



## **“Meet our group!”: Addressing multiple audiences on the websites of Spanish research groups**

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### **ABSTRACT**

Websites offer research groups a powerful tool for self-promotion and dissemination of their research to a diversified audience. The aim of this study is to explore how research groups affiliated to a research institution in a non-Anglophone country compose their websites to achieve visibility and impact and reach multiple audiences. Content analysis of the websites and semi-structured interviews were used to examine the language(s) in which the websites are written and their content. The study shows that through these websites research groups address simultaneously the international disciplinary community and various local audiences and that these audiences shape the choice of language and content. Findings from this study provide insights into new communication and representation practices engaged in by research groups to meet disciplinary goals, requirements for funding, and society's demands.

**KEYWORDS:** Research groups, Digital composing, Academic websites, Audience, Language choice, Multilingual practices.

### **1. INTRODUCTION**

Academics are increasingly resorting to digital genres to enhance their visibility, publicize their research activity and reach various audiences (Bukvova, 2011; Herman & Nicholas, 2019; Hyland, 2012; Kjellberg & Haider, 2018; Kousha & Thelwall, 2014; Luzón, 2017). New digital genres have emerged whose affordances (e.g. heightened multimodality, hyperlinking, interactivity, global reach, ease of composing) facilitate the sharing of scholars'

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research outputs and enable them to present information in various formats, thus adapting it to the needs of multiple audiences. This proliferation of new genres of academic communication has led researchers on EAP (English for Academic Purposes) and academic literacies to reconsider what it means to produce academic texts in the 21<sup>st</sup> century. They stress the need to address the changes that digital genres “imply for academic literacy practices” (Hyland & Hamp-Lyons, 2002: 9), to consider academic texts from a multimodal perspective and to recognize the salience of linguistic diversity in academic production (Lillis & Tuck, 2016). This rethinking of what academic writing means calls for more research on how academics are composing digital texts for new social purposes. The aim of this study is to contribute to this research by analyzing an under-researched genre of academic communication: the research group website (henceforth RGW). I will focus in particular on websites of research groups affiliated to a non-Anglophone institution in order to explore their multilingual, multimodal and hypertextual composing practices in these digital spaces.

Research groups are currently the basic organizational unit for the development of research activity at universities (Vabø, Alvsvåg, Kyvik & Reymert, 2016; Wuchty, Jones & Uzzi, 2007) and therefore it is essential to examine how they communicate and distribute knowledge and how they promote themselves. In a research context where institutions compete for resources and where collaboration, public communication and education for all are becoming an essential part of the scholarly endeavour (Herman & Nicholas, 2019), universities and funding agencies expect groups to produce research outcomes with social and international impact and to engage in outreach activities (see *Spanish Strategy for Science and Technology and Innovation*, 2012). The Internet offers research groups a unique environment to disseminate their research findings both within their disciplines and outside academia and demonstrate the value of their research activity.

One of the tools that research groups are using to increase their visibility and enhance their academic prestige is their website (Thelwall, Li, Barjak & Robinson, 2008). There is abundant research on how university websites are composed to promote the university, enhance its reputation and distribute content to a global audience (Saichaie & Morpew, 2014; Tomaskova, 2015; Zhang & O'Halloran, 2012). Researchers have also examined how individual academics use their university homepages to construct their identity, thus contributing to the institution credibility (Hess, 2002; Hyland, 2012). There is, however, little research on the websites of research groups, despite the fact that many groups in the developed world have their own websites; and their role in publicizing the group's research has been acknowledged in several studies (Jiang & Fitzgerald, 2019; Pagliaro, 2019; Thelwall et al., 2008). Thelwall et al. (2008:19) consider the web “a key method of advertising a research group” and list three potential benefits of RGWs: “increased visibility for the outcomes of research (...); increased networking opportunities (...); and an increased ability to attract members for the group”. Given the potential of these websites for impression

management and dissemination of research outcomes to various audiences, there is a need for more research on the purposes for which they are used in the context of scholarly communication and on the ways research groups compose them to meet demands for research impact, visibility and outreach.

In this study I examine how a set of websites by research groups at a Spanish University are composed to publicize the group and make their research available to various publics. Following previous research on online scholarly communication (e.g. Bukvova, 2011; Hyland, 2012; Luzón, 2017), I analyze the content included on the websites (i.e. the type of information provided). In addition, given that language choice is a resource for identity creation and “audience design” (Bell, 1986) both in scholarly and online communication, language choice on the websites will also be explored. When composing their websites, groups affiliated to non-Anglophone institutions may choose to write them in English, the main lingua franca for academic global communication, or in their first language (L1); they may also choose to integrate both English and their L1, engaging in multilingual practices enabled by the digital environment. Research on the factors that lead scholars and research groups to choose particular languages for their online writing is scarce (e.g. Han, 2017; Luzón, 2017), but essential to understand digital academic communication.

The main questions guiding this research are the following: (i) Who are the intended audiences of these websites? (ii) What contents do these websites feature and how are these contents determined by the intended audiences? (iii) What factors influence the choice and co-existence of language(s) on these websites? Answers to these questions contribute to a broader understanding of the communication and representation practices of research groups in digital settings and provide insights into how these groups are harnessing digital media to respond to new rhetorical exigences and reach diverse audiences.

## **2. BACKGROUND**

### **2.1. Academic websites**

In this knowledge-intensive society, a primary goal of researchers (and research groups) is achieving a good scholarly reputation, since it results in rewards (i.e. resources, promotion) and research opportunities (Herman & Nicholas, 2019). Herman (2018) defines “scholarly reputation” as “the expert appraisal of a scholar’s standing in their collegial reference group, which is collectively determined on the basis of their research achievements” and points out that “successful scholarly reputation building is contingent upon making one’s research visible”. The possibilities afforded by the technological capabilities of websites can be exploited by research groups to showcase their work, demonstrate the value of their research, by making it accessible and understandable to various publics, and thus build their reputation.

Research on scholars' self-representation and impression management online has revealed that scholars carefully and intentionally select and assemble semiotic resources to construct an identity in accordance with the expectations of their imagined audiences (Hyland, 2012; Lupton, Mewburn & Thomson, 2017). This intentional self-representation involves making several decisions (Lupton et al., 2017), such as what platform to use, what information about themselves and their work to include in digital spaces, or what images to choose to represent themselves.

A feature of websites that makes them particularly appropriate for reaching and presenting oneself to various audiences is their hybrid, hypermodal nature. Many digital genres are composed by incorporating other genres through embedding (i.e. reusing texts or fragments of text representing another genre) or linking (i.e. enabling the reader to follow the link into another genre) (Crowston & Williams, 2000). These composing and linking affordances of digital genres allow the producers to integrate a variety of documents (in various modes, formats and languages, and from different platforms) in a single text, which facilitates uptake by multiple audiences simultaneously (Luzón, 2017). Websites, in particular, are complex or composite objects, which may be used to meet various communicative purposes at the same time (Catenaccio, 2012; Tomaskova, 2015). Catenaccio (2011:40) describes them as “hypertextually organized rhetorical interface[s] providing structured access to a network of genres” and emphasizes that while they are self-contained entities, they “have a composite nature” and “embed a multiplicity of genres” (ibid.:47).

In her study of university websites, Tomaskova (2015) stresses that their composite nature and the combination of semiotic resources facilitate the promotional purpose; these websites are composed of a set of texts of various sub-genres which work together to achieve a unifying communicative purpose: “presenting the institution and promoting it” (Tomaskova, 2015:79). Zhang and O’Halloran (2012) also show how hypermodal resources (e.g., text, image, hyperlinks) are integrated on university homepages to create institutional identity and marketize the university. Hyland (2012) examines how visual, textual, and hyperlink features are combined on the homepages of individual scholars to construct their identity as expert and credible members of the community. As for RGWs, they also have a unifying primary purpose, i.e. to publicize and promote the group’s capabilities and research (Thelwall et al., 2008), but each group may use the website for more specific purposes related to their intended audiences, which will determine their choices of content and language when composing their websites.

## **2.2. Audiences and language choice**

### **2.2.1. Language choice in academia**

Studies on the writing and publishing practices of scholars in non-Anglophone countries have revealed that their language choice is influenced by several variables, among them institutional constraints, community expectations, domains and modes of discourse, language competence, publication outlet, linguistic loyalty, topic or genre (Flowerdew & Li, 2009; McGrath, 2014). One of the most important factors determining language use is the target audience (McGrath, 2014; Petersen & Shaw, 2002). Although English is the language chosen by multilingual scholars to publish articles intended for the international research community, these scholars tend to use their L1 to publish their work in local journals for their national disciplinary community. Two variables closely related to the target audience are the disciplinary practices (Flowerdew and Li, 2009) and the genres used for dissemination. Petersen and Shaw (2002:372) report that language use by scholars from different disciplines was determined by the “demands, norms, and language practices” of the various international and local communities in which they participated. In her study of the languages used for publication by scholars at a Swedish university, McGrath (2014) found that language use varies across disciplines and that the dominant language in outreach was the local language, Swedish.

### **2.2.2. Language choice on the Internet**

Previous research has identified several interrelated variables affecting language choice on the Internet and especially in social media, e.g. topic, context and domain of communication, intended audience (Androutsopoulos 2014; Seargeant, Tagg & Ngampramuan, 2012). The theory of “audience design” (Bell, 1984), according to which speakers “design” their style (including language choice) in response to the social characteristics of their audience, has been used to account for language choice in digital contexts. The choice of English is a strategy to maximize the audience, and therefore English is used in these online environments when the writer wants to reach an international audience, while the L1 is used to address speakers of this L1 (Androutsopoulos 2014; Seargeant et al., 2012).

Although most studies on language choice on the Internet have analyzed social media, language choice on websites has also received some attention (Bondi, 2015; Callahan & Herring, 2011). An interesting study on language choice on websites intended for knowledge dissemination is that by Bondi (2015). She analyzed the interplay between the communicative genres in the thematic sections of the EFSA (European Food Safety Authority) website and language choice, and found that English is the dominant language in

the most technical reports, while the genres that most explicitly address the wider public (e.g. introductory and news sections) are translated into other languages.

### 3. DATA AND ANALYTICAL PROCEDURES

This paper reports on a case study of RGWs which take advantage of digital affordances to make the group's research visible and accessible. Online self-presentation is always situated in a particular context and contingent on the technological affordances of the digital space. A case-study approach was therefore adopted because this methodology facilitates a focus on the particularities of the groups and enables a deeper understanding. Data collection and analysis for this case study follows a mixed-methods approach, which combines analysis of the websites and feedback from the research groups through semi-structured interviews. The study draws therefore on two datasets.

The first dataset consists of 14 websites of research groups at the University of Zaragoza (henceforth UZ) (as they were in the week 19th-25th November, 2018). The UZ is a public high education and research institution, with 170 formal research groups (as listed on the "Research Organization" page of the university website). At the moment of data collection, 132 research groups at the UZ had their own multiple-page websites, 14 of which were chosen for analysis.

Since the study involved detailed content analysis of these websites, a manageable sample of websites was selected. The selection of these websites was guided by three criteria, the first of which was the use of Web2.0 affordances. As the study is intended to explore how the capabilities offered by the medium are being harnessed by some groups for self-promotion and research communication, only RGWs which incorporate Web2.0 affordances were selected. The other two criteria were the inclusion of websites from different disciplines, and the inclusion of websites with different language choices. It is important to consider discipline because research has shown that a variety of factors that affect the way computer-mediated communication is used (e.g. importance attached to collaborative research, use of data and models, commercial exploitation of research results) are related to the scientific field or discipline (Barjak, 2006). When deciding on the discipline of the websites to analyze, two facts were taken into consideration. First, consistent with previous research (Barjak, 2006), the number of UZ groups with a website was much higher in Science, Biomedicine, and Technology than in the Social Sciences and Humanities. In addition, few websites in the Social Sciences and Humanities took advantage of the potential of Web2.0 affordances. Thus, I selected websites of groups working in three scientific domains: Science and Technology, Earth Sciences, and Agrofood Sciences (see appendix A for a list of these websites). Table 1 shows the number of websites from each domain and the languages in which they were written.

	English	Spanish	English/Spanish
Science and Technology	6		1
Earth Sciences		2	2
Agrofood Sciences		1	2

**Table 1.** Scientific domain and language of analyzed websites.

A content analysis of the selected 14 websites was carried out. The questions asked for this analysis were the following: What content (i.e. type of information about the group) is presented (verbally and visually) on the website? What content is incorporated through hyperlinking and embedding? Atlas.ti, a qualitative software program, was used to code the data. Documents (consisting of screenshots of all the pages of the websites) were loaded on the program and the different types of content were coded following an inductive approach: although I took into consideration previous research on the content of other online genres used by scholars for self-representation (Bukvova, 2011; Hyland, 2012), I did not start from a priori coding list, but rather generated the codes from the data. Coding was an iterative process, which involved working through the documents several times and refining codes or merging those that were minimally different, until they described the data appropriately. The final codes for types of content are listed in Table 2. The same process was followed to code links and embedded genres (see Tables 3).

The content analysis of the websites was complemented with data collected via semi-structured interviews (conducted in Spanish) with the main researchers of the 14 research groups, with the person(s) responsible for the website, or with both. Informed consent was obtained. Semi-structured interviews are flexible enough to allow for unforeseen information, elaboration of the answers and clarifying questions. The interviews included questions about the group's motivation to create a RGW, the authorship of the website, their choice of language, the intended audience(s) of the website, and their use of specific content (see appendix B). The interviews, which lasted between 45 and 90 minutes, involved exploration of the website with the interviewees, which encouraged them to comment on the different elements and provided deep insights into the reasons for their choice of language and of specific contents. The interviews were recorded and transcribed for analysis with Atlas.ti. In this case codes emerging from the data were grouped into broader categories based on the interview questions (i.e. reasons to create the website, audience, choice of language).

## 4. RESULTS

The results section is organized as follows: first, the results of the interview as regards authorship, purpose, intended audiences and language choice are presented. Then, the results of the content analysis of the 14 website sample are discussed in light of the answers given by the informants during interviews.

### 4.1. Interview results

#### 4.1.1. Authorship, purpose and audience

Despite the importance of researchers' e-visibility for the institution where they work (see Hyland, 2012), the groups did not have technical support from their institution for the creation and updating of their websites. All the websites had been created, and were maintained, by the members of the groups themselves (except for one, which had been created by an external Web technician). In this regard, some of the respondents commented on the difficulties of maintaining the website, especially lack of time for updating. In some cases PhD students and younger members were in charge of the group's web presence, including the website. Interestingly, in addition to their website, 11 out of the groups had an online space on the website of their research institutes. However, this is a very constrained space in terms of the information (and formats) that can be provided, and respondents considered that it did not meet their needs.

The analysis of the interview data revealed several goals for creating a website, all of which have a reputational purpose: achieving visibility and attracting students, disseminating the results of scientific research to various publics, and creating group cohesion. These goals are closely related to the various intended audiences for the websites mentioned by respondents: members of the disciplinary community, doctoral students, funding agencies, private companies, the general public, local practitioners. There were differences between the groups regarding purposes and audiences, which revealed different missions, and different perceptions of their role in society.

The only goal shared by all groups was achieving visibility, especially within the disciplinary community. Since scholars increasingly search for literature online (Kjellberg & Haider, 2018), having a web presence makes it easy to "be found" in searches related to the group's research area (Thelwall et al. 2008). As respondents said, "If other researchers are looking for research on [field], we want them to find us"; "If you are not on the Web, it seems that you don't exist"<sup>1</sup>. The respondents mentioned several reasons why web visibility is important: it increases the possibility of being cited, establishing international collaborations, being part of international/ European projects and getting funding in some project calls; it also increases the possibility of getting private contracts and funding (of key importance for some groups), since information is also made visible to companies in the

sector. 8 out of the 14 respondents also stated that the website helped them to promote themselves in front of funding agencies and to show the research results obtained via the expenditure of public funds.

A related goal of three of these websites is to attract students. One of the respondents reported that their website was a repository with all the information on the group, where they can direct students who want to become members. These results are similar to those in Thelwall et al.'s (2008:20) study: these websites are a "kind of online prospectus" which inform students about the activity of the groups, although they may also be used by students to "find out about the existence of groups within the field".

The second most important goal was to disseminate research to a public audience and increase public appreciation for the discipline. The interested public was a target audience for five groups and the primary audience for one of them, the Aragosaurus group. The website of this group was originally created to provide the interested public with reliable information about the discipline, without the mediation of journalists. Another website (i.e. Proyecto Murero) was created to make the general local public aware of the importance of the archeological site on which they were working. The website Calidad y Tecnologia de la Carne (Meat Quality and Technology, CTC2) was also described by the respondent as a useful tool to reach the general public and the local practitioners and to democratize science:

For the food sector and the general public it is difficult to access the publications we generate (many of which are paid and in English) (...) For us it was essential that this information reaches the sector and the public in general (...) and the website is a convenient way to transmit information. We believe in "return to society" and that the results generated with public money should be public.

Interestingly, of the five groups who want to reach the interested public with their websites, three of them belong to the domain of Agrofood Science and two of them to the domain of Earth Sciences. The general public is particularly interested in the results of Food Science, because they may have a more immediate effect on their lives. Therefore, these websites are addressed not only at experts but also at local practitioners and the interested public, such as associations and organizations. Paleontology is also a discipline that arouses public interest and a field where, in one of the respondents' words, "interested public can understand published research". The primary audiences of the websites Aragosaurus and Proyecto Murero consist of members of various local and national paleontological associations and the lay public in general. By contrast, the websites of groups working on Science and Technology (e.g. Chemistry/ Engineering) were not intended for the lay or interested public. Nonetheless, some respondents considered that public communication is

very important and they reported that this was done via other media, e.g. group or individual academic Facebook, other related websites.

Some websites seek to share results with semi-expert local audiences for whom this information may be useful, e.g. local agents involved in forest management (Geoforest group), agronomy technicians (PROVESOS group), workers in the meat production sector (e.g. cattle breeders) (CTC group).

Finally, three respondents also mentioned “facilitating group cohesion” as one of the goals when creating a website. The website is a repository where all the information of the group, including the group members’ publications, is clearly organized. This is particularly important for groups with members from different disciplines, working in different Faculties and even in different campuses. Having all the publications in a single space enables all group members to use it easily.

#### 4.1.2. Languages

The six websites that are written only in English belong to the field of Science and Technology (see Table 1). The choice of English is consistent with the mission and vision of the institutes to which the groups are affiliated. On the website of the INA (Institute of Nanoscience of Aragon) (<http://ina.unizar.es/>), for instance, it is stated that its mission is to develop their research through national and international projects and their vision is to “establish the Institute as an international research center of excellence in Nanoscience and Nanotechnology”. Respondents in the field of Science and Technology concurred that English is essential to reach a wide international audience and achieve international visibility, and it is the default language to communicate with the disciplinary community: “Our community is an international community, whose working language is English”. They also agreed that, since their main audience is the disciplinary community, a Spanish version is not necessary, because all the expert members in this community understand English. Writing all their academic genres in English (including the website) helps to make PhD students aware that they always have to use English when communicating within the disciplinary community.

The only-Spanish websites belong to groups affiliated to the Institute of Environmental Sciences (IUCA) and the Institute of Agrofood Sciences (IA2). Even if these institutes seek to establish international research networks, their research is intended to have a local impact. On their websites it is stated explicitly that they aim at carrying out research that provides “solutions in solving scientific and technical needs of Aragon for environmental protection and sustainable development” (IUCA); or that has a “maximum potential impact on the Agrofood sector in the region of Aragon” (IA2). Although the main audience of the only-Spanish websites is a local audience, the groups also link to their publications in English to

make them visible (and accessible) for the international disciplinary community. The link between audience, language and type of text is clearly illustrated in the following comment by one of the respondents:

If we want our work to be useful for a non-expert audience, it must be in Spanish and the language must be non-technical. But if there is a publication behind, we post the publication in its original language, which is virtually always English.

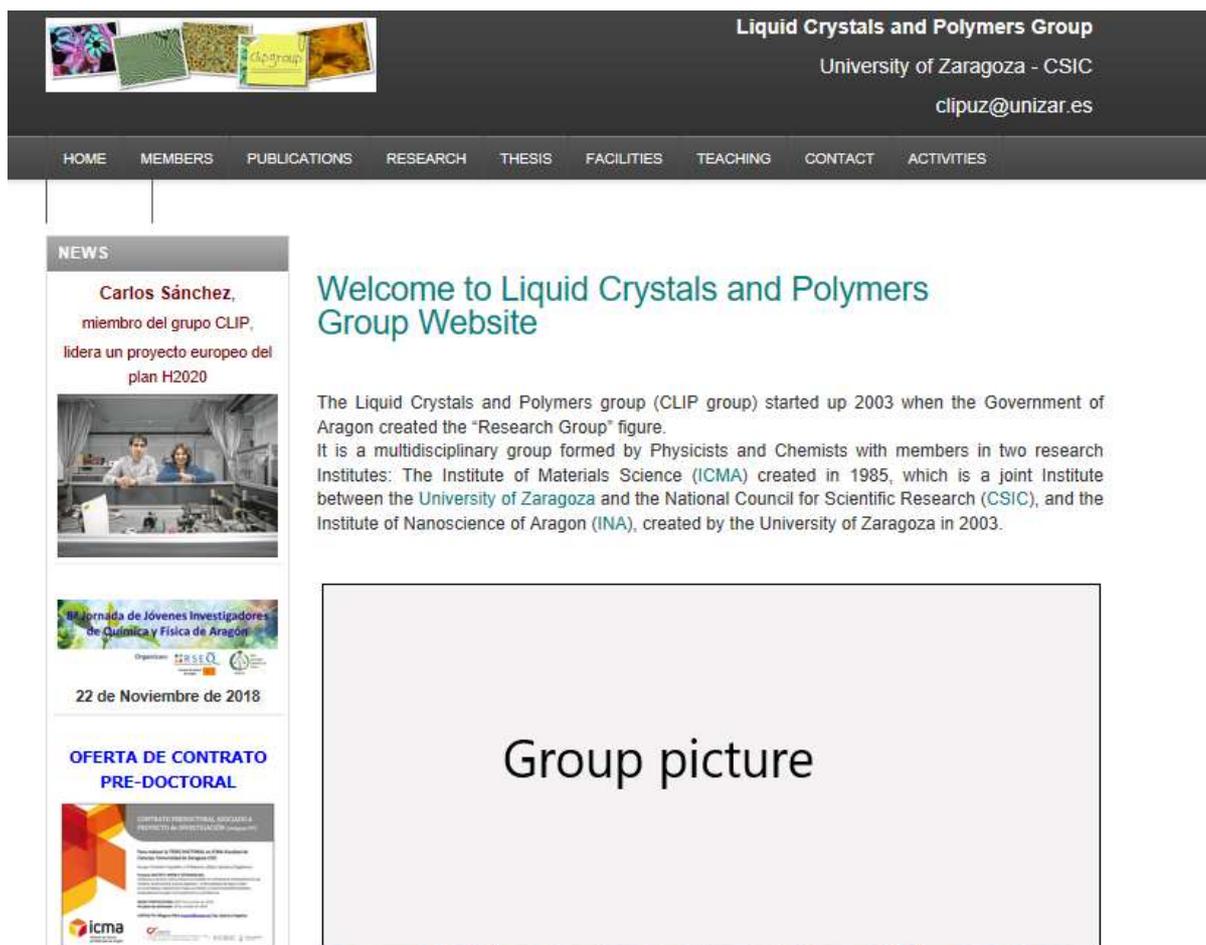
The Spanish-only option was motivated by situational constraints. Respondents actually considered that having also an English version would help them to reach a wider audience. However, as their time and resources are limited, they devote them to writing the content in Spanish.

The interview revealed that the main motivation behind the use of two languages was to reach a diversified audience. For instance, the website of the MDA group is written in Spanish to reach the lay audience and because the group has a big impact in South America; and in English because the group has a big impact in China and India. The Geoforest website is written in Spanish because the group does research on issues that have local and national interest and therefore they wanted their results to be used by a local audience: local forest managers. This is in agreement with previous research showing that in disciplines whose objects of study are locally-relevant scholars publish in the local language (McGrath, 2014). Nonetheless, the Geoforest website also has a version in English because the group's research is of interest for the international community: they use innovative technologies and methods, which are transferrable to the study of other geographical sites.

The interview also offered interesting information on the dissimilar practices of the groups when using English or Spanish to write about their research and results on the website. Writing texts for the website in English sometimes involved recycling and summarizing material from English documents the group had produced for other purposes (e.g. publications, proceedings, European project proposals). By contrast, when writing Spanish texts to disseminate their research for local audiences, groups reframed content for this non-expert audience: they used non-technical language and explanatory strategies, to facilitate comprehension and enhance engagement with the content.

## **4.2. Website analysis**

The RGWs analyzed consist of an “About us” homepage (a page or section for self-presentation and identification) (see Figure 1) and further pages with information on the composition of the group, their research lines and activities, their publications and their achievements, among others.



**Figure 1.** “About us” page of the *LCP* website.

Table 2 presents the different types of content that the websites analyzed included and the number of websites where this information was present.

Content	Number of websites
Publication list	14
Information on research lines	14
Picture related to the group research	14
List of members	14
Presentation of group	14
Information on research projects	11
Picture of group	11
Brief CV/ info on group members	10
Institutional logos	10
Featured news	9
Contact information	9
Information on location and how to arrive	8
Group's logo	7

Information on unpublished work, PhDs, Bachelor's degree final projects	5
Information on facilities and resources	5
Invitation to join the group	3
Information on teaching activity	3
Summaries of publications for lay publics	3
Information on services and technological transference	2
Information on collaborators	2
Information on patents	2

**Table 2.** Content on RGWs.

Table 3 presents the different types of content incorporated to the websites through linking or embedding.

Types of links and embedded genres	Number of websites
Institutional and affiliation links	10
Disciplinary links (journals, blogs)	9
Genres evidencing the group's presence in media (embedded or linked to), e.g. clips of TV programs, newspapers clips	8
Links to the group's publications in journals	7
Links to funding agencies	5
Links to the group's social networks	5
Videos disseminating the group's work in video-hosting platforms (embedded or linked to) (YouTube, vimeo)	5
Links to Google maps	5
Internal links to the group's papers in PDF format	2
Links to unpublished work in university repositories or in the group's own websites	2
Embedded PDF documents disseminating the group's research	2
Twitter feed	2

**Table 3.** Links and embedded genres on RGWs.

The data on Tables 2 and 3 show that RGWs serve to brand the research group and to present it as an organizational entity whose members have a shared mission and collective goals and interests. Several elements on RGWs contribute to presenting the group and identifying its members: a short description of the group (100% of the websites), a picture of

the whole group in their workplace, the group's logo, and the list of members, usually with a picture of each of the members. In many of the websites this list links to dedicated pages for each of the members, where more information on their individual research is provided, including a link to their CV or to their own personal homepage, or to social platforms like ResearchGate or Academia.edu. Therefore, the identity of the group is in part constructed by aggregating the academic information about the different members on various online platforms. The homepages of many RGWs also include "featured news" or similar items (information on important achievements, news related to the group, events and activities organized by the group, group announcements), which help to give a general first impression of the group for first-time visitors. RGWs also serve to position the groups in the context of their institutions and research units, and in connection to research funders, by embedding their logos and linking to their websites. These links also contribute to the group's reputation, since they position it into a network of credible research institutions and show that their research has been evaluated by peers as worth funding (Herman & Nicholas, 2019; Hyland, 2011).

A high amount of the information on these websites is intended to enhance the group's reputation by focusing on their research activity and output. As Table 2 and 3 show, all the websites include a description of research lines, with varying degrees of detail, and a list of publications. Most websites include functionalities which allow readers to get access to the group's publications (or abstract) either through a link to the journal website or by downloading a PDF file of the publication embedded in the website. Making research output (particularly publications) visible, accessible and downloadable facilitates reading and citation by others and thus helps the group obtain recognition and achieve scholarly impact.

Although currently academic reputation is mainly built around publications, other outputs and research activities can also contribute to increasing the group's prestige (Herman & Nicholas, 2019). As the respondents stressed, websites enable research groups to present all their output (e.g. publications, proceedings, unpublished research, PhDs, patents, videos) and academic activity (e.g. projects, organization and participation in conferences and academic events) on a single platform. This helps to promote the research group and their discipline to other researchers and groups, funding companies, and prospective students.

Other types of content to enhance prestige in RGWs are disciplinary links and information on collaborators. RGWs include links of interest to members of the disciplinary community (e.g. links to websites of conferences, professional organizations, journals of interest, websites of other research groups), which help the group to construct their identity as expert members of the community (Hyland, 2012). The information on and pictures of collaborators present in two websites have a similar function. The pictures provided visual evidence of the collaboration, which in the case of collaboration with well-known colleagues or groups within the discipline contributes to showing the quality of the group's research.

During the interview one of the respondents in the study pointed at one of the researchers on the picture and said: “Publishing with him would be like publishing with Darwin if he were alive”.

Some contents on the websites serve to promote the capabilities of the group, e.g. information on resources, facilities and equipment (which usually consists of pictures and descriptions of these facilities). Respondents stated that this information was included to demonstrate that they had the appropriate resources to carry out their research projects, which is important for doctoral students, collaborators, and evaluators of projects and project networks. Other less frequent types of content were information on services and technological transference, used to offer the group’s services to companies and thus get private funding.

The RGWs analyzed also incorporated, to different degrees, content intended to disseminate disciplinary knowledge to a wider audience. These contents prevailed on the only-Spanish websites which, as reported by the respondents, targeted the interested public (e.g. Aragosaurus, Proyecto Murero, CTC). The homepage of the Proyecto Murero website, for example, included a picture with links to basic information in non-technical language (e.g. “What is the Cambrian Period?”, “Where is Murero?” “Which fossils can we find?”). The only-Spanish websites displayed links to pages for a lay public (e.g. the Aragosaurus website has links to Paleontology blogs and websites, to museum websites, and to their own public oriented blog). They also incorporated non-technical texts written in Spanish to explain to the lay audience research reported in their English-medium publications. For instance, on the Proyecto Murero website, the research reported in the paper “Plated Cambrian bilaterians reveal the earliest stages of echinoderm evolution” published in PlosOne, is recontextualized for a lay audience in the text “Fósiles cámbricos revelan que los primeros equinodermos fueron bilaterales” (“Cambrian fossils reveal that the first echinoderms were bilateral”). This is a short text with linguistic and discourse features typical of popularizations (see Hyland, 2010).

The multimedia and linking affordances of the web also enable groups to embed or link to formats that are more engaging for the interested public, such as videos or TV programs. 5 out of the 14 websites analyzed (35.7 % of the websites) embed or link to videos disseminating the group’s research on online video platforms (YouTube, Vimeo). The NFP group, for instance, has links to videos disseminating their research on their YouTube channel "Nanotechnology capsules", with Spanish and English versions. As stated on the homepage of the channel, "Nanotechnology capsules" is a project that seeks to disseminate scientific research on Nanotechnology in order to achieve social impact engaging different stakeholders. The Aragosaurus website also embeds several YouTube videos in Spanish, intended to disseminate knowledge in Paleontology. All the videos on these websites have been created by the groups to fulfil their role as civic scientists, as scientists who work for

social goals and help the public to develop informed views about science. The websites offer these groups a platform to make these videos available to a wide audience. Although most of these videos were originally created to attract secondary students to their disciplines and to open their work to the general public (and they were thus produced in Spanish), one of the respondents pointed out that the videos were also useful resources when presenting their research to professional audiences, to get contracts or funding: the language used in the videos makes it easier to transmit the message than the use of technical jargon.

The websites also serve to provide evidence of the groups' disseminating work and to show that they have an impact on society and on the scientific development of the regional community, as required by research funders. They incorporate information of the groups' appearance in the media or provide evidence of those appearances (e.g. by embedding or linking to newspaper clips or to clips of TV local programs where members of the group explain their research). For instance, the website Proyecto Murero includes a page called "Divulgación" (Dissemination), where the group informs of their dissemination activities, e.g. public projection of popular science documentaries, exhibitions, popular science publications by member of the group.

Two groups had Twitter feed on their websites, through which all the tweets are automatically delivered to the website the moment they are published. The Twitter account of these two groups are intended for different audiences. The OaC group (doing research in Chemistry) uses Twitter mostly to form social networks and share information with other groups. They tweet publications, group pictures or information on conferences and events occurring in real time. Since these tweets are written for the scientific community, they are written mostly in English, although when they deal with local issues (e.g. scholarships, positions) they may be written both in English and Spanish. For the Aragosaurus group Twitter is also a dynamic and convenient complement to the website (see Figure 2), which facilitates quick publication of the information. However, in this case, Twitter is mostly intended for an interested audience. The group uses Twitter to tweet or retweet any information that may be of interest to an audience fond of Paleontology (in the language of the original tweet, e.g. English, Spanish, French, Catalan), e.g. exhibitions at the Science Museum of Zaragoza, news or findings by researchers in any part of the world. Twitter is therefore mainly used as an outreach tool to engage the general public and increase science literacy.

www.aragosaurus.com/

The image shows the homepage of the Aragosaurus website. At the top, there is a banner with a photograph of a geological hammer on a rock, with the text "Aragosaurus" and "Grupo de investigación de vertebrados del Mesozoico y Cuaternario de la Universidad de Zaragoza". Below the banner is a navigation menu with categories: INICIO | BIBLIOSAURUS | PUBLICACIONES | TRABAJOS INÉDITOS | INVESTIGACIÓN | ACTAS CONGRESOS | LISTADO | ENLACES | QUIÉNES SOMOS. Below the navigation menu is a sub-menu with categories: NOTICIAS | ARAGOSAURUS | DINOSAURIOS | PALEOANTROPOLOGÍA | MAMÍFEROS | INVERTEBRADOS | PALEONTOLOGÍA GENERAL. The main content area is divided into three columns. The left column features a news article titled "Hemos descubierto un nuevo dinosaurio saurópodo en la Patagonia argentina" with a date of 02/11/2018 and a small image of dinosaur fossils. The middle column is titled "Últimas noticias" and contains three short news items with dates and titles: "un viaje al legado paleontológico de la Cova des Pas de Vallgornera" (24/10/2018), "Estamos muy tristes. Ha fallecido el catedrático de Paleontología Eustoquio Molina" (01/10/2018), and "Estudiando las costas donde vivían los dinosaurios hace 140 millones de años en Iberia" (13/09/2018). The right column is titled "Tweets por @Aragosaurus" and shows two tweets from @Aragosaurus, one from @pavementgeology and one from @FATAPUERCA.

**Figure 2.** Homepage of the *Aragosaurus* website.

Finally, RGWs also feature information mainly intended for the group, to facilitate their activity. One of the respondents stated that on their “links page” they included any link that could be of interest to the group: disciplinary links, links to websites useful for any researcher (e.g. SciFinder, Scopus) or links to the websites of national and international agencies. Three of the websites also provide password-protected access to the group’s Intranet or the group’s Dropbox files. In these online spaces the members of the groups share questions, internal procedures, and any document that is only intended for internal use. These spaces help therefore to increase group cohesion, facilitate the exchange of information within the group and stimulate group dynamics.

## 5. CONCLUSIONS

The goal of this study was to analyze how a set of research groups affiliated to a Spanish university composed their websites to respond to new rhetorical exigences. RGWs are promotional tools through which groups publicize themselves in front of various audiences by offering information about their research output and activity. The groups use their

websites to help various audiences find and get access to all the academic information on the group and its members scattered throughout the Web, i.e. their publications, their video channels, their members' profile pages in social academic network sites, their accounts in social media. RGWs are thus sites to construct the group's scholarly identity, to accrue academic reputation through public visibility, and to disseminate research-based knowledge.

The analyzed RGWs are all composed to reach both global and local audiences, although to different degrees. They have a diversified audience, who may include members of the disciplinary community, students in the discipline, funding agencies, private companies, practitioners who may apply the results of the research, and the interested public. The composite nature of websites and their multimedia and hypertextual affordances enable groups to integrate multiple semiotic modes, types of content and genres, and combine different languages to cater for various audiences in a single platform. RGWs are therefore a very versatile and flexible genre, which allows research groups to communicate directly and simultaneously with a variety of audiences, opening up the boundaries of scientific communication and offering a platform to disseminate information to publics that are not easily reached with other traditional genres of academic communication. One of the main affordances of digital media for science communication is precisely "context collapse" (Marwick & boyd, 2011), which allows the groups to compose their websites for a heterogeneous audience. RGWs offer information that may be of interest to audiences with different degrees of expertise and different rhetorical needs, and thus blur the boundaries between experts and publics.

The study has revealed that the target audiences for each of the websites depend on the group's agenda and on the role attributed to the website by the group in pursuing this agenda. This agenda is in turn influenced by contextual factors like scientific domain, the type of knowledge generated (more internationally or locally oriented), the values of the disciplinary communities and their knowledge dissemination practices, or institutional requirements for funding. Research groups in the study compose their websites to realize simultaneously several of the following purposes: make the group "retrievable" in Internet searches for research in their field; provide an overview of their research lines for other researchers, prospective students, potential customers and funding agencies, so as to enhance networking opportunities, recruit new members and attract financial resources; make their publications available, thus increasing the possibility of being cited and raising the international impact of their research; facilitate the access of local practitioners to the results of their research; attract students to the disciplines and increase scientific literacy and public appreciation for and interest in the discipline; and provide evidence of their disseminating work in front of funders. All these diverse objectives are subsumed within a primary purpose: to share their research with multiple audiences in order to build their reputation and meet research funders' demands for high-impact research, value to the society and outreach.

Finally, this study has also shown that audiences determine the language choice and the type of content on RGWs. The websites in the domain of Science and Technology are intended mainly for a transnational disciplinary audience and thus most of these groups write their websites only in English, the working language of their disciplinary community. These websites provide mainly information on the group's research lines, research activity and publications. Spanish is, however, also present in these websites when content intended for a local audience is included, e.g. links to documents in Spanish produced in the local context and for a local audience, embedded (or linked to) dissemination videos in Spanish.

Spanish is clearly considered the language for outreach communication and this is the reason why it is chosen by groups who target mainly a local audience (interested public or local practitioners). The content of these websites is also determined by this public, e.g. recontextualization of their publications in non-technical texts, dissemination videos. These groups also seek, nevertheless, to make their research visible to the international disciplinary community and that is the reason why English is also present in some way in these websites, e.g. links to the group's publications in English. Although Spanish is preferred over English to reach the interested public, this does not fully account for the fact that some websites are written exclusively in Spanish. A determining factor for this choice is the lack of human and financial resources to write the website both in Spanish and English, even if that would be their preferred option. In fact, one affordance of RGWs particularly useful for non-Anglophone scholars is their multilingual potential, i.e. the possibility to provide information simultaneously in different languages to reach different audiences. All the groups in the study harness this affordance and incorporate English and Spanish to some degree.

Although this is a case-study based on the analysis of a limited number of RGWs in a single research institution, it contributes to showing how research groups, in particular those affiliated to non-Anglophone institutions, are harnessing the affordances of online media for new communication and representation practices, and helps to extend our understanding of knowledge dissemination in the digital environment. The results of the study have implications for advanced academic writing. The study has shown that when writing their websites the groups in the study made compositional choices that involved genre hybridity, and modal and linguistic variety; it thus suggests the need to shift to a wider definition of academic writing, moving it beyond text-based writing, to include multimodal, multi-voiced, hypertextual writing, and to provide EAP instruction which focuses not only on the academic literacies required to produce traditional linear academic texts, but also on new media literacies required to write digital texts.

The potential of RGWs composed by non-Anglophone groups for simultaneously realizing multiple purposes and reaching international and local audiences makes them a highly useful tool for these groups, affording them the e-visibility and e-presence that seems to be essential in today's competitive research arena. Therefore, further research is needed on

the purposes for which RGWs are used by different disciplinary communities (including also the Humanities and Social Sciences), on the factors that influence how they are composed and on the actual composing practices, on how experts and publics are reconfigured in RGWs (an in other digital genres for science communication), on the way English and local languages interact in this process, and on the strategies used in RGWs to accommodate the research to a wider audience. Also worth of further research are links between online communication by the group and by individual members and the tensions between group and individual web presence.

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## NOTES

1. The responses to the interview questions have been translated by the author of this paper.
2. Acronyms will be used to refer to some research groups. See appendix A.

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## **APPENDIX A: WEBSITES ANALYZED**

Aragosaurus  
Biorganic Chemistry (BC)  
Calidad y Tecnología de la Carne (CTC)  
Geoforest  
Liquid Crystals and Polymers (LCP)  
Magnetismo en Nanoestructuras (MAGNA).  
Mediterranean Diet and Atherosclerosis (MDA)  
Micropaleontology (MP)  
Nanoporous Films and Particles (NFP)  
Organometallics and Catalysis (OaC)  
Producción Vegetal Sostenible (PROVESOS)  
Proyecto Murero  
Robotics, Perception and Real Time (RoPeRT)  
Thermochemical Processes Group (TPG)

## **APPENDIX B: INTERVIEW**

Why did you decide to create a website for the group?

What is the primary function of your website?

Who has created the website and who is in charge of updating it?

What language(s) do you use in your website?

a. English      b. Spanish      c. Both (versions in the two languages)

5. Why did you choose to use this language/ these languages (only Spanish, only English, both)?

6. Who do you see as the audience for your homepage?

- other members of your disciplinary community

- funding agencies

- students

- the general public

- other (explain)

7. Why did you include the following item in your webpage? (Specific questions were asked to elicit information about the content or functionality of specific websites)