

# diid

78

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# Open Debate

A critical issue for contemporary scientific publishing is that it should comply with the forms in which knowledge is produced and organised. This Open Debate section therefore explores cutting-edge issues in the field of scientific publishing, in response to the digital transformation and the open access paradigm, to enable the emergent diversity of knowledge. The essays together have been conceived as a whole, in which integrity and relevance are achieved through the cross-references between the single contributions: by interviewing some of the main players, presenting critical reflections and specific case studies and using the issue itself to experiment with certain advanced publishing features (augmented content accessible by QR code; intra-textual content, accompanying the main text with secondary texts; and finally non-linear reading), the debate calls for the awareness and responsibility of the entire scientific community to reimagine the scholarly discourse formats as a more inclusive, enhanced, evolving and reusable ecosystem of content, complementary to established structures.

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## **Questioning Controlled Consumption in Publishing: Artistic Responses to Tracking, Control, and Access**

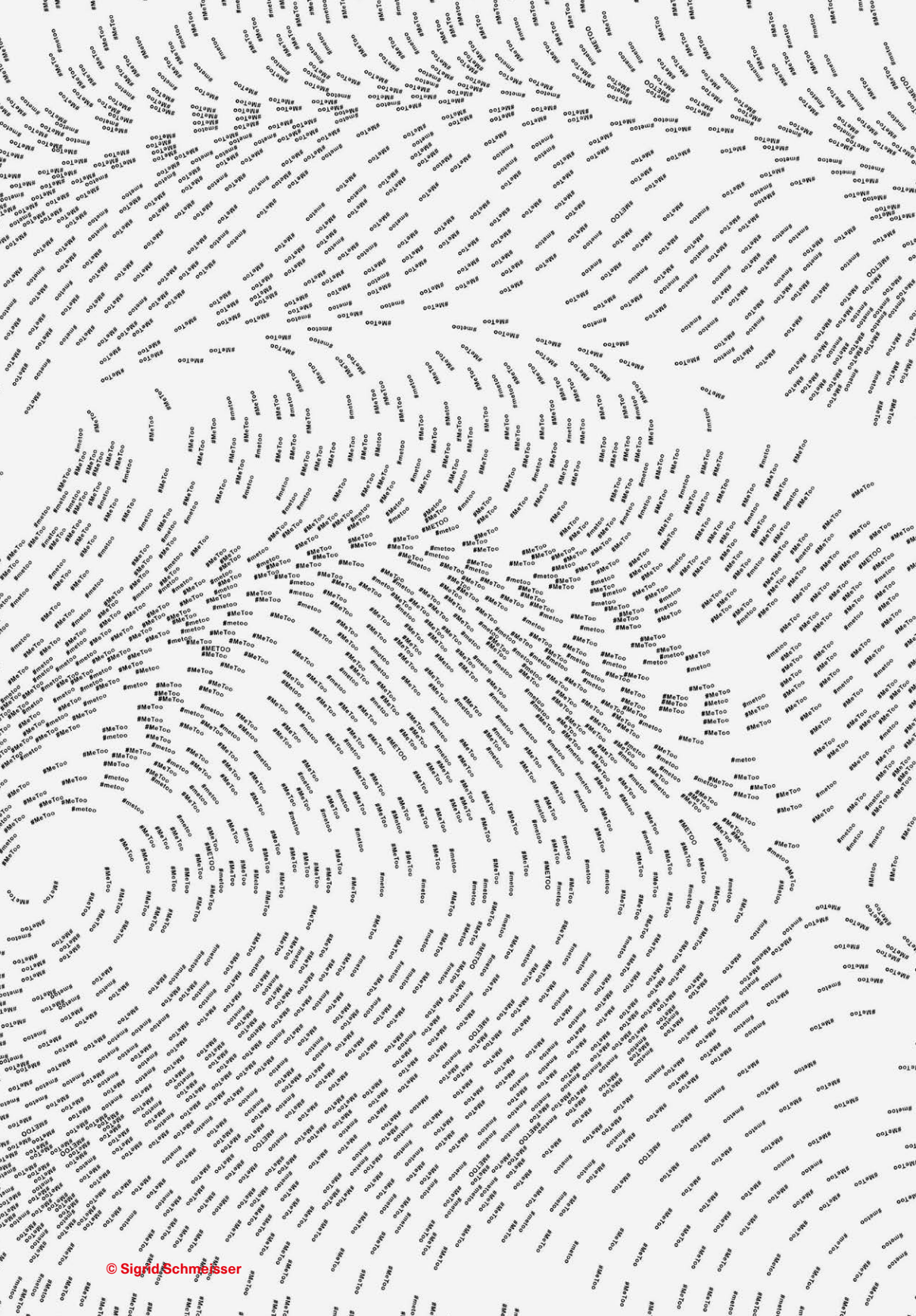
Katherine Mollenhauer Gajardo, Silvio Lorusso

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## **Is There a South-North Knowledge Gap?**

Lorela Mehmeti





# Changing Scientific Production in Design

**Eleonora Lupo**

Politecnico di Milano

eleonora.lupo@polimi.it

ORCID 0000-0003-3677-0245

## **Abstract**

In this essay the Author claims that scientific and academic publishing should comply with the epistemological changes in knowledge production and cognition due to the digital revolution. In calling on the design community for a responsible systemic and cultural change in the publishing ecosystem, the essay discusses the more relevant challenges and new forms, and envisions processes of publication that can enable the emergent diversities of knowledge.

## **Keywords**

**Scientific publishing**  
**Evolving publications**  
**Digital knowledge**  
**Content ecosystem**  
**Publication impact**

## The Epistemological Turn in Knowledge Production

In modern society, the production of new knowledge and the process of scientific publishing are tightly bound: the access to and dissemination of a scientific result through publication initiates the process of knowledge organization and transfer, which can reliably support the generation of new knowledge, in a relational and incremental perspective, especially trusted in the academic domain.

Similarly, the forms and processes of scientific publishing (should) reflect the outputs in which knowledge is produced and organised, in order to maximise its understanding and impact.

In the last century we have witnessed a significant epistemological change in knowledge production, due to the impact of the nascent fields of artificial intelligence, computer science and neuroscience in the mid-1950s on our mental and cognitive processes, and therefore on our way of thinking and organising knowledge. In the mid 20th century, new knowledge production is context-driven, problem-focused and interdisciplinary (Gibbons et al., 1994). A new knowledge model emerged at the turn of the 21st century with the rise of the digital age, which caused Carayannis and Campbell (2006) to assert the coexistence and co-development of diverse knowledge modes, in an interconnected and networked perspective, at the individual, structural and organisational and systemic levels. Finally, the establishment of the open access paradigm in the mid 2000s also began to transform scientific production, affecting its distribution and right of access.

As early as 1986, as a result of the social transformations caused by digitalization, Colombo predicted the paradox of digital archiving as a form of oblivion of collective memory when knowledge is externalised. Similarly Tomás Maldonado (2005), critically posed the question about the future of knowledge within the digital perspective, writing prophetically about its impact on memory and representation, identity, control, homologation, accessibility.

It is evident that, within this digital knowledge revolution (Belisle, 2006), we are still looking for new ways to “imprint” our knowledge because it continues to change.

In this context, the process of scholarly publishing has remained remarkably stable and the key functions are the same ones that have accompanied scientific publishing since the 17th century (EC, 2019). The forms of scientific publishing tend to adhere to traditional structures: while different publishing infrastructures

Fig. 1  
Knowledge map of design for Cultural Heritage, Open Knowledge Map.  
Retrieved from: <https://openknowledgemaps.org/>

## Open Knowledge Map



It is the world's largest visual search engine. It aims to change the discovery of scientific knowledge, by creating a map providing an instant overview of a topic by selecting and showing the 100 documents relevant to the query, using the relevance ranking provided by either the PubMed API or the BASE API. The visualization is intended to give a head start on scholarly search, identifying the main areas at a glance and documents related to them, clustering documents by similarity based on Natural Language Processing.

Kraker, P., Kittel, C., & Enkhbayar, A. (2016). Open Knowledge Maps: Creating a Visual Interface to the World's Scientific Knowledge Based on Natural Language Processing. *027.7 Zeitschrift Für Bibliothekskultur*, 4(2), 98-103.



Fig. 1

and platforms have been founded, the traditional article still predominates in academic journals, and while some innovative features have been added, they show hesitancy in adapting and properly serving the needs of the new forms of knowledge.

This issue of *diid* therefore explores cutting-edge issues in the field of scientific publishing, in response to the digital transformation and the open access paradigm, interviewing some of the main players, presenting critical reflections and specific case studies and using the issue itself to experiment with certain advanced publishing features.

## Cognition in a Digital World

A critical issue for scientific publishing is that the forms in which knowledge is produced and organised depend greatly on current cognitive processes, and in some way publishing should comply with them.

Many scientists are debating how cognitive functions are impacted by digital technologies.

Belisle (2006) states that in acquiring digital literacy, knowledge processing (e.g. gathering, organising and analysing, creating and synthesising information) becomes tool based, multiple representations occur, challenging the dominance of textual knowledge; new sources are legitimised, undermining existing power structures. For Floridi, info-sphere and complex thinking go hand in hand (Floridi, 2017).

Some scholars are somewhat sceptical of the cognitive overload and difficulty in processing caused by technologies (Van Oostendorp, 2003) or, the “outsourcing” of our cognition and our conscious decisions to algorithms, confusing the perception of what we actually know, reinforcing our dependence on digital technologies, and eventually, manipulating our cognition by amplifying our already ingrained cognitive biases (Walker, 2022).

Others are more concerned with the implication of literacy in the digital age. Digital literacy is “the ability to understand the power of images and sounds, to recognize and use that power, to manipulate and transform digital media, to distribute them pervasively, and to easily adapt them to new forms” (The New Media Consortium, 2005, p. 2). Cope and Kalantzis call for multiliteracies to address the need for complexity based on multimodal aspects (textual, linguistic,

Fig. 2  
Stanford Digital Projects  
home page, Stanford  
University Press.  
Retrieved from: [https://  
www.sup.org/digital/](https://www.sup.org/digital/)

## Stanford Digital Projects



Stanford Digital projects is an initiative launched in 2017 by the Stanford University Press, funded by the Andrew W. Mellon Foundation, aimed at publishing digital scholarship. This program developed processes for acquiring, reviewing, editing, producing, publishing, delivering, marketing, and preserving interactive scholarly works. It confers the same level of academic credibility on digital and web-based projects as print books receive, by providing ISBN code and using all the same rigorous processes used for publishing monographs. More than simply remediated books, the projects published are born-digital, multimodal, long-form works of scholarship. Digital projects require design and engineering decisions about form that have a direct bearing on the communication of ideas, and yet are not necessarily part of shared disciplinary rhetoric.



Fig. 2



visual, audio, spatial, gestural, and tactile) (2000); Burdick and Wills (2011) argue that 21st century literacy sounds very much like designing for piecing together information from multiple sources, intuitively using visual-spatial skills and learning through inductive discovery.

In a complementary direction, other scholars are reflecting upon the new ways of thinking in the digital era. Eshet-Alkalai proposes a conceptual framework for digital literacy, including real-time thinking, the ability to process large volumes of stimuli at the same time while acting in a real-time environment (2012). Benke hypothesises that the digital mindset is changing people's responses to and interpretations of a situation towards a more open, chaotic and evolving nature due to the impact of multiple connected interactions (Benke, 2013). The so-called digital natives for instance, according to Prensky (2012), have developed different thinking patterns and hypertext minds.

To understand this cognitive revolution, it is also useful to refer to distributed cognition, which emphasises the ways that cognition is off-loaded into the environment and into artefacts by social and technological means, thereby expanding human cognitive capacity (Hutchins, 2001). The interactions between people and technologies can be regarded as forms of distributed cognition because technology supports cognitive activities distributed among a number of agents, consisting of both humans and machines (Hollan, Hutchins & Kirsh, 2000).

### New Ontologies of Knowledge

This is the scenario in which the new form of “digital knowledge” emerged.

On the one hand, the concept of granularity regained importance in areas from computing to human reasoning, as a component of knowledge representation in cognition and knowledge production. Knowledge is structured and organised or “encapsulated” in different-sized pieces and levels of detail that enhance accuracy and flexibility of interpretation (Mach & Owoc, 2010). According to Pawlak (1998), knowledge granularity is strictly connected with the indiscernibility of the smallest discrete knowledge pieces.

On the other hand, the individual dimension of knowledge and cognitive systems is expanded by the digital. Levy talks about digital based collective intelligence, i.e. the capacity, expanded by

Fig. 3  
A typical article visualisation on a board in JAR (Miltiadis, C., & Sharma, G.K., “Beyond the Visual”, *JAR*, 24). Retrieved from <https://www.jar-online.net/en>

### JAR - Journal for Artistic Research



The *Journal for Artistic Research* (JAR) is an international, online, Open Access and peer-reviewed journal that disseminates artistic research from all disciplines. JAR aims to develop for artistic researchers academic publication procedures similar to the standards for the sciences and humanities, providing a digital platform where multiple methods, media and articulations may function together to generate insights in artistic research endeavors. It seeks to promote expositions of practice as research: in fact articles are named as expositions and often content is displayed and navigable on boards. Recognizing that the field is ever developing and expanding, JAR remains open to continued re-articulations of its publishing criteria.

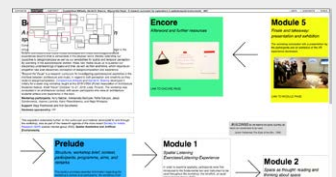


Fig. 3

digital networks, of human communities to cooperate intellectually (Levy in Peters, 2015). Connected intelligence is, according to De Kerckhove, the result of knowledge production as enhanced by the technological context of the Web, that links together, beyond the idea of collective cooperation or collaboration, the potentiality of fragmented units (De Kerckhove, 1997) whose interaction is not always conscious and voluntary (De Kerckhove, 2011).

Knowledge granularity and connected knowledge production therefore represent two sides of the same coin of digital knowledge. In this, digital knowledge should be regarded as an ecology (Wojciechowski, 2010) or approached as an ecosystem (Becker, 2007).

Starting from the stimuli on writing as a technology that leads humans from the alphabet to networks, Derrick De Kerckhove discusses how digital technologies undermine western literate culture and require a continuous search for meaning and relevance. The essay layout itself has been conceived as an experiment in non-linear structure, among the key concepts about digital knowledge, cognition and writing: they are all connected to each other, but not in a strictly pre-ordered sequence.

## New Geographies of Knowledge

In such a knowledge ecosystem the geopolitical dimension is also becoming more important.

Digital geographies identify the conceptual, theoretical, and empirical axes along which spaces and spatiality are engaging with the digital, questioning epistemology and knowledge production (Ash et al., 2018).

Scientific publishing represents a geography of power for the expression, diffusion and consolidation of scientific thinking, raising questions about the visibility and inclusion of a wider geographical range, with a specific regard towards the non-homologation of different cultures of scientific thinking and knowledge organisation.

Graham et al. (2011) present a series of maps showing the cultural and geographical biases of global knowledge, in terms of both infrastructure and cultural discourse; knowledge divides in the social sciences are reported by UNESCO (Gingras & Mosbah-Natanson, 2010); some authors speak about peripheral countries and western domination (Kieć, 2017); finally there is linguistic bias in the global journals system (Larivière & Desrochers, 2015).

Fig. 4  
Dynamic publications novel concepts such as “forking”, “transclusion” and “pull requests” (as illustrated in Heller, The & Bartling, 2014). Retrieved from: [http://book.openingscience.org.s3-website-eu-west-1.amazonaws.com/vision/dynamic\\_publication\\_formats.html](http://book.openingscience.org.s3-website-eu-west-1.amazonaws.com/vision/dynamic_publication_formats.html)

## Dynamic Publication Formats



Dynamic Publication Formats are new publication formats proposing new modes of transparent collaboration, feedback, continued refinement, and reusability of (scholarly) works, to improve today's Online Publication Formats that are still closely bound to the medium of paper. They are conceived as a needed complement, slowly recognized and incrementally integrated into more efficient and dynamic workflows of production, improvement, and dissemination of scholarly knowledge in general: can be changed quickly and easily allowing (and letting visible) changes, making possible corrections and additions, and tracking the specific contribution of individual authors in multi-authored articles.

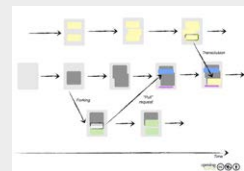


Fig. 4

Heller, L., The, R., & Bartling, S. (2014). Dynamic Publication Formats and Collaborative Authoring. In S. Bartling, & S. Friesike (Eds.), *Opening Science. The Evolving Guide on How the Web is Changing Research, Collaboration and Scholarly Publishing* (pp. 191-211). Springer Nature.

In any case, according to Fiorimonte, the developing geopolitical scenario is challenging the current digital knowledge monopolies (Fiorimonte, 2017). Border thinking (Mignolo, 2012) also becomes relevant.

These reflections are common to design too, often concerned with the concept of a peripheral vision of design, which holds that design should be done *in* and not *for* the peripheries (Bonsiepe, 2003); or marginality to which design history poses some design models (Fry, 1995) and the issue of decolonizing design, to open the hegemonic design discourse of the North to other voices (Fry, 2017).

These topics have been partly addressed in past issues of *diid*, demonstrating the Journal's concern in promoting choral narratives on contemporary design, for instance representing a plurality of new trends and practices from different geographies outside the mainstream (see in particular issue 77, edited by professors Erik Ciravegna, Valentina Gianfrate, Roberto Iñiguez Flores, and Laura Succini).

Within this framework, we assume that digital resources should enable the emergent diversity of knowledge (Boast et al., 2007). Scientific publishing must do the same.

In this issue, various contributors have therefore been asked to address this topic in relation to scientific publishing: both Valentine and Friesike have clarified the constraints of a publishing system that should serve globally, between the legacy of established structures about excellence and the necessity and attempts to make them more permeable. The stories curated by Lorela Mehmeti are specifically devoted to case studies that shed light on the inequality of the global scientific system, in terms of inclusion and under-representation of the Global South in development research.

## Changing Publishing

Many scholars talk about the need to think of scholarly knowledge as an ecosystem (Altman & Cohen, 2022), proposing a holistic and integrated approach to scholarly communication (Birdsall et al., 2005). Scholarly discourse, which was once restricted to printed texts, is now being produced in a variety of formats, including short videos, information visualisations, and networked writing, including work that cannot exist in print (McPherson, 2010). These “Scholarly information infrastructure” (Borgman, 2009) and information architectures lead to new practices (Burdik & Wills, 2011) in which the design of digital tools is an intellectual responsibility, not a technical task (Drucker,

Fig. 5  
An annotated page  
on Hypothesis web site.  
Retrieved from: <https://web.hypothes.is/>

## Hypothesis.is



Hypothesis developed the concept of “open/social annotation”, enabling sentence level note-taking, annotating and sharing of comments or critique on web pages (blogs, scientific articles, books) without needing implementation by any underlying site. Through an open source software used as an extension of the web browser, Hypothesis creates a layer of threaded conversation across documents that can be private or public. It uses the annotation standards for digital documents developed by the W3C Web Annotation Working Group, that approved annotation as a web standard. For instance the *M/m Modernism/modernity* journal of the Modernist Studies Association edited by the Johns Hopkins University Press, offers readers a way to annotate content in private groups using the Hypothesis platform.

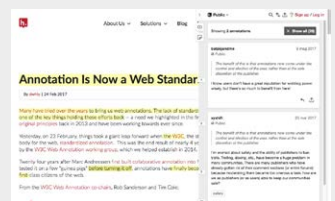


Fig. 5

2009). The scientific publishing landscape is changing (Chiriboga, 2019); many open access publishing platforms and infrastructures have been established and have gained scientific recognition and reliability (Open Research Europe, 2021), questioning the oligopoly of academic publishing in the process (Larivière, Haustein & Mongeon, 2015).

Complementary, experimental practices using a performative and process-based approach are highlighting the commodification of publication: in Lorusso's essay, a case study collection discloses the hegemony over the control and ownership of digital artefacts by editorial platforms.

In this context, for the past 10 years scientific publishing and journals have been under continuous discussion (Cope & Phillips, 2014; Bienfield, 2014), regarding the university press (Pochoda, 2010), the revision of editorial practices (Horbach & Halfman, 2020) and various attempts at profound change: in 2009 Elsevier promoted a pioneer project (unfortunately realised only as a prototype): the *Article of the Future* (Aalbersberg et al., 2012) aimed at improving scientific communication, providing users an optimal reading experience, enriching content and adding context.

We are observing new trends in publishing (Kim et al., 2008) including new types of journal articles (graphic abstract, interactive pdf), and moreover, in relation to the legitimation of new typologies of publishable research products (e.g. OpenAireExplore research products categories: protocols, software, data set, models, etc.), new emerging formats of academic publication, mainly related to Life Sciences and STEM (Stern & O'Shea, 2019), and a few interesting examples from social science and humanities research. Elsevier is a pioneer in this as well, providing acknowledgement and recognition for some of the new typologies of research products, with new typologies of articles — e.g. Research Elements article; Visual Case discussion; Visual Essays; Video Articles. For this reason, the comprehensive term *scientific publication* encompasses, beyond scientific articles, all the various emerging typologies.

New forms of writing have been accredited as well, ranging from mid-forms between the journal article and the monograph length (Newton, 2013) or micro articles to accelerate the publication of peer reviewed research results in concise form, or to publish interesting data that has not grown into a full piece of research, up to dynamic and contributive or collective authoring writing processes (Heller, The & Barting, 2014) and public response articles (such as

Fig. 6  
Case studies of innovative academic assessment on DORA website. Retrieved from: <https://sfdora.org/>

## Declaration on Research Assessment DORA



The Declaration on Research Assessment (DORA) intends to halt the practice of correlating the journal impact factor to the merits of a specific scientist's contributions, that, according to this statement, creates biases and inaccuracies when appraising scientific research. DORA also states that the impact factor is not to be used as a substitute "measure of the quality of individual research articles, or in hiring, promotion, or funding decisions". DORA's vision is to advance practical and robust approaches to research assessment globally and across all scholarly disciplines and has become a worldwide initiative covering all scholarly disciplines and all key stakeholders including funders, publishers, professional societies, institutions, and researchers. The DORA's website provides case studies of universities and national consortia highlighting key elements of institutional change to improve academic career assessment.

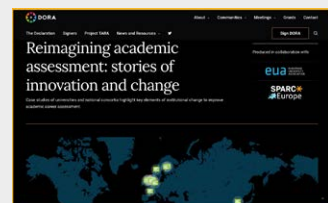


Fig. 6



riPOSTes, in Electronic Book Review journal); in so doing, scientific publications are attributed a more evolving nature and open-ended lifecycle, beyond mere updating, which rely on the scalability and connectedness of discrete units of content by the same author or other contributing authors. This option is especially relevant for early-stage researchers who could ideally add their comment or annotation, or even approved contributions, to other outstanding authors' pieces.

Even within the design domain, the reflection is monitoring trends in journal expansion, in the increase and acceleration of publishing, as well as improvements in the quality of publication (Cross, 2009; Atkinson, Valentine & Christer, 2021).

Apart from more efficient editorial management systems, processes and patterns of scientific publishing, in design there has been no real effect (Gemser & De Bont, 2016) on the format of journals, or on the concept of publications, which remain attached to the idea of traditional articles. Furthermore, the quality of perception, the visual designs and the reading experiences of design journals can be improved (Gemser et al., 2012; Barness & Papaelias, 2021).

We therefore claim and call for the necessity of envisioning and supporting innovative (augmented, enriched, interactive, contributive and collectively-authored) forms of publication that can go beyond the addition of supplemental material (such as visual material, graphic/video abstract, audio podcast, etc., which have already been enabled by many publishers). We should welcome and facilitate the publication and scientific accreditation of new typologies of non-standard and not (only) textual research articles, while considering the possibility of further improving the user's reading experience, for example in regards to non-linear reading, by designing more hybrid content flows and the visualisation and interaction of complex entities (Hohman et al., 2020). We envision publications as mixed media ecosystems of content, optional and complementary to traditional linear articles.

In the second instance, since the impact of a scientific publication is based on discoverability and re-usability, this new publication ecosystem should support the reuse of knowledge beyond mere citation. "Knowledge reuse" is broadly understood in literature: from repositories requirements (Markus, 2001) to knowledge application for innovation (Majchrzak, Cooper & Neece, 2004). In our vision, we would consider the idea of making (parts of) the findings and contents of publications embeddable in a new publication, ensuring

Fig. 7  
Scite home page.  
Retrieved from:  
<https://scite.ai/>

## Scite



Scite is an award-winning platform that helps researchers better discover and understand research articles through Smart Citations, going beyond the mere citation: it scans articles and categorizes, by machine learning, the intent of citation displaying the context of the citation and indicating whether the statement provides supporting or contrasting evidence for a referenced work or simply mentions it.

Nicholson, J. M., Mordaunt, M., Lopez, P., Uppala, A., Rosati, D., Rodrigues, N. P., Grabitz, P., & Rife, S. C. (2021). Scite: A smart citation index that displays the context of citations and classifies their intent using deep learning. *Quantitative Science Studies*, 2(3), 882-898.

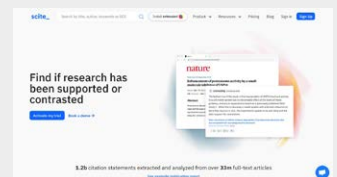


Fig. 7

the correct attribution of authorship and the traceability of original content. In doing so, the publication lifecycle could change, as an article can be incremental and evolve collaboratively, beyond the traditional update after publication, thanks to new discrete knowledge pieces. But, at the same time, we warn of the possible ontological implications on knowledge production, when it causes publications to cluster and pack as much content as possible to make them reusable. In the interviews, Valentine reports how concerned *The Design Journal* is at the moment with the equality of Open Access, while both Friesike and Manghi talk about the mindset and infrastructural shift required to make content really open and reusable, maintaining attribution and credits. Sara Radice's essay presents the Prode case study, a project developed within the Politecnico di Milano, which systematically addressed the design and prototype of a new publishing ecosystem by a new publishing format and platform, based on the concept of *Living Publication*.

Obviously, authorship is a concern if knowledge is increasingly open, collaborative and incremental: some scholars propose to move to a contributorship model, to better identify and endorse the specific contributions of co-authored works, through a taxonomy of roles (Brand et al., 2015).

Finally, the evaluation and assessment of these new publication forms should be completely re-shaped. For instance, according to the interview with Valentine, the visual aspect of an article requires structural changes in editorial processes, especially when it comes to review. It is also worth noting how the review process is becoming more collaborative and transparent: according to Ross-Hellauer (2007) open peer review is making reviewer and author identities open, publishing review reports alongside the articles and enabling direct reciprocal discussion between the author(s) and reviewers and greater participation in the peer review process by the wider community. We also underline the need to move from simple pre-publication peer review to continuous review, due to publication updates, responses and evolving contributions.

Assessing the quality of research publication is a more complex issue to innovate (especially when recruitment and academic careers are based on quantitative metrics of scientific production) because it struggles with institutional evaluation (Colarusso & Giancola, 2020) and new ways to build reputations (Gandini, 2016), following the controversy about the use of impact factors (Curry, 2018; Waltman & Traag, 2021). In Italy the normative system of evalu-

Fig. 8  
An example profile in Impactstory. Retrieved from: <https://profiles.impactstory.org/>

## Impactstory



ImpactStory is an open source, web-based tool that provides altmetrics to help researchers measure the impacts of their research outputs including journal articles, blog posts, datasets, and software. By helping researchers tell data-driven stories about their work, it aims to change the focus of the scholarly reward system to value and encourage web-native scholarship: achievements are measured by the discussion around a research work, level of engagement and openness. ImpactStory is funded by the National Science Foundation and the Alfred P. Sloan Foundation.

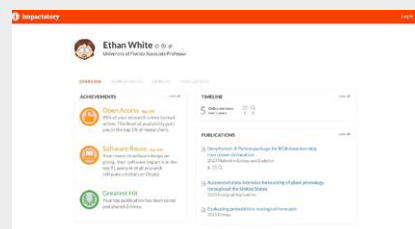


Fig. 8

ation is articulated and complex, due to often-conflicting procedures among actors at different institutional levels. In calling for an alternative perspective on impact (Dinsmore, Allen & Dolby, 2014), we should refer to the “reputation economy” (Fetcher et al., 2017) and talk about “merit” which relies more on quality than on metrics to assess impact (Declaration of Research Assessment-DORA, 2021).

There are some discipline-specificities (digital humanities, machine learning, artistic research) that encourage the early adoption and development of new publishing forms, process and accreditation systems (Lupo, Gobbi & Lonardo, 2020), and it is essential to promote trans- or post- disciplinary models and standards. And with the invited contributions of the Open Debate section, we sought to open the discussion.

## Challenges and Constraints

At the very end, this issue of *diid* turned out to be truly challenging.

With the diverse forms of contribution included, we are questioning the standard of the scientific article itself as an independent and self-standing monad. All the essays in fact have been conceived as a whole, in which theoretical reflection, literature review, notes on key concepts, case studies and project reports are disseminated among them and integrity and relevance are reached through the cross-references between the single contributions. The more traditional essays and the non-standard scientific papers (the focused interviews and the project/case study reports) are not automatically equated but complement each other in the context of the Journal issue as a framework in which the introductory essay provides the necessary background.

In doing this the Guest Editor is deliberately searching for meanings through scalability and connectedness in scientific publishing, relying on the vision of an ecosystem of content that scientific publishing should pursue, and on the concept of pruning as a strategy to reduce the scientific publishing landscape and the proliferation of repetition and especially self-repetition (Leavitt, Mitchell & Peterson, 2010). Scalability gives visibility and credit to the progressive level of development of a concept or a project in an incremental and systemic perspective, in a series of contributions that are not only full research articles but also non-standard or partial publications (micro-articles, or not-only-textual research products): they

Fig. 9  
Open Research Europe platform home page.  
Retrieved from: <https://open-research-europe.ec.europa.eu/>

## Open Research Europe



Open Research Europe is an open access publishing platform for the publication of research stemming from Horizon 2020 and Horizon Europe. The platform offers researchers a publishing venue to share their results and insights rapidly and facilitate open, constructive research discussion, without charging APC to authors. Peer review of articles published takes place after publication and the process is entirely open and transparent: each review, plus the approval status selected by the reviewer, is published with the reviewer’s name and affiliation alongside the article. Articles are published under a CCBY license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited, and leaves the copyright of the article with the current copyright holder (usually the authors or their institution). Finally, Open Research Europe encourages constructive debate on published articles. Comments are open and automatically labelled with the user’s role (author, reviewer or reader).

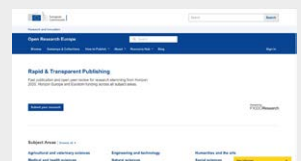


Fig. 9

are worth publishing and acquire completeness and consistency by making reference to previous or parallel or complementary works (by the same author) to which they are clearly connected and on which they are dependent. This is for instance the case with the articles in this issue of *diid* that are discussions about projects and case studies based on preliminary and previously-published research. Connectedness provides the opportunity, especially for renowned and outstanding authors, to make reference to well established scholarly knowledge attributed to other authors or self attributed, therefore using direct citation to moderate extensive discussion. This is the case of the short pieces, like notes on key concepts or the focused interviews in this issue of *diid*.

In addition we have experimented with different means to enhance articles: augmented content accessible by QR Code; intra-textual content, accompanying the main text with secondary texts (apparatus such as collections of cases, projects) like in this essay, that can be read in parallel or as independent content; and finally non-linear reading, reflecting valuable stand-alone key concepts in a different page layout that promotes the creation by the reader of non pre-ordered intertextual sequences.

These proposals are real challenges for a hybrid (printed and digital) journal. We tried to scale them down in feasible though not totally resolutive solutions.

In this challenge we are fully aware of the institutional bonds of accreditation and quality evaluation to which the *diid* Journal adheres. To change this involves a deeper confrontation with the systems that regulate research quality evaluation; this path is a long one that *diid* could not pave in one single issue, given its immediate responsibility towards the authors, and the entire design community. So we remained stable at the helm addressing our vision, but avoided an overly disruptive approach.

Reviews too required an open-minded vision and processes, because the contributions did not follow the expected structure (theoretical basis, methodology etc) of scientific papers.

For everything written, we wish to thank all the Reviewers and above all the Chief Editor, and the entire Editorial Staff (including the graphic designer) of *diid*, for trusting us in this endeavour, and suggesting all the steps necessary to ensure that the issue delivers a robust and valuable approach and result.

The cover image deserves one last remark. The wonderful work by Vincenzo Agnetti "Libro dimenticato a memoria" is an amazing metaphor of what publishing can be: a window to observe, interpret and change the world in an open-ended perspective, or an empty simulacrum of the rigour of scientific thinking.

We really believe in the value of new thinking and visions for scientific publishing, and call for the awareness and responsibility of the whole scientific community.

In conclusion, for any criticism and vulnerability of this Open Debate section, the responsibility rests entirely with the Guest Editor.

**Eleonora Lupo**  
Designer, Ph.D. in Disegno industriale e comunicazione multimediale, she is an Associate Professor in Design at the Politecnico di Milano. Her main research interests are focused on Humanities and Culture Driven Innovation, Design for Cultural Heritage and Product and Processes Design Cultures.



## References

- Aalbersberg, I. J., Heeman, F., Hylke Koers, H., & Zuidlova-Seinstra, E. (2012). Elsevier's Article of the Future: Enhancing the user experience and integrating data through applications. *Insights*, 25(1), 33-43.
- Altman, M., & Cohen, P. N. (2022). The Scholarly Knowledge Ecosystem: Challenges and Opportunities for the Field of Information. *Frontier in Research Metrics and Analytics*, 6, 751553.
- Ash, J., Kitchin, R., & Leszczynski, A. (2018). Introducing digital geographies. In J. Ash, R. Kitchin, R., & A. Leszczynski (Eds.), *Digital Geographies* (pp. 1-10). Sage.
- Atkinson, P., Valentine, L., & Christer, K. (2021). All Change: Reflections on Design Research Journal Publishing, 2014-2021. *The Design Journal*, 24(6), 833-841.
- Barnes, J., & Papaalias, A. (2021). Readable, Serious, Traditional: Investigating Scholarly Perceptions of the Visual Design and Reading Experiences of Academic Journals. *She Ji: The Journal of Design, Economics, and Innovation*, 7(4), 540-564.
- Becker, F. (2007). Organisational ecology and knowledge networks. *California Management review*, 49(2), 42-61.
- Belisle, C. (2006). Literacy and the Digital Knowledge Revolution. In A. Martin, & D. Dan Madigan (Eds.), *Digital Literacy for Learning* (pp. 51-67). Facet Publishing.
- Benke, V. (2013). *The digital mindset. A theoretical discussion* [Unpublished Master Thesis]. Aalborg University.
- Bienfield, P. (2014). Novel Scholarly Journal Concepts. In S. Barting, & S. Friesike (Eds.), *Opening Science. The Evolving Guide on How the Web is Changing Research, Collaboration and Scholarly Publishing* (pp. 155-163). Springer Nature. <http://www.openingscience.org/get-the-book/>
- Birdsall, W. F. et al. (2005). Chapter 7: Towards an Integrated Knowledge Ecosystem: A Research Strategy. In *Towards an Integrated Knowledge Ecosystem: A Canadian Research Strategy, A Report Submitted to the Canadian Association of Research Libraries*. Wayback Machine. [https://web.archive.org/web/20070927214334/http://www.carl-abrc.ca/projects/kdstudy/public\\_html/2005/chapter7.pdf](https://web.archive.org/web/20070927214334/http://www.carl-abrc.ca/projects/kdstudy/public_html/2005/chapter7.pdf)
- Boast, R., Bravo, M., & Srinivasan, R. (2007). Return to Babel: Emergent Diversity, Digital Resources, and Local Knowledge. *The Information Society*, 23(5), 395-403.
- Borgman, C. L. (2009). The digital future is now: a call to action for the humanities. *Digital Humanities Quarterly*, 3(4). <http://digitalhumanities.org/dhqv/vol/3/4/000077/000077.html%20/000077.html>
- Brand, A., Allen, L., Altman, M., Hlava, M., & Scott, J. (2015). Beyond authorship: attribution, contribution, collaboration, and credit. *Learned publishing*, 28(2), 151-155.
- Buffardi, A., & De Kerckhove, D. (2011). *Il sapere digitale. Pensiero ipertestuale e conoscenza connettiva*. Liguori Editore.
- Burdik, A., & Willis, H. (2011). Digital learning, digital scholarship and design thinking: Opportunities for integration. *Design Studies*, 32, 546-556.
- Carayannis, E. G., & Campbell, D. F. J. (2006). 'Mode 3': Meaning and implications from a knowledge systems perspective". In E. G. Carayannis, & D. F. J. Campbell (Eds.), *Knowledge Creation, Diffusion, and Use in Innovation Networks and Knowledge Clusters: A Comparative Systems Approach Across the United States, Europe, and Asia* (pp. 1-25). Praeger Publishers.
- Chiriboga, L. (2019). The changing landscape of scientific publishing. *Journal of Histotechnology*, 42(3), 95-97.
- Colarusso, S., & Giancola, O. (2020). *Università e nuove forme di valutazione*. Sapienza Università Editore.
- Colombo, F. (1986). *Gli archivi imperfetti. Memoria sociale e cultura elettronica*. Vita e Pensiero.
- Cope, B., & Phillips, A. (2014). *The future of academic journals*. Elsevier.
- Cope, B., & Kalantzis, M. (Eds.). (2000). *Multiliteracies: Literacy Learning and the Design of Social Futures*. Routledge.
- Cross, N. (2019). Editing Design Studies - and how to improve the likelihood of your paper being published. *Design Studies*, 63, A1-A9.
- Curry, S. (2018). Let's move beyond the rhetoric: it's time to change how we judge research. *Nature*, 554(7691), 147.
- Declaration of Research assessment-DORA. (2013). <https://sfdrora.org>
- De Kerckhove, D. (1997). *Connected intelligence: the arrival of the web society*. Somerville House Publ.
- Dinsmore, A., Allen, L., & Dolby, K. (2014). Alternative Perspectives on Impact: The Potential of ALMs and Altmetrics to Inform Funders about Research Impact. *PLoS Biol*, 12(11), e1002003.
- Drucker, J. (2009). Blind spots. *Chronicle of Higher Education*, 55(30), pB6.
- Electronic Book Review. <http://electronicbookreview.com/policies-and-submissions/>
- Eshet-Alkalai, Y. (2012). Thinking in the digital era. A revised model for digital literacy. In E. B., Cohen (Ed.), *Issues in Informing Science & Information Technology*, Vol. 9. Informing Science Institute/Press.
- European Commission. (2019). *Future of scholarly publishing and scholarly Communication*. Publications Office of the EU. European Commission.
- Fathers, J., & Bonsiepe, G. (2003). Peripheral Vision: An Interview with Gui Bonsiepe Charting a Lifetime of Commitment to Design Empowerment. *Design Issues*, 19(4), 44-56.
- Fecher, B., Friesike, S., Hebing, M., & Linek, S. (2017). A reputation economy: how individual reward considerations trump systemic arguments for open access to data. *Palgrave Communications*, 3, 17051.
- Fiormonte, D. (2017). Digital Humanities and the Geopolitics of Knowledge. *Digital Studies/le Champ Numérique*, 7(1), 5.

- Florida, L. (2017). *La quarta rivoluzione. Come l'infosfera sta trasformando il mondo*. Raffaello Cortina Editore.
- Fry, A. (1995). A Geography of Power: Design History and Marginality. In R. Buchanan, & V. Margolin (Eds.), *The Idea of Design: a Design Issues Reader* (pp. 204-218). The MIT Press.
- Fry, T. (2017). Design for/by "The Global South". *Design Philosophy Papers*, 15(1), 3-37.
- Gandini A. (2016). *The Reputation Economy. Understanding Knowledge Work in Digital Society*. Palgrave.
- Gemser, G., & de Bont, C. (2016). Design-Related and Design-Focused Research: A Study of Publication Patterns in Design Journals. *She Ji: The Journal of Design, Economics, and Innovation*, 2(1), 46-58.
- Gemser, G., de Bont, C., Hekkert Paul, H., & Ken Friedman, K. (2012). Quality Perceptions of Design Journals: The Design Scholars' Perspective. *Design Studies*, 33(1), 4-23.
- Gibbons, M., Nowotny, H., Schwartzman, S., Scott, P., & Trow, M. A. (1994). *The New Production of Knowledge. The Dynamics of Science and Research in Contemporary Societies*. SAGE.
- Gingras, Y., & Mosbah-Natanson, S. (2010). *Where Are Social Sciences Produced? World Social Science Report 2010: Knowledge Divides*. UNE-SCO et International Social Sciences Council.
- Graham, M., Hale, S. A., & Stephens, M. (2011). *Geographies of the World's Knowledge*. Ed. Flick, C. M., Convoco! Foundation Edition and Oxford Internet Institute.
- Heller, L., The, R., & Bartling, S. (2014). Dynamic Publication Formats and Collaborative Authoring. In S. Barting, & S. Friesike (Eds.), *Opening Science. The Evolving Guide on How the Web is Changing Research, Collaboration and Scholarly Publishing* (pp. 191-211). <http://www.openingscience.org/get-the-book/>
- Hohman, F. et al. (2020). Communicating with Interactive Articles. *Distill*.
- Hollan, J., Hutchins, E., & Kirsh, D. (2000). Distributed Cognition: Toward a New Foundation for Human-Computer Interaction Research. *ACM Transactions on Computer-Human Interaction*, 7(2), 174-196.
- Horbach, S. P. J. M., & Halffman, W. (2020). Innovating editorial practices: academic publishers at work. *Research integrity and peer review*, 5(11), 1-15.
- Hutchins, E. (2001). Distributed cognition. In *International Encyclopedia of the Social & Behavioral Sciences* (pp. 2068-2072). Elsevier Science Ltd.
- Iñiguez Flores, R., & Gianfrate, V. (2022). Geographies of Design Innovation: Cultural Drivers and Global-Local Flows. *diid*, 77, 10-23.
- Kieńć, W. (2017). Authors from the Periphery Countries Choose Open Access More Often. *Learned publishing*, 30(2), 125-131.
- Kim, S., Chung, E., & Lee, J. Y. (2018). Latest trends in innovative global scholarly journal publication and distribution platforms. *Science Editing*, 5(2), 100-112.
- Larivière, V., & Desrochers, N. (2015, November 18). Langues et diffusion de la recherche: le cas des sciences humaines et sociales. *Découvrir. Le magazine de l'Acfas*. <https://www.acfas.ca/publications/magazine/2015/11/langues-diffusion-sciences-recherche-cas-sciences-humaines-sociales>
- Larivière, V., Haustein, S., & Mongeon, P. (2015). The Oligopoly of Academic Publishers in the Digital Era. *PLoS ONE*, 10(6), e0127502.
- Leavitt, K., Mitchell, T. R., & Peterson, J. (2010). Theory Pruning: Strategies to Reduce Our Dense Theoretical Landscape. *Organizational Research Methods*, 13(4), 644-667. <https://doi.org/10.1177/1094428109345156>
- Lupo, E., Gobbo, B., & Lonardo, E. (2021). Towards a new design culture of scientific production—Innovating the formats of scientific publication of design. In L. Di Lucchio, L. Imbesi, A. Giambattista, & V. Malakuczi (Eds.), *Design Culture(s). Cumulus Conference Proceedings Roma 2021, Volume 2* (pp. 1082-1097). Università La Sapienza.
- Mach, M. A., & Owoc, M. L. (2010). Knowledge Granularity and Representation of Knowledge: Towards Knowledge Grid. In Z. Shi et al. (Eds.), *IFIP International Federation for Information Processing AICT*, 340, 251-258.
- Majchrzak, A., Cooper, L. P., & Neece, O. E. (2004). Knowledge Reuse for Innovation. *Management Science*, 50(2), 174-188.
- Maldonado, T. (2005). *Memoria e conoscenza. Sulle sorti del sapere nella prospettiva digitale*. Feltrinelli.
- Markus, L. M. (2001). Toward a Theory of Knowledge Reuse: Types of Knowledge Reuse Situations and Factors in Reuse Success. *Journal of Management Information Systems*, 18(1), 57-93.
- McPherson, T. (2010). Scaling Vectors: Thoughts on the Future of Scholarly Communication. *The Journal of Electronic Publishing*, 13(2). doi: 10.3998/3336451.0013.208
- Mignolo, W. (2012). *Local Histories/Coloniality, Subaltern Knowledges, and Border Thinking*. Princeton University Press.
- New Media Consortium. (2005). *A Global Imperative: The Report of the 21st Century Literacy Summit*. <https://library.educause.edu/resources/2005/1/a-global-imperative-the-report-of-the-21st-century-literacy-summit>
- Newton, H. (2013). Breaking Boundaries in Academic Publishing: Launching a New Format for Scholarly Research. *Insights*, 26(1), 70-76.
- Open Research Europe. (2021). <https://open-research-europe.ec.europa.eu/>
- OpenAire Explore. <https://explore.openaire.eu/search/find?qf=true&active=result>

- Pawlak, Z. (1998). Granularity of knowledge, indiscernibility and rough sets. In *1998 IEEE International Conference on Fuzzy Systems Proceedings. IEEE World Congress on Computational Intelligence - vol.1* (pp. 106-110).
- Peters, M. A., & Lévy, P. A. (2015). Interview with Pierre A. Lévy, French philosopher of collective intelligence. *Open Review of Educational Research*, 2(1), 259-266.
- Pochoda, P. (2010). Editor's Note for Reimagining the University Press. *The Journal of Electronic Publishing*, 13(2). doi: <https://doi.org/10.3998/3336451.0013.201>
- Prensky, M. (2012). *Brain Gain. Technology and the Quest for Digital Wisdom*. St. Martin's Press.
- Ross-Hellauer, T. (2017). What is open peer review? A systematic review. *F1000Res*, 6, 588.
- Stern, B. M., & O'Shea, E. K. (2019). A proposal for the future of scientific publishing in the life sciences. *PLoS Biol*, 17(2), e3000116.
- Van Oostendorp, H. (Ed.). (2003). *Cognition in a Digital World*. Lawrence Erlbaum Associates Publishers.
- Walker L. (2022). *Rewired. How digital technologies shape cognition and democracy*. Digital Cognition and democracy initiative and Institute for Security and Technology. <https://securityandtechnology.org/dcdi/>
- Waltman, L., & Traag, V. A. (2021). Use of the journal impact factor for assessing individual articles: Statistically flawed or not? *F1000Research*, 9, 366.
- Wojciechowski, J. (2010). *Ecology of knowledge*. The Council for Research in Values and Philosophy.