Big challenges for small countries in science communication Roundtable report

Marta Entradas (SciComPT, Portugal)
Per Hetland (University of Oslo, Norway)
Fabien Medvecky (University of Otago, New Zealand)
Padraig Murphy (Dublin City University, Ireland)
Sofía Otero (University of Chile)
Brian Trench (panel convenor; Dublin City University, Ireland)

Introduction (BT)

Science communication programmes, policies and practices have been spreading internationally for over two decades. This is reflected in the increasing number of conference and journal papers and book chapters that describe the 'global spread' (Trench, Bucchi et al, 2014) or that detail the growth of science communication in individual countries (e.g. Fleming and Star, 2017; Gascoigne and Metcalfe, 2017; Watanabe, 2017).

These studies have tended to pay more attention to the replication of phenomena, and to similarities, than to differences. The political, economic, cultural and geographical factors that affect how wide and deep the development of science communication is in particular countries deserve closer consideration. Nation-states tend to set boundaries and structures for science communication, as they do for other institutional and cultural developments.

This roundtable session at PCST 2018 conference examined how and whether the size and status of a country – i.e. its central or peripheral position in a region or continent, or in the world – shape the development of science communication. The roundtable focused on smaller countries, discussing the disadvantages and possible advantages for these countries in adopting and promoting science communication for their needs. It will be noted that the selection of countries represented included countries of vastly different geographic size and population – Chile measures longer from north to south than continental Europe – but all are more or less dependent on, or overshadowed by, larger neighbours.

We expected to observe similarities between the smaller, peripheral countries in terms of those dependencies, the pressure to conform to the national agenda, low levels of funding for scientific research and science communication, and relatively historical weakness of scientific institutions. But we also anticipated that there might be evidence of relatively greater ease of forming networks, securing access to power-holders and –influencers and thus making decisive policy shifts for science communication.

Norway (PH)

Science communication has been an explicit part of Norwegian science and technology policy since 1975. Since this time, concerns with public engagement have led to a mode that is more dialogical across the three models, the dissemination, dialogue, and participation models, within science and technology communication policy in Norway (Hetland 2014). Through an active policy, sponsored hybrid forums that encourage participation have gradually been developed. In addition, social media increasingly allow for spontaneous public involvement in a growing number of hybrid forums. Dialogue and participation have thus become crucial parts of science and technology communication, thereby shaping public engagement and expertise. One may claim that a Nordic model of science communication (NMSC) has emerged, as science communication is always culturally situated.

First, science communication is always understood broadly, including the social sciences and humanities. Consequently, in the Norwegian language, science communication translates into research communication, with a similar meaning to the German word, Wissenschaft, which include humanities and social sciences (Davies and Horst 2016).

Second, science communication has been understood as a crucial part of a long-standing, unwritten social contract between science and society. In Norway, this social contract has increasingly been made explicit and is written, for instance, into the laws governing higher education institutions in Norway. This was first done in the law governing the 1948 University of Bergen, followed by several revisions, and finally the expanded and strengthened 2013 Act Relating to Universities and University Colleges, which declared that higher education institutions have three assignments – education, scientific research, and science and technology communication. The concept of the third assignment, or third mission, underlines the strong contractual element; one may claim that it represents a constitutional moment.

Third, in Norway, science communication has its historic roots in the Danish-Norwegian Enlightenment tradition from the late 1600s and early 1700s. The third assignment, therefore, has been perceived as an important part of the Humboldt legacy of Bildung, or liberal education and civic character formation.

Kalleberg (2012, p.48) draws a clear distinction between two academic roles as follows: “one as experts with clients, the other as public intellectuals with citizens”. Consequently, science communication in the Nordic countries builds on a long tradition of dialogue, irrespective of which science communication model is in play (Hetland 2014; Horst 2012; Kasperowski and Bragesjö, 2011).

Fourth, the Media Welfare State, as it has been called (Syvertsen et al, 2014), emphasizes (ibid, p.2) "universal services, editorial freedom, a cultural policy for the media; and last, but not least, a tendency to choose policy solutions that are consensual and durable, based on consultation with both public and private stakeholders". In the Nordic model free and universally available science communication is considered a foundation for an enlightened public. The Media Welfare State is visible in several collaborative projects, such as forskning.no, forskning.se, and videnskab.dk (Hetland, 2014), three online newspapers devoted to Scandinavian and international research that are also extensively cited in local mass media.

In my view, these four pillars are the core constituent elements of the Nordic model of science communication, which is applied with some important variations across the Nordic countries, which borrow ideas from each other as well as from stronger players.

Portugal (ME)

Science communication is relatively new in Portugal which can be linked in part to the political conditions of an authoritarian state that ruled for more than forty years (1932-1968) and kept scientific institutions and scientists away from society (Goncalves and Castro, 2002). Up to the early 1990s, Portugal was a country with few modern scientific resources, and the practice of science communication was scarce.

In 1995, with the creation of the Ministry for Science and Technology, and through the vision of the then minister, physicist Mariano Gago (1996), the government adopted a strong policy for ‘scientific culture’. This was probably the turning point for science communication in Portugal, and very much anchored it to a policy strategy following a top-down approach.

The national policy for ‘scientific culture’ was reflected in a series of actions by the government to encourage research institutions and scientists to increase their relations with society. Two of the most preeminent were: 1) legislation mandating that all research centres and researchers which are publicly funded should communicate their scientific activity and allocate funding for it; and 2) the creation of the Ciência Viva (Alive Science), a national public awareness programme, fully funded by the government to develop science communication infrastructures and activities.

Over the last twenty years, Portugal has quickly developed its infrastructure for science communication (Granado, 2015) with political support, and continues to do so. For example, in 2016, the government announced that five per cent of the core state funding for research institutes was to be allocated to public engagement activities. This model has been acknowledged by the European Union as a successful model in Europe (Miller et al, 2002).

There are many indicators that point to a greater openness and accessibility of science to society in the last decades. These include a network of 20 Ciência Viva centres, science museums, networks of science communication professionals such as SciComPT which organises an annual science communication conference (Granado, 2015).

The large majority of research institutions engages in some type of public communication and the level of that activity has risen in recent years. Yet, the field suffers from lack of resources in the institutions and lack of professionalization, while public participation in research and policy is marginal (Entradas and Bauer, 2017). Despite the progress, much more needs to be done to respond to the increasing demands for societal engagement. This could include, for example, setting up structures to involve citizens in decision-making around science-related issues, adopting successful models from neighbour countries.

New Zealand (FM)

Science communication in New Zealand cannot be separated from the context and culture in which it occurs: a geographically isolated country that is a former British colony with an advanced economy and solid scientific and medical research capabilities, and with a strong indigenous culture that has its own relationship to knowledge and science (Marie, Zaheer-Ud-Din and Sanjay, 2012).

These factors all affect New Zealand's cultural relationship with science and with science communication. Though small by world standards, New Zealand is large by regional standards. Its population of less than five million is significantly smaller than Australia with 25 million, but much bigger than other Pacific island nations, all of which have populations under one million. New Zealand and Australia are the two most prominent economic and scientific players in the region, often competing and comparing with each other.

Until quite recently, science communication in New Zealand was largely focused on popularizing and disseminating science, though three significant events have changed the direction; a) the recognition of Matauranga – the Maori way of thinking – as a form of rigorous knowledge (Salmon and Priestley, 2015), b) the establishment of academic programmes in the field, and c) a major strategic policy, the first of its kind, called 'A Nation of Curious Minds' (Fleming and Star, 2017).

The New Zealand science communication infrastructure is comprised of a number of programmes in science communication and related fields; a solid national association, the Science Communicators' Association of New Zealand (SCANZ); the Science Media Centre; and a number of policies, including a strong engagement element in the National Science Challenges, described as a set of "cross-disciplinary, mission-led programmes designed to tackle New Zealand's biggest science-based challenges (MBIE, 2014a).

Since 2014, the science communication landscape has been heavily shaped by Curious Minds policy aimed at "encouraging and enabling better engagement with science and technology for all New Zealanders" (MBIE, 2014b). This policy's aspirational values include that "engagement with science and technology is about understanding, becoming informed, and questioning what we need science to address and what we do with the new knowledge that science produces".

This resonates with international trends to increase two-way, dialogic communication. As a way of enacting this aspiration, the policy has been particularly strong in pushing for participatory science, and maintaining a local flavour by including Matauranga as part of science (see, for example, https://www.curiousminds.nz/stories/nga-hekaheka-fungi-with-a-maori-lens/).

However, a practical outcome of this policy is that much of the effort at participation is unquestioningly pro-STEM, limiting the content of what counts as science and knowledge largely to the bio-physical sciences. More importantly, the vast majority of the participatory projects have been focused on the young (often school children), undoubtedly a valuable practice, but limiting the capacity for substantive social discussion "to address and what we do with the new knowledge that science produces". New Zealand's science communication aspirations align with the current leading ideas in the field; it is now a case of enacting policies that more closely align the practice with the aspirations.

Chile (SO)

Public communication of science in Chile appears, figuratively speaking, as an orchestra without a baton. The country has various public financing instruments for science outreach, but no public policies.

The first signal that science was part of development came just a half-century ago, with the creation of the National Commission for Scientific and Technological Research (CONICYT) in the late 1960s. The Commission, dependent on the Ministry of Education, is nowadays one of the two umbrellas under which science communication is developing, thanks to their Explora programme. The second umbrella is the Milenio Programme, from the Ministry of Economy, which also funds scientific research. Both initiatives promote science dissemination beyond experts, under the premise that science financed by the state must reach society and if people don't know about local scientific research, investment might decrease even below the current 0.4% of Gross Domestic Product.

Chile is such a young country in terms of institutional science development, that the Ministry of Science was established only in 2018. This initiative promises to generate public policies based on strategic objectives and for the first time will ensure coordination among the different actors that currently work with scientists and scientific organizations.

Making science visible for the non-expert is one of the goals of science communication but this is still far from working towards the construction of a scientific culture, which requires long-term work and vision. Until now, the development of a scientific culture has lain in the hands of enthusiastic individuals or collectives who compete for annual funding to create activities or products aimed at a broad spectrum of the general public, with a natural inclination for school children (Estrada, 2016).

Some funds are highly competitive (Explora, which focuses more on science communicators, funding one in 20 applications), while some others (Milenio Medium Projection Programme, aimed at scientists) reflect a lack of interest among researchers in science outreach: half of the annual funding for this programme is not used, and as a result the funding has been cut by three-quarters over the past decade (Torrealba, 2018).

Chie being a relatively small country means that individual initiatives can have big impact. None of the major landmarks in the country's scientific outreach culture emanated from a country vision or a development roadmap established by the state. The first science and technology museum was born in the 1980s out of a private initiative led by a team of motivated scientists and engineers (Troncoso, 2010). The national programme that promotes the dissemination and appreciation of science and technology, Explora, started in the 1990s thanks to one person who managed to gather enough collective interest to turn her individual project into a national programme (Tomicic, 2000). The first and only Chilean professional education programme in science communication, was created in 2013 by a group of young Chilean science communication alumni who applied what they learned overseas in creating a diploma programme (Pohl et al, 2013).

In 2016, the first National Survey on Perception of Science and Technology in Chile showed that citizens are interested in science and technology, but consider themselves little or not at all informed about the issues (Conicyt, 2016). This recent national effort to better understand the public will certainly drive future policies about science communication in Chile. But it might tip the

balance towards scientific literacy efforts at a time when PCST internationally is looking towards generating experiences over delivering information.

Ireland (PM)

Ireland has experienced “pull-and-push” between its own innovation policy, Britain’s agenda for public engagement with science and technology (PEST) agenda and influences from the European Commission. British science communication scholarship and practice has been quite influential in Europe, and once the House of Lords Report (House of Lords, 2000) became the template for the PEST agenda, Ireland might have been expected to follow suit. But Science Foundation Ireland through its Discover programme for outreach through the early 2000s, remained focused on education and promotion.

Reflecting the official discourse on relations between science and economy the Special Eurobarometer on public attitudes to science and technology across Europe found Ireland behind only Croatia and Cyprus in the level of public expectation of science as a means to boost the economy (European Commission, 2014).

Major landmarks in the development of science communication have included the education and outreach programmes attached to the research institutes established since the late 1990s, and the efforts supported by the SFI Discover programme that led to Dublin’s hosting of the European Science Open Forum (ESOF) in 2012. A rather different orientation was set out with the opening of Science Gallery Dublin in 2008, exploring arts-sciences connections and collaborations; the gallery is now a global player with several networked sites around the world and more under development.

Two recent documents from state agencies, Innovation 2020 (Interdepartmental Committee, 2015) and SFI’s Science in Ireland Barometer report (Science Foundation Ireland, 2015), show weak or absent interest in public communication, participation and engagement, though references to ‘public’ in the latter connect with notions of trust, value and democratisation. With the backing of the Irish Research Council and SFI, the Irish Universities Association has launched the Engaged Research programme (Campus Engage, 2017) but this agenda has not yet reached the centre of Irish science policy.

The European Commission influence also contributes to that agenda, through Irish participation in EC-funded Responsible Research and Innovation (RRI) projects where communication and engagement are embedded within R&D. Irish science communication may be further shaped by involvement with RRI- and ‘open science’-focused European initiatives. Britain’s departure from the European Union (‘Brexit’) may strengthen further the influences from the continent over those from the neighbouring island.

Conclusion (BT)

These brief commentaries point to, among other things, the influence of political structures and cultural history on how science and science communication have developed in individual countries. The examples here demonstrate connections between the development of science and that of science communication, but not always in a strict linear relationship.

Authoritarian regimes in Portugal and Chile held back science, notably through cultural isolation; the end of the dictatorship in Portugal opened up space for political and cultural initiatives around science communication that have surpassed what might be expected if science communication activity was strictly tied to the scientific infrastructure. The Portuguese case also demonstrates the ‘power of one’, the disproportionate influence a single individual can have; this is also seen in other countries not covered here and not only smaller countries, e.g. Luis Estrada in Mexico from the 1960s (Nepoto and Reynoso Haynes, 2017).

The Norwegian experience is linked to that of neighbouring countries in terms of shared values, while the Irish experience shows relations with neighbours more as domination and dependence. The flavour of science communication in the Nordic model, outlined here, reflects the political and civic culture of those countries. But, as suggested above, the participatory approaches this culture has fostered may be capable of adoption and adaptation in other contexts, where the history has been very different.

The New Zealand commentary points to a contradiction between rhetorical commitment and practical policies around these dimensions of promotion and participation. Here, as in Chile and Ireland in different ways, the push towards promoting scientific literacy or STEM (science, engineering, technology and mathematics) support is in tension with ideas of cultural participation, including in scientific culture.

It is perhaps through a more refined understanding of scientific culture – notably as something more complex than expressed in survey findings on public perceptions – that we can find ways to connect the historical, political and cultural factors that give shape to science communication in individual countries, whether small, peripheral, large or dominant.

References

Campus Engage (2017) Engaged Research: Society and Higher Education Working Together to Address Grand Societal Challenges. Dublin: Higher Education Authority.

Conicyt (2016) Encuesta Nacional de Perception Social de la Ciencia y la Tecnologia en Chile 2016. Available at http://www.conicyt.cl/wp-content/uploads/2014/07/resumen-ejecutivo-encuesta-nacional-de-percepcion-social_web.pdf.

Davies, S. R., and M. Horst (2016) Science Communication: Culture, Identity and Citizenship. London: Palgrave Macmillan.

Entradas, M. and Bauer, M. (2017) Mobilisation for public engagement: Benchmarking the practices of research institutes. Public Understanding of Science, 26, pp.771-788.

Estrada, L. Y. Á. (2016) Políticas públicas e instrumentos para el desarrollo de la cultura científica en América Latina. Revista Trilogía, 8(15), 12.

European Commission (2014) *Special Eurobarometer 419: Public Perceptions of Science, Research and Innovation*. Brussels: European Commission.

Fleming, J., & Star, J. (2017). The emergence of science communication in Aotearoa New Zealand. JCOM, 16(03), A02-02.

Gago, J. M. (1996). Manifesto para Ciência em Portugal. Lisbon: Gradiva.

Gascoigne, T. and Metcalfe, J. (2017) The emergence of modern science communication in Australia. JCOM 16 (03), A01.

Gonçalves, M. E. & Castro, P. (2002) Science, culture and policy in Portugal: a triangle of changing relationships? Port. J. Soc. Sci. 1, 157-173.

Granado, A. and Malheiros, J. V. (2015) Cultura Científica em Portugal. Lisbon: Fundação Francisco Manuel dos Santos.

Hetland, P. (2014) Models in Science Communication Policy: Formatting Public Engagement and Expertise. Nordic Journal of Science and Technology Studies 2 (2):5-17.

Horst, M. (2012) Deliberation, Dialogue or Dissemination: Changing Objectives in the Communication of Science and Technology in Denmark, in B. Schiele, M. Claessens and S. Shi (eds.) Science Communication in the World: Practices, Theories and Trends, 95-108. Dordrecht: Springer.

House of Lords (2000) Select Committee on Science and Technology: Science and Society – Third Report; http://www.publications.parliament.uk/pa/ld199900/ldselect/ldsctech/38/3802.htm (accessed 17 June 2018).

Interdepartmental Committee on Science, Technology and Innovation (2015) Innovation 2020 - Excellence, Talent, Impact: Ireland's Strategy for Research and Development, Science and Technology. Dublin: Stationery Office.

Kalleberg, R. (2012) Sociologists as Public Intellectuals and Experts. Journal of Applied Social Science, 6 (1):43-52.

Kasperowski, D. and F. Bragesjö (2011) Bilda och samverka - om införandet, implementering och förändringen av universitetens tredje uppgift 1977-1997. Göteborgs Universitet: Institutionen för filosofi, lingvistik och vetenskapsteori.

Marie, L. M., Zaheer-Ud-Din, B. and Sanjay, G. (2012). Drug development and research in New Zealand: policies affecting the industry. Drug Development Research, 73(1), 1-10. doi:10.1002/ddr.20460.

Miller S. et al. (2002) Report from the Expert group Benchmarking the Promotion of RTD culture and Public Understanding of Science. Brussels: European Commission.

Ministry of Business, Innovation and Employment [MBIE] (2014a). National Science Challenges. Wellington, New Zealand Government. http://www.mbie.govt.nz/info-services/science-innovation/funding-info-opportunities/investment-funds/national-science-challenges (accessed 6 June 2018).

Ministry of Business, Innovation and Employment [MBIE] (2014b). A nation of curious minds: a national strategic plan for science in society. Wellington, New Zealand Government. https://www.curiousminds.nz/assets/Uploads/science-in-society-plan-PDF.pdf (accessed 6 June 2018).

Nepote, A. C. and Reynoso-Haynes, E. (2017) Science communication practices at the National Autonomous University of Mexico. JCOM 16 (05), C05.

Pohl, N. and Mendez, M. (2016). Postítulo en Comunicación de la Ciencia de la Universidad de Chile, presentation to RedPop-PCST Symposium on Training of Science Communicators, San José, Costa Rica.

Salmon, R. A., and Priestley, R. K. (2015) A future for public engagement with science in New Zealand. Journal of the Royal Society of New Zealand, 45(2), 101-107. doi: 10.1080/03036758.2015.1023320.

Science Foundation Ireland (2015) Science in Ireland Barometer; https://www.sfi.ie/resources/SFI-Science-in-Ireland-Barometer.pdf (accessed 18 September 2018).

Syvertsen, T., G. Enli, O. J. Mjøs, and H. Moe (2014) The media welfare state: Nordic media in the digital era. Ann Arbor, Michigan: University of Michigan Press.

Tomicic, H. (2000) Divulgación y Valoración de la Ciencia y la Tecnología: Explora, on Programa Fondef-Conicyt. Boletín de la Sociedad Chilena de Química, 45(1), 1-3..

Torrealba, C. (2018) Closing speech to the First Milenio Meeting, Universidad de Chile, 17 August 2018.

Trench, B., Bucchi, M. et al (2014) The global spread of science communication, in M. Bucchi and B. Trench (eds.) Routledge Handbook of Public Communication of Science and Technology (2nd edition), 214-230. London: Routledge

Troncoso, M.E (2010). Discurso para los 25 años del Museo de Ciencia y Tecnología Mucytec. Available at http://www.corpdicyt.cl/corpdicyt/wp-content/uploads/2013/06/Discurso-25-a%C3%B1os-MUCYTEC.pdf.

Watanabe, M. (2017). From top-down to bottom-up: a short history of science communication policy in Japan. JCOM 16 (03), Y01.