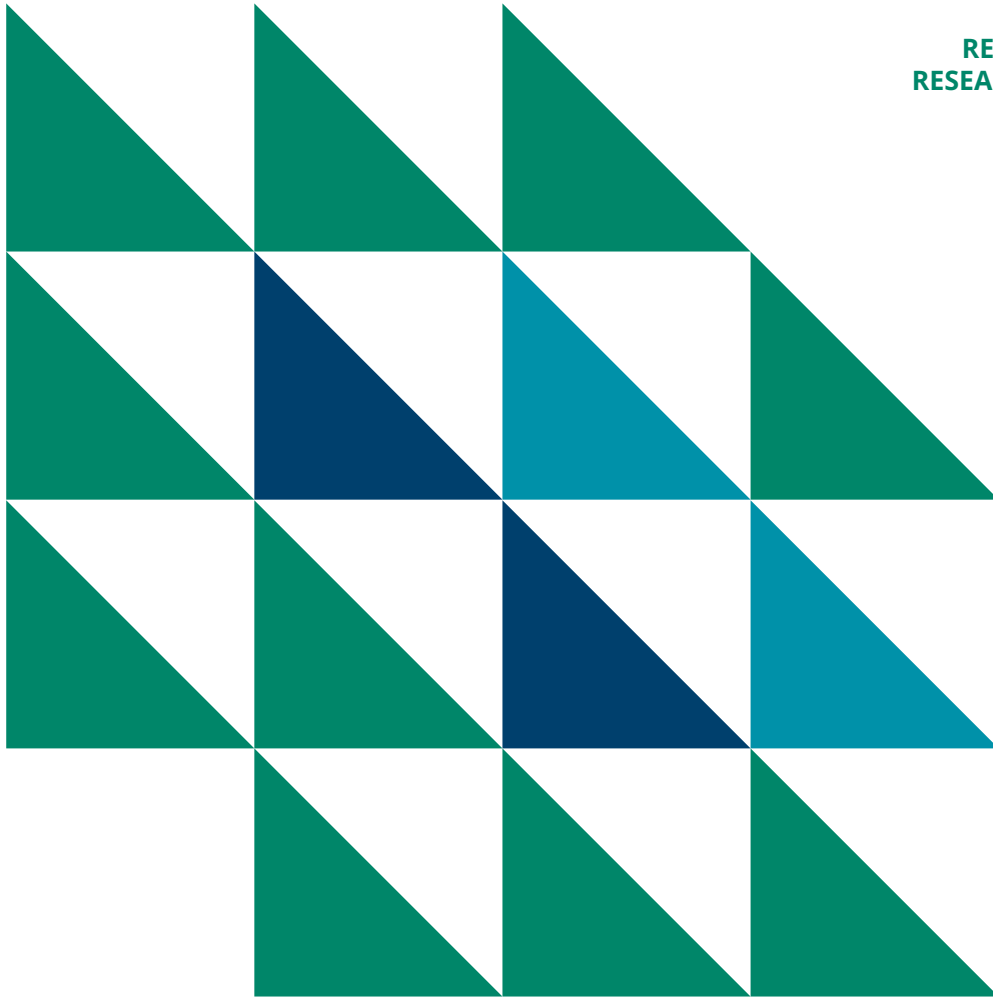


RESPONSIBLE
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13:2022



RECOMMENDATION FOR CITIZEN SCIENCE

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Recommendation for citizen science

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PURPOSE SPECIFIED IN THE DECLARATION

The Declaration for Open Science does not have a well-defined goal for citizen science. However, it includes clear links with the principles of citizen science, such as:

- strengthening education, culture and innovation in society
- increasing the impact of research in society
- increasing interaction between researchers, decision-makers and other citizens.

THE THREE MOST IMPORTANT ISSUES RELATED TO CITIZEN SCIENCE

A survey for research organisations, researchers, funders and people outside the scientific community supported the drafting of the recommendation. The survey mapped out the current standing of citizen science in Finland. The Citizen Science Working Group carried out the survey from 22 March 2021 to 30 April 2021, and received a total of 152 responses. On the basis of the survey, the three most important issues related to Citizen Science are:

1. Interaction between the scientific community and citizens
2. Openness/Transparency
3. Popularisation of science / ease of participation

INTRODUCTION

Throughout history, people from outside the scientific community have participated in science in different ways. However, the development of universities and other research organisations, the complexity and distance of research questions from everyday life as well as the need to maintain expensive and complex equipment have limited citizens' participation in scientific research over the past decades. Although some projects depend on the efforts of citizens, research organisations have in recent decades carried out research projects to a large extent without the participation and interaction of people outside the scientific community. This situation is, however, changing rapidly. The introduction of new information and communication technologies has made scientific results and information more accessible. As a result, the possibilities to participate in scientific research have increased. Constantly evolving information and communication technologies improve opportunities for participation in scientific projects and thus promote public awareness of scientific processes and methods. Interaction between research organisations and the rest of the community is also an effective means of reducing the negative social impacts of fake news and disinformation.

SOCIAL FRAMEWORK FOR CITIZEN SCIENCE

Citizen science is often guided by topics of public interest, such as topics related to the environment, community and urban planning or to the monitoring of major accidents. For example, the Commission Notice Guidelines providing a common understanding of the term 'environmental damage' as defined in Article 2 of Directive 2004/35/EC of the European Parliament and of the Council on environmental liability with regard to the prevention and remedying of environmental damage 2021/C 118/01 mentions the importance of citizen science as a tool for monitoring environmental damage.

*"Of particular relevance will be information gathered and collated ... This may be supplemented by other relevant information of acknowledged scientific value – for example, an environmental non-governmental organisation (NGO) may provide extensive information through **citizen science**"*

Phenomena or perspectives may emerge among a wider audience that enable new approaches to scientific research and at the same time open up new research questions that could not

be dealt with in other ways. These phenomena and perspectives do not necessarily require formal academic recognition, but they can develop in a seed for official scientific discourse and thus also serve as a source of innovation. Citizen science involves people outside the scientific community to take part actively in research projects usually defined by academic researchers. Cooperation between the scientific community and citizens promotes innovation, reveals new research areas, develops technology and facilitates the collection of more far-reaching information. In addition, the participation of citizen scientists promotes public education and understanding of science, supports the transition to a digital society and unites people and researchers around the world. The number of participants in citizen science projects ranges from a few million to a few non-specialised participants in very diverse areas, from the classification of astronomy sites to bird enthusiasts producing and analysing quantitative data, or participating in some other stage of research.

FREEDOM OF A RESEARCHER

The aim of the policy is to facilitate citizen science in a way that supports and increases researchers' freedom and opportunities to use citizen science methods, and to interact and share research-based information throughout society. Researchers must have the opportunity to choose the most suitable methods for conducting research. The higher education and research communities must guarantee incentives and structures for citizen science in a manner that gives equal respect to researchers and research results that use citizen science.

NATIONAL AND INTERNATIONAL FRAMEWORK

Citizen science is a relatively new concept, even though scientific research has already used volunteers to collect observations in the 19th century. Documents produced as a result of both national and international cooperation, which have so far been produced to promote citizen science, have been utilised in drafting this recommendation. Important international sources used in the drafting of the recommendation included the *Green Paper on Citizen Science (2013 EC)*, the *White paper on Citizen Science for Europe (2014 EC)*, the *European Commission Recommendations of the OSPP on Citizen Science (OSPP 30 April 2018)*. Significant national: the principles and measures produced in the *Open Citizen Science* project implemented by Open Knowledge Finland

for the Ministry of Education and Culture's *Open Science and Research* project (2017) and organisations that promote citizen science such as the Finnish Biodiversity Information Facility and the Finnish Environment Institute.

PURPOSE

The purpose of this recommendation is to provide research organisations and their funders as well as other organisations operating in the interface of the civil society with principles and guidelines for promoting citizen science. The recommendation provides answers to questions on how to make citizen science projects more appealing to researchers and how citizen science methods give researchers recognition and merits. The recommendation concerns specific issues in citizen science and provides ways of establishing citizen science as an equal scientific method with other scientific methods in use. The aim of this recommendation is to provide a basis for ensuring the quality of citizen science research in the Finnish scientific community.

This recommendation provides definitions, non-regulatory principles and guidelines to be applied in the definition, decision-making, financing, implementation and evaluation of citizen science projects. The purpose of this recommendation is to clarify the organisation's role as a facilitator of citizen science and to enable the development of citizen science and participatory scientific activities as part of the Finnish organisational culture. By setting a framework for the participation of citizen scientists in scientific research, this recommendation encourages organisations to support processes that enable citizen scientists to participate in scientific research as valued and equal partners, and to open the door for everyone for meaningful and creative interaction with the scientific community.

DEFINITION OF CITIZEN SCIENCE

Citizen science is scientific research conducted partly or entirely by citizen scientists who are outside the scientific community. Citizen scientists can advance research in multiple ways. For example, they can collect, classify or analyse data needed for a study. In responsible citizen science, it is important that the people are not the subjects of the research but the authors of it. There is no need to be a trained scientist to participate in research. Citizen science can also be referred to as *community science*, *crowd-sourced science* or *volunteer monitoring*.

1. Citizen scientists are involved at least at one stage of the research.
2. Citizen scientists are not the subjects of the research but the authors of it.
3. Research must usually be led by a trained researcher.

LEVELS OF CITIZEN SCIENCE

Figure 1. Levels of citizen science (Haklay 2011).

| | |
|---|--|
| Level 4 Extreme Citizen Science | Collaborative science – problem definition, data collection and analysis |
| Level 3 Participatory Science | Participation in problem definition and data collection |
| Level 2 Distributed Intelligence | Citizens as basic interpreters. Volunteered thinking |
| Level 1 Crowdsourcing | Citizens as sensors. Volunteered computing |

OBJECTIVES

| OBJECTIVE | MINIMUM LEVEL | OPTIMAL LEVEL |
|--|--|--|
| Visibility of citizen science within the organisation | The organisation has guidelines on citizen science available. | The organisation has a policy on citizen science as its own policy or as part of another policy on open science. |
| Enabling inter-active citizen science | Organisations arrange support for researchers to support non-technical communication during and after citizen science projects. | Finnish organisations work together to draw up an interaction plan (including good practices and a process description), which will enable researchers to maintain and develop ways of interacting with citizens throughout the project and for a sufficiently long time after the project has come to an end. |
| Funding (means should be considered in advance) | <p>The organisation must ensure that the funding opportunities of citizen science projects are equal to those of other research projects.</p> <p>(Organisations must indicate the need for citizen science funding so that funding organisations can better meet the funding needs of citizen science projects and take into account, such things as, the longer duration of research projects.)</p> <p>Domestic funding organisations must reach the same level as international research funders. (We could fare better in EU framework programmes, if citizen science projects were funded)</p> | The organisation has processes for funding citizen science projects. |
| Training | The organisation offers researchers and staff the opportunity to participate in citizen science training as part of other personnel training. The training must include guidance on both methods and practical implementation. | Organisations provide guidance and courses on citizen science to raise public awareness. Educational institutions include citizen science as part of the curriculum of degree programme students. |
| Legal support | The organisation must ensure that legal services are available to citizen science projects on an equal basis with other projects. | Organisations have a legal expert who is familiar, in particular, with the law concerning citizen science projects. This resource can be shared by organisations or, for example, employed by the Federation of Finnish Learned Societies. |
| Systems | The organisation provides support for the most common systems and platforms used in citizen science. | The organisation has the possibility to build and/or localise systems to facilitate data collection. |

MEASURES

1. Organisation increases personnel awareness of the starting points, methods and preconditions of open science in research conducted using means of citizen science.
2. Organisation offers researchers clear guidelines for citizen science projects.
3. Organisation takes business projects into account in its open science training programmes.
4. Organisation supports preparation of a data management plan in citizen science projects.
5. Organisation supports researchers in publishing and communicating in a sufficiently popular manner in accordance with the principles of citizen science.
6. Organisation supports researchers in drawing up the publication and communication plan in the early stages of the citizen science project.
7. Organisation ensures that researchers leading citizen science projects follow responsible research guidelines
8. Organisation ensures that systems supporting citizen science projects are brought to an adequate level.

EVALUATION AND APPLICATION

Organisations should provide mechanisms for implementing this recommendation and ensure a low administrative burden for researchers. The relevant stakeholder organisations regularly assess the relevance and applicability of this recommendation and, where appropriate, propose and decide on amendments.

APPENDIX: DRAFTING OF THE RECOMMENDATION

The recommendation was drafted by a Citizen Science Working Group put together by an Expert Group on Operating Culture, whose members included:

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