 shows the ten journals surveyed, in which there was a greater presence of articles signed by authors from Brazilian institutions. Among them, two Spanish journals stand out for concentrating the largest number of articles: Comunicar (Q1) and Profesional de la información (Q2). The former is published in Spanish and the latter in a Spanish-English bilingual version. The other journals presented in Figure 3 are of English or American origin.

Figure 3. Q1 and Q2 journals in Communication with highest presence of Brazilian authorship (2007-2017)



Source: Research data, 2020.

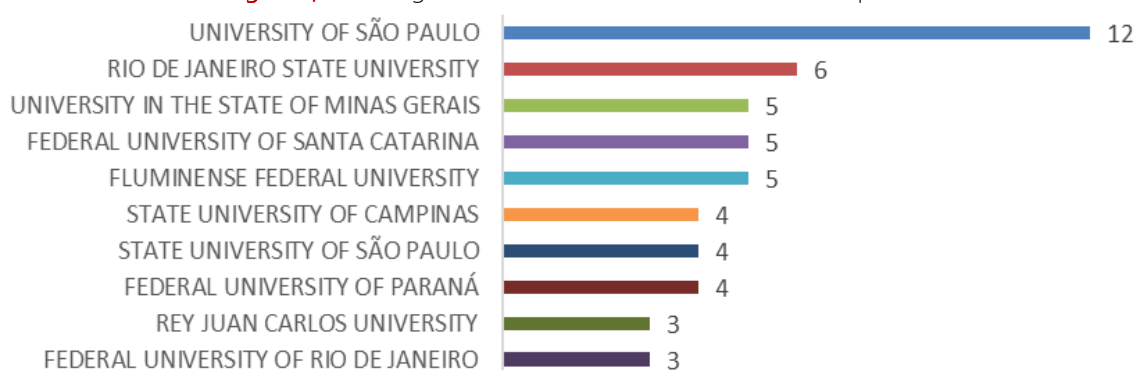
With the exception of the journal 'Telecommunications Policy', which currently offers closed access to its content, eight other journals appear offering a hybrid form of access - articles with closed access and articles with open access. They are: 'Journalism Practice'; 'Information Communication & Society'; 'Journalism Studies'; 'International Journal of Press-Politics'; 'Science Communication'; 'Media Culture & Society'; 'Public Understanding of

Science' and 'Profesional de la Información'. In addition, the journal 'Comunicar' makes its articles available in an open form.

### 3.3 Institutional affiliation of the authors

Of the 68 articles analyzed, it was observed that 54 (79%) are co-authored and 14 (21%) were published with single authorship, and the average number of signatures per article was 3.1. The institutions of origin of all authors who signed the articles were also identified, totaling 78 records from different institutions. As can be seen in Figure 4, the institutions with the most outstanding institutional affiliation are Brazilian.

Figure 4. Ranking of institutional affiliation in authorship



Source: Research data, 2020.

Once the affiliations were identified, we proceeded to find out which are the institutions that appear most in the articles' signatures. Among the 78 institutions of affiliation of the authors, we have the ten with the highest number of occurrences, presented in Figure 4. The following institutions appear in the sequence, with a total of two occurrences each: African Centre for Media Excellence; Anadolu University; Austrian Academy of Sciences; Ben-Gurion University of the Negev; Cairo University; California State University; California State University System; Colorado State University; Lomonosov Moscow State University; University of Santiago; University of Brasília; University of Coimbra; Federal University of Bahia; Federal University of Rio Grande do Norte; Federal University of Rio Grande do Sul; University of Bucharest; University of Colorado Boulder; University of Colorado System; University of Munich; University of Texas at Austin; University of Texas System; and University of the Sunshine Coast. Then, in a scattered manner, we have 46 other institutions that appear with only one occurrence.

These data allow us to see that, apart from the University of São Paulo, there are no centers that stand out from the others in a significant way in terms of the institutional affiliation of the authors.

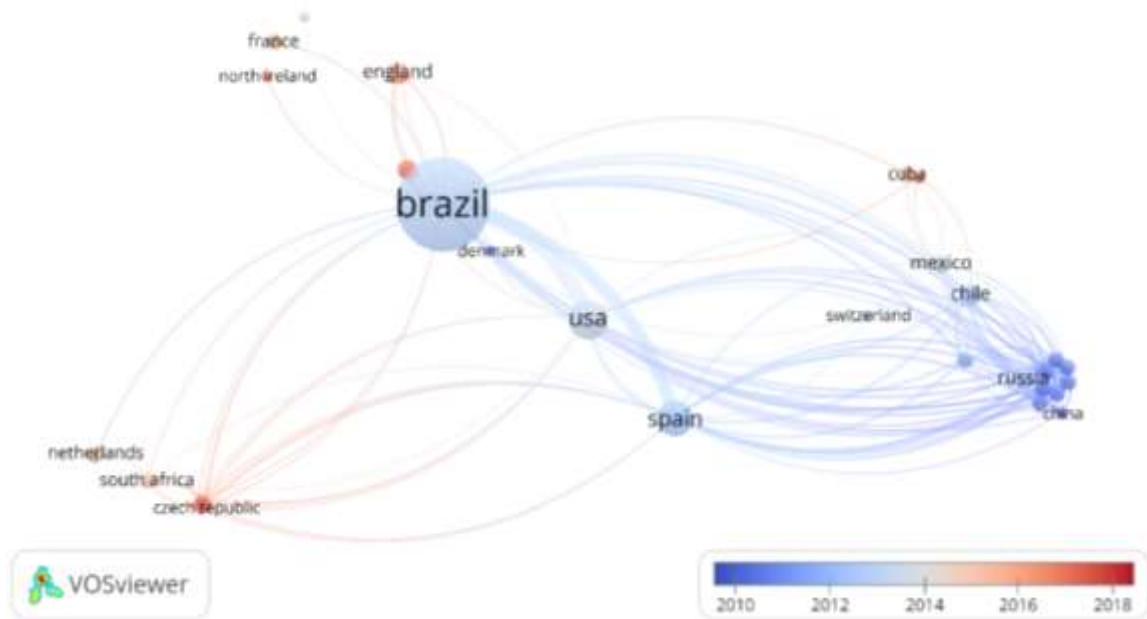
### 3.4 Co-authorship networks by country

One can see how the trend has been changing over the years. Between 2010 and 2014, collaboration with China, Russia, the United States, and Spanish-speaking countries such as Spain, Chile, and Mexico predominated. The situation changes from 2014, giving rise to a



coauthor collaboration with authors from England, Cuba, the Czech Republic, France, Northern Ireland, South Africa, and the Netherlands.

Figure 5. Evolution of international co-authorship (represented by countries)



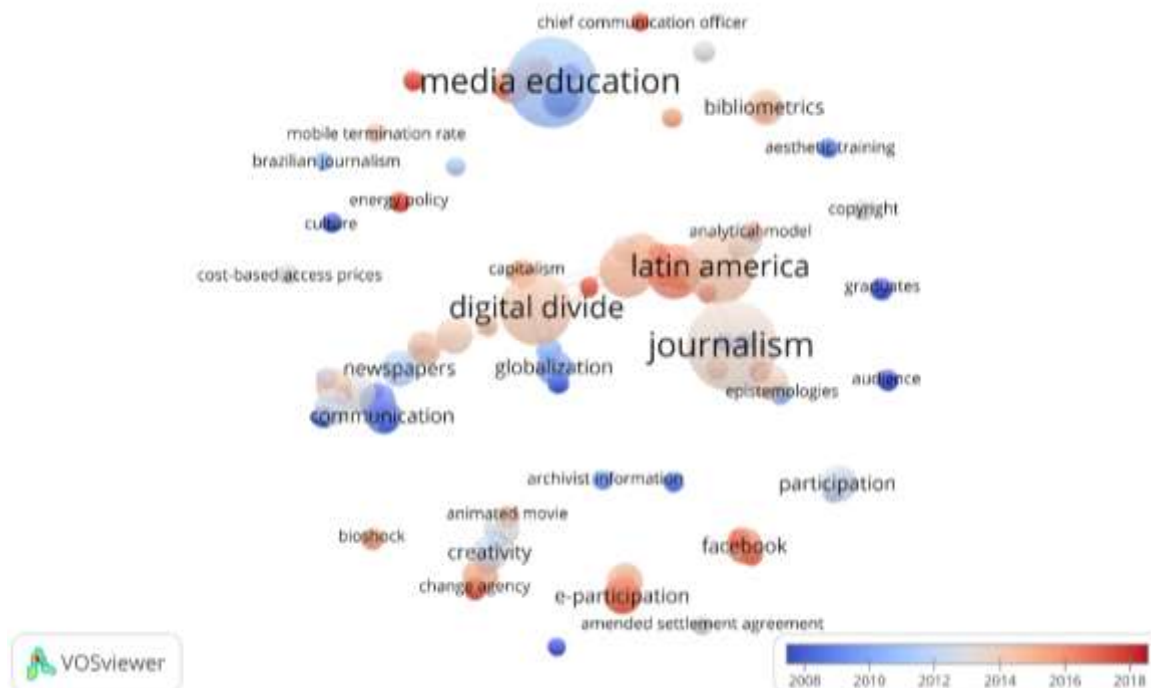
Source: Research data, 2020.

When looking at the language of publication of the articles analyzed, it can be seen that of the 68 articles analyzed, 50 are in English (74%), 15 are in Spanish (22%), and 3 are in Portuguese (4%).

*3.5 Main authors, themes and keywords*

The most used keywords can be seen in Figure 6. For this, a time scale was used, so that the yearly scale, present in the lower corner of the graphic figures, represents the average year in which both keywords had the highest frequency of use and the countries had the most published papers. Note that this is not the first or last year, it is the average year, that is, a scenario with all the words in the years where their occurrences were most accentuated.

Figure 6. graph of most recurrent keywords



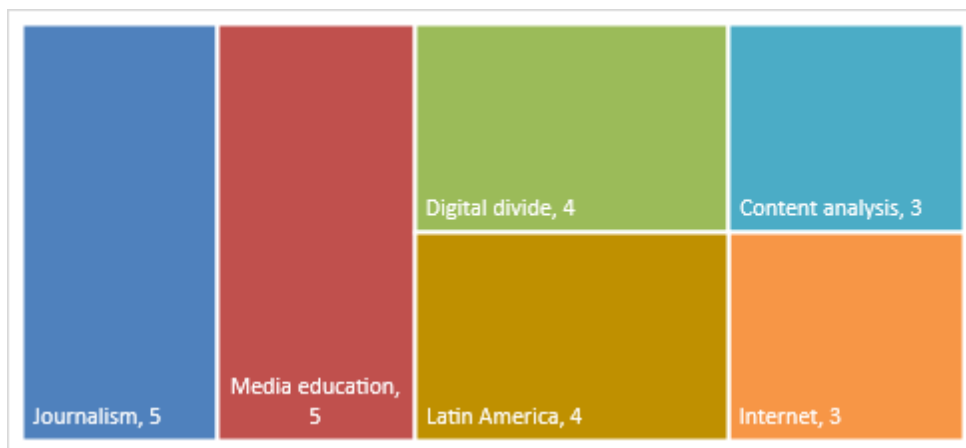
Source: Research data, 2020.

In the articles by Brazilian authors, we see that the most prevalent terms are: journalism, media education, digital dividend, Latin America, and analytical model. These are words that have been retained over the years, and to which others have recently been added, such as Facebook, e-participation, or bibliometric. At the same time, there are terms that were widely used that are losing use, such as communication, newspapers, globalization, and audience.

The year scale at the bottom of the graphs (VOSviewer) represents the average year in which both the keywords had more frequency of use and the countries had more documents published. Remember that it is not the first year or the last year, it is the average year, i.e., taking an average over all the words and their appearances and all the countries and their appearances. The redder, the more recent was this use/development respectively.

Analyzing the topics covered in the articles by keywords, we identified 323 themes normalized by the authors of the study. The most important topics, presented in Figure 7, were: journalism, media education, mobile devices, digital divide, Latin America, content analysis, and the Internet. From the seventh position on, 28 themes that appeared only twice and the others only once.

Figure 7. Most frequent (normalized) themes of the articles



Source: Research data, 2020.

Regarding authorship, among the 177 authors who signed the articles analyzed men were predominant (110 - 62%) over women (67 - 38%). Regarding the volume of production of these same authors, we identified 23 authors with two or more articles published among the articles analyzed. We noticed that 87% of the authors signed only one article, and the average number of subscriptions for the other 13% was 2.3 articles. The most prominent author was Claudia Mellado, with four articles.

#### 4 DISCUSSION AND CONCLUSIONS

The results of this research are in agreement with previous studies (PARK; LEYDESDORFF, 2009; KOIVISTO; THOMAS, 2011; MONTERO-DÍAZ et al., 2018), showing that research activity in Communication has grown in recent years and very significantly in 2017.

The results obtained allow us to validate the hypothesis that the Capes evaluation system may have influenced the scientific production in Communication during the studied period, in line with the observations of authors such as Dias Sobrinho (2007). A predominance of scientific production in the first quartile (Q1) was observed, as recommended by funding agencies and evaluation institutions such as CNPq and Capes, respectively. In addition to the place of publication of the scientific production in Communication, a tradition in co-authorship with international networks can be noticed, according to the criteria valued by Capes. It is observed how fluid these relationships have been with countries like the United States of America, Spain, China, Russia, Chile and Mexico.

It is believed that one of the factors driving this dynamic of international collaboration is the evaluation system of Capes coupled with the incentive policies that existed for research, internships, and international exchanges until the year 2016.

In terms of language, in the interval from 2014 to 2017, they tended to publish in journals where research results are disseminated mostly in English, as shown by the fact that 74% of the published articles are conveyed in that language.

There has been a growth in scientific dissemination in Communication by Brazilian authors during the period studied, which corresponds to the general increase in scientific production in recent years, as indicated by Fecyt (2019).

In the scientific production analyzed there is a greater presence of (male) authors than (female) authors and with a predominance of Brazilian universities as the institutional affiliation of authorship.

Among the articles analyzed, the interest in certain themes was concentrated. The subjects most addressed in the articles have been journalism, media education, and the digital divide. These data reflect a very different reality between Europe and Latin America, which, on the other hand, mark the research agenda in the Communication of Brazilian authors. Latin America has been working for years on the use of technologies and media in educational contexts to reduce a digital divide that excludes millions of people who do not have Internet.

## CRedit

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