

Sharing 'Open Science' Experiences: A Conversation on Citizen Science

Michiel Van Oudheusden; Huib Huyse; Jef Van Laer; Annelies Duerinckx; Violet Soen

What is good citizen science, for whom, and why? This question was the focus of a panel debate on citizen science at the Open Science Day organized by KU Leuven. Four panellists – Jef Van Laer (Scivil), Annelies Duerinckx (Scivil), Huib Huyse (KU Leuven), and Michiel Van Oudheusden (University of Cambridge, KU Leuven) – shared their responses to this question, drawing on their roles and experiences as initiators, facilitators, evaluators, and researchers of citizen science projects and processes.

Citizen science – broadly understood as the involvement of nonexperts in scientific research or data collection – currently attracts considerable public funding in Flanders (Belgium) and other European knowledge-driven economies. At some universities, such as KU Leuven, citizen science is increasingly accepted and practiced across scientific disciplines. Many scientists see it as an opportunity to collect large datasets and have citizens assist them with observations and classifications.

Citizen science can also be enabling of a more open and transparent research culture that gives citizens a greater role in science and technology innovation. These aspirations are central to the EU's science policy of responsible research and innovation (RRI) and help to explain why Flemish policymakers are keen to promote citizen science and open science policies in their region.

As aptly pointed out by moderator Violet Soen (KU Leuven), citizen science did not have an easy gestation in Flanders. In 2016, Soen and other members of the Young Academy of Flanders published a [position paper on citizen science](#) with the aim of raising awareness about citizen science among researchers, policymakers, and wider publics. The publication caught the eye of its intended audiences, but citizen science had yet to take root in Flemish policy and research circles.

Institutionalization kicked in with the establishment in 2019 of [Scivil](#), Flanders' first citizen science knowledge centre – represented by two panellists at the table. Soen also referred to the pioneering work of Huib Huyse, who in 2016 co-initiated an air pollution measurement campaign in Antwerp involving 2,000 citizen scientists. CuriousNoses, as this grassroots campaign was called, later morphed into a large-scale citizen science project on air quality covering the whole of Flanders. [The project](#) had a massive social impact, spurring citizen engagement in the collection and distribution of research data.

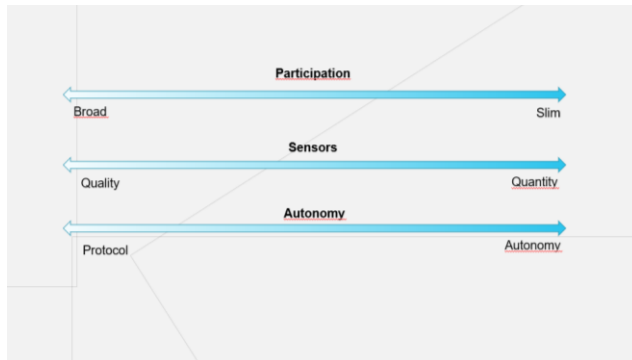
With these illustrations and considerations in mind, panellists broached the question *What is good citizen science?* from their perspectives and experiences.

Scivil members Jef Van Laer and Annelies Duerinckx pointed out how organizing, supporting, and evaluating citizen science projects inevitably gives rise to thorny questions, such as: *What is citizen science?* They stressed that it is important to flesh out such questions with stakeholders (funders, advisers, scientists) before committing to a course of action. While it is difficult to reconcile the vast range of views on the subject, questions and challenges draw attention to the values and theories that inform policies and can thus lead to developmental insight. Van Laer touched on one such theory when referring to the well-established [citizen science pyramid](#), which depicts different levels of civic involvement in science, from contributory (minimal citizen involvement) to co-creation (citizens co-define the research aims and approach); and which can be used to evaluate citizen science projects and proposals.

Both Van Laer and Duerinckx stressed that the pyramid provides a useful model to describe the work of citizen scientists, but that they are reluctant to use it as an evaluative tool. In Duerinckx's words:

“Our view is that citizen science comes in shapes and sizes, and we want to stress that they all have their own value and purpose. We want to stimulate this variety in approaches and feel that a too strict set of rules for citizen science could hamper that.” In this view of citizen science comprising [many modes](#), a co-creative approach to citizen science is as valid as crowdsourcing if the approach fits the goals and setup of the project. Consequently, Scivil uses scales of participation alongside more conventional typologies (see: Image 1).

Image 1. Scales of participation.



These views resonated with Huib Huyse's, who professed uneasiness with the citizen science pyramid and related classifications – especially when these are used to review citizen science projects. Huyse argued that pyramids do more than describe levels of participation; they embed normative connotations, such as the notion that co-creation with citizens is intrinsically better than delegating power to experts. He also argued that, contrary to the main scope of these classifications, participation and empowerment should be understood beyond the boundaries of the research process, for example when citizens use the outputs of citizen science projects to approach their local government to demand action in an area of concern. He added that it can be difficult for research funders and others unacquainted with participatory methods *not* to read these tools along normative lines. The pyramid also simplifies the complexities of participation by drawing tight boundaries between participation levels irrespective of the problem under investigation and the changing social context.

Huyse's considerations can be read as a call for more deliberate reflection on how citizen science is theorized, supported, and evaluated; an appeal partially informed by his experiences with CuriousNoses, which in contrast to other citizen science projects, did not receive government funding.

In his intervention, Van Oudheusden noted that both Scivil and Huyse approach the challenges of citizen science pragmatically, for instance by adjusting methods to fit the demands of the situation. He argued that this willingness to deal with challenges thoughtfully and practically bodes well for the future of citizen science in Flanders.

He also threw in a provocation by giving an antagonistic account of participatory science informed by the work of Philip Mirowski, an [ardent critic of citizen science](#) and open science. He concurred with Mirowski that citizen science can end up reinforcing the very state- or industry-sanctioned forms of governance it is meant to challenge, while adding that it can equally be empowering and rewarding for participants. Rather than viewing citizen science as an essentially flawed process, he proposed a more empirical and dynamic view, which takes as its entry point the realities of participation “on the ground.”

In her closing remarks, Soen invited panellists and participants to further reflect on the relationship between citizen science and open science. How, for instance, are we to make sense of the principles that guide citizen science and open science, such as accountability, transparency, and inclusion? How open do we want science to be? What types of data can be shared and what information should be kept out of the public domain? Does openness imply that everyone has a right to be included in citizen science projects?

These questions, which are only now beginning to take shape, deserve thoughtful consideration. Although developing fruitful responses to them will require time and effort, the process itself can be rewarding when stakeholders commit to learning from one another's citizen and open science experiences. The panel marked a first, tentative step towards openly exploring these experiences from different angles in ways that bring out both the possibilities and limitations of open citizen science.

Biographies

Michiel Van Oudheusden (PhD, 2012, University of Antwerp) is a Marie Skłodowska-Curie research fellow based at the University of Cambridge (UK), working at the intersections of environmental sociology, policy making and digital participation. In his current MSCA research project GRACE, he studies and facilitates interactions between grassroots citizen science groups and formal institutions, such as public authorities and research communities, with the aim of developing mutually responsive environmental governance approaches. He is affiliated to KU Leuven and a cofounder and co-coordinator of the FWO-funded Belgian Science, Technology and Society network.

Prof. dr. **Huib Huyse** heads the research group on Sustainable Development at HIVA – KU Leuven. A substantial part of his research and evaluation work is policy- or practice-oriented and covers topics related to global development and citizen science. Prof. Huyse coordinated the societal impact measurements of CurieuzeNeuzen Antwerp (2016) and Flanders (2018). It became a prize-winning citizen science project that was brought forward as best practice in citizen science by the European Commission, the European Environmental Agency, the Flemish parliament, KU Leuven, and the Royal Flemish Academy of Belgium for Science and the Arts. He currently coordinates the Straatvinken citizen science project (2018-2030) in the area of mobility and street liveability.

Jef Van Laer completed his master's degree in history along with teacher's training in 2009. After teaching history in a secondary school, he joined the science communication team at the Vrije Universiteit Brussel (VUB) in 2011. At the VUB, Jef coached researchers in science communication, as well as coordinating and initiating a variety of outreach initiatives – including citizen science - for almost nine years. In September of 2019, he started working at Scivil, where he initiated a series of surveys and focus groups to explore the state of citizen science in the Flemish region. He regularly engages parties in all corners of society in presentations and workshops on different aspects of citizen science.

Annelies Duerinckx is coordinator of Scivil, the Flemish citizen science centre since its establishment in 2019. Annelies put Scivil on the map with the organization of the first citizen science networking day and the development of an informative website about citizen science (www.scivil.be). Annelies advised the Flemish department EWI on citizen science project grants, organized surveys on citizen science in Flanders and expanded the Scivil network in Flanders and beyond by organizing thematic working groups and providing lectures, information moments, workshops, and individual advice. Annelies obtained her PhD in Physics at Ghent University and the Royal Meteorological Institute of

Belgium in 2015 on top of her Master in Artificial Intelligence (KU Leuven, 2011). After a year as a postdoctoral researcher at the RMI, Annelies started as a Research Advisor at the Research Support team of the Humanities and Social Sciences Group of the KU Leuven in 2016.

Violet Soen is Associate Professor of Early Modern History at KU Leuven. She has been active in the fields of Science Communication and Citizen Science, especially as co-author of the second Position Paper of the Young Academy Flanders, *Citizen Science: Can we count on you?* (2016). As a follow-up, she now helps to bring the worldwide movement towards more Applied History to Leuven and Flanders. With a generous FWO-SBO grant, the Corvus team develops new tools to help in their work and to increase the presence of historians in the public debate. This team works closely together with media services, policymakers, governmental agencies and entrepreneurs, bringing together academic historians and other professionals. At the Open Science Day at KU Leuven, Violet Soen aims to show how her engagement in citizen science and applied history also led her team towards sharing more research data with a wider public.