SISSA – International School for Advanced Studies
ISSN 1824 – 2049

Comment

SOCIALLY INCLUSIVE SCIENCE COMMUNICATION

Reframing social exclusion from science communication: moving away from 'barriers' towards a more complex perspective

Emily Dawson

ABSTRACT: *Science communication is an increasingly important field of activity, research and policy. It should not be assumed however, that science communication practices provide equitable and empowering opportunities for everyone. Social exclusion, inclusion and equity are key challenges for practitioners, researchers, policy makers and funders involved with science communication. In this commentary I reflect on the limitations of the 'barriers approach to understanding social inclusion and exclusion from science communication and argue instead that a more complex perspective is needed. I conclude that placing equity at the heart of science communication is crucial for developing more inclusive science communication practices.*

Science communication plays an increasingly important role in cultural engagement, political practices and life-long science learning. It should not be assumed however, that science communication practices provide equitable and empowering opportunities for everyone. At present in the U.K. there is renewed debate over the social value of science communication in terms of social inclusion, equity and the notion of science 'for all', with two new reports on the horizon commissioned by the Wellcome Trust and British Science Association respectively [1, 18]. In what follows I briefly outline tensions in how social exclusion and inclusion are currently framed through a critique of the 'barriers' approach, arguing instead for a more complex model of social exclusion and inclusion.

Social exclusion from science communication has tended to be described in terms of 'barriers' [3, 10]. Barriers, such as cost or geographic distance, have been positioned as key factors that prevent certain people or groups from being involved in science communication activities. A lack of interest is another barrier thought to explain why some people or groups do not participate in the opportunities offered by science communication [6, 10, 20]. This perspective suggests people's motivation to take part in science communication activities hinges upon their interest (or the absence of it) in science in general,

or specific topics, such as synthetic biology, dinosaurs or space. Research suggests the notion of interest is important in why people get involved with socio-scientific activism [17] or pursue certain hobbies and studies [8]. Certainly, from this perspective disinterest in a science communication activity could be seen as motivation for not participating.

Such barriers to participation in science communication do seem to make sense; people living a long way away from a science centre will struggle to visit it regularly, and those not interested in nanotechnology are unlikely to join a café scientifique meeting on the subject. A barriers approach provides a useful way to begin to describe what social exclusion from science communication might look like. I suggest however, that it does little to explain why and how social exclusion arises and, as a result, offers little to those attempting to understand and develop socially inclusive science communication practices.

Evidence suggests, for example, that single barriers, such as ticket prices, may have less effect than has been assumed. For example, the entrance fees of a number of British museums were withdrawn when they were 'nationalised' by the Labour government of the 1990s. The number of people visiting these institutions, which included large science museums, increased significantly. Examining who these visiting hoards were however, suggests that getting rid of upfront entrance costs did little to change the visitor profile; more of the same kinds of people (white, middle-class, urban families) visited science museums and repeated their visits more often [9]. While finances doubtless affect whether people participate in science communication, this example suggests it may not be as simple as only addressing entrance fees. Framing social exclusion as the result of barriers suggests that their removal might result in social inclusion. I suggest however, that this underestimates the complexity of the situation.

Other attempts at inclusive science communication practice based on identifying barriers and attempting to address them have been found to be problematic. For example, programmes that deliver science communication activities via one-off outreach projects targeted at new audiences have been criticised for implicitly, or sometimes explicitly, assuming that sufficient exposure to science communication is all that is required to overcome barriers and change patterns of participation [2, 7]. While those involved in such projects are doubtless trying hard to navigate difficult waters and their efforts are to be appreciated, I suggest examining the tensions involved in such practices is also important.

Some targeted outreach projects have been criticised as 'assimilationist' for privileging scientific, Western knowledge and practices above others [7, 12, 13]. As Yosso [21] and Levitas [14] have argued, assimilationist approaches to social inclusion position people and groups who do not participate in dominant cultural practices as deficient, as without culture and without knowledge. Furthermore, one-off projects have been critiqued as tokenistic because of their short-term nature and as creating problematic distinctions between practices and audiences that are considered core or peripheral [16].

A double-deficit can be found therefore within a barriers approach to social inclusion in science communication. The first deficit concerns a lack of understanding and appreciation for science, conceived of as an 'interest' barrier. The well-rehearsed criticisms of

the deficit model from scholars of public understanding of science can be levelled at this perceived deficit; that to know science is not always to learn to love it [11, 19].

In other words, there may be a more complicated relationship between interest or disinterest in science (or specific topics) and participation in science communication activities.

A second participatory or behavioural deficit can also be identified: not participating in science communication activities that are thought to be culturally, educationally and politically valuable is perceived as a passive rather than an active choice, thus the removal of barriers will suffice to change behaviours. In writing about social inclusion, Levitas argued that inclusion is framed problematically in dominant cultural practices creating a divide "between those defined, by whatever criteria, as outsiders, and the included majority. The 'problem' then is how to help, cajole, or coerce the outsiders over some perceived hurdle into the mainstream" [15, p. 47]. Such an approach to inclusion overlooks whether or not people may have their reasons to opt-out of mainstream cultural practices, including, for example, science communication.

The underlying tension involved in trying to develop inclusive science communication practices based on a barriers perspective is that the problems of non-participation and exclusion are underestimated. Research suggests social exclusion from science communication is a resilient phenomenon, embedded in science communication practices, the attitudes and experiences of excluded groups and the broader field of power [4]. A barriers approach does little to explain the complexity involved in social exclusion from science communication, not least how multiple barriers might intersect and by foregrounding a focus on barriers, questions of power, dominance and domination recede into the background.

Instead, as Bell et al. [2], Yosso [21] and Levitas [14] suggest, a barriers approach may perpetuate social exclusion. By locating the cause of exclusion with structural issues science communication institutions and practitioners can do little about, such as location or poverty, or with participants' attitudes and behaviours, questions about whether science communication practices are themselves problematic can be deftly side-stepped.

The challenge then, for researchers, practitioners, funders and policy makers lies in how to understand and address the complex, multiple and embedded issues involved in social exclusion from science communication. Of course, as a researcher I am convinced that more research is urgently needed, but there are many avenues to explore. For example, despite the critique outlined above of one-off 'inclusion' projects, such projects represent a valuable space for experimenting with science communication activities that open science up for more people (see for example the Enterprising Science project, [5]). Furthermore, how do we move from one-off projects to the kind of field-wide shifts in science communication practice that would render such projects irrelevant? Developing inclusive science communication practices may require critically assessing current practices, perspectives and motivations in combination with a concerted call to action that places equity at the heart of science communication, rather than on the periphery.

References

[1] R. Atkinson, K. Siddall and C. Mason (2014), *Experiments in Engagement: Engaging with young people from disadvantaged backgrounds*, Wellcome Trust, London, U.K. .

[2] P. Bell, B. Lewenstein, A.W. Shouse and M.A. Feder (2009), *Learning science in informal environments: People, places, and pursuits*, The National Academies Press, Washington D.C., U.S.A. .

[3] A. Charlton, M. Potter, S. McGinigal, E. Romanou, Z. Slade and B. Hewitson (2010), *Barriers to participation: Analysis to inform the development of the 2010/11 Taking Part Survey*, London, U.K. .

[4] E. Dawson (2012), *Non-participation in public engagement with science: A study of four socio-economically disadvantaged, minority ethnic groups*, King's College London, London, U.K. .

[5] E. Dawson (2013), "Developing inclusive informal science education practice: Useful concepts from research", *Enterprising Science Research Briefs Series*, King's College London, London, U.K. .

[6] J. Falk, M. Storksdieck and L. Dierking (2007), "Investigating public science interest and understanding: Evidence for the importance of free-choice learning", *Pub. Underst. Sci.* **16**(4): 455–469.

[7] M. Fenichel and H.A. Schweingruber (2010), *Surrounded by science: Learning science in informal environments*, The National Academies Press, Washington D.C., U.S.A. .

[8] S. Hidi and K.A. Renninger (2006), "The four-phase model of interest development", *Educ. Psychol.* **41**(2): 111–127.

[9] Ipsos MORI (2003), *The impact of free entry to museums*, London, U.K. .

[10] Ipsos MORI (2011), *Public attitudes to science 2011*, Department for Business Innovation and Skills, London, U.K. .

[11] A. Irwin and B. Wynne (1996), "Introduction", in A. Irwin and B. Wynne eds., *Misunderstanding science? The public reconstruction of science and technology*, Cambridge University Press, Cambridge, U.K., pp. 1–18.

[12] O. Lee (1999), "Equity Implications Based on the Conceptions of Science Achievement in Major Reform Documents", *Rev. Educ. Res.* **69**(1): 83–115.

[13] O. Lee and C.A. Buxton (2010), *Diversity and equity in science education: Research, policy, and practice*, Teachers College Press, New York, U.S.A. .

[14] R. Levitas (1998), *The inclusive society?*, Palgrave, Basingstoke and New York.

[15] R. Levitas (2004), "Let's hear it for Humpty: social exclusion, the third way and cultural capital", *Cultural Trends* **13**(2): 41–56.

[16] B. Lynch (2011), *Whose cake is it anyway? A collaborative investigation into engagement and participation in 12 museums and galleries in the U.K.*, Paul Hamlyn Foundation, London, U.K. .

[17] N. Marres (2007), "The issues deserve more credit", *Soci. Stud. Sci.* **37**(5): 759–780.

[18] S. Romain and A. Edbury (2014), *National Science and Engineering Week: Targetting under-represented groups*, British Science Association, London, U.K. .

[19] J. Turney (1998), *To know science is to love it? Observations from public understanding of science research*, COPUS, London, U.K. .

[20] A. Uitto, K. Juuti, J. Lavonen and V. Meisalo (2006), "Students' interest in biology and their out-of-school experiences", *J. Biol. Educ.* **40**(3): 124–129.

[21] T.J. Yosso (2005), "Whose culture has capital? A critical race theory discussion of community cultural wealth", *Race Ethnicity and Education* **8**(1): 69–91.

Author

Emily Dawson is Lecturer on the Science Engagement and Communication at King's College, London. Her research and teaching focuses on how people engage with and learn about science, with an emphasis on equity, in particular the construction of publics and 'non publics' for science. Over the past 8 years she has worked on public engagement with science in a variety of settings including science centres, museums, scientific societies, science documentary film makers and government, where possible, with a focus on social inclusion. E-mail: emily.dawson@kcl.ac.uk.

HOW TO CITE: E. Dawson, *Reframing social exclusion from science communication: moving away from 'barriers' towards a more complex perspective*, *JCOM* **13**(02)(2014)C02.