

Change – The transformative power of citizen science

Editorial

The transformative power of citizen science

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Abstract

In these proceedings the growing and reflective community of Citizen Science actors give insights into their findings which were presented at the joint conference of Österreich forscht and the European Citizen Science Association (ECSA) in Vienna 2024. The conference key topic was *change*, since we face changes in various aspects, in nature and society as well in the way Citizen Science is executed and perceived. Enjoy reading and get guidance and inspiration for your further work in the field of Citizen Science.

Keywords: biodiversity research, open science, funding, innovation.

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Change as leading topic

Change was the leading topic of the joint conference of Österreich forscht and the European Citizen Science Association (ECSA). Integrated into the event was the celebration of already 10 years institutionalized existence of these two vibrant networks and catalysators. ECSA as institutionalization of joint efforts of different communities in different countries (Vohland et al. 2021), and Österreich forscht as bottom up community (Heigl et al. 2016).

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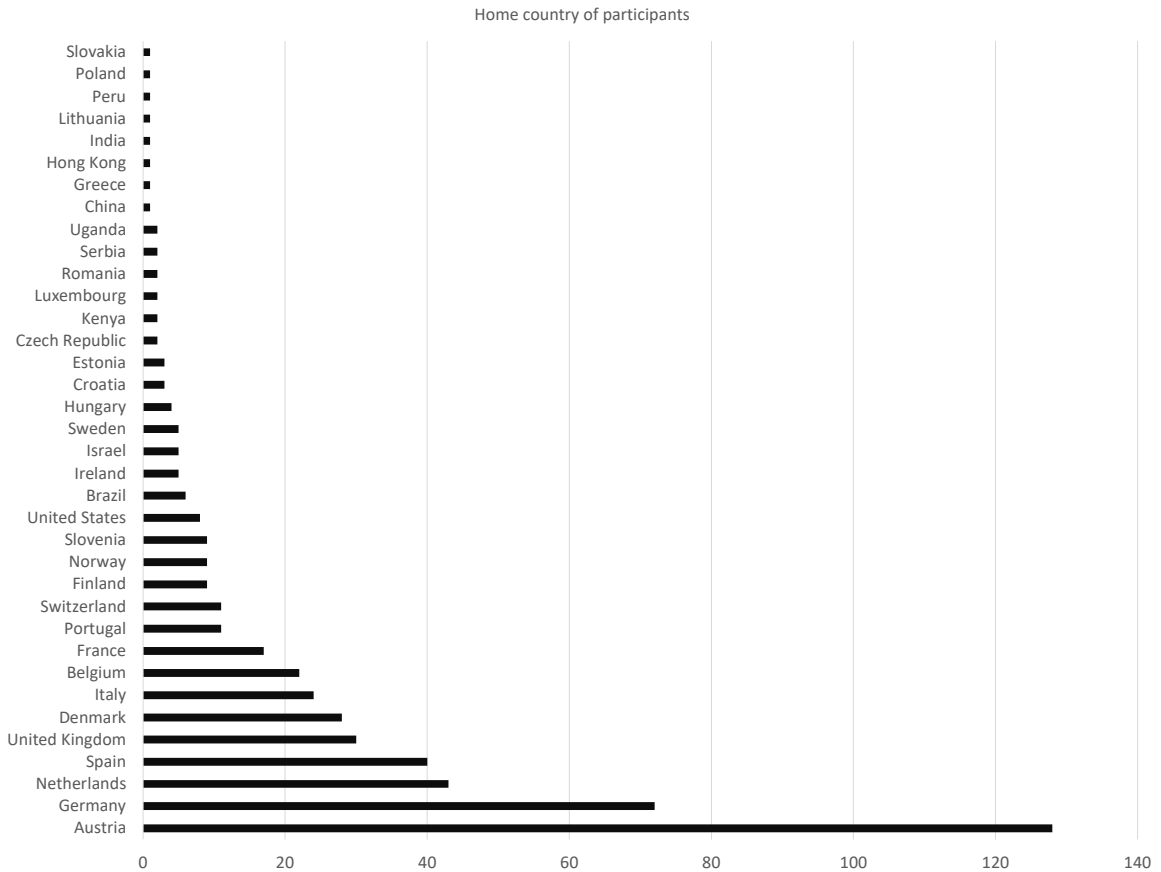


Figure 1. The country of origin of the participants.

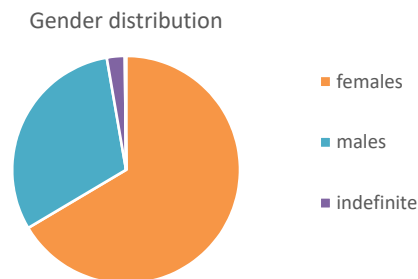


Figure 2. The gender of participants by self-declaration.

Change – for the better – that Citizen Science is linked to a positive change is the normative assumption behind all these activities. Especially now where we observe changes which frighten and upset us: the Big Acceleration with its consequences, the loss of biodiversity, weather extremes, lost habitats and wars in Europe. Citizen Science is seen as tool not only to support academic research but to increase ownership and self-efficacy as remedy against perceived and real faintness. This positive energy may be one explanation for the growth of the Citizen Science community. And indeed, the conference with its audience was beyond any expectation. In our funding proposal we assumed a number of 300–350 participants, but more than 500

from 36 countries (Fig. 1) representing mainly scientific institutions (Tab. 1), with a slight bias towards females (Fig. 2) registered and forced us to also explore the digital space. In this week in April 2024 we therefore celebrated contently the success of the large and growing Citizen Science movement which consists of so many persons and their networks, who are engaged in planning, running, financing, and evaluating Citizen Science.

Table 1. Type of institutions according to the affiliations of participants. Universities comprise all universities, scientific institutions all other research performing institutions. Museums and libraries are determined by self-nomination, NGOs comprise all non-governmental organisations, associations, etc.; companies, governance institutions, and funding organisations are clustered according to their mission, and one participant did not provide an affiliation.

Type of institution	Number of participants
University	193
Scientific Institution	71
Museum	41
Library	13
NGO	84
Company	47
Governance Institution	31
Funding Organisation	4
n.a.	1

Recent developments in Citizen Science

During the conference, we got knowledge of many different projects and approaches to initiate, detect and reflect change in the environment, in biodiversity, or in climate change impact. The areas initiate and enable changes and reflect changes comprised most of the contributions of the conference. New technical developments were proposed as well as the outreach to new communities to trace changes.

More social science-oriented disciplines provided increasing insights into historical, social, or economic interdependencies gained by citizen scientists, and explained how the different projects and approaches empower citizens in order to participate in our science-based society. Citizen Science is also increasingly reflected, for instance with regard to the reproduction of injustice (for instance with regard to access to digital Citizen Science tools, Aristeidou et al. 2024) or reproduction of colonial or hegemonial patterns (Austen et al. 2024; Kragh et al. 2024).

How Citizen Science can be used in schools was embraced by many contributors, for instance through programmes like “Sparkling Science”, funded by the Austrian Federal Ministry of Education, Science, and Research. Next to new knowledge gained for science and monitoring the kids gained insights into scientific working. But another aspect is extremely important: In schools, social segregation is less expressed than what we typically see in Citizen Science projects, a bias towards academically educated persons.

Impact assessment and evaluation of Citizen Science is a growing need not only for funders such as the European Union, but also for projects themselves as researchers want to understand if and how their projects met the intended goals or if they initiated change, as has been reflected by several workshops and presentations during the conference (e.g. Kieslinger et al. 2024).

Last but not least, the fast progress in information sciences during the last years allows to connect, visualize, and analyze data in a new dimension and follow the ECSA principles of Citizen Science (c.f. Robinson et al. 2018) with regard to openness.

Changing nature of Citizen Science

Looking back the last ten years, we saw Citizen Science changing from loose ideas and idealistic networks driven by enthusiastic volunteers to one pillar in the Open Science Strategy of the European Union, we consequently saw it changing from private initiatives to building blocks for the Open Science Policy in Austria or for European Funding Programmes such as Horizon Europe. Public funding in fact was an important driver of the success. When ECSA started, visionary institutions integrated the young association into their consortia. The contribution to the different projects then increased the epistemic and methodological capacity of ECSA while the overhead allowed to run the ECSA office which until today is hosted at the Museum für Naturkunde in Berlin, Germany.

In Austria, BOKU University not only hosted Österreich forscht at the beginning, but also gave Austria's Citizen Science platform a long-term perspective by providing tenured positions to its founders and an annual budget to further foster Citizen Science in Austria. Furthermore, the Austrian Federal Ministry of Education, Science and Research supported the annual Austrian Citizen Science Conference since 2015. Both allowed the network to grow and to realize essential partnerships, concepts and communities for the Austrian Citizen Science network.

The increasing importance and visibility also contain the risks of modification of Citizen Science from an expression of scientific independence to instrumentalizations, either as neoliberal approach for unpaid scientific work or putting co-benefits of Citizen Science such as scientific literacy or awareness raising to the front (Vohland et al. 2019).

Conclusions

This increasing significance impacts also the Citizen Science networks. They also change – or better broaden – from local associations to understand local environments to transboundary or even global initiatives relevant for Planetary Health such as the Mosquito Alert. Is the key interest to support Citizen Science research, i.e. new insights? Or is it in first place education, for instance STEM training? From international guests, economic power through the innovative potential of Citizen Science was expressed, perhaps similar to the European Union who sees scientific literacy as key asset for wellbeing. Citizen Science is also seen as an approach to improve environmental justice. So, Citizen Science is attributed a high transformative force (Austen et al. 2024).

Reciprocity, democratizing and co-creation are huge impact values. More discourses about the role of Citizen Science are urgently needed at different levels to clarify its functions for science and society.

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