Infographics for the visibility and dissemination of scientific articles: analysis from the author's point of view

Infografías para la visibilidad y difusión de artículos científicos: análisis desde la visión autoral

Jorge Cueva Estrada

Universidad Politécnica Salesiana, Ecuador
Universidad Rey Juan Carlos, España
https://orcid.org/0000-0002-3055-1060
jcueva@ups.edu.ec
jm.cueva.2022@alumnos.urjc.es

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Abstract

The era of digital identity increases its positioning and impact within the different spheres of society. In the case of this study, the scientific field, where the digital and technological have permeated strongly, to this is added the massive presence of journals. and scientific publications, with this, competition for visibility emerges to capture the attention of researchers. The objective that guided the present study was to determine the importance of the use of infographics as a means of visibility and dissemination of scientific articles from the perspective of the authors. For this, a data collection process was carried out, in a period of time, to a sample of 385 authors who have published scientific articles in 2022, therefore, the research was empirical, cross-sectional and descriptive, as an instrument. of investigation the survey was used. The new generations of researchers are immersed in the digital world, where the management of their researcher identity is decisive for their professional career, that is where infographics act as a means of visibility. Researchers observe the use of infographics as a motivational element or reward for the work done, this given that few scientific journals use this type of graphic element for their published articles.

Keywords: scientific journals, infographics, visibility, multimedia content, social networks

Resumen

La era de la identidad digital aumenta su posicionamiento e impacto dentro de los diferentes ámbitos de la sociedad, para el caso del presente estudio el ámbito científico, en donde lo digital y tecnológico ha calado fuertemente, a esto se le suma la presencia masiva de revistas y publicaciones científicas, con esto, emerge la competencia por visibilidad para captar la atención de investigadores. El objetivo que guio el presente estudio fue: determinar la importancia del uso de infografías como medio de visibilidad y difusión de artículos científicos desde la perspectiva de los autores. Para esto, se realizó un proceso de recolección de datos, a una muestra de 385 autores que hayan publicado artículos científicos en 2022, por lo tanto, la investigación fue empírica, de corte transversal y de nivel descriptivo, como instrumento de investigación se usó la encuesta. Las nuevas generaciones de investigadores están inmersas en el mundo digital, donde la gestión de su identidad de investigador es determinante para su carrera profesional, ahí es donde actúa las infografías como medio de visibilidad. Los investigadores observan el uso de infografías como un elemento motivacional o premio por el trabajo realizado, esto dado que pocas revistas científicas realizan este tipo de elementos gráficos para sus artículos publicados.

Palabras claves: revistas científicas, infografías, visibilidad, contenido multimedia, redes sociales

Introduction

Factors such as constant technological innovation, the necessary use of the Internet, as well as the emergence of user-friendly and more intuitive software, have transformed the way in which people produce, consume and transmit information (Cueva and Sumba, 2016). This has given way to the so-called democratization of information, through the easy production of content and free access to information. The transformation in the form of communication and access to information has left its mark on all aspects of people's daily lives. In the academic and scientific world years ago, the dissemination of knowledge was limited to the physical printing of books and scientific journals, however, the constant emergence of digital technologies has transformed the way of accessing and sharing research results, this and added to public policies has allowed the emergence of a large number of scientific journals (Ganga-Contreras, et al., 2022), which serve as a means to validate the knowledge that is created and shared. This action has been a significant contribution to the social appropriation of knowledge (Arjona-Granados, et al., 2022).

The constant emergence of technologies and digital media, plus the benefits of the Internet, have allowed the consolidation of different types of formats (audio, text, images and videos) that allow the transmission and dissemination of content. arising other audiovisual elements that combine various formats. In this sense we can mention infographics, the main element of study for this research work, which combines the use of text and images, in order to summarize, make more striking and easy to consult the information to be transmitted.

In line with the above and relating it to scientific journals, it can be noted that the use of infographics as an element to improve the visibility and dissemination of scientific content has not been massively adopted by scientific journals, in line with the findings of Cueva Estrada et al (2023a) in their study of Spanish journals indexed in Scielo, where they found that only 22% of the journals studied use some form of infographics. In this regard, it is important to add that another study also showed the poor use and proper management of social networks by scientific journals, a key digital environment for the dissemination of scientific content and infographics (Cueva et al., 2023b). Taking into account all of the above, the research seeks to determine the importance of the use of infographics as a means of visibility and dissemination of scientific articles from the perspective of the authors.

The visibility of scientific articles

There is a close relationship between the number of existing scientific journals and the high production of scientific content (Blanco and Graffe, 2000), which translates into high competition among scientific journals to stand out and capture the attention of new researchers. To improve their visibility, scientific publications make use of digital media and social networks in which they seek to share relevant and eye-catching content for users (Araújo, 2015). Latindex on its website records that Argentina, Mexico, Brazil, Ecuador and Peru are the countries with the highest rate of scientific production, in addition, it can be evidenced the registration of more than 4094 scientific journals in its catalog 2.0 (Latindex, 2023). This growth is due to the benefits brought about by technological advances and on the other hand to government policies of each of the countries in the region (León et al., 2020).

Considering the above, it can be said that scientific journals compete among themselves to: 1) obtain a greater number of scientific articles submitted by authors from different countries, 2) have their publications more widely read, and 3) obtain a greater number of references for their research.

The above is not at all simple if we take into consideration the large number of existing scientific journals and the high amount of scientific production. For this reason, scientific publications should seek strategies to improve their visibility and positioning within the scientific community. It is precisely in this challenge where an adequate use of social networks and a strategic production of multimedia content of interest to the scientific community could help to improve the visibility of publications, all this in line with the guidelines of digital transformation and proper content management by scientific journals (Spitsina et al., 2022).

As already mentioned, one of the current means used by scientific journals to increase their visibility and dissemination of published scientific articles are social networks, digital networks consolidated as a means to cultivate and establish relationships and connections between people, in addition to helping rapid disclosure and dissemination of information, which contributes significantly to the social appropriation of knowledge (Herrero-Gutiérrez et al., 2011; Chan et al., 2020). This makes it possible to increase scientific dissemination and sustain virtual communities of researchers and academics interested in the topics covered by the publication. The presence of scientific publications in social networks is strictly due to tactics of visibility, dissemination and generation of contacts with other journals or academic institutions to publicize the publications and encourage the generation of new research (Oller Alonso et al., 2012; Ojeda et al., 2022; Artigas and Guallar, 2022).

But a correct management in social networks and a strategic creation of audiovisual content that contributes to the visibility of scientific journals and articles does not always happen, Martínez-Guerrero (2018) suggests that the editorial team of the scientific journal must be committed to an orderly and methodical management of their social networks, as well as a strategic publication of content to improve the visibility of publications. For the case of the present research, the use of infographics as a strategic dissemination medium for the content of scientific articles will be analyzed.

Infographics

Due to its composition, the word infographics can be broken down into the words info (information) and grafías (graphics); therefore, it is a strategy that seeks to share information complemented with visual resources (Colle, 1998). From another point of view, the word infographics can be interpreted by the union of info (information) and grafía (graphics), from this composition infographics are those elements produced by computer software where text and images are combined (González, 2014).

Infographics are a non-traditional form of reading for the brain, however, this strategy allows high levels of comprehension of the information shared (Marín Ochoa, 2009). Later, Medina Domínguez et al (2011) describe infographics as media that strategically combine visual elements that add value to the information; their use is based on offering complex information combined with graphic elements that contribute to its comprehension. However, Roney Aguirre et al (2015) argue that infographics do not replace the full text or content, but are positioned as a complementary medium that invites and arouses curiosity for the complete reading of the text.

At this point it is interesting to differentiate between concepts such as data visualization commonly used and an infographic. A data visualization is actually a process that allows the exploration of data to subsequently convert them into information, i.e. it is a process that works on a set of data in general, while the benefits that infographics suggest is to show information strategically much more specific, tabulated and organized, with graphics and texts that generate interest and visual impact (García-Avilés, and Arias Robles, 2016). To conclude, it is important to mention three characteristics that infographics should have, this from the perception and as a synthesis of the authors mentioned above: 1. Strategically use graphics and images 2. Transmit information that arouses interest and that is truly useful for the reader.

One of the main objectives pursued by scientific journals is the dissemination of knowledge and from this contribute to the development of societies, it is at this point where infographics help to a much simpler and effective dissemination of published content, in this regard Valero Sancho (2009) notes that the acquisition of knowledge should not be seen as a conscious activity by the individual, but as a set of interpretive and interactive processes, in which the use of infographics contributes significantly.

Regarding the use of infographics for the visibility of scientific articles, Corbella and González (2017) state that infographics and video articles are media used by impact journals to disseminate their publications and add that they use social networks such as YouTube, Facebook, Twitter, Instagram and Pinterest, later Mengual (2018) argues that technological advances have transformed scientific communication through the inclusion of multimedia elements, much more attractive that bring the content closer to the new generations of researchers. Therefore, it suggests an increase in the visibility not only of the results of a research but also in the visibility of the scientific journal (Ruiz Corbella et al 2020).

Methodology

The main objective of this study was to determine the importance of the use of infographics as a means of visibility and dissemination of scientific articles from the perspective of the authors, for this a data collection process was carried out, using a form provided via web, to a sample of authors

Table 1
Distribution of journals by Latindex subject

Subject	Number of journals	Percentage	Number of authors for the sample by area
Arts and Humanities	712	17,39%	67
Agricultural Sciences	127	3,10%	12
Natural Sciences	342	8,35%	32
Medical Sciences	363	8,87%	34
Social Sciences	1988	48,56%	187
Engineering Sciences	256	6,25%	24
Multidisciplinary	306	7,47%	29
Total, number of journals indexed in Latindex:	4094		Size of authors considered for the sample: 385

Note. Based on Latindex 2023

who have published scientific articles in 2022, therefore, the research was empirical (Lind et al., 2012) and cross-sectional (Bisquerra, 2012). The level of the research was descriptive, with the study of both qualitative and quantitative variables, and the survey was used as a research instrument (Hernández et al., 2014). To form the sample, the percentage of participation of journals indexed in Latindex in the 2.0 catalog (June 2023) was used; the distribution of journals according to their subject is shown in Table 1. Based on this percentage, the sample of authors was constructed proportionally to the percentage of participation of each journal by multiplying the sample size (n=385) by the percentage of representation of each subject.

The sample of authors was 385, which guarantees a reliability of 95% and a maximum error of 5% in the results obtained. The selection of the members of the sample was made by obtaining the e-mails of the authors of scientific articles published during 2022, for this purpose, the websites of the journals were accessed and the corresponding author was located. In order to locate the number of authors by subject of journals indexed in Latindex according to Table 1. More than 800 e-mails were sent, collected from the websites of journals indexed in Latindex, from which only 385 authors responded.

Results and discussions

Regarding the use of social and academic networks by the researchers surveyed, the results are shown in Figure 1 below.

The high percentage found of use of social and academic networks in this study by the surveyed authors is supported by Quintas Froufe (2016) who concludes in his research that social and academic networks are shown as media that allow the instantaneous dissemination of scientific content and production, however, he comments that the relationship between visibility and impact is an aspect that still needs to be analyzed. With respect to open science, these means of scientific dissemination are positioned as a quick way to get research results, in this sense Anglada and Abadal (2018,) argue that social networks allow the development of open science, contribute to collaboration and knowledge construction, in addition to bringing science closer to society.

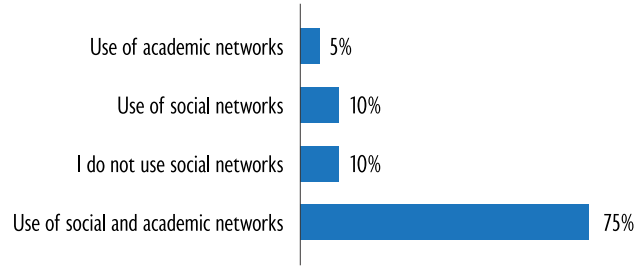


Figure 1
Use of social and academic networks

Note: Prepared by the authors with data from the 2023 survey.

Regarding the work of dissemination and disclosure of published articles, the responses of the respondents are shown in Figure 2, it should be noted that the answers are not exclusive, i.e. a respondent could have indicated more than one option. In this sense, Artigas and Casanova (2020) add that the work of researchers does not end with the publication in a scientific journal, but must now also consider the time devoted to social and academic networks, sharing and updating information, as well as interacting with the members of the network, which is a determining factor for the visibility of the document.

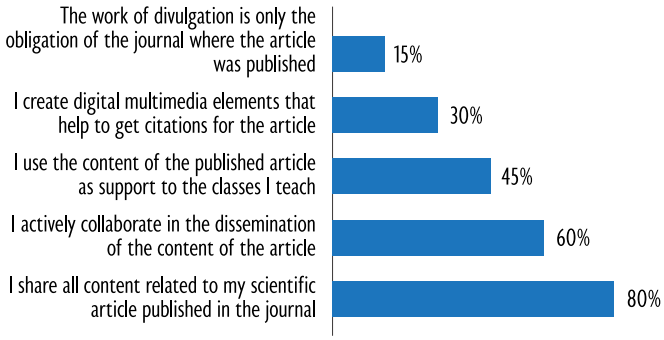


Figure 2
Outreach and dissemination work from the author's perspective

Note: Prepared by the authors with data from the 2023 survey. The answers are not exclusive

Figure 3 shows the percentage of authors who received some multimedia element from the scientific journal where their last publication was made, in order to help disseminate and publicize their research. The result obtained evidences the conclusion of Cueva et al. (2023a), who argue that scientific journals should give greater weight to the management of social networks, platforms where content is shared that should be of interest to the community.

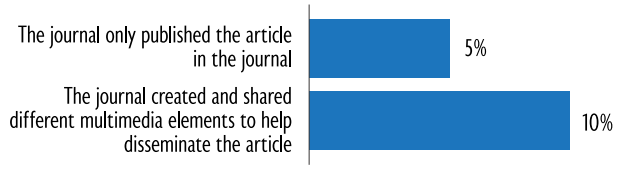


Figure 3
Creation of multimedia content by scientific journals

Note: Prepared by the authors with data from the 2023 survey

While in Figure 4, the authors evaluate the dissemination work done by scientific journals, there is little satisfaction with respect to this work, Cueva et al., (2023b) conclude that the formats most used by scientific journals for publications in social networks are text accompanied by images, this shows the little interest and creativity on the part of the

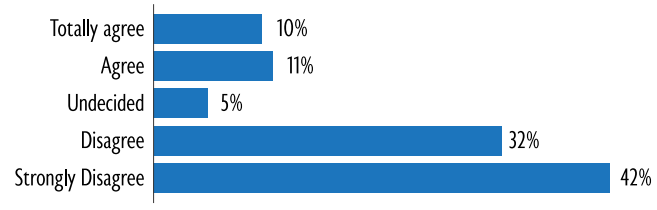


Figure 3
Creation of multimedia content by scientific journals

Note: Prepared by the authors with data from the 2023 survey

scientific journal for the management of content determinants for the dissemination of the scientific article.

After showing the respondents an infographic as an example (in this case an infographic published by the magazine Retos de Ecuador was used), the authors were asked if in any publication, any of the scientific journals complemented its publication with a digital element like the one shown, 79% reported that the publication had not made any similar element, 15% some similar element and only 6% confirmed recognizing that the journal had made a publication like the one shown.

Figure 5 shows the perception of the authors surveyed about the usefulness for the visibility of scientific articles regarding the use of infographics. It was found that 86% of respondents believe that infographics contribute to the dissemination of scientific content, a result in line with those obtained by Vilaplana Camús (2019) where it was found that 86.1% of respondents consider that it is interesting to include infographics as an additional value to their publications. Valderruten (2021) argues that the creation of infographics directly contributes to the social appropriation of knowledge, a fundamental factor for the development of societies.

Table 2 shows the willingness of the surveyed authors to share the infographics in their social and academic networks.

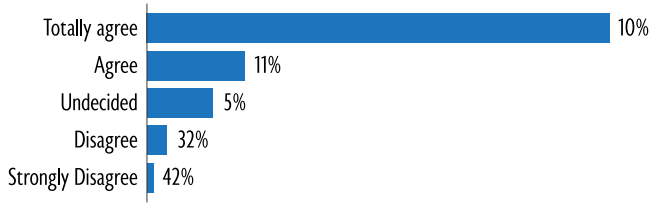


Figure 3
The infographics shown are a determining element for the visibility and dissemination of scientific articles.

Note: Prepared by the authors with data from the 2023 survey

Conclusions

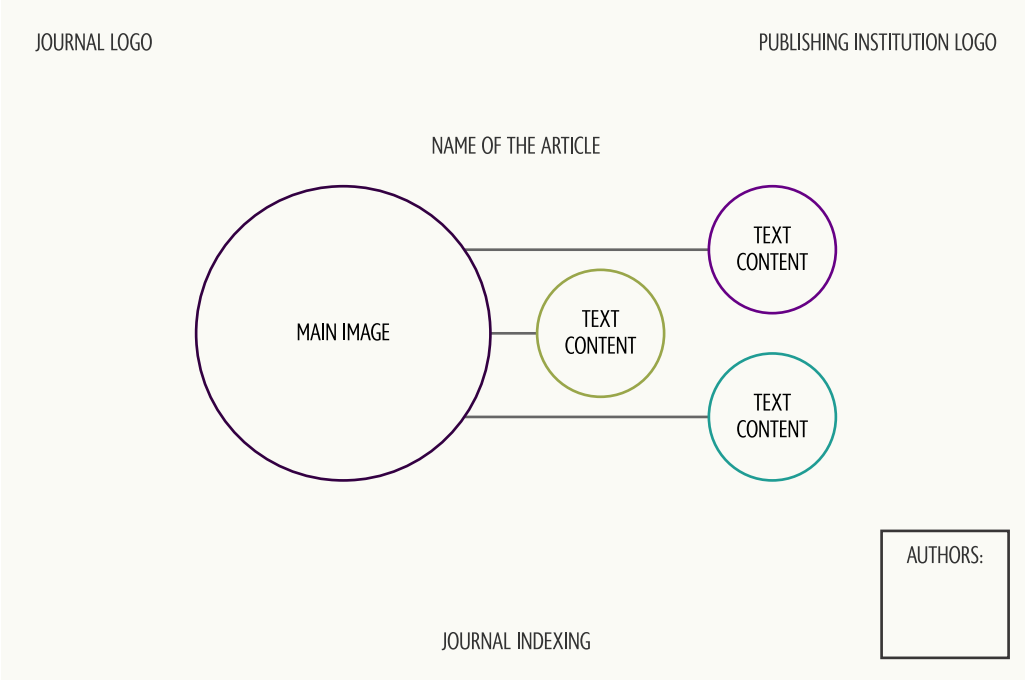
The era of digital identity is in full swing and its influence in various areas of society is constantly growing. In the scientific field, which was the focus of the study, the presence of the digital and technological has had a significant and profound impact, in this sense the use of social networks, management, creation and dissemination of strategic digital content by scientific journals becomes decisive for their management and to increase the visibility of published scientific articles, all this without neglecting the quality with respect to methodological and scientific rigor that by itself suggests the publication of a research article.

Table 2
Availability to share infographics

Evaluated feature	Yes	No
Would you voluntarily share the infographic shown in your Social Networks?	85%	15%
Voluntarily you would share the infographic shown in your Academic Networks	97%	3%
You would voluntarily share the infographic shown on your WhatsApp profile	65%	35%
Voluntarily you would share the infographic displayed in the classes you teach	92%	8%
You consider that the infographic is a kind of award given by the journal for the work done in your research.	85%	15%
When selecting a scientific journal to submit your research article to, do you consider this element (the infographic) to be a determining factor in your decision?	75%	25%

Note: Prepared by the authors with data from the 2023 survey

Figure 6
Proposal for the development of infographics.



Note: Prepared by the authors base don Herrera (2019)

The creation of an infographic as a complementary element to the scientific publication, to be shared in the different virtual environments where the journal is located, suggests an increase in the interest of the new generations of researchers, who are much more immersed in this new digital world where the management of their researcher identity is increasingly crucial for their professional career. It is precisely at this point where infographics contribute to the development and dissemination of research work carried out by the scientific-academic community, in line with this it was evidenced that the creation of infographics by scientific journals becomes a determining element for the researcher when selecting a journal and submitting their work, 75% of the respondents said so. In view of this, the creation of infographics becomes very important for scientific journals that adopt this digital strategy, as they would see an increase in

the number of submissions they receive and this would lead to the generation of positive statistics for the publication, in addition to increasing its visibility.

Researchers see the use of infographics as a motivational element or "reward" for the work done, given that few scientific journals use this type of graphic elements for their published articles. In view of this, it can be concluded that the respondents demonstrated their willingness to share this element in their social and academic networks, in addition to using it as a means of support for the classes they teach. The above described undoubtedly makes a significant contribution on the one hand to the positioning of the journal and on the other hand also helps the positioning of the publishing institution, which favors visibility and internationalization. For this purpose, it is necessary to include the logos of both the scientific journal and the publishing institution in the infographics, as shown in the proposal of this study. It can be added that for everything to work there must be a strong commitment on the part of the editorial team and the management of the journal's social networks.

As limitations of the study, it can be pointed out that the sample involved the participation of authors from different countries and articles from different thematic areas, which provides general and not specific results, in addition to the fact that only the journals shown in Latindex catalog 2.0 on its web page were considered. Therefore, as future lines of research, the scientific-academic community can be invited to conduct research involving only journals that have adopted infographics as a visibility strategy and observe the satisfaction of authors and the effect on publication metrics. Studies can also be developed that involve representative samples of specific countries, specific thematic areas or analyze journals present in other indexes.

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