

Citizen science as a band-aid for an ailing science system?

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Citizen science is becoming increasingly popular. As the popularity of citizen science increases, so does the number of voices that question citizen science. While representatives of citizen science proclaim the advancement of academic knowledge through the involvement of citizens in research, the strengthening of trust in science among society, or the democratisation of science, critics argue that citizen science is a band-aid for an ailing science system in which a lack of resources is compensated by volunteer work, a development which may jeopardise the freedom of research. Neoliberalisation, platform capitalism, and the cementing of power relations through citizen science are also voiced criticisms. Furthermore, citizen science can contribute to revealing precarious working conditions in academia. On the other hand, there are academic successes that citizen science projects can boast. Additionally, there is significant political backing and funding for citizen science by the European Union. This article examines citizen science in this field of tension and contrasts both perspectives.

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1. Introduction

Related to the motto of this year's ÖCSK conference (ver.suchen, ver.einen, ver.antworten), the focus of this contribution lies on *ver.antworten* (being responsible and being accountable). The starting point for this article is my personal situation in academia. As a postdoctoral researcher and citizen science enthusiast, I coordinated citizen science projects in the field of linguistics and published on citizen science in the past. However, when explaining my work in the field of citizen science to my colleagues in academia, this was not always met with appreciation. I heard condescending remarks or statements that made me think about my current position in academia. Several of these statements demonstrated that some persons in academia do not distinguish between science communication, including outreach activities, and citizen science ("Citizen science...this is science communication, right?") or do not see the added value of collaborating with citizens in academic research projects ("This [citizen science] is not really beneficial for your academic career."). The latter is also a topic in open science [1] addressing the problem that researchers engaging in science communication, open science or citizen science are currently not rewarded by the academic system, which favours publications in high-ranked journals, or the amount of external funding acquired, among others. While these statements downplaying citizen science did not seriously worry me, other questions did: "Now anyone can do our work, right?" or "You are contributing to laying us off?" or "What is happening after the project ends?". While these questions did not puzzle me initially, they hit a nerve. This article therefore addresses the underlying issues of these statements and how far citizen science can keep its promises. It also discusses the question whether citizen science is the symptom of an ailing science system.

2. Symptoms of an ailing science system

2.1 The outside perspective

Although the sentiment of Europeans towards science is positive asserting a positive influence of science on society, respondents of the Eurobarometer survey [2] are also stating that not everybody is benefitting equally from science. Nevertheless, the respondents are also in favour of citizen science to meet the values and needs of citizens. We can see a similar picture in Austria [3] with one major difference, namely the fact that one third does not trust science. Instead of trusting academic findings, the Austrian population would rather rely on their common sense. Additionally, Austrians assume that the influence of business and politics on academia is too high. This can be an indication that the relationship between science and society is deteriorating [3]. In addition, there are also critical voices within academia itself.

2.2 The inside perspective

2.2.1 Reproducibility crisis

A study [4] among researchers asking about the reproducibility of a researcher's own results or those of others has created quite some stir in academia since it showed that more than 70% of the respondents could not reproduce the experiments of others, and more than half of them could not reproduce their own. While this study had a clear focus on natural sciences, the underlying factors in academia leading to irreproducibility are also prevalent in other fields of knowledge. According to the respondents, the reproducibility crisis can be attributed to two major factors,

namely the publish-or-perish paradigm and selective reporting in studies. Apart from aspects specific to the natural sciences also the competition for research funding and positions in research as well as more and more bureaucracy contribute to this crisis [4].

2.2.2 (Academic) misconduct and precarious employment relationships

While the reproducibility crisis concerns science itself, also the framework conditions in academia are not necessarily bright and welcoming. Apart from academic misconduct, such as the falsification of results or studies, there is also misconduct in personal relationships, such as senior academics bullying early career researchers [5] or abuse of power, which are behaviours that are promoted by the current reward system in academia. Even if academics are working in a supportive and appreciative environment, they might be caught up with administrative work or face precarious employment relationships. In Austria, for example, the Universities Act as amended prohibits consecutive short-term employments of academics, thus especially affecting early career researchers who are often employed on a project-by-project basis.

The examples above show that science has to tackle several challenges, such as improving the relationship between science and society as well as with colleagues inside academia, allowing for the reproducibility of research results, and improving the framework conditions.

3. Promises of citizen science

Now back to the title of this paper alluding to the situation that citizen science can help to improve this situation. This claim is not unsubstantiated since the citizen science literature lists many promises and benefits that citizen science holds: e.g. democratization of science [6], increasing the public understanding of science [7], the public acquiring disciplinary knowledge and competences for scientific reasoning [8], or improving the relationship between science and society [9] by aligning research with the needs and values of society.

4. Citizen science as band-aid?

While several authors draw a positive picture of the benefits of citizen science, others question that citizen science can be a remedy or that it can tap into the innovation potential [10]. Critics [10] argue that proponents of citizen science sell the benefits of citizen science as higher goals but that they do not discuss the interests and hidden agendas in the academic practice.

Referring back to the statement “You are contributing to laying us off?”, Mirowski criticises citizen science because it convinces “people that experts are a waste of time and effort” [10] and that conducting science does not require any professional training or expertise. Thus, citizen science makes experts superfluous. However, citizen science projects often require an academic qualification. For example, in the European Union it is easier to receive funding for citizen science if an academic partner is involved. In addition, expertise can take many forms and is not restricted to academic expertise alone.

Other criticism [10] includes the top-down nature (of many) citizen science projects, the compensation of the lack of resources in academia by resorting to volunteers, the neoliberalisation of science and the cementing of power structures. This can be exemplified by an underresourced scientific elite who draws on citizens’ resources or efforts to reach personal goals without giving anything back. Moreover, citizen science would help reduce the entire culture of science to the academic method alone. Furthermore, critics argue that volunteers are not informed about the purposes for which their data and efforts are used [10].

The exploitation of volunteers is also a concern within citizen science. However, volunteers do not necessarily need to be paid in order to experience a benefit or reward from participating in a citizen science project. Also participants might be guided by different interests, which must not necessarily be monetary ones. However, the goals of the project, the roles of the participants and the consequences of their participation in the project should be clearly communicated from the very beginning. To protect the participants in citizen science projects, there are several guidelines, such as the ECSA's ten principles of citizen science addressing communication and interaction with participants, as well as ethical conduct.

Another criticism is that citizen science brings citizens to heel instead of allowing them to influence the use of the knowledge (they have co-created) for their own benefit [10]. Citizen science is in a (political) field of tension shaped by the rationalisation of society and technocratisation. For citizens, citizen science comes with both obligations and a right to participation in decision-making [11]. The involvement of citizens in academic decision-making, however, may jeopardize academic freedom since citizens would then also set the course of research.

Apart from the criticism, citizen science can also combine two important fields in today's societies, namely democratic decision-making and science as a pool of expert knowledge. It can open science up for participation from outside and counter current developments in the science-society relationship as a social movement [11].

5. Conclusion

Academia is facing many challenges shaped by a society being partially distrustful of academia and its results as well as problems within the scientific system itself. Citizen science is holding many promises, including ambitious ones, such as changing the relationship between science and society (which can be seen as emancipatory-participative view of citizen science [11]). Although there is not much evidence for this change yet, citizen science is already impacting traditional (academic) structures, even if citizen science is 'only' considered as a means (the instrumental-pragmatic view [11]) used by academics to achieve their goals.

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