

## Connecting science communication research and practice: challenges and ways forward

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### Abstract

Science communication is a thriving field that is vitally important to confront and overcome current societal challenges. To make science communication effective, science communication research and practice need to come together and share knowledge and experiences. However, their collaboration is hampered by a variety of obstacles on both sides, ranging from lack of time to lack of incentives and awareness. In this Special Issue we give space to authors from a wide range of backgrounds to reflect on the relationship between science communication research and practice and inspire the field with their insights and learnings.

### Keywords

Bridging research, practice and teaching; Public engagement with science and technology; Public understanding of science and technology

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Science communication researchers and practitioners both come from thriving yet diverse and hardly consolidated communities. On the one hand, there is the field of science communication research, which is sometimes referred to as the “science of science communication” [Fischhoff & Scheufele, 2013], a cross-sectional, inter- as well as transdisciplinary field of research. Science communication research is a broad field of study. Research in this field focuses on a wide range of different topics from different modes of science communication to the role of science journalism and media effects [Rauchfleisch & Schäfer, 2018] with much research focused on or concerned with analysing current practices [Bonfadelli, Fähnrich, Lüthje & Milde, 2017]. Also, the field is interdisciplinary and includes disciplines such as communication science, psychology, sociology as well as educational research and various specific disciplines from the life sciences, engineering, and natural sciences.

On the other hand, science communication practice is also becoming increasingly established and professionalised as well as diversified. With the attention to science communication and the funding that is available to communication activities, the community of people who communicate about science and research is growing

[Trench, 2017]. These range from individual scientists engaging in public discourse [Bauer & Jensen, 2011], to professionals communicating on behalf of universities and research organisations, science journalists, bloggers and stakeholders from the fields of politics or civil society who refer to science and research in their communications [Davies & Horst, 2016]. These diverse communities of practice aggregate and establish common bodies of knowledge, each contributing their unique practical experience [Anjos, Russo & Carvalho, 2021].

### The challenges of research-practice relations in science communication

In recent years, researchers and practitioners have argued that science communication research and practice should grow together [Jensen & Gerber, 2020; Anjos et al., 2021; Scheufele, 2022] and have pointed out the benefits this can bring to research and practice alike [Riedlinger et al., 2019; Seethaler, Evans, Gere & Rajagopalan, 2019; Wirz et al., 2022] — ranging from more relevant research to informed practice. For example, researchers may be able to “reshape their own research agendas in cooperation with different communities of practice” [Scheufele, 2022] and thereby improve relevancy and further their research field. Science communication practice may improve the effectiveness of science communication [Jensen & Gerber, 2020] and succeed in reaching broader audiences, as well as engaging different publics in science [Riedlinger et al., 2019].

Looking first at the side of the practitioners, it has often been argued that practitioners might not be familiar with science communication research [Anjos et al., 2021]. Many practitioners may simply lack the time to stay up to date with current science communication research as well as the theoretical, conceptual and methodological knowledge to interpret the respective research results [Miller, 2008]. Even the mere access to research results may be obstructed by closed-access publications and additional financial constraints [Anjos et al., 2021]. This is further complicated by the fact that research results on science communication are being published in a wide range of journals serving different scientific disciplines. What is more, many practitioners may find that research neglects practitioners’ perspectives and perceive research as irrelevant to their daily work [Riesch, Potter & Davies, 2016]. Science communication research rarely provides clear answers to specific practical questions and the existing body of research often provides diverse and conflicting evidence [Bucchi & Trench, 2021]. Also, given the often fast-paced nature of practical work, decisions need to be taken quickly and it might not be practical to endure lengthy publication processes in science and research [Han & Stenhouse, 2015]. The internal quality assurance in science can take a long time, and therefore, evidence from research is often available too late to be considered in strategic planning by practitioners.

Looking at the perspective of researchers, it is noticeable that although societal impact is increasingly regarded as a key indicator of scientific quality among science policy stakeholders [Fecher et al., 2021], there is a trend within science communication research to overlook applied research in favour of basic research [Gerber et al., 2020; Scheufele, 2022]. This tendency often results in a gap between research and its practical relevance, with a notable lack of integration of practical knowledge and experience in the field. This suggests that the discipline is prioritising internal scientific reputation — measured through publications in prestigious journals and the acquisition of third-party funding — over practical applicability. This focus on academic credentials is further reinforced by the

prevailing academic and funding infrastructures, which predominantly support basic empirical research. Such structures discourage scholars from engaging deeply with practical application in their research [Jensen & Gerber, 2020]. A potential explanation for this trend could be attributed to the relative novelty of the science communication field. To gain legitimacy and establish a firm standing within the academic community, scholars may feel compelled to prioritise traditional metrics of scientific achievement.

We believe that from this very brief synopsis it has become abundantly clear that bringing research and practice together is no easy task. Both fields are diverse, face their own challenges and are confronted with the manifold developments in today's societies. We therefore need to reflect on how research and practice might come together in a way that is mutually beneficial and enriching to both alike. This is what we set out to do in this Special Issue.

### **This Special Issue**

The idea for this Special Issue came about through discussions and conversations at different conferences reflecting about the challenges outlined above and from shared experiences that many scholars and practitioners of science communication alike are facing. We came together as an editorial team made up of four people all active in either science communication research or practice or at the intersection between the two. Our perspectives from different professional and cultural backgrounds have all contributed to shaping this Special Issue. Our intense discussions throughout the formulation of the call text, the selection of abstracts, and the review process were often challenging but consistently enriching.

The overwhelming response to our call for submissions for the Special Issue, evidenced by the 72 abstracts we received, significantly underscores the widespread interest in this topic. Selecting abstracts for submission proved to be an exceptionally challenging task for us, given the sheer volume and high quality of contributions. Throughout this process, we placed a strong emphasis on diversity, striving to represent a broad range of disciplinary and practical perspectives, as well as global viewpoints. Recognizing science communication as a field that transcends borders, we ensured our selection process and subsequent review management reflected a commitment to global inclusivity and diversity. Sadly, we are unable to represent the full spectrum of this global field in this Special Issue, and we would indeed have liked to be able to include more regional perspectives in this Special Issue. However, we also wanted to meet the tight timelines of the journal and had to make some compromises in view of the limited scope of a Special Issue. Nevertheless, we are very proud to contribute such a varied and insightful collection to the ongoing discussions in science communication research and practice, enriching the debate with a multitude of perspectives.

In the Special Issue we explore the nature of research-practice relations in science communication. We want to highlight how research and practice come together and contribute to informed science communication. We do not wish to deny the many challenges outlined above, but we want to give space to projects — regardless if they were successful or not — that have attempted to navigate research-practice relationships despite these challenges.

The Special Issue consists of essays, reflecting on the interactions between research

and practice, practice insights reporting on concrete collaborative projects, and research articles investigating the relation between science communication research and practice. It is noteworthy that we received only very few submissions for research articles, the overwhelming majority from Germany. Due to our aim to provide diverse global perspectives and the necessity to provide more extensive revisions that would have exceeded the timeframe of the Special Issue, we are only able to include one research article in the final publication. This again illustrates the great need for further research in this field.

The Special Issue invited science communication researchers, practitioners and those who inhabit both worlds, to critically interrogate their own role. To that end, we have called for *essays* that were required to be written by a team of at least one science communication researcher and one practitioner.

In their essay “Bridging research and practice: Insights from collaborative science communication research on Japanese television”, Taichi Masu and Yasuhito Abe interrogate their own experiences in collaborating on a research project focusing on science communication in Japanese commercial terrestrial television. They highlight how their unique perspectives from research and practice were able to enrich each other and contribute to greater insights.

Similarly, Karen Rader and Cynthia Gibbs interrogate their joint endeavour in the essay “Broadening Adult Engagement and Education in Science Cafés: 2 Lessons from an STS-Science Communication Boundary Spanning Experiment”. From the perspectives of a researcher and practitioner they report on a practice project, reflect on the benefits but also challenges of their collaboration and highlight important learnings for similar future undertakings.

Carolin Enzingmüller and Daniela Marzavan contribute an essay on “Collaborative design to bridge theory and practice in science communication” in which they share their experiences with and thoughts on the two established frameworks of design-based research and design thinking. They interrogate these as methods for successful cooperation between science communication theory and practice in developing communication strategies that meet the needs of their audiences.

Additionally, we have called for contributions that explore how collaborations between science communication research and practice were realised in the form of actual projects and that reflect on the benefits and challenges of such endeavours. To that end, we have invited *practice insights* which interrogate how research and practice worked together in a specific real-world context, reflect on the challenges they encountered and how these were met and sometimes overcome.

In their global overview of science communication training, Siddharth Kankaria, Alice Fleerackers, Edith Escalón, Erik Stengler, Clare Wilkinson and Tobias Kreutzer highlight different science communication training formats from the US, U.K., Canada, Germany, India, and Mexico. They show how science communication research insights can be integrated into these trainings and what their unique contribution is to each of the programmes.

In their practice insight report “Transforming Science Journalism through Collaborative Research”, Christopher Buschow, Anja Noster, Holger Hettwer,

Lynda Lich-Knight and Franco Zotta present lessons learned and results from their collaboration in a transformative research approach in the context of science journalism and specifically the case of the German “Innovation Fund for Science Journalism”.

The article “Exhibition research and practice at CERN: challenges and learnings of science communication ‘in the making’” by Daria Dvorzhitskaia, Annabella Zamora, Emma Sanders, Patricia Verheyden and Jimmy Clerc offers a practice insight into a collaboration between science communication practitioners and researchers at CERN’s education and outreach centre. The project implemented various evaluation studies, online surveys and testing tools to inform the development of interactive exhibitions. The paper offers a glance behind the scenes, discusses challenges and learnings of research-informed exhibition development and invites readers to reflect not only the process of research-based practice but also to evaluate the process of evaluation.

Finally, we have invited *research articles* analysing the interrelations between science communication research and practice and shedding light on methods and models for successful interactions.

The research article “Science Communication as Human Right”, by Gabriela Frias-Villegas, Kathia Elisa García-Gómez, Alejandro Guzmán-Vendrell, Irvin Alberto Mendoza-Hernández, Fabiola Vázquez-Quiróz and Ricardo Tránsito-Santos, from Mexico, contributes an innovative and robust perspective of co-creation with four communities in vulnerable situations with approaches from sociology, anthropology and science communication as an empowerment tool.

There are a number of people who have contributed greatly to this Special Issue and we want to take this opportunity to thank all of them for their time and effort. First and foremost we wholeheartedly thank Robert Inglis of Jive Media Africa who has greatly supported us in the process of selecting abstracts for publication and who has continuously enriched our discussions with his unique perspective. We further thank the researchers and practitioners who have contributed to this Special Issue by reviewing the articles and supporting us with their insights and expertise. We also thank the editors of JCOM and the whole JCOM editorial team for their continuous support and guidance throughout the editorial process. Finally, we thank everyone who has submitted an abstract in answer to our call for abstracts. We are very happy to see such a great interest in this important topic and hope we will continue to all advance these issues together.

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