

Developing open, reflexive and socially responsible science communication research and practice

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Abstract

There are many different pathways into science communication practice and research. But rarely do these pathways require critical reflection on what it means to be a 'responsible' science communicator or researcher. The need for this kind of critical reflection is increasingly salient in a world marked by the wilful disregard of evidence in many high-profile contexts, including politics and, most recently, public health. Responsible science communicators and researchers are audience- and impact-focused, beginning their decision-making process by considering their audiences' starting positions, needs and values. This article outlines some key considerations for developing social responsibility for science communication as a field both in terms of practice and research.

Keywords

Public engagement with science and technology; Scholarly communication; Science communication: theory and models

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Developing socially responsible science communication practice

A recent global study of researchers conducted as part of the Responsible Research and Innovation Networking Globally (RRING) project (rring.eu) found widespread enthusiasm for public engagement. High percentages of researchers across all world regions agreed with the statement, 'I feel a professional responsibility to communicate findings from my research or innovation work to public audiences'. Furthermore, the study found a great deal of support for social inclusion, with majorities of researcher respondents across world regions agreeing with statements such as:

- It is important to promote gender equality in my research and innovation work.
- It is important to involve individuals/organisations with a diverse range of perspectives and expertise when planning my research and innovation work.

- It is important to take ethnic diversity into account when developing my research and innovation work.

Despite this global consensus on the need for science engagement and also for more social inclusion, the practical implementation of principles of socially responsible research within the context of science communication remains elusive. How can we integrate principles of socially responsible research and innovation within the practice of public engagement with research to create ‘socially responsible science communication’? A clear starting point for such practical implementation is reflexivity. Being responsible as a science communicator involves critically self-assessing your position, ensuring you take a realistic approach to engaging audiences or stakeholders. Other articles in this special issue address this point, including critical link between reflexivity and strategic science communication:

Practitioners could ask themselves the question: “Do I use the appropriate science communication model to accompany for goals that I have set, the perspective on science-society that I have, and the activities that I undertake? Do I ask the right questions? And how can I find out?” (this issue¹)

Part of this self-assessment process is to consider the best communication approach and tools to bring to bear on a given situation. It is best to have a broad toolkit of available science communication methods, implementation mechanisms and framing devices to adapt to the needs of your audience and the impact you are seeking to develop. Adaptability in both the selection and application of communication approaches and tools is most effective when paired with appropriate training and evaluation practices.

Moreover, the best available evidence in science communication should help to guide the decision-making process of practitioners at all levels [Jensen and Gerber, 2020]. A number of defining characteristics for socially responsible science communication practice are summarised under the auspices of ‘evidence-based science communication’ as follows [Jensen and Gerber, 2020]:

- Planning, developing, and applying objectives in a logical way to address the needs of specific stakeholders or audiences.
[...]
- Ensuring appropriate and relevant communication skills are developed and applied for a given science communication challenge.
- Being inclusive and welcoming of those who are often marginalised or excluded, both in the development and delivery of science communication activities.
- Willingness and capability to reflect on limitations in one’s own communication objectives and strategies, despite institutional constraints and agendas, even if this may invalidate previously accepted practices.
- Committing to continually improve practice based on ongoing collection and analysis of evaluation evidence [Jensen, 2014; Jensen, 2015a].
[...]

¹‘Strategies towards a reflective practice for science communicators’

- Working to make any given science communication activity as resource efficient as possible to ensure that opportunities for positive impact are not squandered.

These dimensions of responsible science communication require a focus on professional development and a wider social ecosystem of collective self-improvement for this field of practice (underpinned by appropriate financial resources and institutional support). While some dimensions, such as social inclusion, have gained increasing attention in recent years [e.g., Dawson and Jensen, 2011; Kennedy, Jensen and Verbeke, 2018], there is clearly a lot of work ahead to align practice with aspirations.

Effective science communication and collective responsibility

Regardless of the communication approaches and tools you choose, as a responsible science communicator, you should be concerned about effectiveness. There is a treasure trove of insights about what is likely to support effectiveness of communication initiatives available from the social sciences (both basic and applied). For scientists and other engagement practitioners, I advocate training in core principles of communication and learning — as well as key insights from psychology, anthropology, political science, media studies and sociology — that have been demonstrated by prior social research and theoretical development.

Furthermore, for science communication activities that are well-funded or conducted by full-time professionals, robust evaluation should be conducted to inform practice [Jensen, 2014; Jensen, 2015a; Jensen, 2015b]. However, it is also important for the global field of science communication to periodically reflect on the big picture to see where there are gaps, who is left behind, what values are promoted through our work, etc. [e.g., see Dawson and Jensen, 2011]. Responsible science communication cannot be left only to the individual science communicator: It is a collective responsibility to establish high quality, evidence-based practice grounded in a robust understanding of societal needs.

Being a socially responsible science communication researcher

Reflexivity and social responsibility is not only essential for science communication practitioners. Science communication *researchers* should also be reflexive and socially responsible in their work to effectively play their role in the field. The standard expectations of social science researchers to be ethical in their practices and to gain informed consent from any participants should go without saying. I will therefore focus here on the aspects of socially responsible science communication research that are less widely acknowledged. Firstly, it is worth noting that the leading edge of scholarship and practice on the topic of socially responsible research in general has advanced dramatically in recent years. Many of these developments sit under broad and abstract labels such as ‘open science’, ‘responsible research and innovation’, ‘social responsibility of science’ or ‘research integrity’. Yet, they directly relate to the kind of changes in science that many in the science communication research world have advocated for decades, such as transparency, responsiveness to societal needs and social inclusion. Indeed, the relevance of open science principles, critiques and proposed reforms to the research system are clearly applicable to social scientists focusing on communication [Dienlin et al., 2020].

However, the practice of science communication research — along with large swathes of academic social science — has largely proceeded in a ‘business as usual’ mode. For example, science communication journals seem to eschew (or at least show no interest in) established transparency and accountability mechanisms routinely employed in other scientific fields, such as publishing underlying instruments, data, and analyses alongside empirical journal articles, requiring good practice in quantitative or qualitative data analysis or including a statement about the precise contributions of co-authors to a paper.

This is a missed opportunity for science communication research to be at the vanguard of advancements in responsible research practice. Moreover, poor implementation of socially responsible research practices is just as much of a problem for the quality and impact of science communication research as it is for research in medical or natural sciences, for example. To demonstrate the case for the relevance of work on socially responsible principles and practices for science communication researchers, based on my experience I summarise in Table 1 the applicability of one framework that has gained significant traction in the European research context, known as the ‘process’ dimensions (extracted verbatim from: RRI Tools [n.d.]).

In addition to the RRI Tools ‘process dimensions’, I would also highlight key documents such as the Montreal Statement on Research Integrity (<https://wcrif.org/montreal-statement/file>), which proposes a number of valuable precepts that science communication researchers should consider adopting when they participate in collaborative research.

In table 2 I highlight just a few of the principles put forward in this important statement and their implications for science communication research based on my analysis.

Conclusion

In this article, I have made the case for socially responsible science communication research. Through my involvement in projects funded through the European Union Horizon 2020 Programme, the need to consider what it means to be a responsible science communicator or researcher has again become apparent. In the first section, I highlighted the characteristics of responsible science communication practice. Furthermore, I called attention to useful tools and frameworks for developing socially responsible science communication practice. Finally, I highlighted the role for critical reflection, on-going self-improvement, evidence-based decision-making, orienting ethical values, social inclusive principles, and a supporting community of practice to develop responsible science communication.

This article applies a selection from the rich body of scholarship and practice around enhancing socially responsible research, developed over recent years. I would encourage further dialogue about how the field of science communication can reclaim its role at the vanguard of open, reflexive and responsible science. Doing so will enable science communication scholarship and practice to leverage its porous borders and interdisciplinarity to enhance quality and impact.

Real change that goes beyond mere shifts in terminology does not come easy in the field of science communication [e.g., Jensen and Holliman, 2016]. It is essential that

Table 1. Process dimensions drawn from RRI Tools and key questions for science communication research and practice.

Process dimension of responsible research and innovation	Key questions for science communication research
<p>Diverse & inclusive: involve early a wide range of actors and publics in [research] practice, deliberation, and decision-making to yield more useful and higher quality knowledge. This strengthens democracy and broadens sources of expertise, disciplines, and perspectives.</p>	<p>How diverse are science communication research teams and individuals' personal/professional backgrounds? Is a diversity of different types of expertise, disciplines and perspectives being brought to bear in science communication research? How diverse and inclusive are science communication activities in general [cf., Jensen, Jensen, Duca and Roche, 2021; Jensen, Jensen, Duca, Daly et al., 2022; Kennedy, Jensen and Verbeke, 2018]? Is social inclusion really prioritized in science communication practice?</p>
<p>Anticipative & reflective: envision impacts and reflect on the underlying assumptions, values, and purposes to better understand how [research] shapes the future. This yields valuable insights and increases our capacity to act on what we know.</p>	<p>How reflexive is science communication research about its underpinning assumptions, values, and purposes? Who currently benefits from science communication research, and how can wider benefit be enabled? How much does science communication practice anticipate future needs in its design and content?</p>
<p>Open & transparent: communicate in a balanced, meaningful way methods, results, conclusions, and implications to enable public scrutiny and dialogue. This benefits the visibility and understanding of R&I.</p>	<p>Does science communication research present its methods, results, conclusions, and implications in a way that enables critical scrutiny and dialogue? How can scrutiny take place when much of the underpinning data and analytic instruments, etc. remain private, and most science communication journals have paywalls? Meanwhile, how transparent is science communication practice about the funding and motivations driving public engagement?</p>
<p>Responsive & adaptive to change: be able to modify modes of thought and behaviour, overarching organisational structures, in response to changing circumstances, knowledge, and perspectives. This aligns action with the needs expressed by stakeholders and publics.</p>	<p>This dimension directly links to science communication research, raising the question of how responsive it is to stakeholder and public needs, as well as the wider societal context. In terms of science communication practice, this dimension highlights the need for science communication to integrate stakeholder analysis, as well as a strategic approach to communication design that accounts for context and audience needs.</p>

each of us ask ourselves on a regular basis whether we are really being a responsible science communicator and/or science communication researcher/professional? It takes such critical reflection, on-going self-improvement, evidence-based decision-making, orienting ethical values, social inclusive principles and a supporting community of practice to develop responsible science communication. This is not an easy prospect for the field of

Table 2. Selection from the Montreal Statement on Research Integrity and key questions for science communication research

Montreal Statement (Selection)	Key questions for science communication research
10. Resource Management: collaborating partners should use human, animal, financial and other resources responsibly.	Are research findings accurate and robust, providing good long-term value for the resources invested to create the research? How efficient is science communication research? How skilled are science communication researchers?
18. Authorship and Acknowledgement: collaborating partners should come to agreement, at the outset and later as needed, on standards for authorship and acknowledgement of joint research products. The contributions of all partners, especially junior partners, should receive full and appropriate recognition. Publications and other products should state the contributions of all contributing parties.	How are collaborations handled by science communication researchers? Whose contributions are represented in published science communication research? Are all parties being given the opportunity to participate in the benefits of the research or is science communication research operating as a kind of extractive industry?
20. Accountability: collaborating partners should be accountable to each other, to funders and to other stakeholders in the accomplishment of the research.	How accountable are science communication researchers? What accountability mechanisms have been adopted on a field-wide basis to ensure good and ethical research practice? Why are research accountability mechanisms that have evolved in the natural, medical and physical sciences (e.g., publishing research plans in advance or full-scale FAIR open data practices) not being employed in science communication? [see Dienlin et al., 2020]

science communication as it currently stands [e.g., Gerber, 2013; Gerber et al., 2020]. But for science communication research and practice to maintain its relevance and value, there is no alternative but to begin to implement reforms rooted in both evidence and public accountability.

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