Meaningful public engagement in the context of open science: reflections of early and mid-career academics

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Abstract
What is public engagement, what is needed for successful public engagement and how can public engagement be perceived as part of open science? This commentary highlights reflections on these questions from 15 public engagement fellows in Utrecht University's Open Science Programme. With a goal of finding common ground intended as input for further discussion and policymaking within the university and beyond, these reflections are based on an analysis of twelve expert interviews conducted among and by the public engagement fellows.

We identify three key conditions for meaningful public engagement in the context of open science: 1) room for diversity in (organizational) support and in rationales for the pathways towards meaningful societal impact; 2) a broad conceptualization of open science, offering a foundation for the structural integration of public engagement in academic work; and 3) the need for a continuous dialogue amongst academics, support staff, and management on public engagement and the conditions necessary to facilitate public engagement. Our findings suggest that in order to make public engagement an integral part of open science, universities should invest in institutional support, create awareness, and stimulate dialogue amongst staff members on how to 'do' good public engagement.
Keywords
Public engagement; open science; rewards & recognition; citizen science; stakeholder engagement; co-creation; science communication; reciprocity

Key messages
1. Public engagement has the potential to support the realization of open science, if a broad diversity of motivations for public engagement is explicitly connected to open science policy narratives.

2. Successful integration of public engagement in academic work requires collaboration in changing the necessary policy and support systems and academic culture by academic and support staff together, and with consultation of societal stakeholders.

3. The acknowledgment of public engagement as part of open science includes engagement with societal stakeholders as well as with citizens and social communities. Recognising and rewarding academic and support staff for meaningful public engagement activities is crucial for the societal impact of academic work.

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Introduction

“Public engagement is essentially about science in society. Positioning science as part of society needs to be done better than it is now, in many ways. Making research accessible, letting the public participate—showing that you listen, that they make a difference—that the image of the ivory tower is not how we want academic research to work. To me, these are the big goals behind open science. Public engagement is hugely important for that.” (interview E2)

Public engagement is one of the four pillars of the Open Science Programme at Utrecht University (Utrecht University, 2021). Open science is increasingly considered to be a necessary step to regain public trust in science and to improve the reliability, efficiency, and relevance of research (European Commission, 2019; Miedema, 2021; UNESCO 2021). The contribution of engagement with societal partners and citizens to the accessibility and legitimacy of science, is often acknowledged (Nowotny et al., 2001; Duncan & Oliver, 2021).

In practice, public engagement is sometimes still viewed as a welcome, yet nonessential by-product of academic work. The goal of this commentary is to explore the role of public engagement in open science. For this purpose, we interviewed twelve public engagement fellows at Utrecht University, from a wide variety of disciplines. These fellows are part of an intra-university network aimed at mutual learning about, and promotion of, public engagement. Members are (mostly mid-career) academic staff and some support staff who have applied or been invited to this network based on their involvement with public engagement. In this article, we share thoughts and issues arising from these expert interviews that are intended as inspiration and invitation for discussions regarding open science and public engagement. After describing our method and explaining the position of public engagement within context of open science at Utrecht University, we present the patterns that we discerned in our data along the following three lines of discussion: What is public engagement? What is needed for successful
public engagement? How can public engagement be perceived as part of open science? We conclude with lessons learned and suggestions for moving forward.

Method

Twelve fellows interviewed each other on their interpretation of public engagement and the role it plays in their research. The goal was to find common ground and start the development of an experience-based vision as input for further discussion and policymaking in various part of the university (and beyond). Interviews were conducted online in pairs, and each fellow who was interviewed was in turn responsible for conducting an interview with another fellow. Interviews were recorded and transcribed and subsequently coded per theme in NVivo, using five key questions as guiding principles: 1. What does public engagement mean to you? 2. Why do you do public engagement? 3. Why is public engagement part of open science? 4. What is needed for successful public engagement? 5. How does public engagement contribute to societal impact? Fellows from different faculties teamed up in pairs and coded all subsequent data, thematically analysing all interview transcripts, and discussing their observations. The codes and observations were then discussed in the larger group. The interview and data analysis were conducted following the ethical guidelines of the Faculty of Social and Behavioural Sciences at Utrecht University.

Open science at Utrecht University

Open science is generally understood as making science and scientific research available to all. In the Dutch academic context, open science refers to “the transition to a new, more open and participatory way of conducting, publishing and evaluating scholarly research” (National Plan Open Science, n.d.). The idea that all aspects of research are shared as openly as possible lies
at the heart of open science. Prominently, open science requires action on FAIR data and
software, Open Access, and Recognition and Rewards.

At Utrecht University we also perceive public engagement as an integral and logical part of
open science (Figure 1). A rather unique and relatively early analysis that explicitly connected
open science and public engagement put forward the question whether open science should
“develop as a deep and bidirectional mode of engagement between members of the public and
researchers” (Grand 2012: iii). This perspective suggested several issues to address when
research is opened to a wider public, like shared practices and understanding of research
methods (e.g., data analysis) and of judgments about the validity and reliability of knowledge.
Academic questions, methods, data and results are not merely output to be shared by
researchers; they can also be translated, used and co-created by citizens and stakeholders
outside of academia (and from other academic fields or disciplines). This integral open science
approach of Utrecht University is the backdrop for our reflections on public engagement.
Figure 1: Infographic illustrating the mission and vision of the Open Science Programme at Utrecht University (Source: https://www.uu.nl/sites/default/files/styles/original_image/public/Utrecht-University-towards-open-science.jpg)

**Question 1: What is public engagement?**

The fellows generally perceive public engagement as an umbrella concept that harbours many ideas about why, and in what ways academics can involve the public in their scientific endeavours. First, fellows do have different views on the *degree of interaction* and the *effect* of public engagement. Some consider communication about scientific results to a non-academic audience as public engagement. Other fellows criticize such communication as a one-way perspective. In their view, public engagement is an inherently reciprocal process, in which academics and members of the public inform, surprise, and inspire each other: “I see it as a mutual conversation going back and forth (...) at different times throughout the research process”
(interview C2). Topics of discussion include not only research results, but also the research process, the limits of scientific research, and ethical dilemmas related to research.

Second, elaborating the notion of public engagement as a reciprocal process, fellows emphasized that the word ‘engagement’ in public engagement calls for commitment, both from academics and the public, and requires an open and collaborative attitude. To some scholars, this attitude comes naturally and as a result they thoroughly enjoy public engagement activities: “I commit myself to use the things I learn from the public in my research and teaching” (interview I2). Policy makers promoting public engagement should recognize that a natural ease and willingness to engage with the public, is an important academic asset. Academics who believe that public engagement is important, but lack such aptitude and experience, may experience it as a burden.

Third, fellows pointed out that public engagement activities should be context-dependent. For example, the nature of the engagement should vary with the public’s age category, social background, degree of academic literacy, and impartiality to both the content and the topic under discussion. These factors should not only affect the location of engagement (e.g., whether the public is involved via (social) media, schools, public science festivals or community centres) but also the means of engagement (e.g., whether the interaction takes place via discussions with the public, interactive workshops, or active involvement in research activities). When designing public engagement activities, academics need to take into account the representativeness and accessibility of the publics involved. In discussing medical topics, for example, patients could have a different interest than other citizens, and this should be reflected in the design of the public engagement activity.
Question 2: What is needed for successful public engagement?

Three core themes arose from the fellows’ reflections on what is needed to make public engagement successful in the service of open science: 1) the skills needed to do public engagement; 2) the institutionalisation of public engagement practices, means, and support, and 3) recognizing and rewarding public engagement for academics’ professional and career development.

Skills to do public engagement include, but are not limited to, being able to tell stories and communicate in an accessible way (i.e., without jargon), being able to translate questions from society to science and vice versa and being able to interact with various publics. Training programs to acquire such skills should address the multiple forms of public engagement, and help academics obtain the practical skills needed to integrate public engagement in the early stages of research and teaching projects. According to the fellows, the most benefits can be obtained by training early-career scholars (MA and MSc students, PhDs, postdocs) as they are important conveyors of the (future) public engagement culture and valuable collaborators in public engagement projects.

Due to a lack of such training, public engagement is mostly undertaken by those with intrinsic motivation, skills, and experience. These motivated academics subsequently run the risk of being over-burdened with public engagement tasks and requests, while their less-skilled colleagues remain largely unasked and unsupported. “If public engagement always loses out amid teaching, writing papers, and applying for grants, then it’s going to depend on personal enthusiasm and the value individual academics place on it. That is vulnerable, that is too vulnerable in my opinion.” (interview E2). For this reason, university wide support of public engagement endeavours is essential for its successful and sustainable integration into the academic system. In short, public engagement needs to be institutionalised.
Institutionalisation in this case refers to establishing public engagement in the culture, structures, and procedures of the university. Fellows mentioned the need for a platform where academics can find and learn about public engagement practices, and procedures for incorporating public engagement in the early stages of research projects and teaching activities. Furthermore, creating a formal public engagement community and an internal communication network is perceived as an important aspect of institutionalisation of good public engagement practices.

In the context of institutionalisation, fellows often mentioned the need for resources in terms of sustainable funding, support, and allocated time. Without proper financing, many programs lack continuity or sustainability. Whilst many faculties at Utrecht University provide ‘seed funding’ for establishing new initiatives, structural financing for public engagement is scarce. Finding time to develop and execute public engagement activities is a well-shared concern amongst fellows. Public engagement can be time-consuming, and is often done in the evenings, weekends, or in one’s spare time, because people lack the time for it during office hours.

Moreover, good public engagement depends on a stimulating working environment, which is an integral part of institutionalisation. It is important to work as a team, and to involve students and early-career scholars in the process. “What I would recommend to senior academics: don’t go do it all yourself. Make it a team effort, where master’s students, PhD students, and post-docs can help. Public engagement is a thing that you can do incredibly well already at the beginning of your career” (interview D2). Existing support agencies within universities can also help scholars think about their public engagement goals. As one respondent suggested: “perhaps resource support offices could help by asking questions like, ‘have you thought about public engagement in the subsidy application you’re currently writing? Do you have a fair data plan? An open access plan?” (interview C2)
Recognizing and rewarding public engagement refers to the informal and formal ways in which public engagement is valued within the academic community: “I don’t think everybody has to do public engagement. But every academic must be aware that there is a social contract between science and society. We can’t retreat into that ivory tower, that’s a really outdated idea”. (interview D2). Currently, fellows experience what could be called a public engagement paradox: what they are recognized for most, is rewarded the least. As one of them put it: “My podcast is perhaps the most appreciated thing I do, in reactions to grant proposals for example (….) Yet getting a grant for a methodological research project is more highly valued than getting one for a public engagement project (i.e., research is more highly valued, ed), although the amount of funding may be similar” (interview B2). To create formal appreciation of public engagement, a diversification of careers should be facilitated from PhD level onwards, according to the fellows. Recognizing and rewarding career diversification will help those who want to excel in public engagement but currently lack the career opportunities to do so. At the same time, the fellows indicated that academics who cannot, or do not want to engage with the public should not be forced to do it. Academics have different interests and talents, and there should be room for diversification.

Good public engagement, in the service of open science, partly depends on academics being able to explain why public engagement activities are meaningful to their academic work. Narrative approaches in performance assessment cycles could help them articulate such visions. Furthermore, fellows indicated a need for a shared vision within the academic community about what ‘good and effective public engagement’ is, also as a basis for estimating its value for the scientific community.

Regarding the informal appreciation of public engagement, fellows highlighted the importance of a stimulating and positive work culture, where supervisors and colleagues explicitly express their appreciation for public engagement. What seems to underlie these three
key themes related to making public engagement a successful endeavour is the need to move on from being ‘a group of enthusiasts and early adaptors’ to the structural embedding of public engagement in the organization. One respondent summarized this as: “It starts with inspiration, then support, then acknowledgement” (interview B2). Public engagement should be firmly integrated in academic procedures and practices, while respecting the diversity of ways in which people shape their public engagement activities.

**Question 3: Public engagement as an intrinsic part of open science**

Most fellows see public engagement as crucial for the success of open science. They view open science as a broad movement that needs to establish collaborative connections between science and society, with the aim of making the university a more reliable and relevant public institution. Public engagement is seen as an essential means to achieve this.

Fellows laud the open science efforts of making data and publications freely available, but agree that open access and open data are not enough to allow societal stakeholders and the broader public to become part of the scientific process. Involving audiences in scientific discussions requires inspiring and skilful public engagement that is tuned to the characteristics of the public and the topic under discussion. In addition to the different interpretations of ‘public engagement’, there are differences among fellows regarding the term ‘open science’. Some fellows view it narrowly as making scientific publications, data, and software more accessible. The majority, however, see open science more broadly as a movement that creates and arranges partnerships between academia and society, with the aim of positioning the university as an integral part of society, reflecting the broad approach taken at Utrecht University (see figure 1).

Most fellows view public engagement and open science as mutually reinforcing sets of activities, for three reasons: 1) Both activities emphasize that scientific research is publicly funded, which comes with the responsibility to serve the public good (cf. the notion of a social
contract mentioned earlier). To achieve this, interaction between academics and society is essential; 2) Both activities aim to enhance trust in science and the university as a public institution. They not only entail improving the accessibility of research data, publications, and insights in research methods, but also organizing open discussions and input sessions about the goals, methods, results, and implications of research; 3) Both activities share the belief that participation of society improves the quality and impact of science. Accessibility and transparency help academics to ask a wide range of important questions, from both academic and societal points of view, thereby increasing the reliability and impact of their research.

Some fellows argued that including public engagement in open science is crucial because it reinforces the goals of other open science practices like open access and open data. They noted that making data and publications freely available is not enough to allow societal stakeholders and the broader public to become part of the scientific process. Academics need to organize public interactions and actively invite publics to participate in academic discussions. This is where public engagement is essential.

Mostly, the fellows see public engagement as a means to an end; the overarching strategy is open science, with public engagement as an essential contributing component. The open science movement strives for more transparency and societal impact, and public engagement is a way to achieve this because, on the one hand, it is a way to share research and results with societal partners and citizens, and on the other hand, a way to ensure academics are addressing questions that matter to society.

The interviews also revealed potential differences between public engagement and other components of open science, for example on the issue of obligation. Fellows noted that while every academic must adhere to open access and open data norms, not all academics should be required to actively participate in public engagement activities. In that sense, public engagement is considered less prescriptive than other aspects of open science. At the same time, fellows felt
that every academic needs to be aware of the ‘social contract’ between science and society, which means they cannot retreat into their ‘ivory tower’ and must commit to the public good in one way or another. In this broader sense, public engagement may be somewhat prescriptive after all.

Conclusion and recommendations

Our reflection on the relationship between public engagement and open science demonstrates the dynamic, interactive process of doing open science, and how the thoughts and behaviours of academics shape and are shaped by the institutional context in which they operate. Moreover, our findings suggest that there is no prescriptive way of doing public engagement within the broader context of open science. Rather, the nuanced reflections of fellows from multiple scientific domains demonstrates the co-existence and development of various perspectives on public engagement within a university. Under the umbrella of open science, public engagement must be structurally embedded in the organization of the university. This needs to be done while respecting the diversity of ways in which people shape their public engagement activities.

Public engagement includes practices as diverse as participatory research, science communication, citizen science, transdisciplinary research and co-creation with stakeholders. Such modes of engagement target different audiences, require different types of organizational support, involve different motivations and incentives for academics, and differ in their rationales as a pathway to societal impact.

A broad conceptualization of open science with a focus on interactions between academia and society may offer a strong basis for the structural integration of public engagement in academic work. Such a conceptualization should acknowledge the differences and similarities outlined here, for open science policy development and implementation. The
conceptualization should speak to (and can be co-created by) university management, academic and support staff, PhD students & postdocs, and societal stakeholders alike. *Engaging* academics rather than *addressing* them as performers of public engagement, requires a continuous dialogue with room for their personal motivations to be involved in public engagement, and including the perspective of the publics and societal actors they engage with. To support that dialogue in the academic community, we have created a visual representation of public engagement as a collective of already existing practices, that can be connected more productively and sustainably embedded when integrated in the movement towards open science and the accompanying transition to new frames for rewarding and recognizing the value(s) of academic work (Figure 2).

![Figure 2: conversation starter on public engagement and open science at Utrecht University](https://www.uu.nl/onderzoek/open-science/themas/public-engagement)
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Wouter Boon is associate professor in Innovation and life sciences. His research in the field of innovation studies focuses on the dynamics and governance of emerging technologies in science-based sectors, such as life sciences and healthcare. The focus of his work is on the role of user innovations, user-producer interactions and stakeholder engagement in emerging technology fields.

Judith de Haan is the Open Science Programme manager at Utrecht University. Since 2019, together with her team, she is directing the integrated approach of the open science movement at Utrecht University and connecting policies and plans with implementation. Her background is in biomedical sciences as she received her PhD at the Experimental Cardiology department at the University Medical Center in Utrecht (UMCU) in 2018.

Carien Duisterwinkel is Senior Advisor Stakeholder Relations at Utrecht University’s Faculty of Veterinary Medicine. In addition, Carien is involved in furthering the university’s Open Science Public Engagement strategy. With a background in International Relations and Corporate Social Responsibility, Carien brings 15 years’ experience in stakeholder relations and project management at the interface between business and non-profits, in Europe and abroad.

Lauren Gould is assistant professor in Conflict Studies at Utrecht University and the project leader of the Intimacies of Remote Warfare (IRW). IRW is a research programme that aims to inform academic, public and policy debates on the intimate realities of the remote wars waged by advanced militaries. Dr. Gould is Public Engagement and Centre for Global Challenge fellow, co-founder of the Contesting Governance platform, and board member of the Nuhanovic War Reparation Centre.

Willem Janssen is associate professor in European and Dutch Public Procurement Law, School of Law, Utrecht University, and a researcher at the Centre for Public Procurement (UUCePP) and the Centre for Regulation and Enforcement in Europe (RENFORCE). His research delves into questions on sustainability, social injustice, innovation and public procurement law.

Karin Jongsma is assistant professor of bioethics at the Julius Center of the University Medical Center Utrecht, with a particular interest in the ethics of patient and public involvement and digital health ethics. She obtained her PhD in medical ethics at the Erasmus University Medical Center in 2016. Karin is a founding member of an international Ethics of Public Engagement network and has wide spread experience with public engagement and public outreach activities.

Megan Milota is assistant professor of Medical Humanities at the University Medical Center Utrecht. She is responsible for introducing narrative medicine into the medical and paramedical training programs in 2017, and continues to create and coordinate innovative and interdisciplinary educational initiatives that focus on individuals’ experiences and stories. As a member of the New Utrecht School, Megan also organizes public dialogues and international summer schools that thematize various issues in the healthcare domain.
Maud Radstake is head of the Public Programs office at the Centre for Science Communication and Culture of Utrecht University, and one of the track leaders for Public Engagement in the university’s Open Science Programme. Trained as cultural anthropologist, she received her PhD in Science & Technology Studies from Maastricht University in 2006. Before coming to Utrecht, she worked as researcher, research manager and policy advisor at Radboud University and Radboud University Medical Centre.

Saskia Stevens is assistant professor in Ancient History and Classical Civilization. Her research focuses on the significance and physical appearance of boundaries in the Roman Empire. She is currently PI of a multidisciplinary project on the Roman frontier in the Netherlands, Constructing the Limes (2021-2026). After studying Classics at Radboud University, she moved to Oxford University where she obtained her DPhil in Classical Archaeology in 2010. She has been at Utrecht University since 2010.

Madelijn Strick is associate professor of Social Psychology at Utrecht University. Her main expertise is the public engagement with science. She develops instruments to measure the societal impact of public engagement projects and uses these instruments to identify the working ingredients of “good” (i.e., impactful) public engagement. Her other main expertise is the psychology of humor and how it affects social influence, communication, and well-being. She teaches courses on social influence and communication.

Marij Swinkels is assistant professor at the Utrecht School of Governance (USG), Utrecht University. She is passionate about academic teaching and public engagement, and connects the two in a variety of ways. In her research, she explores how leaders deal with and learn from transboundary crises and actively engages with stakeholders about the implications of her research for leadership practice.

Erik van Sebille is professor of oceanography and public engagement at Utrecht University. He investigates how ocean science can be used for sustainable development through public engagement. After receiving his PhD from Utrecht University in 2009, he worked at the University of Miami in the US, the University of New South Wales in Australia, and Imperial College London in the UK before returning to Utrecht University in 2017.

Niko Wanders is assistant professor of hydrological extremes at Utrecht University. He studies how humans impact the hydrological cycle and how floods and droughts impact societies. After receiving his PhD in Physical Geography from Utrecht University (2015), he worked at Princeton University in the US. There he worked on improving our understanding of droughts and developing forecasting systems to reduce the impact of these disasters, before continuing this work at Utrecht in 2017.

Mara A. Yerkes is associate professor of Interdisciplinary Social Science, Utrecht University. Her research centres on comparative social policy (on families, labour markets, and welfare states) and social inequalities (in particular relating to gender, generations, and sexuality). Yerkes is PI of the European Research Council (ERC) project CAPABLE, a comparative study on gender inequalities in work-life balance in eight European countries and of CoGIS-NL (the longitudinal COVID-19 Gender (In)equality Survey Netherlands).
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