MONOGRÁFICO

Círculo de Lingüística Aplicada a la Comunicación
ISSN: 1576-4737

EDICIONES COMPLUTENSE

https://dx.doi.org/10.5209/clac.81307

Dialogic interaction with diversified audiences in Twitter for Research Dissemination Purposes

Daniel Pascual[1] & Pilar Mur-Dueñas[2]

Received: 14 January 2022 / Accepted: 8 February 2022

Abstract. International research groups are expected to ensure global dissemination and visibility of their knowledge production, for which Twitter is effectively employed to reach diversified audiences. This paper analyses the dialogic dimension of tweets published in accounts of Horizon2020 research projects, where group's productivity and work are promoted, and multiple readers addressed. Our study focuses on the use, in these Twitter accounts, of interactional pragmatic strategies, their verbal realisation through engagement markers, as well as on medium affordances and non-verbal markers. A sample of 1 454 tweets from 10 accounts of the EUROPROtweets corpus were coded and analysed through NVivo. The data-driven pragmatic analysis triggered the identification of 8 interactional strategies. We then quantitatively analysed the use of engagement makers and qualitatively studied the characteristic non-verbal markers with a dialogic function within each of these. Our findings will help understand the complexities of current digital academic professional practices, especially as regards the dynamics of dialogic interaction in social media.
Keywords: research Twitter accounts; dialogicity; engagement markers; interactional pragmatic strategies

Cómo citar: Pascual, D.; Mur-Dueñas, P. (2022). Dialogic interaction with diversified audiences in Twitter for Research Dissemination Purposes. *Círculo de Lingüística Aplicada a la Comunicación* 90, 61-79.

1. Research communication and dissemination in online settings

Research collaboration is being increasingly emphasised in academic and professional environments, especially through international projects of partners from different institutions and multiple disciplinary backgrounds. These research projects are to be held accountable for the funding received. They need to demonstrate to the institutions financing their investigations and to the citizenship in general that public expenditure is fruitfully used to bring innovations and benefits to society. Therefore, knowledge transfer is geared towards indicating the accomplishments and results of the project and the applications of the research for society as a whole.

It is digital communication that ensures broad dissemination of the project findings and outlets, and has come, as such, to be increasingly regarded as an essential part of this joint research work. The endorsement and development of digital discursive practices by international research projects can boost the impact of their investigation and maximise their outreach to wide, diversified audiences. Hand in hand with this pursuit, these practices contribute to enhancing research projects' e-visibility, and play a fundamental role in the building of a digital collective identity that is positive for the research project and its individual members. This panorama is clearly in line with the phenomenon of Scholarship 2.0, which profits from the inter-connected online environment and provides academics with tools to work together and construct knowledge on the existing fields of science (Baykoucheva, 2015).

The study of the growing digital academic practices that research groups are developing as a result of their membership of international research projects has been tackled in relation to the research project website, which is understood as a window for readers to meet the core information of research projects. These analyses have been approached from different analytical perspectives such as such as evaluation (Lorés, 2020), multimodality (Corona, 2021), visibility (Lorés-Sanz and Herrando-Rodrigo, 2020), and engagement (Mur-Dueñas, 2021). In this paper, we attempt to enlarge the understanding and spectrum of the digital practices research projects endorse by focusing dig-

[1] Universidad de Zaragoza-University Research Institute on Employment, Digital Society and Sustainability (IEDIS), Spain Email address: dpascual@unizar.es ORCID: https://orcid.org/0000-0001-6692-575X

[2] Universidad de Zaragoza-University Research Institute on Employment, Digital Society and Sustainability (IEDIS), Spain Email address: pmur@unizar.es ORCID: https://orcid.org/0000-0001-8966-1013

ital practices by focusing on another object of study, Twitter, and by leveraging the notion of dialogicity as a further angle to look into the dissemination of findings and specialised knowledge by research groups.

The usefulness and power of social media, like Twitter, in scientific and scholarly contexts is being increasingly taken up in order to develop and share knowledge more rapidly, globally and effectively. The variety of social ecosystems where scientific and scholarly discourses are enacted and supported is growing far beyond traditional academic publishing systems, and this is purposefully enhancing a broader impact both within scientific communities and for the wider public (Bik and Golstein, 2013). Twitter as used within academia has already received some scholarly attention. This research has tended to focus on the use of this digital practice during conferences (e.g. Mazarakis and Peters, 2015; Lee et al., 2017; Luzón and Albero-Posac, 2020), as well as on its potential influence on new metric systems (altmetrics) for scholarly citations (e.g. Eysenbach, 2011; Weller and Puschmann, 2011). In this study, however, we seek to gain insights into how Twitter is a dialogical asset for research projects to discursively engage users and disseminate their outreach. We thus aim to provide an answer to the following research questions:

(1) Which particular interactional pragmatic strategies are deployed by research projects in their Twitter accounts to establish a dialogic interaction with a diversified audience?
(2) Which engagement markers are used in the verbal encoding of such strategies to establish a dialogue with the readers and followers of such Twitter accounts?
(3) What is the role of non-verbal resources and medium-dependent affordances in framing the potential dialogicity of Twitter as used for Research Dissemination Purposes?

The rest of the article is organised as follows. In Section 2 we provide the theoretical foundations for our analysis of dialogicity in Twitter accounts maintained by research groups internationally financed. Then, we discuss the characteristics of Twitter as a meaningful social medium in academic contexts (Subsection 2.1) and explore dialogic communication from a pragmatic and interpersonal perspective (Subsection 2.2). In Section 3 the EUROPROtweets corpus, on which our analysis is based, is described together with the methodology of the study. Next, Section 4 offers the quantitative results about the use of interactional pragmatic strategies, the linguistic realisation of the strategies through engagement markers and a qualitative analysis of their interplay with non-verbal affordances. The paper closes with some implications from the analysis on our understanding of current scholars' digital practices.

2. Theoretical framework

In this section, we provide a review of studies on the main pillars on which our analysis rests. 2.1 discusses the general characteristics of Twitter as a Social Networking Site (SNS) and the specific applications and implications it has come to trigger when employed for Research Dissemination endeavours. Section 2.2 looks into the notions of dialogicity and engagement from which to tackle pragmatic and textual analyses of academic digital discourse in general and of our corpus of tweets in particular.

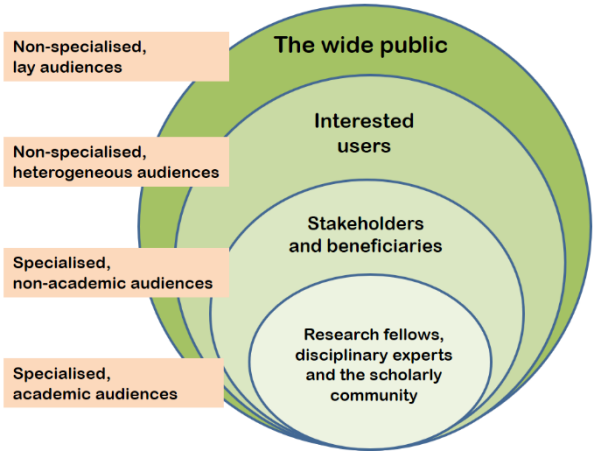
2.1. Twitter as a social medium for Research Dissemination Purposes (TRDP)

In the reciprocal advantageous relationship between social media and science communication, microblogging platforms are particularly practical in that users have the possibility of selecting and adjusting the types of content to be published: news, opinions, announcements, miscellanea. With their periodical publications, they attempt to initiate potential dialogues with users and elicit interactivity and participation from them. Platforms such as Twitter stand out as an effective, instrumental and professional social network for researchers and research groups to disseminate their outputs among different stakeholders. It is through them that they can widely report on the "behind the scenes" of their projects (Kuteeva, 2016). In general, four affordances are intrinsic to SNSs and mediated by users when communicating: 1) persistence (capture and archiving of content); 2) replicability (duplication of content), 3) scalability (broad visibility of content) and 4) searchability (access to content via search) (boyd, 2010). Echoing Adami's (2015) model of interactivity applied to websites, medium-specific affordances in Twitter such as hashtagging, mentioning and retweeting, and hypermedial and hypermodal resources like links and videos provide users with 'sites of action'. They boost users' interactivity with media and allow them to click through and construct "construct their own dialogic experiences".

In particular, the maximisation of these affordances in Twitter accounts held by academics help enhance the circulation of specialised information, while increasing the scholarly impact of their profiles and posts and, overall, contributing to interweaving a network of data and users from which they can benefit for a wide variety of purposes (e.g. accountability, opinion-sharing, visibility, prestige). Twitter appears to offer researchers the tools to respond to calls for public engagement as well, allowing them and diversified users to have conversations, share content, form communities and build relationships (Kietzmann et al., 2011). Twitter provides a forum where the communication between research groups and digital readers, and the involvement of the latter in the scientific dissemination of the former's projects can be strengthened.

Thus, the use of SNSs for Research Dissemination Purposes entails the blurring of boundaries between internal communication (scholarly discourse) and external communication (science communication) (Puschmann, 2015). Research findings and scholarly outputs can be published in different venues and made potentially accessible to an unprecedented diversity of readers to consume them. As Myers (2016: 283) argues, "this unpredictability of the audience is one of the ways that the internet transforms face-to-face and print genres", and inevitably affects the processes of interaction and engagement among users. Interestingly, Kaplan and Haenlein (2011) highlight 'anonymous voyeurism' as one characteristic of micro-blogs that may well apply to the notion of audience in this social medium and its use for professional and academic goals. Such voyeurism would entail that any user in Twitter may keep updated of the accounts and feeds they want to consume, even if they may not have a sense of duty of reacting and replying to them. In turn, this implies the need for research groups maintaining a Twitter account to target both scientific and specialised readers and lay audiences when they publish new content. While building these relationships through tweets, researchers get involved in meaning making practices and in an ongoing performance of their identity in online environments under a common human desire for affiliation with other voices and communities of people they want to connect with (Zappavigna, 2012). Although the audience in academic digital discourse is fuzzier than ever, some audiences when using Twitter for Research Dissemination Purposes (TRDP) can be imagined and foreseen, as can be observed in Figure 1. They range from specialised academic audiences comprising research fellows and members of the same and neighbouring disciplinary communities to non-specialised lay audiences, i.e. the wide public. In between those two ends, broad types of readers can be identified, for example, stakeholders, beneficiaries, collaborators, participants, users with sustained interest and spontaneous visitors. Twitter offers, then, an outlet for researchers to share their professional routines and work, while simultaneously connecting with societal citizens that may well have different interests and degrees of expertise.

Figure 1. Diversified audiences potentially addressed and engaged in the Twitter accounts of international research projects.



In all, whether the audiences for which tweets are published are academic or non-academic, specialised or non-specialised, two macro-purposes prevail in the Twitter communication of research projects, namely dissemination and networking. Dissemination is pursued in order to spread new scientific knowledge about the investigation undertaken and to ensure its diffusion and impact among these various readers. Consequently, Twitter provides an advantageous setting for the circulation of data and the communication of findings and implications which traditional publishing and broadcasting do not address (Puschmann, 2015). Networking is bolstered in order to reach ample, numerous readers and, thus, increase the interpersonal relationships and professional bonds of the research group. The building of these relations is beneficial both to users, who get to know the project and may potentially follow its updates, and to research groups, who extend their net of contacts and accomplish a wider, tangible transfer of their work.

In light of all these aspects enclosing the usage of TRDP, it is, thus, interesting to look at how dialogicity is pragmatically and discursively encoded in the communication of international research projects, and promoted through the digital affordances of this social medium.

2.2. Dialogic interaction and engagement in academic (digital) discourse

Broadly speaking, dialogic communication involves any exchange of ideas, attitudes and perspectives, by which interactants try to arrive from intersubjective positions at mutually satisfying positions through open and negotiated discussion (Kent and Taylor, 1998). Texts can be considered sites of dialogue geared towards interactions among human beings or relations between words and texts –or else, among participants in an interaction and between the writer and the reader (Gil-Salom and Soler-Monreal, 2014). Such a dialogic dimension in specialised communication

influences and is influenced by authors' actions, persuasive purposes and intended effects, readers' reactions and the textual genre selected. May give rise to three dialogic phenomena in academic texts, namely participant-oriented features, action-oriented features and evaluative dialogue (Bondi, 2018a). Our focus will be mostly on participant-oriented features, as manifestations of an ongoing researchers-multiple readers dialogue. At some points, the latter are encouraged to take particular actions which tend to be accompanied by hyperlinks or multimodal elements to continue navigation.

Dialogicity is entrenched in any form of oral or written communication (Flowerdew, 2014) but is fostered to a greater extent in computer-mediated settings, prompted by their various digital medium affordances and their pursuit for open access. Dialogicity has received some attention in English for Academic Purposes to unveil how a given relationship between academics or experts and diversified audiences is built in digital academic communication, for instance in blogs (e.g. Bondi, 2018b), or in websites (e.g. Mur-Dueñas, 2021). This interest may be rooted in the need to understand the existing gap between the potential of web-native and web-mediated platforms for online dialogic communication and the actual use scholars and researchers make of them. Therefore, not only the lexico-grammatical, discursive and rhetorical choices in the verbal mode but also the medium affordances and non-verbal features can condition the particular interactive, dialogic writer-reader relationships established with multiple audiences in digital academic communication. The interconnection of all these elements poses a challenge for research groups when attempting to effectively establish dialogue and interaction with digital users about their research projects through their Twitter accounts.

To understand the dialogic potential of SNSs like Twitter, medium-dependent affordances need to be considered to observe how users may appropriate them for their own purposes and in what ways they encourage dialogic interaction and participation in their tweets. Table 1 shows the specific medium affordances of the Twitter platform and relate them to key dialogic functions pertinent to the use of Twitter for Research Dissemination Purposes in particular.

Table 1. Connections between TRDP and ensuing dialogicity affordances and ensuing dialogicity.

Medium affordances particular to Twitter	**Potential dialogic functions**	
Live interaction, immediate publication	Closeness and proximity	Relationship building
Mentioning	Networking and rapport	
Retweeting and quoting	Alignment, endorsement of ideas	
Following users and lists	Impact and credibility	
Embedding multimedia content	Engagement and meaning-making	Facilitating audience traffic
Hyperlinking	Navigation and accessibility	
Hashtagging	Searchability and findability	

Scholars can immediately publish their tweets and promote potential live interaction with multiple addressees, bringing information about their research topics, findings, events, or others close to them, establishing proximity and rapport. By following users and getting followers, their credibility and impact can be enhanced. Finally, the use of hyperlinks can guide the audience in their navigation mode (Askehave and Nielsen, 2005), triggering a plethora of reading paths around the project. Drawing on Pascual's (2019a) classification, these hyperlinks may be, depending on where they lead users to, internal (providing users with access to the research project website and its inner sections), external (driving users out of the sites held by the research project and opening up other sources of information) and peripheral (taking users to external sites outside the main project website that are inherently connected to the communication of the research project, e.g. questionnaires for participants, social media profiles, downloadable files).

Concerning the affordances, hashtags have seen their original function expanded and not only serve as a stylistic resource in tweets combining personal, informal discourse with mediated, public contexts, but also filter users' interpretations (Scott, 2015). In this way, they may cater for diverse information needs pondered by research projects towards imagined, heterogeneous audiences on specific topics and areas of interest.

In turn, mentions help build dialogic relations in Twitter by connecting users in a straightforward way. Squires (2016: 242) emphasises that a mention "establishes addressivity for a tweet, it triggers a notification to the @mentioned user that they have been addressed, it creates a link to that user's profile, and it establishes the conditions for threading multiple tweets together as a "conversation"". In academic contexts, this eases the transfer of knowledge and approaches researchers to all kinds of audiences, from specialised users to lay readers. Finally, retweeting is another dialogic practice that serves to forward information and increase the reach and impact of the tweet and the prestige and the image of the user being retweeted. It is a 'sharing' formal property whose strategic use is dependent on the community of users interacting. Yet, retweets have been found to endorse interpersonal ends as well (Gruber, 2017), since they let users appropriate content that has been published by others while building rapport with users that have similar interests and concerns. As such, research teams can utilise this affordance to establish rapport and show alignment with certain ideas, groups and institutions.

Specifically, in Twitter for Research Dissemination Purposes further verbal and non-verbal markers can harness dialogic relationships with such varied audiences. To study them, we are going to look at the use of interactional pragmatic strategies in our corpus of research project tweets. These strategies are understood as functional units of analysis that enable to uncover speakers' context-sensitive intentions in a given communicative event when attempting to establish relationships with readers. We also seek to analyse their specific textual encoding through the use made of engagement makers, under the belief that they help foster dialogicity in these specific digital texts as well as non-verbal resources, such as visuals (e.g. emojis and icons, pictures, or logos), videos and hyperlinks, which clearly render an interactional function in this social networking environment.

At the verbal level, engagement markers, viewed as interactional metadiscourse features (Hyland, 2005a; Mur-Dueñas, 2021), directly appeal to readers, seeking to address and involve them. In our analysis of TRDP they comprise directives (including imperatives, obligation modals and adjectival phrases expressing necessity), questions, reader references (inclusive "we", "our" and "us", as well as second person "you", and also direct references through @), and also exclamations. This last category was not found in previous accounts of metadiscourse analysis of traditional genres, as the formal nature of the academic discourse may have hindered its use. The informal nature characteristic of Twitter (e.g. Scott, 2015; Sifianou and Bella, 2019) may favour or call for their use. Personal asides, which "briefly interrupt the argument to offer a comment on what has been said" (Hyland, 2005a: 152) have not been found in our EUROPROtweets corpus as they are too short texts to include such digressions. Neither reference to sharedness, as "explicit markers where readers are asked to recognize something as familiar and accepted" (Hyland, 2005b: 184) has been found, due to the character constrictions of the medium but also because the potential diversity of the audience would not allow for generalised assumptions of shared, previous knowledge.

For interactional pragmatic strategies research projects frequently resort to emojis in their tweets. These pictographs constitute an identifying feature pertinent to digital written communication that has gained rapid popularity (Vela Delfa, 2020). They are regarded as a writing practice etched into standardised images with potential symbolic meanings that primarily fulfil salutation, punctuation, phatic and emotive functions (Danesi, 2017). As non-verbal cues, they can express intentions and emotions (Roele et al., 2020) that can be considered to be more readily understood and interpreted by diversified audiences reached in the Twitter platform. Kejriwal et al. (2021) underline the ubiquity of emojis as visual extra-linguistic resources, which have a distinctively social nature and hold a unique place in online interactions, since they embody a 'shared culture' and the density and diversity of their usage is likely to vary depending on the type of discourse at stake. Pictures are often included below the verbal messages of the tweet to complement the content posted and attract the audience's attention, contributing to meaning making and fulfilling informational, persuasive and interpersonal functions. Logos serve to convey information about the disciplinary field of the project and its specific research goals, providing visually attractive extended information for audiences to get engaged, read their tweets and possibly trigger a reaction. Through meaning-making combinations of colours, fonts and shapes, research projects intend to transfer in their logos a lot of information and establish a more engaging relationship with readers. Semiotic meaning is also provided non-verbally through the exploitation of typographic resources (e.g. capital letters, coloured text, repetitions). Not only are some of the affordances inherent to Twitter, such as mentions and hashtags, highlighted in blue, but also colour is used to perform important user-dependent visual communicative work. As has been explored in research project homepages, colour is a consistent, decisive element in constructing the visual identity of the research group (Corona, 2021) and can have a persuasive role in the creation of a dialogue with multiple audiences.

Both verbal (engagement) markers and non-verbal markers (visuals and hyperlinks) conditioned by the Twitter platform and its affordances play a key role in the realisation of interactional pragmatic strategies, and fulfil a key interpersonal function in as much as their use shapes and is shaped by the writer-reader relationship. Such a relationship concerns research projects or teams and a wide, blurred, diversified audience ranging from expert specialised academic audiences to non-specialised lay audiences (Figure 1). By looking at the frequency of these pragmatic units and the use of engagement makers together with the role played by varied semiotic resources, it is our intention to explore how dialogicity is orchestrated in this academic context within social media platforms.

3. Corpus description and methods

Our study of pragmatic strategies in Twitter research project accounts and the use of engagement markers, as features of potential dialogicity, has been based on the EUROPROtweets, a pilot corpus of the tweets in 10 Twitter accounts from H2020 research teams. This is part of a bigger corpus, which also comprises the texts from 30 research project websites (Pascual et al., 2020, cf. http://intergedi.unizar.es/methodology/). Twitter was found to be the most common social network used by these projects. As can be seen from from their titles (Table 2), these funded projects can be hardly classified into just one specific research area, as they are made up of interdisciplinary consortia and aim to advance science in innovative ways that may cause positive effects on society at various levels. They target matters connected with industry, logistics and technology, and revolve around pressing issues for our globalised world, such as energy, sustainability, supply and housing.

Table 2. H2020 projects in the EUROPRO digital corpus from which Twitter accounts were retrieved.

Research project name	Description	Duration
Disire	Integrated process control based on distributed in-situ sensors into raw material and energy feedstock	3 years. 01/01/2015-31/12/2017
Dice	Developing data-intensive cloud applications with iterative quality enhancements	3 years 7 months. 01/02/2015-31/08/2018
GreenGain	Supporting sustainable energy production from biomass from landscape conservation and maintenance work	3 years. 01/01/2015-31/12/2017
BuildHeat	Standardised approaches and products for the systemic retrofit of residential buildings, focusing on heating and cooling consumptions attenuation	5 years 6 months. 01/09/2015-29/02/2020
FieldFood	Integration of PEF in food processing for improving food quality, safety and competitiveness	3 years. 01/04/2015-31/03/2018
Cosmic	European training network for continuous sonication and microwave reactors	4 years. 01/10/2016-30/09/2020
Harmoni	Harmonised assessment of regulatory bottlenecks and standardisation needs for the process industry	2 years 3 months. 01/08/2017-31/10/2019
Flexiciency	Energy services demonstrations of demand response, flexibility and energy efficiency based on metering data	4 years. 01/02/2015-31/01/2019
AgroinLog	Demonstration of innovative integrated biomass logistics centres for the agro-industry sector in Europe	4 years 9 months. 01/11/2016-31/07/2020
Simpla	Sustainable integrated multi-sector planning	3 years. 01/02/2016-31/01/2019

Table 3 shows the size and specific nature of EUROPROtweets digital corpus on which this study is based. The reasons to choose a convenience corpus are in line with Koester (2010), who points out that "smaller, more specialised corpora have a distinct advantage: they allow a much closer link between the corpus and the contexts in which the texts in the corpus were produced" (67). More specifically, scholars have also stressed the suitability of smaller domain-specific corpora for the study of pragmatics, in that they allow an ongoing interpretive process among texts, interactants and contexts (e.g. Vaughan and Clancy, 2013; Rühlemann and Clancy, 2018).

Table 3. Description of our EUROPROtweets digital corpus.

Coding reference	Twitter username	No. tweets	No. words
Tw1	@DISIRE_2020	48	767
Tw2	@diceh2020	212	4258
Tw3	@greenGain_eu	49	793
Tw4	@BuildHeatH2020	186	5924
Tw5	@FieldFOOD_H2020	71	1570
Tw6	@ETN_COSMIC	90	1986
Tw7	@Harmoni_H2020	48	1313
Tw8	@FLEXICIENCY	212	4068
Tw9	@AGROinLOG	88	1878
Tw10	@Simpla_project	447	13 961
		1451	36 518

Retweets were included in the analysis considering that retweeting someone else's words is a practice that enables Twitter users to endorse those ideas and forward them in their own accounts. In that sense, it is a medium-specific form of reported speech which implies a change in author roles as a consequence of the application of platform-specific affordances (Draucker and Collister, 2015). Additionally, retweeting is to be seen as highly dialogic, prompting interaction with diversified audiences and establishing networks. As Gruber (2017) argues, retweeting constitutes a communicative need of Twitter users, who may favour this practice over replying in order to widely 'share' content and ensure communication with their 'imagined audience'. This dialogic affordance also has an effect on the practices of international research groups in Twitter.

We pragmatically coded all tweets regardless of the languages in which they were written, even if languages other than English (Spanish, Italian, Greek, Dutch, Portuguese, French, Danish, Romanian, Galician and Catalan) were only sparingly used. Yet, for the analysis of the realisation of the engagement markers, only English tweets were chosen. For the data-driven analysis of the corpus, 8 interactional pragmatic strategies were identified (Pascual, 2019b):

1. Guiding the audience to perform an action
2. Inviting the audience to consume research project output
3. Making information visually salient
4. Engaging audience to participate in the project
5. Hooking the audience
6. Fostering networks
7. Praising and thanking others
8. Offering contacts for information

To code the EUROPROtweets corpus we employed the computer-assisted qualitative data analysis software (CAQDAS) NVivo and followed two stages. First, we coded and quantified the interactional pragmatic strategies to observe their deployment and occurrence. We then identified and tagged engagement markers for each of the interactional pragmatic strategies to determine their overall use in the verbal realisations of the strategies and the frequency of specific markers in each of them.

The lack of one-to-one correspondence between textual evidence and pragmatic strategies made the process time-consuming and fine-grained. Mirroring previous studies on dialogicity (e.g. Wang and Yang, 2020), a random sample representing 20 % of the data was first selected and coded by each researcher in search of full coherence in the interpretation of the categories. Then, we decided to independently code the entire corpus of tweets to raise the inter-coder reliability. This allowed us to agree, as the coding process was thickening, on "some codes [that] should be abandoned, refined, combined, or merged with other codes" (van den Hoonaard, 2008: 445). A few problematic cases where consensus was not reached from the outset required discussion and revisitation between the researchers. Overall, this process served to guarantee a high degree of analytic rigor in the identification and quantification of interactional pragmatic strategies and of specific engagement markers in their realisation.

4. Results

The range and frequency of use of interactional pragmatic strategies deployed by research groups is first presented in Section 4.1 to comprehend how they address diversified audiences and involve them in the project and research process, while simultaneously disseminating information about them and their investigation. Section 4.2 presents the results of the identification and frequency of use of engagement markers within those interactional pragmatic strategies and their combination with non-verbal features afforded by the Twitter medium.

4.1. Interactional pragmatic strategies in research Twitter accounts

As can be seen in Table 4, several pragmatic strategies seem to be resorted to in Twitter with the aim of establishing a dialogic relationship between the research projects and the diversified audiences. It is interesting to see that all of they are systematically found in all accounts analysed (except for "Offering contacts for information"), which points towards conventional ways to promote digital dialogicity in Twitter for Research Dissemination Purposes. There are, nevertheless, differences in the extent of use of each of them depending on the Twitter account and project, as can be seen in Table 5.

Table 4. Occurrence of interactional pragmatic strategies in Twitter accounts held by Horizon2020 research projects.

Interactional pragmatic strategies	No. of accounts featuring them	No. of occurrences / Percentage
Making information visually salient	9	553 / 23.1 %
Fostering networks	10	491 / 20.5 %
Guiding the audience to perform an action	10	489 / 20.4 %
Inviting the audience to consume research project output	10	410 / 17.1 %
Hooking the audience	10	200 / 8.3 %
Engaging the audience to participate in the project	10	154 / 6.4 %
Praising and thanking others	10	98 / 4.1 %
Offering contacts for information	2	3 / 0.1 %
TOTAL		2 398 / 100 %

Table 5. No. of interactional pragmatic strategies per Twitter account.

Interactional pragmatic strategies	**Tw1**	**Tw2**	**Tw3**	**Tw4**	**Tw5**	**Tw6**	**Tw7**	**Tw8**	**Tw9**	**Tw10**
Making information visually salient	24 (32.0 %)	6 (2.8 %)	8 (23.5 %)	75 (22.2 %)	0	48 (26.5 %)	51 (51.0 %)	118 (29.6 %)	3 (4.5 %)	220 (25.0 %)
Fostering networks	8 (10.7 %)	51 (24.1 %)	6 (17.6 %)	79 (23.4 %)	23 (29.5 %)	33 (18.2 %)	16 (16.0 %)	50 (12.5 %)	15 (22.4 %)	210 (23.9 %)
Guiding the audience to perform an action	23 (30.7 %)	45 (21.2 %)	6 (17.6 %)	54 (16.0 %)	21 (26.9 %)	17 (9.4 %)	35 (35.0 %)	105 (26.3 %)	5 (7.5 %)	178 (20.3 %)
Inviting the audience to consume research project output	9 (12.0 %)	77 (36.3 %)	4 (11.8 %)	29 (8.6 %)	6 (7.7 %)	49 (27.1 %)	12 (12.0 %)	41 (10,3 %)	39 (58.2 %)	144 (16.4 %)
Hooking the audience	7 (9.3 %)	16 (7.5 %)	3 (8.8 %)	45 (13.3 %)	10 (12.8 %)	19 (10.5 %)	4 (4.0 %)	22 (5.5 %)	1 (1.5 %)	73 (8.3 %)
Engaging the audience to participate in the project	2 (2.7 %)	7 (3.3 %)	5 (14.7 %)	47 (13.9 %)	13 (16.7 %)	2 (1.1 %)	13 (13.0 %)	21 (5.3 %)	3 (4.5 %)	41 4,7 %)
Praising and thanking others	2 (2.7 %)	10 (4.7 %)	2 (5.9 %)	9 (2.7 %)	4 (5.1 %)	13 (7.2 %)	2 (2.0 %)	42 (10.5 %)	1 (1.5 %)	13 (1,5 %)
Offering contacts for information	0	0	0	0	1 (1.3 %)	0	2 (2.0 %)	0	0	0
	75	212	34	338	78	181	135	399	67	879

The overall most common strategy used to interact with the audience is "Making information visually salient" even though there is one Twitter account that does not display it (Tw5). The reason may be that it is not a very exploited account and, once the project finished, just 71 tweets had been published. It seems then that this project posted news at very specific times during the project development, but did not fully maximise the visual affordances that Twitter enables and that may trigger this particular pragmatic strategy. In enacting this strategy research projects may display abundant emojis for the establishment of a relationship with the audience, as in Example 1. "City" and "news" are visually reformulated through informational emojis, a pin is included to draw the readers' attention to that particular link and lead them to click on it, and two other emojis (a "thunder" and a "car") are inserted as symbols of the project central values and interests: energy, environment, sustainability. In all, this tweet entails some negotiated exchange of ideas with an audience that can have different levels of understanding and expertise as well as expectations regarding conventional uses in Twitter.

Example 1. Tweet displaying the interactional pragmatic strategy "Making information visually salient" (Tw10-2).

The second most common interactional pragmatic strategy in the EUROPROtweets corpus is "Fostering networks". As can be seen in Example 2, research projects make use of this platform to establish connections with other projects as well as with peers and possible stakeholders. The Twitter affordances of creating lists as well as following users and retweeting their posts prompts this specific interactional pragmatic strategy.

Example 2. Tweet displaying the interactional pragmatic strategy "Fostering networks" (Tw1-41).

"Guiding the audience to perform an action" is the third most common interactional pragmatic strategy. Through this strategy readers are prompted to take a course of action, which frequently entails persuading them to consume further information or outreach from the project. Example 3 shows how an event related to the research topic is announced through a mention and readers are encouraged to get further information on it. The intention seems to be, additionally, to get the audience also interested in the topic and implications of their research. This is made available through an internal hyperlink, that is, a link to a particular section in their website, thus attracting traffic to the account and directing it to the host digital genre, their project website (Pascual, 2019a). Furthermore, in the researchers' attempt to persuade the audience to be informed on their research endeavours and activities, the visual mode plays a significant role. A photo is included which is directly related to the research project topic, featuring a fresh apple. The photo is predominantly green, which has been found to be used in website homepages of research projects focused on nature, sustainability and growth (Corona, 2021), complying with the idea that the choice of colour, in photos or logos, has interactional purposes, since it "seeks an effect on the viewer" (358).

Example 3. Tweet displaying the interactional pragmatic strategy "Guiding the audience to perform an action" (Tw5-56).

In the following section the specific frequency of use of linguistic engagement markers in these interactional pragmatic strategies is provided together with examples which illustrate the combination of such characteristic verbal realisation with non-verbal elements (hyperlinks, icons, emojis, symbols, pictures, or logos).

4.2. Dialogic realisations of interactional pragmatic strategies in research Twitter accounts

Directives have been found to be the most frequent category of engagement markers in the interactional pragmatic strategies in our corpus used to involve readers establishing a dialogic relationship with diversified audiences (accounting to 41 % of all engagement markers used) (Table 6). These audiences are directly addressed and encouraged to undertake some actions, normally entailing the consumption of further information by visiting different sites and sources, thereby attracting traffic and guiding them in their navigation. Reader mentions are the second most common category of engagement markers in these interactional pragmatic strategies, with a significantly lower incidence of use than directives (23 %). Personal pronouns and adjectives, and Twitter mentions, create proximity with the audience, fostering interactions and promoting closeness. Exclamations are the third most remarkable category of engagement markers in the realisation of interactional pragmatic strategies within the corpus (20 %). They similarly contribute to establishing a close relationship with the audiences, stressing specific aspects which can be more interesting or useful for them. Finally, questions are the least common category of engagement markers (16 %), although their frequency is also high and it shows how research project teams resort to them to involve the audiences, get their attention and seek their acceptance and interest.

Table 6. Occurrence of engagement markers in the EUROPROtweets corpus in interactional pragmatic strategies.

Interactional pragmatic strategies	Engagement markers				
	Directives	Exclamations	Questions	Reader mentions	Total/Ratio per strategy
Making information visually salient	8	5	1	1	15 / 0.02
Fostering networks	71	72	33	72	248 / 0.64
Guiding the audience to perform an action	388	76	64	166	694 / 0.74
Inviting the audience to consume research project output	164	52	53	50	319 / 0.41
Hooking the audience	24	47	132	78	281 / 0.77
Engaging the audience to participate in the project	163	94	26	69	352 / 0.69
Praising and thanking others	10	56	0	33	99 / 0.41
Offering contacts for information	1	0	0	0	1 / 0.5
Total number of engagement markers and percentages	829 41 %	402 20 %	309 16 %	469 23 %	2009

When looking at the ratio of engagement markers per pragmatic strategy, it ensues that the highest incidence is accrued when "Hooking the audience" (0.77 markers per instance). Although this is not one of the top prominent interactional strategies, engagement markers (especially questions and reader mentions, and exclamations to a lower extent) show a high frequency (Example 4). As illustrated in this instance, these may be accompanied by typographical resources, such as full capitalisation of "Guiding the audience to perform an action", "Engaging the audience to participate in the project" and "Fostering networks" display a displays a rather high number of engagement markers per instance, showing a recurrent combination of directives, questions and reader pronouns (Example 5).

Example 4. High incidence of engagement markers in "Hooking the audience" (Tw10-87).

Example 5. High incidence of engagement markers in "Fostering networks" (Tw10-201).

Guiding the audience to perform an action" may be instantiated through affordances. This may be due to their possible instantiation through affordances and non-verbal resources other than verbal engagement markers that may more fruitfully encapsulate research projects' intentional actions and the sought reactions from diverse audiences (Example 6). This shows that dialogicity can also be impicit, which is rather implicit dialogicity, which is likely to be acknowledged by readers as such, triggering their reaction and interactivity.

Example 6. Lack of engagement markers in interactional pragmatic strategies (Tw9-3).

Whereas engagement markers are found in all interactional pragmatic strategies, there seem to be clear correlations between predominant markers with specific strategies. Directives have a high incidence of use in the interactional pragmatic strategies "Guiding the audience to perform an action" (Example 7), "Engaging the audience to participate in the project" (Example 8) and "Inviting the audience to consume research project output", an output which can be of different kinds (Example 9). In Example 7 readers are encouraged to perform a physical action and to join the project at a given event. The directive "Come" prompts readers to perform what could be considered a textual act in this particular medium, and serves to indirectly introduce a peripheral link to attract audience traffic and foster users' navigation (Pascual, 2019a).

Example 7. Directives as a prominent engagement marker in "Guiding the audience to perform an action" (Tw7-4).

When research groups seek to involve diversified users somehow in the project, directives are also a prominent feature in their tweets. They are likely to target a rather specialised audience, especially if their use is related to the dissemination of activities and events programmed by the research consortium. Thus, the tweet in Example 8a spreads out information about the next project meeting so that international project members and researcher peers from similar disciplinary backgrounds may attend and participate. The directive is in this case the phraseological unit "Save the date", which triggers the rest of the tweet and where typographical emphasis is provided through its full capitalisation. Example 8b also refers to specialised readers, but opens up the door to other curious users that may want to know more about the project and its members in an event that seems to be less academic. Unlike in the previous examples, directives in Example 8c would be addressed to society in general, that is, to any user consuming the Twitter feed of the research project. "Grab" and "learn" urge readers to perform an action, for which they need to employ project-related outputs. Moreover, users are engaged to visit the project website and its contents to efficiently carry out those actions, as evidenced in the last sentence of the tweet.

Example 8. Directives as a prominent engagement marker in "Engaging the audience to participate in the project".

a) (Tw1-7)

b) (Tw4-11)

c) (Tw10-117)

Directives are further used to bring diverse audiences' attention and encourage them to consume or read various types of outlets: "primary" output in the form of academic publications (Example 9a), dissemination practices in the form of blog posts about specialised information (Example 9b) and periodical updates on their projects for more diversified audiences in the form of newsletters (Example 9c), among others.

Example 9. Directives as a prominent engagement marker in "Inviting the audience to consume research project output".

a) (Tw6-70)

b) (Tw2-159)

c) (Tw8-211)

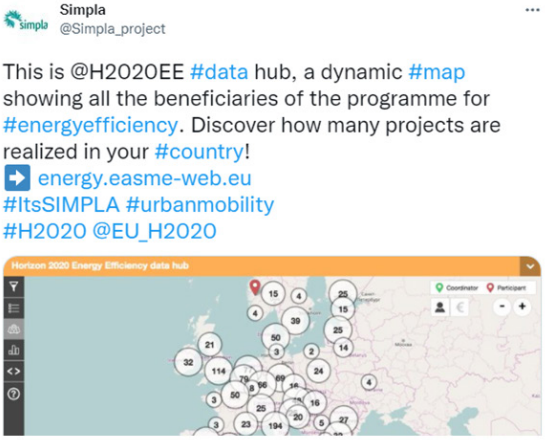
Reader mentions are the second most salient category of engagement markers. They encompass not only personal pronouns (inclusive "we", "our" and "us" referring to both authors and readers, as well as "you" and "your"), but also direct references through mentions introduced by @. Overall, their frequency is highest when "Guiding the audience to perform an action". The various examples displayed below elucidate how research groups tweet bearing heterogeneous groups of users in mind. Example 10a illustrates how specialised users are encouraged to subscribe to the project news ("to your inbox") in order to receive updated information about the development of the project and, in a way, bridging the gap between the research group and interested users. Example 10b constitutes the first tweet published in the account of this research project. The action to be carried out by (non)specialised users in this case is to follow other social media accounts of the project. This is interestingly done not through explicit directives, but rather through reader mentions and the use of "could". Eventually, a much more diversified audience, and probably with rather non-specialised users in mind, is addressed in Example 10c. Here a dialogic interaction is established with a wide range of readers that may not be interested necessarily and/or specialised in the project and its area of expertise. The possibility of finding out information about the project outreach is accompanied by a picture showing a visual map to attract users from different countries and diverse backgrounds, thus facilitating their performance of the expected action and making it more enticing.

Example 10. Reader mentions as a prominent engagement marker in "Guiding the audience to perform an action".

a) (Tw7-1)

b) (Tw8-169)

c) (Tw10-78)



Reader mentions are also particularly characteristic of the strategy "Hooking the audience", which purports to grab readers' attention in quick and straightforward ways through interpersonal appeals. Example 11 below reflects the repetitive use of inclusive "we" in a retweet to approach the audience and make them feel part of a common environmental concern. The various needs and actions we can tackle are enhanced by both a reader mention and their visual representation at the end via an emoji. The tweet finishes with the formulaic phrase "Let's" and with emojis that substitute the content words "love" and "world", which may on the whole increase the attractiveness and impact of the tweet and the dialogic reaction of the reader.

Example 11. Reader mentions as a prominent engagement marker in "Hooking the audience" (Tw4-128).

Reader mentions are particularly prominent together with exclamations and directives when "Fostering networks" (see Example 2). We can see how the first part of this tweet is constituted by a question, where specific users are directly addressed through The use of the personal pronoun "you". In this case, the Twitter account of Horizon Europe is trying to extend the net of projects being financed by the Horizon2020 programme and to create connections among them by making a list of searchable contacts in Twitter. The second part of the tweet is an exclamative sen-

tence, which includes an imperative to call readers into action and another second person pronoun to make clear who is being targeted. This example is actually a retweet of one of the H2020 research projects within the EUROPROtweets corpus that followed the command of the original tweet to stay updated on and align with other funded projects.

As shown in Table 6 above, exclamations are particularly frequent when "Engaging the audience to participate in the project" (Example 13), "Guiding the audience to perform an action" (Example 14) and "Fostering networks" (Example 15). In Example 12 exclamation marks reinforce the attempt to engage users by making a future commitment of sharing the results based on users' participation and feedback and by explicitly encouraging them to attend a physical event where the project is represented. Dialogic interaction is also built by means of other engagement features: reader mentions, including the pronoun "you" and the mention @, and the directive "Visit". Such dialogue or relationship further relies on the use of self-mentions, establishing bridges between the diversified audience and the project members, as well as on the use of a picture portraying who and what the audience will find if they undertake the course of action highlighted. Also, hashtags stress the key ideas of the project and what the audience can find further about.

Example 12. Exclamations as a prominent engagement marker in "Engaging the audience to participate in the project" (Tw10-80).

Exclamations also serve to emphasise the actions research projects wish readers to perform and, therefore, tend to be accompanied by directives. That is the case of Example 13, where repeated exclamation marks are used by the research group to strongly push users to check the papers published by a member of the project. Hyperlinks are provided for easy access to the publications and the emoticons that close up the tweet visually represent the verbal content expressed earlier. These non-verbal markers refer to the disciplinary field of the project, the emotion of surprise for the new publication, the piece of writing itself and a diamond as a symbol of value and excellence.

Example 13. Exclamations as a prominent engagement marker in "Guiding the audience to perform an action" (Tw6-90).

Finally, exclamations have been found to be recurrently used as a dialogic marker in relation to the pragmatic strategy "Fostering networks". Example 14 illustrates a retweet by a research member of one of the projects within the EUROPROtweets corpus. The content of the tweet first poses a question to catch users' attention, simultaneously pinpointing the need and impact of projects specialised in climate, sustainability and urbanism, as a central concern in current research and innovation programmes. Then, two other projects sharing the same thematic background are mentioned, so that their profiles are more searchable, users can easily follow their updates and they may overall accomplish a higher impact in Twitter. To that respect, the exclamation mark closes the tweet and may help foster the networking by leading users to click on the project Twitter accounts. By including a picture featuring construction works, emphasis seems to be placed on the direct transfer and implications of their research endeavours.

Example 14. Exclamations as a prominent engagement marker in "Fostering networks" (Tw4-140).

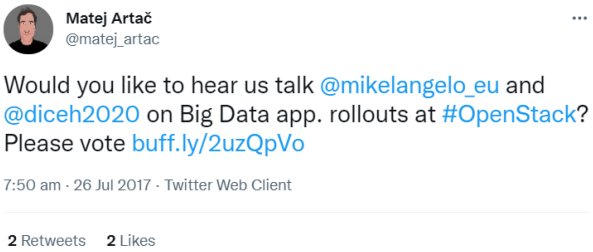
The last category of engagement markers that is used in the realisations of interactional pragmatic strategies in research groups tweets is questions, which feature especially high when "Hooking the audience" (Example 15). They are a highly dialogic interpersonal feature which seeks to rhetorically engage the audience driving them to find the answer by consulting further information. Quite often several questions are posed, as in the example, making readers ponder their answers.

Example 15. Questions as a prominent engagement marker in "Hooking the audience" (Tw4-118).

As indicated above, and shown in Examples 16 and 17, there is a common interactional pattern consisting of a question followed by a directive together with a hyperlink prompting the audience to navigate further and easily ac-

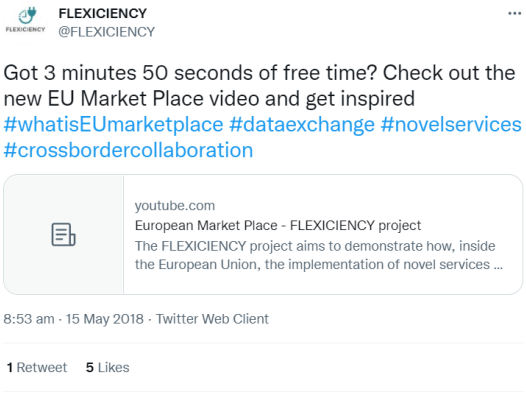
cess the research project websites, attracting traffic to them. Even if the most common engagement marker resorted to when guiding the audience to perform an action has been found to be directives, questions (functioning as invitations) can also be employed to realise this interactional pragmatic strategy. In Example 16, the question, reader pronouns and mentions accrue together with a hashtag to emphasise the topic the project will deal with and entice users to click on the external hyperlink and vote.

Example 16. Questions as a prominent engagement marker in "Guiding the audience to perform an action" (Tw2-69).



Questions are also inserted when inviting the audience to consume the various pieces of output the project the project may have created and published. In Example 17, a shortened question (with omitted auxiliary verb and subject) has been used as an informal prompt to get readers to click on the video, underlining its short length to convince them to watch it.

Example 17. Questions as a prominent engagement marker in "Inviting the audience to consume research project output" (Tw8-47).



In this section, we have explored the most frequent pragmatic strategies with an interactional function in the communication of research projects funded by the Horizon2020 programme. Salient engagement markers have been analysed in relation to the interactional pragmatic strategies that contribute to the dialogicity of the communication performed by these research groups and to the interaction among them and diversified users. The role played by the affordances of the medium and the addition of visual characteristics in the encoding of the strategies has also been highlighted.

5. Conclusions

The present study contributes to the exploration of how scholars and professionals are entangled in new online environments which involve the use of digital genres and media and require researchers to endorse and deal with ever-evolving academic disursive practices. Following a top-down approach, we first identified specific interactional pragmatic strategies in the EUROPROtweets corpus. We then focused on their verbal realisation, primarily paying attention to the engagement markers that were prominent in the pragmatic strategies identified, under the premise that they can be understood as indicators of researchers' dialogic awareness of the audience. As such, they may attract Twitter users and build a relationship with them, creating a heterogeneous virtual community. Engagement markers are, thus, efficient resources to meet not only the expectations of readers (communicative affordances), but also to make use of

the conventions of Twitter (technical affordances). Together with verbal markers, the role of affordances and visual cues in the texts of the tweets (e.g. hashtags, mentions, links, pictures or emojis in their realisation) has also been offered.

The analysis has unveiled researchers' various practices and choices, both from pragmatic and interpersonal perspectives, when seeking to reach diversified audiences in Twitter. Within the non-specialised public, i.e. lay and heterogeneous readers, research groups should bear in mind their assumed knowledge, as well as readers' potential interest and level of expertise in an attempt to bring them close to the project rationale and development. Within the specialised public, professional and purely academic audiences can be addressed, bringing about research groups' attempts to persuade them to keep updated on the research project and trigger dialogic interactions with them.

Particular interactional pragmatic strategies have been identified in Twitter for Research Dissemination Purposes. Our findings show that the most remarkable strategies are geared towards making information visually salient for readers, fostering networks with them and guiding the general audience to perform an action, which would reinforce a participant-oriented kind of dialogue (Bondi, 2018a). Some strategies do not necessarily rely on verbal engaging mechanisms to catch the audience's attention and may be rather realised by taking advantage of dialogic functions enabled by Twitter affordances, such as hashtags, hyperlinks, mentions and retweets. Nevertheless, the high incidence of engagement markers found evidences that they also play a key role in effectively verbally promoting dialogicity in TRDP.

The analysis has shown that particular verbal engagement markers prototypically instantiate specific interactional pragmatic strategies. "Hooking the audience" is characterised by questions and reader mentions and "Guiding the audience to perform an action" mainly by including directives and reader mentions in their tweets. Next, research groups "engage the audience to participate in the project" by resorting to directives and exclamations, whereas "Fostering networks" is commonly enacted equally through directives, exclamations and reader mentions.

Specific non-verbal resources are resorted to in the interactional pragmatic strategies enhancing the addressivity and dialogicity of the Twitter setting, particularly, emojis, typographic elements and pictures. Emojis contribute to catching readers' attention by supporting invitations to take actions and react to the profiles of research projects. Typography in the form of repetition and capitalisation emphasises the intention of the research group to strategically highlight pertinent details and reach diversified audiences. Finally, pictures are inserted in tweets to fulfil likely expectations of Twitter users to find disclosed information about the project's day-to-day development.

Our results contribute to the understanding of current digital academic professional practices in the turn towards Scholarship 2.0. Our focus has been on digging into the complex ways in which dialogic interaction is built between international research projects and different stakeholders when disseminating knowledge and their research results through SNSs. The analysis of researchers' interactional pragmatic intents and discursive choices has helped reveal how Twitter is exploited dialogically and how they get to establish an interpersonal relationship with heterogeneous users through their tweets. Pedagogical implications from our study can be drawn, not only as for the context-embedded interactional strategies that research groups emphasise in their Twitter accounts, but also regarding the purposeful deployment of salient engagement markers and the exploitation of non-verbal resources afforded by the medium. All in all, research groups and Twitter consumers, as users at both ends in this writer-reader dialogue, will benefit from being more aware of the multiple ways in which they can persuade and be persuaded, respectively, to interact with the medium, with one another and among them.

Acknowledgements

This research is a contribution to the InterGedi research project (https://intergedi.unizar.es/) and has been financed by the *Ministerio de Economía y Competitividad* (FFI2017-84205-P) and the *Gobierno de Aragón* (H16_17R), Spain.

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