JCOM

Science centres and science engagement activities as *research facilities*: blurring the frontiers between knowledge production and knowledge sharing

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Abstract

The future challenges within science communication lie in a 'grey area' where the frontiers between production and sharing of knowledge are blurred. An area in which we can satisfy at the same time and within the same activity the autonomous interests of researchers and those of other stakeholders, including lay publics. Settings are emerging, where we can provide real contribution to scientific research and at the same time facilitate the publics in their process of hacking scientific knowledge to serve autonomously defined and often unpredictable functions. Some are linked to research institutes, others to science centres, others are precisely inbetween. This editorial explores why these special places are needed, and present some case studies, leading to the need of interpreting science culture centres as research facilities.

Keywords

Citizen science; Participation and science governance; Science centres and museums

The future challenges within science communication lie in a 'grey area' where the frontiers between production and sharing of knowledge are blurred. An area in which we can satisfy at the same time and within the same activity the autonomous interests of researchers and those of other stakeholders, including lay publics. This requires renewed forms of collaboration between researchers (institutional or not) and other professionals and social actors. And it gives a renewed, special role to universities, research institutions, innovation hubs, knowledge oriented CSOs, etc. If we want to take the knowledge society seriously, science communication venues and science engagement activities should look less and less like today's museums, science centres or festivals, and become more and more similar to *research facilities*. In order to explore specific areas of the natural world (the extremely small, the extremely far away, etc.) we built specific research facilities: particle accelerators, telescopes, etc. In order to explore scientific research in its wider social context, we also need specific research facilities: science-culture venues which allow us to generate a better understanding of society as seen from science, of science as seen from society, of art as seen from science, of science as seen from culture, of culture as seen form innovation, and we could continue endlessly with such binomes. . . . In brief, we need *research facilities* where scientists and other key actors from the knowledge society (among them the so called 'general public') explore together

those aspects of scientific research that can truly benefit from social, artistic, cultural, political 'perturbations'. Including (but not exclusively!) the social impact of research itself.

One of the main, wonderful features of the scientific method is the fact that sharing of knowledge and knowledge production are deeply entangled. Public science communication activities often seem to neglect the opportunity of mimicking this aspect. A scientific conference is at the same time a moment of knowledge sharing and knowledge production for all the parties involved. A science engagement event is on the contrary in most cases characterized by a clear distinction between the different roles. In most cases, we witness a situation in which scientists are invited essentially for what they know, and the public is invited essentially for what it does not know. This is intrinsically contradictory, if we look at the very nature of science (interested mainly about the unknown) and of democratic citizenship. In the 'grey area', scientists are invited not only for what they know, but also for what they don't know, thus as researchers and not only as experts; and various publics are invited also for what they know and they wish to offer to the knowledge society, thus as citizens, and not only as spectators. The issue here is not whether we build a one-way, two-way, or multi-way communication.[1] Neither is it to ensure that a (often ill-defined) "dialogue" occurs. Instead, the issue concerns the very reasons why scientists and the public participate in common events: why are they there, and what will they do with the outcome of the encounter. Too often, we do not offer a setting in which scientists are able to find a real professional interest (that is, useful for scientific research). Neither do we create settings in which we facilitate the publics in their process of hacking scientific knowledge to serve autonomously defined and often unpredictable functions.[2]

These settings are indeed emerging, and an awareness of their implications is growing both in the research community and among science communication practitioners. Here are some examples. JCOM has extensively explored the emerging role of citizen science and its complex landscape.[3] Research institutions, in particular in the health and environment fields, are developing units and specific facilities in order to facilitate citizen science initiatives, and science shops[4] have anticipated this trend. Will these facilities merge with the traditional cultural or informal education facilities? What would be the benefits of explicitly merging these functions? The approach of science centres as 'ideas colliders' pioneered by the Science Gallery[5] at Trinity College, Dublin, has strongly influenced the science

[1] In the past, the literature in science communication or science in society tended to frame this issue in terms of the 'deficit model'. I am very sceptical about the usefulness of such a concept today. The main reason for scepticism is the intrinsically derogatory nature of the term: if one would like to defend the deficit model, she would never use the term 'deficit'. The use of such self-fulfilling terminology is mainly a way to satisfy academic or professional needs for defining a standpoint or a territory, while preventing deeper understanding of the real issues. In fact, in many science communication practices, what our community define as 'deficit model' describes in fact a very clear and non-ambiguous contract fully understood, chosen and assumed by all the parties involved, and in particular by the public.

[2] Castelfranchi, Y. (2016). "Política hacker": o desafio da cidadania tecnocientífica na democracia contemporânea. In: Democracia digital Publicidade, instituições e confronto político. Ed. by R. F. Medonça, M. A Pereira and F. Filgueiras. Belo Horizonte, Brazil: Ed. UFMG, pp. 311–366.

[3] JCOM, Issue 01, 2016 — Special Issue: Citizen Science, Part I (jcom.sissa.it/archive/15/01); Issue 03, 2016 — Special Issue: Citizen Science, Part II, (jcom.sissa.it/archive/15/03).

[4] www.livingknowledge.org.

[5] dublin.sciencegallery.com.

communication community, and Science Galleries do indeed represent a good example of 'grey area' approach, in particular through the 'lab in the gallery' initiative, in which a research need (such as gathering data for a cognitive science experiment) is the key driver of a scientific exhibition. The "living lab" approach is a fast growing trend in public science communication activities. Originally developed in the industrial sector, this approach is gaining momentum within the science culture communities, also thanks to the contributions of maker spaces and Tinkering Studio approaches.[6] Within cultural venues, Living labs redefine the respective roles of experts and publics, creating spaces in which all parties are able to autonomously define the relevance of their experience. The French network Inmediats[7] explored the challenges and opportunities of such an approach in science communication, in particular through the example of 'Le Dome',[8] a living lab oriented centre in Caen. Similar experimentations are taking place in several, very different settings, as for example the newly founded '10lab', located within a technology park (Sardegna Ricerche), in Sardinia, Italy, or the hackaton approach, experimented in science culture contexts in particular in the US. Finally, we should not neglect the many experiences of science centres all over the world that were able to include local, indigenous, or sectorial knowledge in their activities, such as the project for a social and environmental reconstruction of Morro de Moravia in Medellin involving the Parque Explora Science centre, reported not long ago in a JCOM commentary on socially inclusive science communication.[9]

At Traces — Espace des Sciences Pierre-Gilles de Gennes[10] in Paris we are trying to combine these aspects, taking advantage of the close proximity with scientific research in its making (the Espace is the science culture venue of ESPCI Paris and PSL Research University), and linking this with exhibition co-production processes through a living-lab inspired approach. The forum-exhibition "Science frugale"[11], for example, included a phase of incubation in which public events, workshops, debates, co-creation activities, etc. contributed to the actual curation and practical fabrication of the exhibition (all the objects exposed were built by the visitors in open workshops), favouring interactions among researchers, designers, makers, NGO's workers, and helping researchers to gain an understanding of the richness and usefulness of the 'frugal science' concept. The 'Grande Experience Participative'[12] (a call for proposal for the best scientific experiment able to exploit the participation of several thousands visitors of the Researchers Night in France) is an example of blurring the frontiers between a research activity and a communication activity (interestingly enough, the latter funding the former).

These are just a few European examples of a trend which is obviously of global nature and which is strongly diverse in its very own nature (indeed, natural laws are universal, but the processes of knowledge production are localized in time, space and culture, and should be reflected as such in science culture venues). It is

[6] tinkering.exploratorium.edu.

[7] inmediats.fr.

[8] ledome.info.

[9] Aguirre, C. (2014), 'Science Centers. Which role can they play to participate in a city social reconstruction?", *JCOM* 13(02), C04. URL: https://jcom.sissa.it/archive/13/02/JCOM_1302_2014_C01/JCOM_1302_2014_C04.

[10] www.espgg.org.

[11] www.science-frugale.fr. The project was awarded the 2017 Mariano Gago "smart and simple" award, delivered by the ECSITE network.

[12] nuitdeschercheurs-france.eu/GrandeExperience.

the role of a journal like JCOM to observe such trends and capture their impact, to help understanding and interpreting these phenomena, identifying what is just a fashion effect, and what is producing durable changes: we therefore welcome submission of papers helping to explore what is happening in this fascinating "grey area". Keeping in mind a fundamental aspect: that every innovation in the way science is put into dialogue with the rest of society should help move toward increased opportunities for everyone — regardless of educational background, socio-economic status or geographical origins — to participate, if they want, to the shaping of the knowledge society.

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