

Science communication in blogs of scientists: reflexivity and collaboration

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Abstract

We study the configuration of science communication in science blogs written by scientists. The studied phenomenon fits into the contemporary context of participatory culture where there is an increasing of initiatives of scientists in the creation of independent blogs. In initial mapping, we located 66 Brazilian science blogs written by researchers and graduate students. A preliminary analysis, based on the observation of 1.187 posts of science blogs, makes it possible to describe some characteristics related to their content and use by scientists. Results show that the content is distributed in the following categories: scientific themes, scientific praxis, services and others. Scientists use blogs to disseminate scientific and informal contents that have no place in scientific traditional publications. In the first case, blogs extend accessibility and interaction between scientists and readers, by facilitating the access of any user of the internet to information that was previously restricted to a smaller group of scientists. In the second, blogs occur as spaces of reflexivity where the scientist exposes its worldview and reflects and discusses issues that impact their daily practice. By potentiating an approximation with non-specialized public, blogs can consolidate themselves as spaces of interaction and collaboration between scientists and non-scientists.

Introduction

The extensive use and dissemination of social media has transformed communication in a large scale, bringing possibilities of content production and consumption. What Shirky (2011) calls participatory culture is enhanced by the accessibility and low cost to disseminate content of social media and spreads herself to science community. The willingness to participate, produce and interact can be seen in how scientists are increasingly involved in social networks such as Facebook, ResearchGate and Academia.edu¹.

According to Shirky (2011), the main revolution caused by new communication technologies is the inclusion of ordinary people in content production processes. This is the case of science blogs written by scientists and ordinary people interested in science. There, bloggers can publish materials without asking permission for journalists or other press professionals. Science blogs have grown over the past years. In Brazil, the two most expressive groups of blogs (ScienceBlogs Brazil and Anel de Blogs Científicos²) aggregate about 240 blogs of science written in Portuguese.

Before this panorama, we are interested in knowing more about how the insertion of scientist on-line functions, how blogs function and which content is most widespread in these spaces. In this paper, we study the configuration of the content of Brazilian science blogs written by researchers and graduate students. Our principal objective is to investigate what kind of content is presented in science blogs, followed by how these spaces are used by scientists.

Methodology

We based the content analysis of science blogs on the observation and description of 45 blogs written by scientists, 17 of Biological Sciences, 14 of Social Sciences and 14 of Natural and Exact Sciences, totalizing 1.187 posts from January to November of 2013. We selected this corpus from the groups of blogs “Anel de Blogs Científicos” and ScienceBlogs Brasil. The selection was based in the following criteria: 1) Brazilian blogs

¹ The ResearchGate (<http://www.researchgate.net/>) and Academia.edu (<http://www.academia.edu/>) are social networks of the internet of researchers, which enable these create a profile presentation, add their scientific articles and connect with other researchers in your area. Created in 2008, the networks are currently used by over three and four million researchers around the world, respectively.

² <http://anelciencia.wordpress.com/>

of science communication; 2) blogs with frequent updating and 3) blogs of researchers (phD professors bound to research and teaching institutions and graduate students). The last criteria was achieved by the utilization of *Lattes* platform³ to identify Brazilian researchers. We compared the bloggers' name with *Lattes* data.

Results

Based on observation, we divided the content of science blogs in the following categories: scientific themes, scientific praxis, services and others. Their recurrence in the *corpus* appears in figure 1:

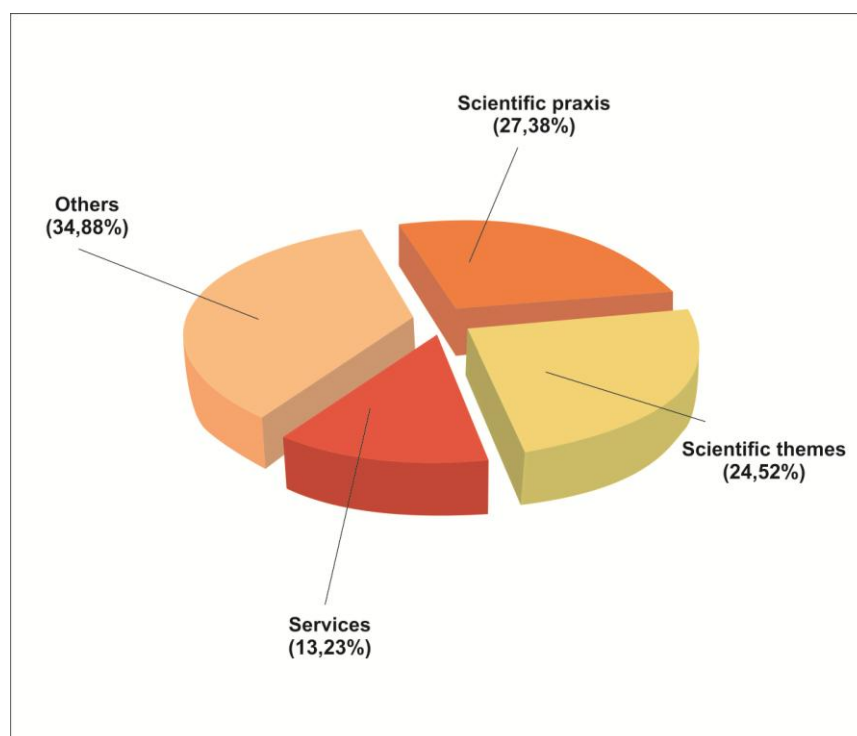


Figure 1 – Science blogs content

“Scientific themes” category is composed by posts that intend to disseminate informations about a specific scientific field. There are texts about research objects, theoretical discussions of scientific concepts and presentation of the results of a recent

³ The Lattes (www.lattes.cnpq.br) is a platform of the Brazilian National Agency of Scientific Research (CNPq) used to registrate the curriculum of researchers and activities of research groups. Curriculum Lattes has become a national standard of data about scientists and is adopted by most funding agencies, universities and research institutes in Brazil.

scientific study. Texts try to explain reality and daily themes by science's point of view, reiterating it by the insertion of interviews with scientists and the citation of other studies.

In blogs of Biological Sciences, posts are about biological phenomena and bring explications about plants, animals, etc. In blogs of Social Sciences and Natural Sciences, the texts are about theoretical and epistemological discussions and concepts. These texts quote scientific studies and have books and scientific articles references in the end of the post. Usually, they are hyperlinked to "Research Blogging"⁴, which makes them visible to a larger number of people. The aggregation to the site increases the circulation of the *post*, connecting it to other blogs about scientific researches.

There are posts about scientific research results and ongoing projects of the blogger. The blog "Colecionadores de Ossos", for example, provides partial results of an archaeological expedition of a group of scientists searching for fossils of vertebrates on the Brazilian northeast⁵. In this case, the blog allows the reader to participate in the research process through access to these videos.

The category of "Scientific praxis" addresses reflexive and critical texts about science system, its practices and politics and personal experiences in research. The aim of the blogger is to show how science is done to his readers, bringing aspects of everyday science and its structure. In the first case, the blogs provides the readers' approximation with the routine of science labs and the craft of scientist. In the second, it shows the political and economic structure that supports science, bringing at the same time an activist profile of the scientist blogger.

The texts intended to show the laboratories' routines have an informal language and relate research experiences of the scientist blogger, as the failure of experiments, the challenges of master's and doctorate and of academic writing. Texts with tips for beginning researchers about developing scientific writing, making a promising scientific career, finding scientific articles on the Internet, creating an online resume are also inserted in this category. In this case, blogs serve as manuals for students to begin their careers as researchers.

⁴ <http://www.researchblogging.org/>.

⁵ The post is available in: <http://scienceblogs.com.br/colecionadores/2013/04/em-busca-do-permiano-parte-1/>. Access in 6 of November 2013.

The category of “Scientific praxis” also contains opinionated posts that are critical to the functioning of the scientific system and the structure of research in Brazil. There are blogs that have a significant amount of these texts, which are marked a political-ideological bias, such as “A Neurocientista de Plantão” and “Ciência Brasil”. The first advocates the professionalization of the scientist, the second deals with allegations of plagiarism and scientific fraud. These blogs are written by researchers and activists inserted in political activities and become tools for them to express their causes.

In the category of “Scientific praxis”, there are posts that discuss the practice of science communication and blogging in a reflexive way. In addition to reflecting on the scientific activities within the lab, the scientist blogger occupies the blog as a space for reflection and defense of their relations and practices of science communication to the wider public.

The category of “Services” covers posts with an informative tone used to divulgate some services, such as academic lectures, podcasts, research founding and scientific articles, or display of materials, such as books, films and scientific articles. This category of posts provides information to the readers on activities and lectures promoted by graduate courses in Brazil. They promote the event before it happens or evaluate and make available the lectures and content of what was discussed at events that have already occurred. In both cases, there is the inclusion of the blogger comments on events scientist.

Ten of the 27 posts of the blog “Ácido Cético” belong to the category of services, configuring themselves as texts that publicize the radio program “Fronteiras da Ciência”⁶. The program is available in podcast format on a specific site linked by the blog. The blogs “A neurocientista de plantão” and “Você que é biólogo...”⁷ also use this kind of post, as they offer videos and other materials of lectures and classes given by scientist bloggers. The first one offers Suzana Herculano’s lectures at universities about the scientist professionalization. The second one also makes use of this feature, by providing some of the blogger’s presentations on scientific seminars for download. Users who want to delve into these issues and were unable to attend the events can access this material.

⁶ The blog is available in: <http://coletivoacidocetico.blogspot.com.br/>. Access in 5 of November of 2013.

⁷ Blog provides event presentation of the blogger in: <http://scienceblogs.com.br/vqeb/2013/04/de-muitos-para-muitos-a-educacao-do-ponto-de-vista-do-cientista/>

Another initiative used by blogs inserted in the category of “Services” is the publicity of research founding, known as crowdfunding. It uses blogs to articulate a network of people and raise money for scientific projects. The blog “Você que é biólogo...”, for example, made a campaign to raise money to finance a research project about the mussel genome. The project, divulgated in April 2013, had over than 350 donors and achieved 40.000 Brazilian real in 60 days.

At last, the category of “Others” provides texts on other non-scientific subjects, depicting aspects of reality and social events viewed from the perspective of the scientist blogger. This category includes the largest amount of posts (414) when compared to other categories, which is nonetheless surprising considering that the central theme of the blogs is science. This significant amount of posts on non-scientific subjects is due mainly to the content of the blog “Ciência Brasil”, which encompasses 289 posts, 69.8 % of the total. These posts contain texts of political parties that have no direct relationship with science.

Other posts that belong to this category refer to texts on everyday themes that has no relationship with the scientific practices of the scientist blogger. Many texts report issues recently discussed in social media and traditional media, as was the case of the mobilizations and protests in various cities of Brazil on June of 2013.

Discussion

The analysis of the posts of science blogs show them as spaces of dissemination of traditional scientific communication and of other informal contents that have no place in scientific traditional publications. In this sense, blogs are spaces that congregate a few tasks of other science communication dispositive, offering at the same time new utilizations, treated by researchers as new affordances (MILLER, 2009; DAVIES & MERCHANT, 2007). For Miller (2009), the affordances of blogs are properties of information and interaction (hiperlinks, etc.) offered to the user to serve communicative uses, which are different from other media.

The differential of blogs is to aggregate a various number of functionalities, as they can work at the same time as a space of dissemination of content and expression of

opinions of the research blogger⁸ (KJELLBERG, 2010). In the first case, blogs can extend accessibility and interaction between scientists and readers, by facilitating the access of any user of the internet to information that was previously restricted to a smaller group of scientists. Posts of “Scientific themes”, for instance, can connect to each other, which generates a dynamic and richer content.

Blogs also occur as spaces of reflexivity where the scientist exposes its worldview and reflects about issues that impact directly on their practice, as shows the “Scientific praxis” category. The non-scientific contents (“Others” category) of science blogs brings a profile of a scientist that is also a citizen. Blogs contain impressions of scientist bloggers about the reality outside science laboratories and experiments, opening space to the construction of an image of a scientist that is not only interested in his own specialty, and has also opinions about other subjects.

The other aspect about blogs is their articulation with social sphere, as Bruns and Jacobs (2007) comment:

For example, it is the social networking of blogs and the potential for collaboration that provides a decidedly human dimension to the publishing and publicizing of information. By personalizing content, blogs go beyond a purely informative role and provide a platform for debate, deliberation, and the expression of personal identity in relation to the rest of the (blogging) world (BRUNS; JACOBS, 2007, p.5).

The blogosphere is, thence, constituted by the construction of networks between individuals, allowing these users to dialogue intensively using hyperlink structure. As other blogs, science blogs reinforce ways of collaboration in science blogosphere that would be difficult outside the internet. Crowdfunding is an example. The articulation with other blogs helped the blog “SynbioBrasil” to raise money for a group of students of São Paulo to go to a competition of Synthetic Biology. The blog “Você que é biólogo...”

⁸ According to Kjellberg (2010), there are other functionalities for blogs to scientists, such as keeping up-to-date information, remembering, writing, interacting and creating relationships with other scientists.

also publicized their cause in Brazilian off-line journals and magazines, gaining the attention of future donors.

Initiatives in science blogs are related to another communication dynamic between scientists and non-scientists. As Porto (2010) has shown in her study, interactivity between production, circulation and consumption has been transformed by the use of blogs:

Through interaction mechanisms as hiperlinking, reviews, among other tools proposed by blogging, [blogs] are adopted in the science communication process as an artifact capable of making the information circulate on the Web, not just informing the ordinary user, but also enabling him to establish a dialogue where it is possible to senate some questions and get more information about science (PORTO, 2010, p.16).

Conclusion

Blogs written by researchers imply some changes and reconfigurations in the practices of scientific field. These operate in two different spheres: intrinsic, related to scientists and their writing, and extrinsic, which enclose the relationships between scientists bloggers with their peers and the public. The first one provides other forms of expression of the scientist through the blog, which has space to express their ideas and reflect about science and scientific practice. Blogs have become essential for the exercise of reflexivity by scientists. In addition to reflecting on their scientific practice - as they do in other scientific media - these individuals also use blogs to reflect on wider issues about the practice and scientific institution .

Beyond the intrinsic transformations on scientific community, blogs also provide extrinsic forms related to the scientist modifications to communicate with their peers and society in general. As science blogs constitute themselves as spaces of broadcast content, they empower a closer relationship with the non-specialized public. These categories can be linked to the increasing of visibility of institutions and individuals provided by blogging. In these spaces, it is possible to create specific relationships between scientific institution and society, based on dialogue and collaboration.

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