

The White Paper

Supporting Global Science Communication: A White Paper on Recommended Next Steps

1 Introduction

Rapid advancements in science and technology have major implications for society, both positive and negative. As humanity pushes the boundaries of exploration and innovation, society must adapt to keep up. The coevolution of science and society necessitates that citizens are empowered to understand, trust, and engage meaningfully with scientific topics and policies (Mannino et al., 2021). The global Covid-19 pandemic, which brought with it an epidemic of misinformation (Saitz & Schwitzer, 2020) and the devastating fires and floods caused by climate change have been stark reminders of this need.

Science communication is a field ideally positioned to answer this call. As an academic discipline, it is relatively young, transdisciplinary by nature, and involves a diverse range of actors and practices.

“Science communication describes the many ways in which the process, outcomes, and implications of the sciences – broadly defined – can be shared or discussed with audiences. Science communication involves interaction, with the goal of interpreting scientific or technical developments or discussing issues with a scientific or technical dimension.” (Dijkstra et al., 2019).

In recent decades, society has gone through many transitional phases in how we receive, digest, and engage with information, and this trend is expected to continue into the future (Kupper et al., 2021). Science communicators must adapt to these changes in order to develop impactful, high quality content (Mannino et al., 2021). Failure to adapt will diminish trust in science, leading to potentially devastating effects for society at large (Roche et al., 2021).

With a constantly changing landscape, limited resources, and its diverse, fragmented nature, science communication as a field is at risk of lagging behind the curve and has been described by some as being in a ‘moment of crisis’ (Davies et al., 2021; Kupper et al., 2021). Based on research and practice from the GlobalSCAPE project (Roche et al., 2021), and backed by feedback provided by international stakeholders, this white paper will outline recommended next steps to support science communicators in achieving high quality engagement with various publics across the globe.



2 GlobalSCAPE

GlobalSCAPE (Global Science Communication and Perception) is one of eight projects funded as part of the Horizon 2020 programme, under the 'Science with and for Society' call SwafS-19: Taking stock and re-examining the role of science communication. The aim of GlobalSCAPE was to gather an accurate, up-to-date picture of science communication in a global context (Roche et al., 2021). This action sought to identify obstacles faced by scicomm practitioners across the globe, and to promote activities designed to overcome such obstacles, with the goal of generating high quality content, training, and engagement within the field. This white paper has been developed as part of the GlobalSCAPE project, and has been refined through feedback gathered from co-creation sessions held in the final month of the project.

3 Foundational values of science communication

In order to consistently achieve impact and meaning within science communication activities, it can be useful to fall back on a set of values that can be seen as foundational within the field. These values can forge the path to developing a relationship between science and society, built on trust and high quality engagement, that can consistently withstand obstacles. Here we present these values, including the challenges associated with implementing them, that have been identified through literature review, practice, and co-creation sessions carried out with international scicomm actors. This is not by any means a complete or definitive list, but instead serves to provide a glimpse into the current thoughts and ideas circulating in the scicomm field.

1. Inclusion and Diversity:

Mainstream science communication can currently be seen as operating within an exclusive field that is dominated by white, Western viewpoints (Guenther & Joubert, 2017; Dawson, 2021; Finlay, S. M. et al., 2021). This lack of diversity and inclusion creates a one-sided perspective of best practice. Science communication is highly contextual, deeply dependent on the cultural and political factors of where it is being implemented (Dawson, 2021; Davies et al., 2021). If this is not adequately addressed, implemented practice can be unimpactful, irrelevant, and ultimately lead to a waste of resources. A perspective that is only representative of a small portion of the world's population cannot solely develop meaningful strategies to overcome obstacles that are faced in a global context.

2. Trust, Openness and Integrity :

Openness and integrity are fundamental to promoting trust in science, therefore it is no surprise that they are also deep-rooted in the communication of its topics, both externally and within the field (Davies, 2021). Knowledge sharing promotes quality improvement in both research and practice, allowing scicomm actors to build on the good work and experience of their network.

Unfortunately, many science communication professionals often feel their network is small and discipline specific, while initiative to collaborate across disciplines is lacking (Davies et al., 2021). Large disparities have shown up in science communication research, teaching, and ideas of best practice across the field,





causing difficulties to arise when training is being developed and implemented. Specifically, research carried out is often not explained in language accessible to practitioners, reducing the potential impact of many scicomm activities (Davies et al., 2021; Joubert, 20223).

3. Sustainability:

Research, practice, and training activities within science communication should strive for a form of sustainability to reduce resource waste, ensure relevance and high impact, and promote the perception of scicomm as a highly skilled, independent, and important field of work. Sustainability promotes network and support system building within the scicomm community. Long term projects can be used to identify changing trends in the coevolution of science and society and to quickly overcome obstacles that arise (Gerber et al., 2020). However, to achieve sustainability, scientific institutions and other funding bodies must see science communication as a vital component of scientific research and technological development. This highlights an important aspect of assisting scientists and other researchers who wish to share their own work with members of wider society (Besley et al., 2021).

4. Innovation and relevance:

To implement all values previously mentioned, science communicators overall must remain innovative. Research and practice must overcome previously set norms by pushing for inclusion, diversity, openness, and sustainability to remain relevant in a changing landscape. Unexplored collaborations can provide exciting new perspectives and valuable ideas previously overlooked. As the relationship between science and society evolves, so must the research and methods used to build it.

In the next section, we will present a number of recommendations on how such values can be further instilled in the research and practice of global science communication. These recommendations have been developed based on the activities of GlobalSCAPE, which will also be described in this section, and have been refined using feedback gathered from co-creation sessions with science communication professionals.

4 Recommendations

Recommendation #1: Build with Marginalised Voices

The future of science communication should be designed and built with marginalised voices at the forefront (Dawson, 2021; Finlay et al., 2021; Judd & McKinnon, 2021)¹. This can be achieved by:

- Working towards developing a global picture of science communication, through collaborative research and worldwide partnerships.
- Working alongside members and experts of diverse communities to identify requirements for engagement with their communities, and taking these requirements into account when implementing activities or carrying out research.

GlobalSCAPE Activities: GlobalSCAPE has begun the endeavour of building a global picture through its longitudinal diary studies, that once analysed will shine light on the experiences of science communication professionals from diverse backgrounds all over the world. The project embedded a global approach in the

¹ This recommendation is based on the idea of 'building an inclusive science communication network' by Prof. Emily Dawson, who has given permission for this concept to be included in this white paper.



foundation of many activities by collaborating with international experts outside of Europe through its Advisory Board, training workshops and resource-sharing efforts.

Recommendation #2: Facilitate Knowledge Sharing

Those who wish to communicate science to the public should feel supported and empowered to do so. This can be facilitated through:

- The implementation of workshops that share useful knowledge and practice, designed for the region in which they are located alongside local experts.
- More sustainable training opportunities, and a centralised location that easily identifies when and where such opportunities are available.
- Making research results more accessible to practitioners through a change in language and dissemination strategies.
- Using funding to develop adaptable resources that can be easily accessed and shared. This includes investing in the translation of documents and materials where possible.
- Developing networking opportunities and creating knowledge brokers who can support knowledge sharing and collaborations both within the field of science communication and with external stakeholders.

GlobalSCAPE activities: GlobalSCAPE is dedicated to ensuring its outputs and resources, such as an undergraduate science communication module, training session content, and white paper, will be made open access and adaptable, with the white paper also being translated into several languages. GlobalSCAPE has formed a collaboration with the Network for Public Communication of Science and Technology (PCST), supported by its Teaching Forum, which has led to the further development of a worldwide database of science communication programmes and courses, as well as a special issue of the Journal of Science Communication (JCOM) showcasing how such programmes are taught on a global scale.

Recommendation #3: Foster National and Regional Support

Building on the importance of knowledge sharing, science communicators must be offered support and advice when undertaking new endeavours. The establishment of both local, national, and international hubs to act as a knowledge broker between members of the science communication community and other stakeholders, such as scientists, students, and policy makers, will empower knowledge sharing, collaboration, and dialogue between traditionally separated groups. For such schemes to be successful, these centres must be independent, sustainable entities and receive continuous funding and support from governmental bodies and other stakeholders.

- Local centres should ensure relevance in activities being implemented within that area, and connect those carrying out small-scale endeavours with actors who can provide expertise and required resources, possibly through the national centre.
- National centres should provide support and a network for local centres, offer mentorship programmes and training, lobby for national change, and work with national scientific institutions/organisations to secure funding for various projects and activities. They should have a form of representation in an international centre.
- Larger international centres can facilitate international collaborations, and lead the way in ensuring global science communication remains innovative, inclusive, and relevant.



Future Activities: COALESCE is an upcoming project that recently received a 4-year Horizon Europe grant to establish a "European Centre for Science Communication" (GA 101095230), and will build on the work of the eight SwafS-19 projects.

5 Closing remarks

To ensure the coevolution of science and society is built on trust, understanding, and high-quality engagement, the future of science communication must be inclusive, open, honest and sustainable. Researchers and practitioners within the field must be supported both by each other and external stakeholders such as governments, policy makers, and the scientific community to continue to improve their work and reach new audiences within a landscape in continuous transition.

Acknowledgements

The authors would like to thank the GlobalSCAPE partners, the PCST teaching forum, and the Advisory Board Experts for their insightful feedback on the topics outlined within this white paper. They would also like to thank all participants who joined the co-creation sessions and gave their valuable input that could be built upon for this document. Finally, the authors would like to thank the European Commission for the support they have provided throughout the GlobalSCAPE project.

Conclusion

The deliverable contains an evidence-based white paper outlining recommendations to support science communication and its evolution on a global scale. This white paper builds on the work of GlobalSCAPE and other SwafS-19 projects, and was further improved and refined utilising end-user feedback from a variety of stakeholders of the project. The white paper will be open-access and has been translated to a number of languages, allowing for it to be easily reviewed or adapted by those who wish to utilise it.

The white paper itself calls for an open, inclusive, innovative and sustainable future of science communication. Knowledge sharing is at the forefront of its recommendations, and it uses local, regional and international centres as a product through which this can be supported.

The white paper will remain as a 'living document', outlasting the GlobalSCAPE project and continuously being improved and updated to ensure accurate representation of the landscape it is lobbying for.





References

- Besley, J. C., Garlick, S., Fallon Lambert, K., & Tiffany, L. A. (2021). The role of communication professionals in fostering a culture of public engagement. *International Journal of Science Education, Part B*, 11(3), 225–241. <https://doi.org/10.1080/21548455.2021.1943763>
- Davies, S. R. (2021). An Empirical and Conceptual Note on Science Communication's Role in Society. *Science Communication*, 43(1), 116–133. <https://doi.org/10.1177/1075547020971642>
- Davies, S. R., Franks, S., Roche, J., Schmidt, A. L., Wells, R., & Zollo, F. (2021). The landscape of European science communication. *Journal of Science Communication*, 20(3), A01. <https://doi.org/10.22323/2.20030201>
- Dawson, E. (2018). Reimagining publics and (non) participation: Exploring exclusion from science communication through the experiences of low-income, minority ethnic groups. *Public Understanding of Science*, 27(7), 772–786. <https://doi.org/10.1177/0963662517750072>
- Dawson, E. (2021). Introduction: The Future of Science Communication must be Inclusive. In *White Paper on Inclusive Science Outreach 2021*. Gobierno De España, Ministerio de Ciencia e Innovación.
- Dijkstra, A. M., de Bakker, L., van Dam, F., & Jensen, E. A. (2019). Setting the Scene. In *Science Communication: Vol. Volume 1* (pp. 1–16). World Scientific. https://doi.org/10.1142/9789811209888_0001
- Finlay, S. M., Raman, S., Rasekoala, E., Mignan, V., Dawson, E., Neeley, L., & Orthia, L. A. (2021). From the margins to the mainstream: Deconstructing science communication as a white, Western paradigm. *Journal of Science Communication*, 20(1), C02. <https://doi.org/10.22323/2.20010302>
- Gerber, A., Metlcalfe, J. E., & Lorke, J. (2020). *Science Communication Research: An Empirical Field Analysis*. Edition innovare. <https://rri-tools.eu/-/science-20communication-20research-3a-20an-20empirical-20field-20analysis>
- Guenther, L., & Joubert, M. (2017). Science communication as a field of research: Identifying trends, challenges and gaps by analysing research papers. *Journal of Science Communication*, 16(2), A02. <https://doi.org/10.22323/2.16020202>
- Joubert, M. (2023, February 3). *System changes and new approaches required for meaningful public engagement with research*. GlobalSCAPE Final Event, Brussels.
- Judd, K., & McKinnon, M. (2021). A Systematic Map of Inclusion, Equity and Diversity in Science Communication Research: Do We Practice what We Preach? *Frontiers in Communication*, 6. <https://www.frontiersin.org/articles/10.3389/fcomm.2021.744365>
- Kupper, F., Moreno Castro, C., & Fornetti, A. (2021). Rethinking science communication in a changing landscape. *Journal of Science Communication*, 20, E. <https://doi.org/10.22323/2.20030501>
- Mannino, I., Bell, L., Costa, E., Di Rosa, M., Fornetti, A., Franks, S., Iasillo, C., Maiden, N., Olesk, A., Pasotti, J., Renser, B., Roche, J., Schofield, B., Villa, R., & Zollo, F. (2021). Supporting quality in science communication: Insights from the QUEST project. *Journal of Science Communication*, 20(3), A07. <https://doi.org/10.22323/2.20030207>
- Roche, J., Arias, R., Bell, L., Boscolo, M., Fornetti, A., Knutas, A., Kupper, F., Magalhães, J., Mannino, I., Mendoza, I., Moreno-Castro, C., Murphy, K., Pridmore, J., Smyth, F., Tola, E., Tulin, M., Weitkamp, E., & Wolff, A. (2021). Taking Stock and Re-Examining the Role of Science Communication. *Frontiers in Environmental Science*, 9. <https://www.frontiersin.org/articles/10.3389/fenvs.2021.734081>
- Saitz, R., & Schwitzer, G. (2020). Communicating Science in the Time of a Pandemic. *JAMA*, 324(5), 443–444. <https://doi.org/10.1001/jama.2020.12535>

