

Centre for Science and Policy

Virtual Workshop

Innovations in Citizen Science for Public Policy

A summary of the discussions held on 24-25 March 2020

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Purpose and Summary

The last decade has seen a dramatic surge in the number and variety of citizen science experiments. At the same time, policy making urgently needs to find new ways to engage citizens as both knowledge stakeholders and knowledge generators. The Centre for Science and Policy is interested in encouraging policy makers to rethink citizens' participation in the scientific and political processes. In partnership with Professor Johannes Vogel (Museum für Naturkunde, Berlin) and Professor Jennifer Gabrys (Chair in Media, Culture and Environment, University of Cambridge), CSaP plans to explore the opportunities and barriers for policy makers to make use of recent experiments that engage citizens as active agents in the production and use of knowledge.

To underpin CSaP's efforts to rethink approaches to public policy in these turbulent times, we convened leading policy makers, practitioners, scientists and scholars to hear about examples of citizen participation across various policy domains, learn from each other and chart the way forward for citizens to contribute more effectively to policy making.

Virtual Sessions

What are citizen sciences?

- Alan Irwin opened the session by providing three framing comments on future directions for citizen science
 - In praise of plurality
 - Wouldn't want the OED definition to crowd out other ways of thinking about citizen science (e.g. co-production, citizen-defined meanings)
 - Balancing critique and potentiality:
 - Easy to see as extremely limited or extremely broad but best to get off that 'see-saw'
 - Kimura and Kinchy (2016) outline the seven virtues of citizen science which promotes an open-minded approach about both the limitations and potential (i.e. brings together increasing the amount of scientific data with building social capital and community leadership, and expanding scientific literacy with catching polluters and bringing them to justice)
 - Acknowledging and hopefully addressing challenges
 - Citizen sciences could be understood as a way of acknowledging challenges
 - Role of science: relationship to scientific institutions (in collaboration or provocation?)
 - Quality: how to determine what is good quality citizen science work?
 - Ethics and accountability: how do we apply these questions commonly asked of scientific knowledge and expertise to citizen science?
- Muki Haklay explained a study he recently conducted to demonstrate the need for broadly defined citizen science but also the need to define in some way due to funders, policy makers and other institutions
 - Proliferation of typologies of citizen science reveal intentions of author more than anything else (e.g. Arnstein's ladder of participation holds a strong value judgment toward higher participation)

- History of definition: difference between NIH (came from institute with environmental justice mission) and OED
- Have a definition without a definition: accommodate a wide range of definitions to define an outline of the field
 - Identify factors that influence people's view about an activity (e.g. which area of research, who is leading, impact of payment) through survey responses
 - Most vignettes had responses across the spectrum from 'this is definitely citizen science' to 'I'm not sure if it's citizen science or not' to 'this is definitely not citizen science'
 - The study culminated in a set of characteristics which can be found [here](#), including statements calling for plurality
- Jennifer Gabrys closed with her perspective on the potential for the proliferation of citizen sciences to expand possibilities for collective inquiry and action
 - "How is theory as it applied to practice different than practice-based theorizations?"
 - ERC 'Citizen Sensing' project
 - What is a citizen? Who is a citizen?
 - Someone expressing political agency by undertaking environmental observations
 - 'Performative citizen'
 - Articulating rights to the city, to participate, to clean air, even to breathe
 - Definition of citizen and citizen science assembles through different kinds of inquiry and political claims
 - How are these forms of inquiry different than a scientist might conduct in a lab or field, and what might these mean for the characteristics of data collected by citizens?
 - Raises questions about how evidence assembles, how data could have different characteristics if citizens gather observations in their everyday environments (i.e. pollution they can see or smell)
 - Example of citizen science 'in the making', dynamic and experimental with the potential to provoke or challenge science as usual
 - One of many types of citizen science and it alone is not a singular category; it is a way of multiplying the political subjects and modes of inquiry that might be undertaken
 - By working through practice-based theorizations it's possible to identify sites for intervention (i.e. opportunities to do science differently, to engage different actors, to tackle problems in ways that might allow for more interesting and even more democratic solutions to problems like air pollution)

Lightning Talks

- Sarah Darwin opened with a discussion of her work with Forschungsfall Nachtigall, a project based at Museum für Naturkunde in Berlin which has engaged citizens in recording and collecting stories about nightingale songs
 - Scientific goal: to find out whether nightingales have regional dialects

- Citizen scientists recorded over 7000 nightingale songs using an app created for the project 'Naturblick'
 - Each recording was manually checked and those that were real nightingales put onto an interactive map
 - PhD student is creating a song catalogue of over 2000 different nightingale song types
- Ways in which the project met cultural and community building goals:
 - Hosted cultural events combining music, science, poetry and visual arts
 - Given the significance of the nightingale in Syria and Iran, refugees from this region engaged with the project and reported feeling a new sense of place and belonging
 - Collected 300 stories about nightingales
- Project has shed light on how the general public can know nature in different, and equally important, ways than scientists
- Michiel van Oudheusden discussed two examples of grassroots citizen science, their potential to tackle environmental threats and the responsiveness of formal institutions to citizen-driven movements
 - As opposed to professional scientists involving citizens in their work, grassroots citizen science is self-organising and operates outside of formal processes and institutions
 - Safecast (Japan) developed their own devices after the Fukushima disaster and sought to empower citizens to use these tools to better understand radiation spreading in the environment and created data maps, accessible online, which are aimed at helping people determine where to move and where to avoid
 - Safecast used 'citizen science' but most, if not all, local citizen groups in Japan did not use the term because it is very much contested in Japan
 - Japanese government did not know how to mobilize monitoring systems properly and later acknowledged the Safecast played an important role in filling that information vacuum
 - International Atomic Energy Agency (IAEA) Report from 2014 stated: "empowerment of the public is not necessarily a negative development"
 - Curious Noses (Belgium) has mobilized 20,000 citizens in northern Belgium to measure nitrogen dioxide
 - The movement was initiated by activists but eventually dissociated themselves from regular activists and called themselves citizen scientists
 - Both examples show how formal institutions and grassroots movement can and may need to find middle ground but also how grassroots citizen science can work strategically to gain credibility
- Jess Montgomery then surveyed her work with public dialogues and other engagement on artificial intelligence and machine learning at the Royal Society.
 - The Society's machine learning set out to investigate how the UK can maintain a leading role in developing machine learning and AI technologies; public dialogue was a central component of these efforts, and in considering how these technologies could be safely and rapidly deployed

- A series of dialogue sessions convened with Ipsos MORI explored case studies from across a range of domains, from targeted advertising to healthcare, to predictive policing
 - Core to these discussions were questions about who benefits from the use of machine learning and AI, who is developing the technology and for what purpose, and who bears the most risk
 - A key finding of this study was that attitudes to machine learning—and the ways that individuals evaluate its risks and benefits—are highly context-dependent
- A later collaboration with the Cambridge Leverhulme Centre for the Future of Intelligence explored the narratives that shape how different public talk about AI, and the implications of this for public dialogue and technology development; this noted the need for a wider range of narratives to reflect different experiences of technology and different pathways for technology development
- Since these studies, the public conversation about AI has continued to grow, and a key question today is how to build on the dialogue exercises that have been carried out so far:
 - Dialogue exercises on a range of technologies—including genetic technologies and nanotechnologies—show that attitudes towards emerging technologies are highly context-dependent
 - How can these insights be embedded in the design of future dialogues?
 - It is important that a range of voices are heard in these dialogues
 - How can these conversations be made more inclusive?
 - Many of the public dialogues to date—even when carried out over an extended period—relate to discrete projects
 - How can the research and policy communities contribute to a sustained infrastructure that brings citizen engagement and public dialogue closer to policymaking?
- The public are already talking about fairness, accountability and power arising from technology change—all of which are relevant to the development of AI and the design of data governance
- New platforms or ways of tapping into these conversations may be needed to ensure a continued dialogue with policy makers about the future of these technologies
- Philipp Verpoort furthered the discussion about different forms of citizen engagement by reflecting on citizens assemblies and their uptake by policy makers and politicians
 - Citizen assembly with Greater Cambridge Partnership (Sept-Oct 2019) brought together 60 randomly selected people for two weekends to discuss reducing congestion, improve air quality and provide better transport in Cambridge
 - Selection process aimed at ensuring a diverse and representative sample, from ethnic minority groups to people who did and did not vote in the last election
 - Listened to urban planning, transport, public health and climate change experts

- Then came up with their own ideas about how to take transport policies forward in Cambridge, grappling with difficult trade-offs between economic feasibility, potential for behaviour change and climate-related priorities
 - French climate convention is an interesting case study because Macron committed himself to enacting any recommendation that comes out of it without any filters
 - Tool to find out what citizens think and feel about policies and has the potential to create trust and legitimacy for different policy options
- Maïke Weißpflug shared her thoughts on the value of non-expert knowledge by drawing on an example from political philosophy
 - Some thinkers in social philosophy abandoned their own predecessors' approaches and criticized the separation of non-expert and expert knowledge, such as the French philosopher Jacques Rancière turning against the teachings of Louis Althusser
 - Rancière was uneasy about the critical intellectuals' claim to speak on behalf of the workers and the oppressed and regarded it as paternalistic
 - Rancière expressed his new ideas in *The Ignorant Schoolmaster* (1987)
 - Based on a radical notion 'the equality of intelligences' which abolishes the distinction between the 'knowing' and the 'ignorant'
 - Developed new critical approach called 'universal teaching' which claimed that anyone is able to learn any subject independently and without the explanation of a teacher
 - Teacher is still important for supervision and to provide students with a framework to empower them to teach themselves
 - Applied to politics, Rancière claims that intellectuals should no longer explain the world to workers and the oppressed but rather enable them to become capable of action on their own
 - Rancière later conducted a study collecting stories of 19th century workers who became intellectually active in *Proletarian Nights* (1989)
 - Claims that workers do not only enter the world of science but also create their own language equal to that of their times
 - Jason Chilvers concluded the session by sharing how some of his recent work on 'remaking participation' and a more constructivist perspective might contribute to the citizen sciences
 - Dominant approach to participation: pre-given, specific, ready-made, defined by method, happening in discrete cases/events/projects, with narrow metrics of success and the burden is generally placed on the public
 - Constructivist approach: emergent, experimental, co-produced, happening in diverse and interrelated systems, the effects (good and bad) cannot be predicted and institutions are challenged to respond to the multiple forms of public relevance
 - Disaster risk reduction (DRR) project (led by Jenni Barclay, UEA) aims to map citizen science globally around DRR
 - Broad definition of citizen science as 'new knowledge' opens up scope to not only include science-led projects but also other forms of public knowing, such as oral histories, experience of local community, local narratives, vernacular knowledges and storytelling
 - Running observatory over next five years for societal engagement with energy and net zero transitions, co-produced with industry, policy makers and civil society organisations

- Part 1: Mapping and monitoring engagement using digital methods, case study approaches and crowdsourcing
- Part 2: Networking and bringing stakeholders together
- Part 3: Translating these plural forms of evidence for responsible innovation and just transitions by taking them to policy makers in BEIS, into innovation processes around smart technologies and also to thinking about and trying to shape new forms of democracy and engagement in relation to, for instance, citizens assemblies
- Potentially a new institutional architecture for participation and citizen science

Next Steps

- How can we bridge methods that policy makers are more and less familiar with (i.e. citizens assemblies have now gained traction while other citizen sciences have had less success)? How can we help policy makers make sense of the terrain?
- Currently, citizen science as grassroots involvement (e.g. looking at beetles in your backyard) does not connect to citizens assemblies and other initiatives that involve decision making
- As a collective, we do not want to get stuck in the trap of writing essays addressing the question of ‘what really is citizen science?’
- We could use webinars, podcasts and other online tools to raise awareness, generate discussion and find others interested in these topics
- It would be important to involve citizens and more policy makers in future conversations about the citizen sciences
- Rather than focusing on what citizen sciences are, could we use the different formats of engagement discussed during these virtual sessions (i.e. citizen monitoring, citizens assemblies, surveys, public dialogues and more) as an organising strand for future work?
- Does using the term ‘citizen science’ complicate conversations with policy makers? Could it be framed rather as a question of attending to or accounting for public knowledge?
- CSaP could play an important role by drawing on institutional relationships to promote their responsiveness to different forms of citizen science as well as demonstrating the plurality of participation to the scientific community
- CSaP could also potentially do some foresight by addressing questions such as what kinds of citizenships are going to come forward or be foreclosed as a result of the directions we choose?
- A compilation of citizen science stories, including what they did and what impact it had, could be a useful contribution from CSaP
- The British Academy is thinking about how to facilitate engagement that includes citizens from the outset and does not limit their role to data collectors or similar; a project on the future of democracy is in its early stages of incorporating citizen scientists into the programme of work
- The current pandemic also makes questions about citizen science and policy especially topical, as policy makers will be looking for new ways of solving the pressing problems of our time

- In some contexts, such as Argentina, policy makers' interest in the citizen sciences stems from their desire to better manage differing public opinions and understand what citizens need, rather than an innate interest in the knowledge itself
- Another provocation to consider is how to bring citizens' voices into business as usual in the policy world when questions about accuracy, trust and power struggles frequently make policy makers hesitant to engage within citizen scientists
- How might we recognise participation that is already occurring while also creating spaces where provocations can potentially be generative and constructive of different kinds of public dialogue?

Attendees

- **Matias Acosta**, Head of Exploration, UNDP
- **Hannah Baker**, Research Associate, Cambridge Centre for Research in the Arts, Social Sciences and Humanities
- **Jo Bradley**, Policy, British Academy
- **Katie Cohen**, Research Assistant, Centre for Science and Policy
- **Jason Chilvers**, Professor of Environment & Society, University of East Anglia
- **Sarah Darwin**, Museum für Naturkunde
- **James Dolan**, Junior Research Fellow in Science Communication, King's College Cambridge
- **Rob Doubleday**, Executive Director, Centre for Science and Policy
- **Jennifer Gabrys**, Professor of Media, Culture and Environment, Cambridge Department of Sociology
- **Muki Haklay**, Professor of GIScience, Extreme Citizen Science (ExCiteS) research group), UCL
- **Gary Hickey**, Senior Public Involvement Manager, NIHR Involve
- **Alan Irwin**, Professor, Department of Organization, Copenhagen Business School
- **Edward Leigh**, Smarter Cambridge Transport
- **Chris Lintott**, Principal Investigator, Zooniverse and Professor of Astrophysics/Citizen Science Lead, University of Oxford
- **Kate McNeil**, Communications Coordinator, Centre for Science and Policy
- **Jess Montgomery**, Senior Policy Adviser, Royal Society
- **Fabien Moustard**, Extreme Citizen Science (ExCiteS) PhD Student, UCL
- **Harry Pearse**, Research Associate, Cambridge Centre for the Future of Democracy
- **Michiel Van Oudheusden**, Marie Skłodowska-Curie Research Fellow, Cambridge Department of Sociology
- **Steve Scott**, Public Engagement Lead, UKRI
- **Philipp Verpoort**, Co-director, Sortition Foundation

- **Maïke Weißpflug**, Museum für Naturkunde
- **Yaqian Wu**, Extreme Citizen Science (ExCiteS) PhD Student, UCL