

## Keeping participants engaged in citizen science projects: the role of science communication strategies

**Cristina Luís,<sup>a,\*</sup> Inês Navalhas,<sup>a</sup> Esther Marín-González,<sup>b</sup> Joana Magalhães,<sup>c</sup> Rosa Arias,<sup>c</sup> Paolo Giardullo,<sup>d</sup> Leire Leguina.<sup>e</sup>**

<sup>a</sup> CIUHCT – Centro Interuniversitário de História das Ciências e da Tecnologia, Faculdade de Ciências, Universidade de Lisboa, 1749-016 Lisboa, Portugal

<sup>b</sup> cE3c - Centre for Ecology, Evolution and Environmental Changes & CHANGE - Global Change and Sustainability Institute, Faculdade de Ciências, Universidade de Lisboa, 1749-016 Lisboa, Portugal

<sup>c</sup> Science for Change (SfC), Carrer de Vilamarí 50, 7è pis, 08015 Barcelona, Spain

<sup>d</sup> University of Padova (UNIPD), Department of Philosophy, Sociology, Education and Applied Psychology (FISPPA), Section of Sociology - Via Melchiorre Cesarotti 10/12, 35123, Padova, Italy

<sup>e</sup> Spanish Foundation for Science and Technology (FECYT), Calle Pintor Murillo 15, Alcobendas, 28100, Madrid, Spain

E-mails: [cmluis@fc.ul.pt](mailto:cmluis@fc.ul.pt), [iinavalhas@fc.ul.pt](mailto:iinavalhas@fc.ul.pt), [emgonzalez@fc.ul.pt](mailto:emgonzalez@fc.ul.pt),  
[joana.magalhaes@scienceforchange.eu](mailto:joana.magalhaes@scienceforchange.eu), [rosa.arias@scienceforchange.eu](mailto:rosa.arias@scienceforchange.eu),  
[paolo.giardullo@unipd.it](mailto:paolo.giardullo@unipd.it), [leire.leguina@fecyt.es](mailto:leire.leguina@fecyt.es).

Scientists, policy makers and non-governmental organisations, among other actors, increasingly recognize the relevance of conducting research through citizen science (CS). As such, new projects involving this practice continue to emerge. Participants in CS projects can be engaged in various steps, which can range from contributions in designing the projects and defining/prioritising hypotheses, collecting and analysing data, to communicating the results. However, as with other research practices, CS faces several challenges and questions that need to be addressed such as the recruitment of participants and their retention. Since retention of participation is central to the success of projects and their overall impact, a better understanding of the specific actions that increase such retention could benefit the citizen science community. The NEWSERA project (<https://newsera2020.eu/>) is analysing how to improve engagement of each stakeholder from the quadruple-helix model (citizens, academics, policy makers and industry) in CS through the implementation of co-created innovative science communication strategies. So, in a dialogue roundtable that took place at the Engaging Citizen Science Conference 2022 (Aarhus, Denmark), the NEWSERA team developed a methodology to discuss with CS project managers, participants, and other stakeholders, the challenges faced in maintaining long-term engagement, specifically focusing on citizens as the main stakeholder target group. The discussions and results that came out of this session contribute to the debate around the best strategies to engage and keep participants in CS projects and provide some clues for CS project managers to improve their engagement strategies.

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\* Speaker

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## 1. Introduction

Citizen science (CS) projects can involve from just a few participants to millions of people collaborating around a common goal. Typically, participant involvement focuses on data collection, analysis, or reporting (such as in contributive and collaborative projects), but other types of collaboration are also possible, such as defining and/or prioritising the research question or communicating results (e.g., in co-created projects, citizens participate in all levels of the project).

However, as with other research practices, CS faces several challenges and questions that need to be addressed, such as the recruitment of participants. In fact, engaging and recruiting participants is integral to the success of CS projects, and low levels of recruitment or declines in participation can lead to projects ceasing [1]; additionally, recruitment is highly interconnected with the motivation to participate and the retention of participants. While the motivation of participants for contributing to CS projects has been thoroughly discussed [e.g., 2, 3], with the results showing that motivation can arise from self-directed and altruistic motives, the retention of participants, which is one of the most challenging issues in CS, has deserved less attention. In fact, retaining participants/sustaining participation in a project offers several benefits to both projects and participants: it reduces the amount of time project managers must spend recruiting and training new participants; the level of experience achieved by participants over time can lead to higher quality data; long-term participation in programs that involve geographically-based observations produces sustained observation records, valuable for documenting changes over time at a single site; and it can also lead to greater participant satisfaction. Since retention of participants is central to the success of projects, a better understanding of the specific actions that increase such retention could benefit the citizen science community.

The NEWSERA project (<https://newsera2020.eu/>) is analysing how to improve engagement of quadruple-helix stakeholders (citizens, academics, policy makers and industry) in CS through the implementation of co-created innovative science communication strategies. The work is still ongoing, so what will be shown here are only preliminary results, but all feedback and discussion is essential if one really wants to improve the ways different stakeholders are involved in CS. Our two objectives with this dialogue roundtable were: 1) to discuss with CS project managers, participants, and other stakeholders the challenges faced in maintaining long-term participant engagement, focusing, specifically on citizens as the main stakeholder target group; and 2) to understand how can well-defined science communication strategies play a determining role in this process. Thus, the driving questions of this session were the following: What are the main difficulties in keeping participants engaged? Which strategies can be applied to motivate them? Which techniques could be most effective in increasing or maintaining higher levels of engagement? How can well-defined science communication strategies play a determining role in this process?

## 2. Methods

The dialogue roundtable consisted of two rounds of discussion, each 20 minutes in length, for small groups of 6 people seated around a table. At the beginning of each round, a short introduction was provided on the importance of maintaining long-term participant engagement followed by an explanation regarding the dynamics that would follow. Participants were also asked to consider the participant perspective in terms of needs, inclusiveness, etc. (e.g., what are the needs of the participants to feel engaged and if they feel included, are the strategies inclusive?). Taking into consideration the challenges faced in maintaining long-term participant engagement and how well-defined science communication strategies can play a determining role in this process, the participants in the roundtable were asked to:

- 1) Look at a list of main difficulties in keeping participants engaged (previously identified based on literature review), discuss them and add other relevant ones not identified. The list provided included the following examples: lack of interaction about the project [4], lack of feedback about the project results [5], lack of information about the project aims [6], some difficulties in performing tasks [7], lack of recognition [8] and lack of information about data use [5].
- 2) Discuss which science communication strategies could be applied to motivate project participants and deal with the aforementioned difficulties.
- 3) Debate about which techniques might be most effective in increasing or maintaining higher levels of engagement.

## 3. Results

The roundtable participants included representatives from academia, funding institutions, citizen science practitioners, and high school teachers from various European countries and South Africa, who brought their background and views on engagement and sustaining participation in citizen science projects to enrich the interaction. Their contributions provided important input for understanding how citizen science projects can improve their communication strategies to better engage their participants. Due to the interest shown in the topic, it was possible to hold three roundtables instead of the two initially planned.

To begin with, the roundtable participants identified other difficulties (Figure 1, on top) in keeping the participants engaged, in addition to those provided in advance by the NEWSERA team. The lack of coordination in terms of engagement, existence of a digital divide (lack of access and affordability of ICT resources, including access to electricity and access to broadband connection), the fact that projects may be linked to institutional communication, and the existence of a bureaucratic language led by institutional communication channels, enriched the set of barriers that are already being explored in the NEWSERA project.

Regarding the strategies that can be applied to motivate project participants to keep engaged, some were pointed out (Figure 1, bottom left): identifying and understanding the target audience; using the appropriate social media channel; the use of gamification to explain concepts; a partner and champion engagement system; and workshops or other face-to-face approaches.



**Figure 1:** Examples of difficulties in engaging participants in citizen science projects, and of strategies and techniques to overcome these difficulties, obtained from the dialogue roundtable organised.

In terms of the techniques that might be most effective in increasing the levels of engagement or keeping them high, the participants identified the following (Figure 1, bottom right): training the trainers; organise events to provide recognition and feedback to participants; having well-defined communication channels; using more visuals to communicate; using project management tools and giving participants access to them; creating mentoring groups, especially when dealing with local communities; check-in with participants to ask how they are doing or, in some cases, visiting them regularly; making use of existing communities (like clubs or associations).

#### 4. Discussion

This dialogue roundtable enabled very fruitful discussions and reflections around the best strategies to engage and keep participants involved in citizen science projects. The participants in the roundtable were very keen to share their experience and this positively reverberated in the task of identifying the main difficulties in keeping participants engaged. The participants recognised most of the difficulties that have previously been identified in the literature. Furthermore, by identifying personal experiences faced in their own practice, and making it possible to add other difficulties to the list, it was possible to extend our knowledge about difficulties not previously identified in academic works.

However, when it comes to thinking about what might be the most suitable science communication strategies to keep project participants motivated, that was not an easy task. Many participants recognised that there are many details to consider when getting to this part and that there are many specificities related to each type of project. Nevertheless, the participants came out with very interesting suggestions that may have an application across several projects. Among them were that a communities' gatekeepers can contribute as facilitators; they can open the opportunity to get in touch with communities and further keep them engaged across time (Figure 2)<sup>1</sup>

In terms of communication techniques that might be most effective in increasing the levels of engagement or keeping them high, a lot of suggestions and examples were provided, many of them coming from the experience of the participants, and many others coming from the lively dialogue that took place. Some of them further support what the NEWSERA team and their communities of practice already established during their Citizen Science Communication Labs [9] and is also being explored by others at the European level, under mutual learning exercises [10].

Overall, the results and inputs from the participants of this dialogue roundtable provided us with information that can be compared to what is in the literature regarding communication strategies and techniques to motivate participants to keep engaged with the citizen science projects in which they are involved. These results have been excellent contributions to the research that is underway within NEWSERA. The techniques and strategies identified reflect how communication is currently done within the projects themselves. Citizen scientists, as an integral part of the project, need to be included as an important part of the communication and feedback process; given due recognition regarding the data that is owed to them when that data is published, thus being given recognition for their work; involved in the project processes, such as in the creation of games or involved in mentoring groups or in the process of knowledge transfer; and finally contributing to open science, so that citizen science avoids becoming a gatekeeper. These strategies can be important vehicles to address the motivations that lead citizens to participate in citizen science projects and afterwards can be used to keep participants involved. Indeed, this is something that we have been exploring under the NEWSERA project and that has been addressed in our policy briefs [11].

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<sup>1</sup> The vivid debates were well illustrated by Frits Ahlefeldt, a science journalist collaborating with the conference organisation.

Our dialogue roundtable showed that more discussion and reflection around the theme is needed, and that besides involving those responsible for the citizen science projects, it is necessary to include in the discussions precisely the ones that the projects wish to get involved and to keep engaged.



**Figure 2:** The role of gatekeepers in communities' engagement for citizen science. Drawing made by Frits Ahlefeldt, [Drawn Journalism](#)

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