Citizen Science

Citizen science represents an innovative approach to scientific research that actively involves the public in scientific projects.

This approach allows people from the general public to collaborate with scientists in solving complex problems and discovering new insights. Scientific projects that utilize citizen science often rely on the assistance of volunteers, who can contribute their observations, measurements, or data analyses. This approach increases the capacity for scientific research and promotes public awareness and education in science.

Citizen science opens the door to numerous projects that enrich our society and deepen our understanding of the world. Projects cover various topics, from tracking climate change and monitoring biodiversity to researching human health.

Ten principles of Citizen science

The concept of citizen science is continuously evolving. There are various definitions and interpretations of this term, often depending on the context. Citizen science can vary across scientific disciplines in terms of process design, level of participation, and ways of involving the public. However, the basic rules and ethical principles that citizen science projects should adhere to, and which contribute to a fundamental understanding of their goals and content, have been published by the European Citizen Science Association (ECSA) in the document " Ten Principles of Citizen science." A basic summary of these principles can be found below.

Ten principles of citizen science

1. **Citizen science projects actively involve citizens** in scientific endeavour that generates new knowledge or understanding. Citizens may act as contributors, collaborators, or as project leader and have a meaningful role in the project.
2. **Citizen science projects have a genuine science outcome**. For example, answering a research question or informing conservation action, management decisions or environmental policy.
3. Both the **professional scientists and the citizen scientists benefit from taking part**. Benefits may include the publication of research outputs, learning opportunities, personal enjoyment, social benefits, satisfaction through contributing to scientific evidence e.g. to address local, national and international issues, and through that, the potential to influence policy.
4. **Citizen scientists may**, if they wish, **participate in multiple stages of the scientific process**. This may include developing the research question, designing the method, gathering and analysing data, and communicating the results.
5. **Citizen scientists receive feedback from the project**. For example, how their data are being used and what the research, policy or societal outcomes are.
6. **Citizen science is considered a research approach like any other**, with limitations and biases that should be considered and controlled for. However, unlike traditional research approaches, citizen science provides an opportunity for greater public engagement and democratisation of science.
7. Citizen science **project data and meta-data are made publicly available and where possible, results are published in an open access format**. Data sharing may occur during or after the project, unless there are security or privacy concerns that prevent this.
8. **Citizen scientists are acknowledged in project results and publications.**
9. Citizen science **programmes are evaluated for their scientific output, data quality, participant experience and wider societal or policy impact.**
10. **The leaders of citizen science projects take into consideration legal and ethical issues** surrounding copyright, intellectual property, data sharing agreements, confidentiality, attribution, and the environmental impact of any activities.

Benefits and challenges of citizen science

Citizen science offers a range of benefits for both the scientific community and participants from the general public. Scientists gain access to new perspectives and extensive datasets from various geographical areas, which would

otherwise be difficult or impossible to obtain. Participants can expand their knowledge, gain experience, improve their skills, and become part of scientific work. This approach also fosters collaboration and mutual understanding between scientists and the public, leading to greater public engagement in scientific issues. Collaboration with the public can also help reduce data collection costs and other research activities.

Despite the many advantages of citizen science, some challenges need to be addressed. Examples include ensuring the quality and reliability of data, motivating and engaging volunteers, or addressing issues related to data protection and ethical standards. The key to success is effective project management and the support of collaboration among all involved parties.

How to participate?

Participating in Citizen Science research as a general public member is relatively easy. For many projects, all you need to participate is access to the internet and a smartphone or computer. Interested individuals can engage in various activities, from bird watching and star mapping to analyzing images from microscopes or satellites. Everyone can find a project that matches their interests and skills.

A platform that provides an overview of Citizen Science projects in the Czech Republic is the website Citizenscience.cz . This platform offers a basic database of projects with information and instructions on how to get involved in these research activities.

Citizen science at the European level

The European Citizen Science Association (ECSA) plays a crucial role in integrating citizen science at the European level. ECSA provides a platform for sharing knowledge and best practices, helping to bridge the gap between scientists and the public, enhancing scientific literacy, and supporting the development of policies that enable citizen science to contribute to scientific and societal progress in Europe. In this way, it allows citizens to actively participate in addressing key global challenges such as climate change, biodiversity conservation, and public health.