DIGITAL DISSEMINATION PRACTICES: AN ANALYSIS OF EXPLANATORY STRATEGIES IN THE PROCESS OF RECONTEXTUALISING SPECIALISED KNOWLEDGE

Pilar Mur-Dueñas

Abstract

Researchers and scientists are increasingly encouraged by their institutions, by external organizations and by societal demands to foster the global dissemination of their knowledge production. Such dissemination is nowadays very frequently carried out online through different digital practices and texts. The current Web 2.0 and Science 2.0 context requires complex discursive practices to recontextualise and communicate specialised knowledge in a way that is accessed, understood and accepted by multiple audiences. The use of explanatory strategies has been highlighted by previous research as playing a key role in the recontextualisation of scientific findings. Such strategies can be realised verbally and non-verbally through diverse semiotic modes and affordances of the digital medium. A taxonomy of verbal explanatory strategies (elaboration, explicitation, exemplification, enumeration and comparison) and non-verbal (visual representations and spatial organisation) is presented stemming from the data-driven analysis of a sub-corpus of web-hosted practices, which is part of the SciDis Database compiled by the InterGEDI research group at Universidad de Zaragoza. In particular, the sub-corpus consists of 30 texts: 10 author-generated digital texts – from the knowledge dissemination community *The Conversation* –, and writer-mediated digital texts – 10 feature articles and 10 research digests – on circular economy and sustainability. Results show that verbal explanatory strategies are more frequent than non-verbal ones and that within the latter exemplification and explicitation are most common across all three types of digital dissemination practices. Author-generated scientific digital texts present more non-verbal explanatory strategies than writer-mediated ones – feature articles, and especially than research digests. The findings on the strategies resorted to and their realisation can be used to design tools for researchers, scientists and scriptwriters, mediators of disciplinary knowledge, who need to communicate such knowledge through digital platforms to diversified audiences.

Keywords

recontextualisation, scientific dissemination, knowledge communication, digital discourse analysis, digitally mediated communication

1 Introduction

It is no news that the Internet and technologies have greatly transformed most, if not all, professional practices. The Internet has brought about with it new, evolving and emerging discursive practices related to those professional practices. Thus, the Web has also impacted how science is conducted and

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disseminated, and in turn, scientists' discursive practices. Science 2.0 entails further collaboration and openness among scientists, taking advantage of everything the web has to offer to undertake more challenging scientific endeavours and to open and share results and advances (Shneiderman 2008, Waldrop 2008). Baykoucheva (2015) establishes a parallelism between Web 2.0 and Scholarship 2.0, which involves different ways of finding information and sources, undertaking research, and especially disseminating and circulating it. Thus, Web 2.0, Science 2.0 and Scholarship 2.0 bring with them digital practices within professional communities (Jones et al. 2015) as a result of complex professional practice (Sarangi & Candlin 2011) and diverse, intricate discursive practices for scientists and scholars requiring the construction, interpretation and use of hybrid, evolving professional genres (Bhatia 2008).

In this Scholarship 2.0 scenario, the publication of peer reviewed articles, chapters and conference papers, is of course still paramount. This "primary output" constituting certified and legitimised knowledge (Puschman 2015), upon which scientists' and scholars' credibility and reputation are largely determined. This gave way to the "publish or perish" aphorism, which has been true for quite some time. Nevertheless, this does not seem enough anymore. To this we add – in this Scholarship 2.0 environment in which we operate – the need to disseminate, circulate and transfer such output, which many times involves the use of different digital genres and practices. Indeed, scholars and scientists "must not only produce research but also place it in the right journals and get it cited, then popularize it on blogs, tweets and websites, and show it has real world impact" (Hyland 2023: 30). Hence, a renewed aphorism seems more in vogue, "publish *and market* or perish".

This paper focuses on such digital dissemination, circulation and transfer of specialised knowledge. It is the aim of this study to look into an important phenomenon when expert knowledge is communicated digitally beyond community insiders, that of recontextualisation. The digital medium entails that scientific communication can reach diversified audiences, from peers and experts in the field, to the general public. Recontextualising specialised knowledge for the digital medium involves identifying and selecting key information, as well as reshaping it through the use of varied semiotic resources and taking advantage of online affordances. In particular, the extent of use and realisation of explanatory strategies is analysed in a corpus of digital disseminating practices on the topics of circular economy and sustainability, including author-generated texts taken from *The Conversation* platform and scientific digital texts by knowledge communicators, in particular feature articles and research digests.

The rest of the paper is divided as follows. First, the theoretical framework focuses on key aspects and affordances of the digital medium which can have a bearing on the phenomenon of recontextualisation in general and of explanatory strategies in particular. Section 3 will present the corpus on which the study rests, and which has been taken from the SciDis Database compiled by the InterGEDI research group at Universidad de Zaragoza (Spain) together with the taxonomy of explanatory strategies stemming from the analysis of the corpus. In section 4 results will be presented on the overall use of explanatory strategies in the digital dissemination practices and their specific uses. Also, specific patterns and characteristic elements of their discursive realisation will be pointed out. Finally, section 5 will close the article with some concluding remarks, implications from the findings and venues for further research.

2 Digital dissemination and recontextualisation of specialised knowledge

Web 2.0, Scholarship 2.0 and Science 2.0 have enabled professionals to collaborate in the pursuit of common scientific goals and have facilitated the establishment of international networks with colleagues within and across fields around the globe. It has also contributed to opening science (Puschman 2015) to society and also to broader scrutiny favouring transparency. This openness has ensured citizens' participation and public engagement, as a way to democratise science and bridging or softening knowledge asymmetries (Engberg 2021). Nevertheless, digital scientific dissemination practices may result in an increasing marketisation process of academic life and commodification of knowledge (Pascual et al. 2023).

The digital communication and dissemination of science and expert knowledge makes it available to heterogeneous, indeterminate audiences, blurring the boundaries between expert and non-expert communication, between specialists and the general public. This is a challenge for scientists, scholars and mediators of domain-specific knowledge who need to bear in mind the background information, needs and expectations of a diversity of readers who may consume science communication as it is made available online. Digital science communication is "instantly available to millions of different populations – stakeholders, peers, funders, students, practitioners, promotion committees and the general public" (Hyland 2023: 25).

Through the varied digital professional and discursive practices that scientists and scholars are pressed to take on, they construct their identity and gain visibility, establishing their reputation, credibility and recognition. As Pascual et al. (2023: 13) underline, "the rise of the digital medium has brought about researchers' aspiration for a higher visibility that may allow them to reach a wide

audience, have a bigger impact and develop a digital identity that makes their investigations recognisable and prominent".

The analysis of digital communication and digital genres has underlined a number of key aspects and affordances that are due to or reinforced by the actual medium. Some of these are: intertextuality, hypertextuality, interdiscursivity, hypermediality, interactivity, remediation, resemiotization, multimodality, hybridity and recontextualisation. The focus of this paper is on the latter, understood as "a process by which some part of discourse is extracted from one communicative context and conveyed into another" (Bondi et al. 2015: 2). This is especially favoured and enhanced by the use of digital media and platforms. It requires the transformation of specialised, expert knowledge to make it accessible, understood and accepted by multiple audiences, potentially addressed to in the digital medium. This recontextualisation can bring with it hybridity and interdiscursivity (Bhatia 2010), as conventions from diverse discourses can be appropriated, as well as multimodality – as adjusting specialised content to different audiences may bring with it the use of diverse modes.

According to Linell (1998, 2001), recontextualisation entails the dynamic transference and transformation of some part or some aspect of a text (or text type) tied to a particular context to another text tied to a different context. The study of recontextualisation for the digital medium requires going beyond the linguistic reformulation, that is, beyond intertextual recontextualisation (i.e. overt transfer and transformation of specific parts of one text to another) to the social and cognitive-discursive level, that is, to interdiscursive recontextualisation (i.e. the transfer and transformation of more abstract features and semiotic resources and conventions across texts, genres and practices) (Mäntynen & Shore 2014).

Recontextualisation can be taken to be a knowledge building process carried out by experts when communicating with other experts and non-experts (Engberg & Maier 2020). Once experts realise the difference with addressees in knowledge base, they resort to different processes and make that difference visible in communication through verbal and non-verbal resources, as a response to and seeking to overcome knowledge asymmetries (Engberg & Maier 2015, Engberg 2023). Recontextualisation can, thus, be considered as a process to mediate understanding across those attested knowledge asymmetries. From the recontextualisation literature (Bezemer & Kress 2002, Calsamiglia & van Dijk 2004, Gotti 2014, Luzón 2013, 2019, Mattiello 2017, Carter-Thomas & Rowley-Jolivet 2020, Bondi & Cacchiani 2021, Lorés 2023), two types of strategies can be discerned. Explanatory or illustrative strategies on the one hand, and engagement or attention-getting strategies, on the other. The focus of the analysis presented in this paper will be on the former. Explanatory

strategies have been referred to differently and they will be taken as a point of departure to look at the phenomenon of recontextualisation in the digital dissemination practices to be analysed. Luzón (2013) refers to strategies to tailor information and encompass: explanation of terms and concept, paraphrases/reformulations, comparisons/metaphors, examples from daily life, links, and visuals conveying information. In her analysis of science videos Luzón (2019) establishes four strategies and those used to tailor information to the assumed knowledge of potential readers are labelled "Framing" (the other three are: Source credibility, Convincing argument and Engagement). Framing strategies contribute to facilitating understanding of abstract ideas and distant situations (Gotti 2014), and therefore to knowledge communication potentially reaching more diverse audiences. In three-minute thesis presentations, such strategies to tailor information entail "decisions about which aspects of the research topic to underline and which to downplay or exclude, how to explain key terms, concepts and processes, and how to frame the research so that it becomes accessible to the audience" (Carter-Thomas & Rowley Jolivet 2020: 5). In her analysis of recontextualising strategies in online research digests, Lorés (2023) establishes three dimensions, of which "comprehensibility of text", that is, the "discoursal efforts made by the scriptwriter to facilitate the understanding of the text by audiences with different degrees of expertise" (Lorés 2023: 72) would correspond to what are referred in this paper as "explanatory strategies".

Thus, as understood in this study, explanatory strategies are used to tailor domain-specific information to a global, diffuse audience, to frame research to make it accessible and to bridge a gap in knowledge between experts (disciplinary fellows) to non-experts (interested users and the wide public). The article seeks to provide an answer to the following research questions:

1. Which explanatory strategies are included in the digital dissemination practices identified when transferring knowledge on circular economy and sustainability?
2. Which ones are more commonly used within and across these digital dissemination practices so that specialised knowledge in this field is made accessible, understood and accepted by a wide audience? Are there any differences in their use between author-generated (articles in *The Conversation*) and writer-mediated (feature articles and research digests) digital scientific dissemination practices?
3. How are these explanatory strategies realised? What (lexico-grammatical) features are characteristic of the process of recontextualisation in the digital scientific dissemination practices identified?

3 Methods

3.1 Corpus and procedure

Explanatory strategies are analysed in a sub-corpus taken from our SciDis Database which includes digital texts and practices related to three fields (Health, Economy and Natural Sciences) in which we assume that the practices of dissemination of knowledge in digital media are currently occurring as they are of particular relevance to the public and of significant social impact. We selected texts and genres on topics within each of the three fields which can be of special interest to the society as global citizens, and which can be connected with specific Sustainment Development Goals (SDGs), adopted by all United Nations Member States in 2015, as shown in Table 1. We believe that research has to be disseminated to promote global understanding of these issues at stake so that the Agenda established for 2030 can be met. The texts that constituted the sub-corpus here analysed correspond to the field of Economy, and in particular, to the topics of sustainability and circular economy in connection with SDG 12 (Responsible consumption and production).

Field	Topics	SDGs
Health	Physical activity and nutrition Mental health	SDG3 Good health and well-being
Economy	**Sustainability** **Circular economy**	**SDG12 Responsible consumption and production**
Natural sciences	Energy efficiency Climatic change	SDG7 Affordable and clean energy SDG13 Climate action

Table 1: Fields and topics within the SciDis Database of digital dissemination practices

We have attempted to determine so far some disseminating digital practices and we have drawn two distinctions, one with the authorship of the digital texts disseminated and one with the platform or space in which the practices are upheld. First, as regards authorship, we have distinguished between those practices in which the constructors of expert knowledge and the disseminators of such knowledge coincide, and which we have labelled author-generated, and those in which expert knowledge is disseminated not by the researchers or scientists themselves but by other knowledge managers – science scriptwriters and journalists, which we have labelled writer-mediated. We believe this distinction can have a bearing on discourse choices. Second, as regards platforms or spaces, we distinguish between web-hosted practices and social media practices, since the level of interactivity, for example, a key digital affordance, entails differences in one and the other.

In this paper the focus is on web-hosted practices, including both author-generated and writer mediated practices. Overall, 30 texts were selected: 10 author-generated ones taken from *The Conversation* platform, and 20 writer-mediated ones: 10 feature articles taken from two sites (*Nature* and *The Smithsonian Magazine*) and 10 research digests taken from another two sites (*Science Daily* and *European Commission*) (see Table 2). As stated on their website, *The Conversation* is "a nonprofit, independent news organization dedicated to unlocking the knowledge of experts for the public good", aims to "publish trustworthy and informative articles written by academic experts for the general public and edited by our team of journalists", and "to raise up the voices of true experts and to make their knowledge available to everyone" (https://theconversation.com/us/who-we-are). Feature articles selected from *Nature* have a DOI number assigned and some contain references, whereas those in *The Smithsonian Magazine* do not. In both cases they are signed by scriptwriters and journalists. Research digests from *Science Daily* and *European Commission* include information on how to cite the text and acknowledge the source of article and material from which scientific knowledge is disseminated.

	Author-generated web-hosted disseminating practice	**Writer-mediated web-hosted disseminating practice**				**TOTAL**
		Feature articles		Research digests		
	The Conversation	*Nature*	*The Smithsonian Magazine*	*Science Daily*	*European Commission*	
Nº of texts	10	5	5	5	5	30
Nº of words	8,997	5,742	8,894	3,489	3,579	30,124
Average nº of words per text	900	1,464		707		1,120

Table 2: Description of Eon Sci-Dis sub-corpus

Text length in the *The Conversation* texts ranged from 736 to 1,166 words, all of them included at least one picture in relation to the research or scientific topic. Text length in feature articles varied considerably in the two sites from which the texts were compiled. They ranged from just 634 to 2,956 words. All feature articles but one (*Nature* Econ3) contain at least one picture. Research digests are overall shorter texts and their length varies from 443 to 953 words. Research digests published on *Science Daily* contain no picture.

For the analysis of explanatory strategies employed when recontextualising specialised knowledge, the Computer-Facilitated Qualitative Data Analysis software Nvivo12 was used. A data-driven analysis was applied and a resulting taxonomy of seven explanatory strategies stemmed, which is presented in the next sub-section. These were turned into nodes and all texts were coded accordingly.

3.2 Taxonomy of explanatory strategies in digital scientific dissemination

Seven explanatory strategies, divided into verbal and non-verbal, were derived from the data-driven analysis of the sub-corpus. The five verbal explanatory strategies found in the digital scientific dissemination practices analysed are:

1) Elaboration. Through amplifications, meaning is made accessible to wide audiences. It is judged that the understanding of the specialised information may be compromised and specific concepts and ideas are expanded to ease their comprehension and overall acceptance. They may be discursively introduced by means of commas, hyphens, parentheses or relative clauses, as shown in Example 1:

(1) In the United States, 17 percent of skiable terrain benefits from machine-made snow, according to the National Ski Areas Association (NSAA), **an industry group that represents more than 300 ski areas in the U.S.** However, there's a lot of regional variability – snowmaking tends to be more common at ski resorts in the East than those in the West.

But Sunshine Village Ski Resort in Alberta, Canada, also known as Banff Sunshine, takes a different approach: snow farming. For decades, the resort has pioneered this technique, **which involves setting up miles of fencing across its highest terrain to capture large amounts of wind-blown, natural snow**.

(Feature article *The Smithsonian Magazine* Econ 3)

In this brief text two elaborations have been included. The first one can be taken to be a description of the Association, which may not be known by all readers, the second one provides a definition of snow farming, which again has been judged by the knowledge mediators as not understandable for all potential audiences by the authors managing knowledge.

2) Explicitation. In this case specific details or peculiarities are provided to make the idea or concept clearer to the audience. On many occasions acronyms are spelled out and again these are seen as turning implicit content explicit to adjust to diverse audiences who may find certain aspects and terminology obscure. Explicitations can be introduced in the text by commas, hyphens and varied discursive elements. In Example 2 two particular details which some readers may not consider to be part of the life cycle of a product are highlighted to make sure the information is understood as intended.

(2) The scientists therefore call for product stewardship to encompass the entire life cycle -- **including disposal and recycling** -- as the basis for optimising the design of sustainable processes.

(Research digest *Science Daily* Econ 3)

3) Exemplification is the third explanatory strategy used to recontextualise specialised knowledge so that it is readily understood by diversified audiences. Examples are provided to illustrate given aspects which, as a result of authors' management of knowledge, are considered knowledge reminded or knowledge being constructed (Calsamiglia & van Djik 2004). In Example 3 an imperative is used to introduce an example of the staggering environmental impact of the fashion industry trends. Examples are most commonly introduced by discourse markers, as in Example 4.

(3) Taken together, these trends are having a staggering environmental impact. **Take water**. The fashion industry, one of the world's largest users of water, consumes anywhere from 20 trillion to 200 trillion litres every year.

(Feature article *Nature* Econ 5)

(4) This means taking into account important habitats **like mangroves and seagrass**, as well as other priorities that might compete with aquaculture for space, **such as tourism and maritime transpor**t.

(*The Conversation* Econ 8)

4) Enumeration, indicating the specific number of elements in a category previous to their specification can make the information more easily accessed by the reader. The sequencing may be a result of pruning information to its essential components. In Example 5 two subsequent examples of enumeration as an explanatory strategy accrue. A framework consisting of three stages and four sets is being reported.

(5) They identify **three stages – identifying opportunities, initiating projects, and scaling implementation** – and propose management and decision-making tools that could be of use in each. They also highlight **four sets of external conditions that are required to enable the transition, relating to technology and design, funding and investment, markets and governance, and society and labour.**

(Research digest *European Comission* Econ 4)

5) Comparison/analogy is used to bring the concepts and ideas close to other concepts that managers of knowledge judge to be more common and better known by the audience or for them to better grasp the relevance or significance of figures and data provided, as in Example 6. In order for

the magnitude of the percentages to be fully understood, it is explained further through a comparison.

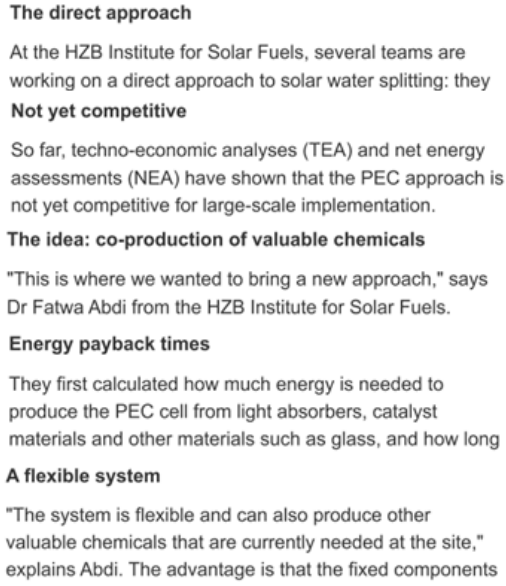
(6) Africa's agriculture sector accounts for about 35% of the continent's gross domestic product, and provides the livelihood of more than 50% of the continent's population. These shares are **more than double those of the world average and much higher than those of any other emerging region**.

(*The Conversation* Econ 7)

The two non-verbal explanatory strategies found in the digital dissemination practices analysed are:

6) Spatial organisation (layout). Whereas the layout may be constrained by the platform affordances, very often these texts, however short, contain headings and bullet points chunking the information, which contributes to clarifying meaning, making it accessible to audiences with diverse levels of expertise. This breaking down of information may be the result of streamlining specialised knowledge and of pruning ideas, as these are selected and recontextualised in the new medium, easing their comprehension.

(7)



The direct approach

At the HZB Institute for Solar Fuels, several teams are working on a direct approach to solar water splitting: they

Not yet competitive

So far, techno-economic analyses (TEA) and net energy assessments (NEA) have shown that the PEC approach is not yet competitive for large-scale implementation.

The idea: co-production of valuable chemicals

"This is where we wanted to bring a new approach," says Dr Fatwa Abdi from the HZB Institute for Solar Fuels.

Energy payback times

They first calculated how much energy is needed to produce the PEC cell from light absorbers, catalyst materials and other materials such as glass, and how long

A flexible system

"The system is flexible and can also produce other valuable chemicals that are currently needed at the site," explains Abdi. The advantage is that the fixed components

(Research Digest *Science Daily* Econ 3)

7) Visual representations tend to comprise representationally narrative rather than conceptual pictures (Kress & van Leeuwen 2021), as they portray people and settings directly related to the idea or phenomenon being recounted and bring it closer to the readers' likely experiences and conceptualisations. The inclusion of visual representations in the digital disseminating practices analysed can be taken to be a multimodal knowledge enhancement process in as much as they entail the repetition of concepts in more than one modality (Engberg & Maier 2022). As stated by Lorés (2023: 74) in relation to comprehensibility of text in the digital recontextualisation of knowledge, "[v]isuals and text combine and interact giving way to a 'communicative ensemble' which enhances understanding and reinforces meaning."

(8)

Solar panels float on a mountain lake in Switzerland. The first such system was installed in 2008. Gunter Fischer / Education Images / Universal Images Group via Getty Images

(Feature article *The Smithosian Magazine* Econ4)

The following section presents the main findings on the extent of use of each of these strategies in the corpus of digital scientific dissemination and on how they are realised, providing an answer to the research questions posed.

4 Explanatory strategies in the digital disseminating texts

Explanatory strategies do play a crucial role in the transformation of disciplinary knowledge to adjust it to broad social needs and expectations when it is disseminated online, as attested by the number of such strategies found in the sub-corpus (Table 3). Scientific, specialised knowledge is not only identified and selected but also shaped through specific, especially verbal, strategies.

	Author-generated		**Writer-mediated**					
	The Conversation		**Feature articles**		**Research digests**		**Total**	
	Number	Per 1,000 w.	Number	Per 1,000 w.	Number	Per 1,000 w.	**Number**	**Per 1,000 w.**
Explanatory strategies	164	18.2	183	12.5	98	13.9	**445**	**14.5**
Verbal	113	12.6	150	10.2	86	12.2	**349**	**11.4**
Non-verbal	51	5.7	33	2.3	12	1.7	**96**	**3.1**

Table 3: Total number of explanatory strategies in the three digital dissemination practices analysed.

Given the text-rich nature of these web-hosted practices, verbal explanatory strategies have been found to be very frequent. Authors and scriptwriters turn to discoursal choices to amplify, expand and provide extra information for the audiences to access, understand and accept disciplinary knowledge. Normalised figures of verbal explanatory strategies show similarity across author-generated and writer-mediated scientific digital disseminating texts, a lower proportional number of which are found in feature articles. There are differences in the frequency of use of non-verbal explanatory strategies. These changes are mostly due to the lack of pictures in research digests, which show the lowest number of non-verbal explanatory strategies (1.7 per 1,000 words), and to the large number of headings and bullet points in *The Conversation* texts, which show the highest number of non-verbal explanatory strategies (5.7 per 1,000 words). Overall, these author-generated texts include a higher number of strategies per 1,000 words. As general research results tend to be reported in these texts, rather than those stemming from a particular publication or publications, authors may believe that domain-specific knowledge needs to be reminded, actualised, or newly constructed (Calsamiglia & van Djik 2004) to a greater extent. The texts may be intended to reach and be consumed by lay people with general interest in the topics but little depth or breadth of knowledge (Engberg & Maier 2020), which may require further (multimodal) recontextualisation strategies to bridge knowledge asymmetries between producers and consumers of such specialised

knowledge. On the other hand, readers of feature articles and research digests, recontextualising concrete research publications, may be judged to have at least further breadth of specialised knowledge.

In the following two sub-sections findings on the use of each specific verbal and non-verbal explanatory strategy identified in the corpus of author-generated and writer-mediated scientific dissemination texts are presented.

4.1 Verbal explanatory strategies

As shown in Table 4, exemplifications and explicitations are the most common verbal explanatory strategies across the three disseminating digital practices. Authors and writer-mediators often resort to examples to increase the chances of being understood not only by peers but also by (semi)laypersons (Ciapuscio 2003), and potentially the general public.

	Author-generated		**Writer-mediated**			
	The Conversation		**Feature articles**		**Research digests**	
	Number	**Per 1,000 words**	**Number**	**Per 1,000 words**	**Number**	**Per 1,000 words**
Exemplification	44	4.9	49	3.3	36	5.1
Explicitation	30	3.3	53	3.6	30	4.2
Elaboration	25	2.8	31	2.1	14	2.0
Enumeration	7	0.8	5	0.3	5	0.7
Comparison/ analogy	7	0.8	12	0.8	1	0.1
Total	113	12.6	150	10.2	86	12.2

Table 4: Verbal explanatory strategies across the three digital dissemination practices analysed

Exemplifications have been found in 29 out of the 30 texts analysed, their frequency ranging from one to thirteen strategies per text. They are most commonly introduced in the texts by the markers "for example" or "such as". They are also signalled by phrases such as "an example is..., "another example is…". However, they are not necessarily preceded by a marker or an introductory phrase. In Example 9 two examples of circular solutions are inserted, even if they are not explicitly signalled as such.

(9) […] to come up with circular solutions to that stalwart of every wardrobe. Some manufacturers have made their jeans-production process more circular **by using organic cotton, and by inserting zips in a way that allows them to be easily removed when clothes are recycled. Others are using reinforced stitching to make their products last longer**.

(Feature article *Nature* Econ 6)

Explicitations have been found in all texts in the sub-corpus but two, with their frequency ranging from one to twelve strategies per text. They are most commonly included between commas, brackets, or dashes, as an extra remark, anticipating possible readers' knowledge gaps. Authors and writer-mediators judge the audience's background information to be insufficient, and as a result they provide further information to ensure the audience's access to the concepts or ideas discussed. These very often refer to acronyms and also to specific locations and details about entities or people. It is interesting to see that in feature articles explicitations outnumber exemplifications. This may be due to the use of more specific terms or concepts and acronyms that need to be spelled out in these texts. Even if technicality in content and vocabulary may be reduced in these digital dissemination practices, they are not superseded; in fact, they may be reduced to a lower extent than in other disseminating practices, especially oral ones, such as TED talks (Mattiello 2017).

Elaborations is the third category of verbal explanatory strategy found in the dissemination practices analysed and they have been found in 24 out of the 30 texts in the sub-corpus, in eight of the feature articles, seven of the research digests and ten of *The Conversation* texts. Elaborations go beyond the provision of specific details and amplify the text in an attempt to promote understanding from audiences with diverse levels of expertise in the fields and topics covered. These amplifications entail very often providing a definition (Example 10, and also Example 1 above), a description (Example 11) or provide an explanation in the form of a paraphrase (Example 12).

(10) The move to a circular economy – **a system that aims to reduce, reuse and recycle materials** – could address 70% of global greenhouse
(Feature article *Nature* Econ 4)

(11) Modular design – **where product parts can be replaced and upgraded** – is a promising way of extending product lifetimes.
(Research digest *European Commission* Econ3)

(12) using life cycle analysis to shorten its overseas supply chain – **to use as few intermediaries as possible**.
(Research digest *European Commission* Econ4)

These elaborations often imply the use of a relative clause that defines or describes the concept or process that is being highlighted, as shown in Examples 10 and 11.

There are two other types of verbal explanatory strategies which have also been found in the three types of digital disseminating texts, but they are used to

a lesser extent: enumerations and comparisons/analogy. Enumerations contribute to break down information and to make it more digestible for the non-specialised audience and appear in twelve texts (evenly distributed across the three different digital disseminating practices). Comparisons/analogy are frequently used for readers to understand the magnitude or importance of the concept, element or idea discussed and which feature in ten texts, five feature articles, four texts from *The Conversation*, and one research digest.

These strategies imply that language and scientific discourse is not just adapted, but specialised terms and concepts are maintained and explained in a possible attempt to avoid oversimplification and risking losing credibility, and therefore, acceptance of the ideas discussed. Through these strategies specialised knowledge may be reminded, actualised or newly constructed (Calsamiglia & Van Djik 2004) depending on the audiences consuming them.

4.2 Non-verbal explanatory strategies

The number of non-verbal explanatory strategies is much lower than that of verbal ones in all three digital disseminating texts. Pictures, bullet lists and headings are most common in author-generated texts, and least common in writer-mediated research digests. These, as a multimodal knowledge enhancement process, can greatly contribute to constructing meaning and to making ideas and concepts more transparent, accessible and understood by non-specialised audiences.

	Author-generated		**Writer-mediated**			
	The Conversation		**Feature articles**		**Research digests**	
	Number	Per 1,000 words	Number	Per 1,000 words	Number	Per 1,000 words
Visual representations	24	2.7	28	1.9	5	0.7
Spatial organisation	27	3.0	5	0.3	7	1.0
Total	51	5.7	33	2.3	12	1.7

Table 5: Non-verbal explanatory strategies across the three digital dissemination practices analysed.

As far as visuals are concerned, no tables, graphs or figures are present in these digital dissemination practices. It is interesting that this information has not been selected to be repurposed or resemiotised by knowledge managers mediating between specialised knowledge and these disseminating texts. This leads to the idea that it is not results or evidence that needs to be disseminated in

this secondary output, but rather the implications, applications, consequences of that research or data for citizens. Pictures, on the other hand, are included in all texts except in one of the two sites from which research digests have been taken, *Science Daily*. Pictures are mostly narrative representational structures and are highly modal (Kress & van Leeuwen 2021). They are considered to make the message and topic more accessible to less competent or knowledgeable readers in as much as they depict a setting or element establishing a connection with everyday or more concrete experiences, as shown in Example 8 above and in Example 13. In this picture piles of new brand clothes in an undefined department store are shown to depict our common shopping habits and to gear our reading into the environmental impact of such daily practices.

(13)

How fast fashion can cut its staggering environmental impact

The textiles industry urgently needs input from researchers to help it to embrace the circular economy.

Fast fashion results in new lines being added every week — instead of four times a year — most of which goes to landfill. Credit: Eve Edelheit/Bloomberg/Getty

(Feature Article *Nature* Econ5)

Just on a couple of texts, in research digests, the pictures included are conceptual, evoking key terms and the relationship among them.

As far as spatial organisation is concerned, breaking down information into bullet points or into different sections accompanied by a heading entails breaking down complicated information, thus mediating specialised knowledge for readers to better understand it. Whereas all author-generated texts from *The Conversation* include a bullet list or a heading (ranging from 1 to 5 spatial organisation realisations per text), only two feature articles and two research digests distil the information recontextualised in this way. As highlighted above, the different nature of the knowledge disseminated through these author-generated texts may explain the greater use of these non-verbal explanatory strategies.

Overall, even if verbal explanatory strategies outnumber non-verbal ones in the digital disseminating practices analysed, non-verbal ones also play an important role as multimodal knowledge enhancement devices (Engberg & Maier 2022) especially in the author-generated texts in the corpus, helping readers get across specialised knowledge, and help them represent, access and accept it.

5 Conclusions

The Web 2.0, Science 2.0 and Scholarship 2.0 has revolutionised how specialised knowledge is created, shared and communicated. In this context further analyses of the evolving, increasingly complex digital professional and discursive practices need to be carried out. More light needs to be shed on why and how scientific findings are disseminated by knowledge generators and managers of such knowledge on economic sustainability and circular economy, and accessed, understood and accepted by users (citizens). This paper has sought to contribute to this understanding by focusing on the role of recontextualisation, especially on the explanatory strategies resorted to when disseminating this specialised knowledge widely online. As has been shown, such verbal and non-verbal explanatory strategies are aimed at simplification and easification of concepts and ideas that are judged to be complex by authors and writer-mediators to ensure comprehensibility. Such strategies, however, should not compromise credibility and legitimation for less expert readers not only to understand such specialised knowledge but also for them to accept and approve it (Engberg 2021).

In response to the research questions posed, a taxonomy of seven explanatory strategies (five verbal and two non-verbal) has been presented as used in author-generated digital dissemination practices, namely, *The Conversation* texts, and writer-mediated disseminating practices, namely feature articles and research digests. Verbal explanatory strategies have been found to outnumber non-verbal ones. Among verbal explanatory strategies, explicitation and exemplification are

not only the most frequent ones but also the ones that feature in the most number of texts, followed by elaboration, which is also commonly used to expand and amplify information ensuring comprehensibility, followed by enumeration and comparison/analogy, which are the least common. Among non-verbal explanatory strategies, two types have been discerned: visual representations, constituting mostly narrational pictures, and spatial organisation, comprising bulleted lists and headings. When looking at the normalised frequency of use of verbal strategies, a rather similar trend is perceived. Frequency differences are found, however, in the use of non-verbal strategies, which are less common in writer-mediated digital disseminating practices, as not all research digests include a picture which plays a significant role in enhancing comprehension, and just two out of the ten research digests present headings. Non-verbal explanatory strategies are more profusely used in author-generated *The Conversation* texts, in which authors seem to bridge knowledge asymmetries through different modes to a greater extent. Overall, then, commonalities were found in the explanatory strategies resorted to in both author-generated and writer-mediated digital scientific disseminating practices as well as in their realisation. Some differences were observed in the use of non-verbal strategies by different knowledge managers. Researchers resorted to as a multimodal knowledge enhancement process in their author-generated *The Conversation* texts to a greater extent than science scriptwriters and journalists in their mediated feature articles and research digests. The use of explanatory strategies in the digital scientific disseminating practices selected, give way to hybrid texts as a result of a process of interdiscursivity (Bhatia 2010). Authors and mediators when disseminating scientific, specialised knowledge draw from or appropriate discourse conventions of other genres and practices. This scientific discourse seems to be blended and combined with pedagogical discourse which encompasses definitions, explanations, comparisons to ensure that meaning is effectively conveyed and processed. Other strategies are also used in digital recontextualisations of expert knowledge to claim credibility trustworthiness and legitimation as well as to engage audiences (e.g. Luzón 2013, 2019, Carter-Thomas & Rowley-Jolivet 2020, Bondi & Cacchiani 2021, Lorés 2023), which bring further interdiscursivity and discoursal hybridity appropriating features characteristic of promotional and marketing discourse. The analysis of such strategies, however, lies beyond the scope of this study and could constitute venues for further exploration of these digital knowledge disseminating practices.

Further research could also be undertaken on a larger corpus containing texts from other fields (especially Health and Natural Sciences as they are part of the SciDis Database) to check if the use of the explanatory strategies in the taxonomy presented is maintained in the different digital disseminating practices regardless

of the field and topic. Future studies could also delve into exploring the cognitive mechanisms in the process of recontextualisation of scientific knowledge online for diverse audiences, exploring, for instance, which information is selected from the sources used, and how it is selected.

Knowledge communicators and managers (researchers and science scriptwriters) need to develop specific communication skills to disseminate scientific ideas and advances digitally tailoring such knowledge to diverse audiences and bridging knowledge asymmetries between scientists and citizens while maintaining expertise and avoiding oversimplification. They need to orchestrate other non-verbal modes and make use of the platform affordances to ease the comprehensibility of the information encoded so that specialised knowledge is actualised shared, consumed, and understood. The results of the present study on the explanatory strategies used in the digital disseminating practices analysed may be used to develop discursive tools which can be of help to researchers and mediators of disciplinary knowledge using English to transfer research results at a global level making domain-specific knowledge accessible through digital media to diversified, indeterminate audiences. They could inform English for Academic Purposes and English for Specific courses to contribute to training future effective professional communicators.

The study presented in this paper is just a preliminary look into how expert knowledge is reframed and discursively represented in digital scientific dissemination practices. Further explorations are needed of how specialised knowledge is recontextualised and knowledge asymmetries tackled discursively and multimodally, while maintaining credibility, trustworthiness and legitimation (Bondi & Cacchiani 2021).

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Pilar Mur-Dueñas is a senior lecturer at the Department of English and German Studies at Universidad de Zaragoza (Spain). She is a member of the InterGEDI research group (https://intergedi.unizar.es/) and is currently involved in the research project "Processes of recontextualisation in the transfer of knowledge: A pragmatic, linguistic and multimodal study of digital scientific discourse for dissemination purposes (SciDis)". Her research focuses on the analysis of scholars' digital practices in the communication of specialised knowledge.
ORCID ID: https://orcid.org/0000-0001-8966-1013

Address: Pilar Mur-Dueñas, Departmento de Filología Inglesa y Alemana, Facultad de Educación, Universidad de Zaragoza, C/Pedro Cerbuna 12, 50009, Zaragoza, Spain [e-mail: pmur@unizar.es]