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BOOK REVIEW

DIGITAL SCIENCE COMMUNICATION: NEW NEEDS, NEW CONTEXTS AND NEW GENRES

María-José Luzón and Carmen Pérez-Llantada (Eds.). SCIENCE COMMUNICATION ON THE INTERNET. OLD GENRES MEET NEW GENRES (2019), Amsterdam/New York: John Benjamins. 242 pp., ISBN-978-9-0272-0466-0 (HBK) ISBN-978-9-0272-6179-3 (EBK).

The exponential growth in the amount and the complexity of information transmitted and shared on the Internet and the capabilities offered by this medium (e.g., hypermedia, multimodality, interactivity) result in the continuous emergence of new genres, the recontextualisation of traditional ones as well as new literacy practices. The interpretation and understanding of these new complex multimodal genres and practices calls for new models of analysis, and new approaches to genre analysis have to take centre stage as *Science Communication on the Internet* shows. The book highlights the natural connection between the dramatic increase in digital communication in the academic field and the Open Science movement – as pointed out by the editors in their introductory chapter – on the grounds that Web 2.0 provides spaces and tools for the public dissemination of science to a diversified audience. It also details how digital genres co-exist and interact in complex ways in a single communicative space, and how researchers have to cope and keep pace with ever-changing needs in professional and academic settings. *Science Communication on the Internet* is a necessary response to a growing interest in the intersection between technology, discourse, and research and professional practices in the Open Science era, as previously attested by volumes such as Luzón, Ruiz-Madrid, and Villanueva (2010) or Bou-Franch and Garcés-Conejos Blitvich (2019).

This volume contains 11 chapters that apply varied and combined methodologies to explore the true nature of digital genres for science dissemination from different perspectives. This approach enriches the volume and endows it with extra value, while also allowing the reader to further understand the complexity of the semiosphere of digital genres.

The book begins with an introductory chapter by the editors (Luzón and Pérez-Llantada) (Chapter 1), which provides an overview of genre theory and its evolution in the digital era. This chapter calls for a different perspective to be adopted on digital scientific communication research. The authors conclude that there is a need to move from the analysis of single genres to the study of the synergies and networks between digital and traditional genres to further understand the true ecology of genres for online science communication. The chapter ends with a brief overview of the contributions of the volume.

Chapter 2 focuses on the research article. First, Harmon reviews previous works on the scientific article from its origin to the digital era. The literature review carried out in the study reveals significant changes in journals as a whole, as the author explains: "journal contents have been radically transformed into a diverse assemblage of genre" (p. 23). The scientific article, however, does not seem to have evolved in such a dramatic way, the essence of the digital genre being very similar to that of the printed version. He then shows how the Internet could affect the generic nature of the scientific article by analysing two articles published by the Public Library of Science (PLOS), which exemplify many of the advances the Web 2.0 affords for online science communication. Finally, Harmon paves the way for future research by enumerating some conventions that could become the defining generic traits of the digital scientific article of the future.

In line with Chapter 2, Chapter 3 also points out the stability of the science article as a genre, despite the evolution in terms of complexity and variety of interconnected digital artefacts that shape the online ecology this genre inhabits. Mehlenbacher and Mehlenbacher highlight the importance of analysing the evolution of academic genres not only from the technological perspective but also as a response to new community discursive practices. This is the case of the Registered Report, which provides researchers with a discursive artefact that can be used to give "a direct response to the contemporary replication crisis" (p. 43) in the life and psychological sciences. In this particular case, Registered Reports means a new approach to the Peer Review process, which is defined in two differentiated stages: first, the theoretical framework and the method sections undergo the first round of peer review, and once these sections have been accepted the full article is sent out for the second round of peer review. This chapter clearly shows how old and new genres interact in a complex and enriching way in order to make genres evolve.

Chapter 4 explores the status of the Graphical Abstract (GA) as a digital genre and its relation to similar genres such as verbal abstracts and research article visuals. Hendges and Florek analyse a textual sample of 30 GAs from the field of

chemistry and engineering taking into account three different categories: i) layout and visual entities; ii) originality, and iii) nature of the images. They complement this textual analysis with data from journal editors' and authors'/readers' practices and perceptions collected by means of online questionnaires. The authors conclude that the GA should be considered a digital genre under construction due to the lack of uniformity in terms of layout, originality and nature of images within and across disciplines. They also consider GA as complementary to verbal abstracts and research article visuals that could be understood as the natural evolution of multimodal discourse in the field of journal publications for promotional and persuasive purposes.

Chapter 5 investigates the role audiovisual affordances play in the evolution of three different genres: Three-minute Thesis presentations, author videos and podcasts on a popular science, and research journal website. What the three genres have in common is their audiovisual nature and their brevity. With a corpus of four "scholarly soundbites" (p. 84) – as the authors called the audio and video recordings they analyse – Rowley-Jolivet and Carter-Thomas conduct a Swalesian move-based analysis to explore to what extent these genres differ from their written equivalents (theses and research articles). Results show differences in content, rhetorical structure and communicative strategies due not only to the medium, but also to the need to reach wider audiences for the promotion and democratisation of science. This chapter raises important issues for genre analysis and genre theories by questioning the extent to which the affordances of the medium can affect the communicative aim of the genre and eventually transform it into a different genre.

Chapter 6 by Breeze looks into the genre status of peer review. Digital media allow this traditionally private communicative process to be made public and transparent for the community, as is the case in the online journal *eLife*. This open process can affect the nature of this particular genre. These changes are analysed in this chapter and, in line with previous chapters, it sheds further light on the evolving process of digitalisation of genres in general and peer review in particular. Drawing on a qualitative and quantitative analyses of anonymised and public responses to peer reviews in the biomedical sciences, Breeze explores both relational features such as interpersonal aspects and textual features such as length, organisation and complexity of response. She concludes that the visibility of the process afforded by the medium has led to slight but persistent changes in the author response genre, making authors' discourse longer and more complex, and also more elaborate concerning relational work.

Chapter 7 draws on the analysis of research-based articles from the *Harvard Business Review* website. In particular, Maier and Engberg study adjusting strategies employed in the transition from this genre to other generic forms with the aim of widening the potential audience. In doing so, they follow a twofold approach: first, from a multimodal perspective, they explore the nature of the multimodal ensembles that have emerged according to audience expertise in the

mediation and remediation process. The second approach involves adopting a more structural perspective by applying levels of explanatory depth to analyse the knowledge base created by the multimodal text. Results confirm the validity of this particular framework to explain the nature and role of multimodal ensembles in the relations between the three articles analysed and the different genres accompanying them (an interview, a video and a webinar).

Chapter 8 further elaborates on the role of hybridity and hypermodality in digital knowledge dissemination. Focusing on the *IEEE Spectrum* website, Mirović, Bogdanović and Bulatović explore the way in which nine digital articles offered on this website make the most of the digital medium to reach a wider but also more diverse audience in terms of levels of expertise. The analysis is carried out following the multileveled knowledge building model described and validated in Chapter 7. Results indicate that the digital articles from *IEEE Spectrum* can be considered a new hypermodal genre. The characteristics of the genre are modified to integrate existing and new genres, which results in a dynamic and multigeneric entity with which to respond to the diverse potential audience of the magazine. The chapter offers pathways for future research on multiliteracy competence in the field of digital communication in general and online science communication in particular.

In line with previous chapters, Chapter 9 combines a multimodal approach and a corpus-based analysis in order to shed light on the genre nature of ECDC_VPD tweets. Drawing on the two corpora compiled from the @ECDC_VPD Twitter account of the European Centre for Disease Prevention and Control's (ECDC) Vaccine Preventable Diseases (VPD) Programme, Orpin examines the semiotic-discursive strategies used by @ECDC_VPD tweet authors to recontextualise information from epidemiological reports in a character-constrained genre targeted at a more heterogeneous audience. Results show that the macro-structural properties of @ECDC_VPD tweets have increased in complexity over time and, as a result, more complex meanings are communicated.

Chapter 10 focuses on the recontextualisation of a traditional print genre: the Laudato Si'. Smart and Falconer describe the epistemic discursive activity organised by two genre sets, where the Laudato Si' occupies a place. The first genre set includes discursive practices (the ACTA, the summary report, the papal address and the papal encyclical) between a succession of eight Popes and generations of Academy scientists on their shared concern for advances in science and technology. The *launch-day* genre set – as the authors refer to it – consists of the digital textual responses in a number of genres, in which the authors recontextualised different aspects of the Laudato Si'. The authors conclude that Laudato Si' can be considered a hybrid genre, which combines digital traits and affordances with the rhetorical aim of the traditional print version, the ultimate aim of this digitalisation process being more effective dissemination and the widening of the potential audience.

Chapter 11 delves into the issue of polycontextuality and context collapse in the digitally-mediated production and communication of research in the field of the biological sciences. Reid and Anson carried out a qualitative case study on the citizen science *Heartbeats Project* that allowed them to shed light on how scientists employ digital genres to accommodate different communicative needs and aims in order to multiply their communicative effect and reach varied public audiences (expert–amateur). In line with Chapter 8, this chapter also highlights the need to further explore digital literacies that could help scientists not only "to effectively navigate the digital age as a scientist", but also "to shape scientific communication for the digital age" (p. 235).

This volume focuses on issues such as the transformation of genres from one medium to another, the emergence and evolution of genres in digital contexts, the identification and classification of digital genres, the relationship between traditional print genres and their digital counterparts, the recontextualisation of expert knowledge through the Internet genres, the erosion of boundaries between audiences, and the relations between genres intended for audiences with different degrees of expertise or disciplinary knowledge, among others. Although closely intertwined and crucial to understanding online science communication genres, these issues are frequently discussed separately, with little reflection on the need to combine them in order to develop an integrative multidimensional framework for digital genre analysis. Despite this, *Science Communication on the Internet* undoubtedly opens up avenues for further study on online science communication by exerting far-reaching implications on future research into the recontextualisation of expert knowledge through Internet genres. At the same time it highlights the timely relevance of the increasing digital turn of scientists' social activities.

This book will be of great interest to researchers and practitioners of any discipline, since it raises awareness of the fact that academics need to meet the intellectual expectations of varied interdisciplinary and expert-level audiences to produce effective online science communication. Students and scholars of academic discourse analysis, specialised discourse, corpus linguistics, linguistics and other areas concerned with interdisciplinary science communication around the world also stand to benefit greatly from reading this significant work.

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