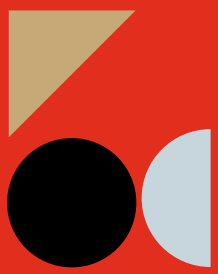
REPORT

Institutionalization of Science Engagement

Commitment to Action



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1 *Ana I. Faustino worked on this report and associated content after her participation as a Science Engagement practitioner in the Falling Walls Engage Hub Kenya, in March 2020, organized by Falling Walls Engage, Falling Walls Foundation. The work here presented was developed voluntarily and was/is not associated with past/current work affiliations of the author.*

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Table of contents.

01.

Why is Science Engagement relevant?

The current global challenges – the COVID-19 pandemic, climate change, global inequality, loss of biodiversity, pollution of air, soil and sea, over-consumption, to name a few – necessitate fundamental rethinking, redirecting, and transforming of our societal systems. This includes rethinking how science can be included as part of the process of finding solutions for these challenges, namely through promoting public trust in science, evidence-based decisions and policy-making that follows scientific recommendations. Science Engagement holds the key to making this happen. With the support of scientific and funding institutions, scientists and/or Science Engagement practitioners can involve citizens, leaders of industry and civil society organizations, in initiatives that promote science literacy and have the potential to shape and co-create the scientific process and science-knowledge production.

02.

Falling Walls Engage Commitments to Action.

2.1

Falling Walls Engage

Falling Walls Engage (website ***here***), hosted by the Falling Walls Foundation in cooperation with the Robert Bosch Stiftung, is a global platform for Science Engagement that aims to inspire and connect creative individuals, projects and organizations that actively involve the public with science to generate mutual benefits for science and society all around the world.

2.2

Science Engagement Definition[2]

Falling Walls Engage defines Science Engagement as activities, events, or interactions bridging the gap between science and society, to generate mutual learning and mutual benefits, and belonging to the spectrum between public engagement, science communication and citizen science. Engagement is per definition a two-way process, with the goal to shape and co-create the scientific process together, to promote active involvement of the public and scientists in scientific knowledge production.

2 | *Definition coined by Falling Walls Engage.*

2.3

Falling Walls Engage Hubs

To foster and promote Science Engagement worldwide, Falling Walls Engage has launched independent network nodes – the Falling Walls Engage Hubs – to connect local and regional scientific communities with the global Falling Walls Engage community. The Hubs are an open format with a regional focus, which translate into a series of events, conferences and workshops addressing specific topics in Science Engagement.

Figure 1: Science Engagement challenges workshop, Falling Walls Engage Hub Kenya. Photo credit: Falling Walls Foundation.

2.4

Falling Walls Engage Commitments to Action

Commitments to Action (CtA) are formats integrated in the Falling Walls Engage Hubs, where Falling Walls Engage community members participating in the Hub, develop projects that address Science Engagement challenges which emerged from the Hub exchange. The goals are:

01. **Scaling up dialogue among Science Engagement practitioners, projects and institutions, on Science Engagement challenges.**

02. **Finding solutions to specific Science Engagement challenges, that benefit the whole community of Science Engagement practitioners.**

The process is guided and supported by the Falling Walls Engage team through discussion, consulting and showcasing of projects. The ongoing Commitments to Action were initiated in the Falling Walls Engage Hub Kenya, in March 2020, addressing the following topics: 1) institutionalization of Science Engagement; 2) engaging hard-to-reach and vulnerable populations; 3) Science Engagement and funding. For more information on the Commitments to Action projects, please visit ***this*** website.

The present report addresses the challenge: low institutionalization of Science Engagement.

03.

The challenge: low institutionalization of Science Engagement.

3.1

Scientists and Science Engagement

Scientists participate in Science Engagement initiatives and more than half want to spend more time doing it[3]. However, in general, most Science Engagement initiatives are conducted by only a small number of scientists, many of whom consider Science Engagement to be a moral and scientific imperative[4]. **In fact, a study conducted in the United Kingdom[5] shows that scientists:**

- consider science to be at the core of many great world challenges;
- think Science Engagement may change the public's perception of scientists;
- think Science Engagement can make the public more supportive of scientific research;
- think Science Engagement activities can be enjoyable for those involved and may enrich peoples' lives.

3 | *Poliakoff, E., & Webb, T. L. (2007). What factors predict scientists' intentions to participate in public engagement of science activities. Science Communication, 29(2), 242–263. https://doi.org/10.1177/1075547007308009*

4 | *Watermeyer, R., & Lewis, J. (2017). Institutionalizing public engagement through research in UK universities: perceptions, predictions and paradoxes concerning the state of the art. Studies in Higher Education. DOI:10.1080/03075079.2016.1272566*

5 | *Poliakoff, E., & Webb, T. L. (2007). What factors predict scientists' intentions to participate in public engagement of science activities. Science Communication, 29(2), 242–263. https://doi.org/10.1177/1075547007308009*

Thus, it is clear that, even though scientists see the relevance of doing Science Engagement, only a selected group of them are involved in Science Engagement initiatives. This seems to be happening because scientists see Science Engagement as an activity that is a moral obligation as a researcher, which is enjoyable for those involved, but that is not an intrinsic part of their career as a scientist. But why is this the case?

3.2

Low institutionalization of Science Engagement

After reflection with other Science Engagement practitioners and scientists, and a small consultation of available literature, one can conclude that several reasons stand behind the fact that not all scientists are involved in Science Engagement and consider it as part of their career:

- anti-engagement atmosphere within scientific institutions:
  - lack of encouragement on the institutional level – no incentives (e.g. money, awards) are given as reward, by the scientific institutions, in return for the Science Engagement initiatives developed by scientists;
  - negative impression – those that do Science Engagement are considered sub-par scientists;
- lack of time – scientists dedicate all their time to research-related tasks (e.g. experiments, data analysis, writing manuscripts and grants), leaving no time for other occupations like Science Engagement initiatives;
- lack of money:
  - funding schemes that fund research do not have strong Science Engagement criteria;
  - funding schemes that fund Science Engagement are scarce;
- losing money – time dedicated to doing Science Engagement is time not dedicated to research;
- lack of Science Engagement skills – some scientists think they do not have the necessary skills for doing Science Engagement;
- lack of knowledge regarding available Science Engagement opportunities, which forces scientists to spend a considerable amount of time creating their own initiatives or locating available ones;
- Science Engagement is not viewed as an intrinsic part of a scientist's career;
- almost nonexistent assessment of the career development in Science Engagement – there few programs that evaluate the Science Engagement efforts of scientists (e.g. no awards, no metric system for evaluation).

Given the reasons stated above, one can conclude that despite the growth and development of the past decades, the Science Engagement field is still dealing with an obvious challenge: its low institutionalization. It seems like, in order for more scientists to be involved in Science Engagement initiatives, several institutional changes and measures need to be considered, in order to embed Science Engagement in the daily life of scientists, scientific institutes and universities, in an incentivised and sustainable manner. The next section of this report presents an approach that aims to raise the awareness of the global Science Engagement community for the challenge of the low institutionalization of Science Engagement, as well as to foster the discussion on actions that can solve it.

6 | *Ecklund, E. H., James S. A., Lincoln A. E. (2012). How Academic Biologists and Physicists View Science Outreach. PLoS ONE 7(5): e36240. doi:10.1371/journal.pone.0036240*

04.

How to tackle the challenge?

A workshop and literature consultation

In order to scale up the dialogue regarding the challenge of the low institutionalization of Science Engagement, and to have an international discussion about potential actions on how to solve it, two approaches were taken: a workshop and a literature consultation.

4.1

Workshop

The workshop, named "*Institutionalizing Science Engagement*", had the aim of discussing the topic of the institutionalization of Science Engagement, focusing on: the relevance of Science Engagement; the causes behind the low institutionalization of the field; potential actions on how to solve the challenge. This workshop was integrated into the program of the Berlin Science Week 2020, as an online workshop. 92 participants registered to take part in the workshop, with diverse professional backgrounds (see figure 2). **From these, 61 participants from all over the world attended the workshop, which included the presence of four relevant speakers for the institutionalization of Science Engagement topic:**

- **Isabella Kessel** | Robert Bosch Foundation; Funding institution representative.
- **Julian Rayner** | Cambridge Institute for Medical Research & Wellcome Genome Campus Connecting Science; Science Engagement practitioner & science institution representative & Science Engagement institution representative.
- **Marzia Mazzonetto** | Stickydot; Science Engagement practitioner & Science Engagement institution representative.
- **Rodrigo Tapia** | Science and Society Division – Ministry of Science, Technology, Knowledge and Innovation of Chile; Governmental representative.

After an initial presentation on the relevance of Science Engagement and the potential causes behind the low institutionalization of the Science Engagement field, the panellists presented their considerations about the topic. This moment was followed by group's discussions in breakout rooms (Zoom) and the presentation of the work the groups developed. The workshop ended with a Q&A with the invited speakers and a final remarks moment.

After the workshop, participants filled in a small evaluation survey, where 95% rated the relevance of discussing the institutionalization of Science Engagement as "relevant" or very relevant" (figure 3) and an average of 3,9 (on a scale from 0 to 5) of the participants considered that the workshop made them learn about solutions and actions that they can use to promote the institutionalization of Science Engagement (figure 4). Please check figure 4 for the evaluation of other learnings by the participants.

The workshop's conclusions on actions to solve the challenge of the low institutionalization of Science Engagement are presented in section 5.

4.2

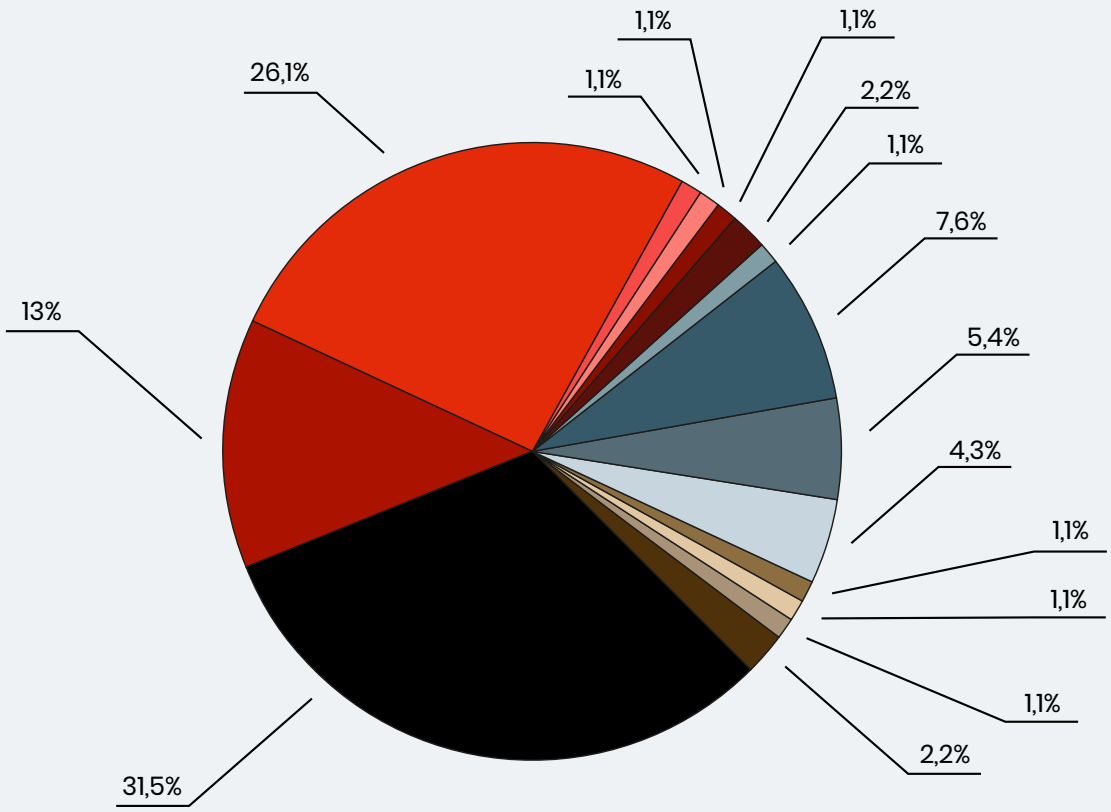
Literature consultation

Besides the workshop mentioned above, a small literature consultation on the institutionalization of Science Engagement topic was also conducted, with the goal of having a better grasp on:

- causes behind the low institutionalization of the Science Engagement field;
- actions that can be implemented/have been implemented to solve the challenge.

The conclusions associated with this literature consultation were used in the content of the sections 3, 5 and 6.

What is your professional background?



- Science Engagement practitioner
- Scientist
- Scientist & Science Engagement practitioner
- Science officer
- Head of scientific institute
- Head of department of university
- Funding institution staff member
- R&I enterprise staff member
- Non-governmental organization staff member
- Nonprofit organization staff member
- Community member
- Scientific publishing staff member
- Science corporation staff member
- Scientist & Science Engagement practitioner & Nonprofit organization staff member
- Student

Figure 2: Professional background of the participants that registered for the workshop "Institutionalizing Science Engagement".

How relevant is it to discuss the Institutionalization of Science Engagement?

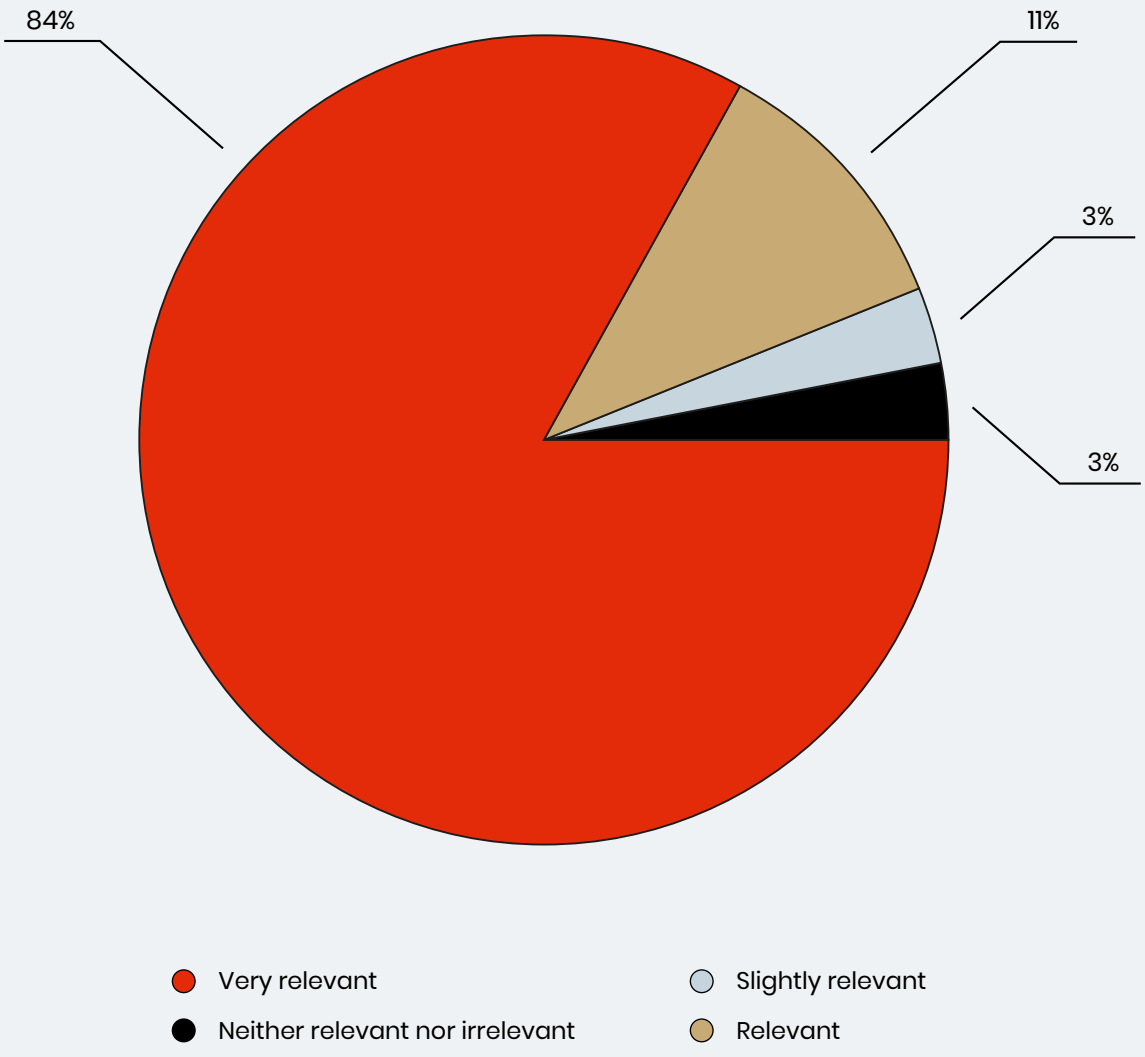


Figure 3: Relevance of discussing the Institutionalization of Science Engagement – opinion of the participants of the workshop "Institutionalizing Science Engagement" (37 responses).

To what extent do you agree with the following statements about the content of the workshop?

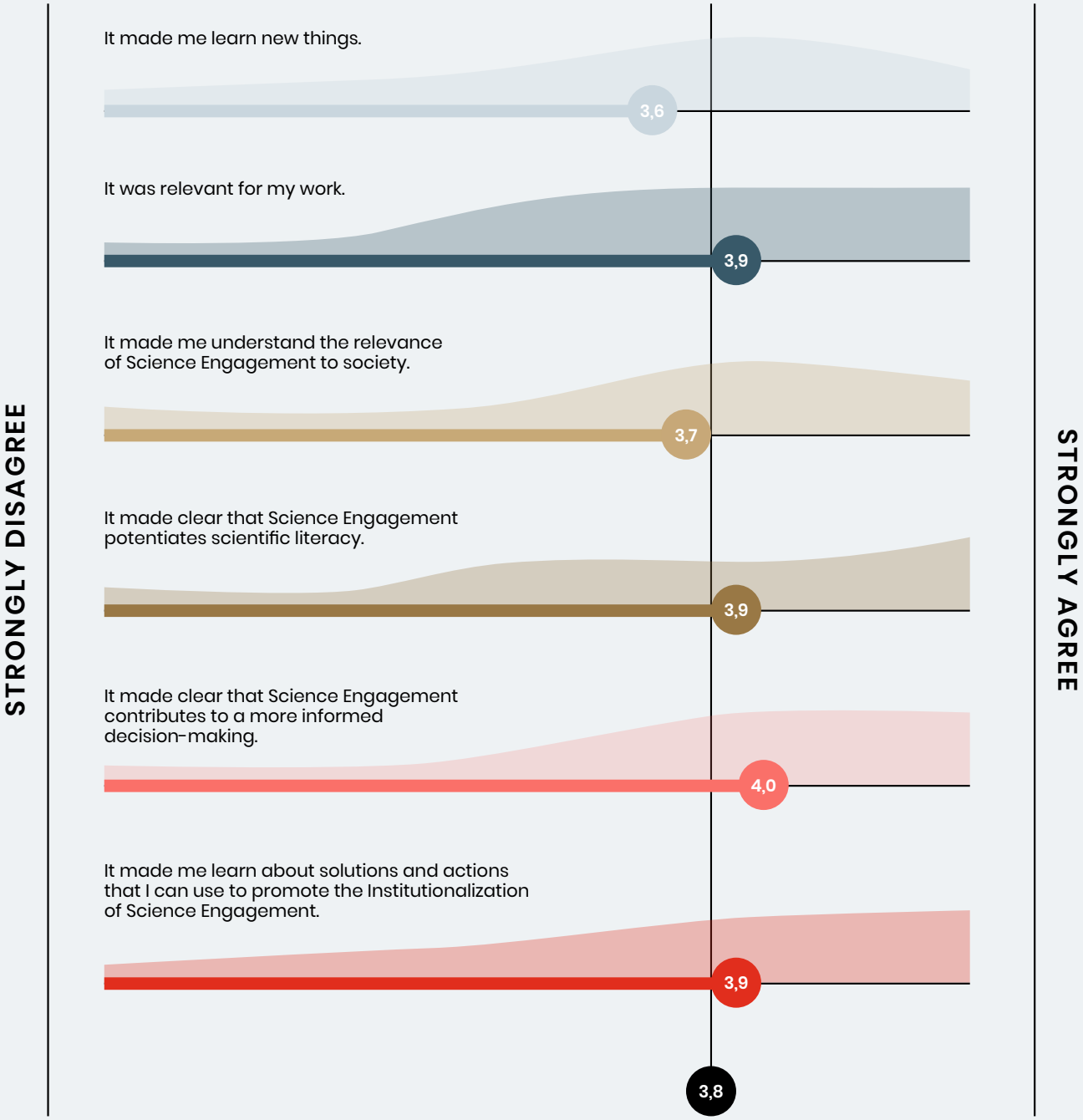


Figure 4: Opinion of the participants in the workshop "Institutionalizing Science Engagement" regarding the content of it. Strongly disagree = 1, Strongly agree = 5 (37 responses).

05.

Actions to solve the challenge.

> **If science is going to fully serve its societal mission in the future, we need to both encourage and equip the next generation of scientists to effectively engage with the broader society in which we work and live.**
>
> ***Alan Leshner***

In this section, one will be able to find potential actions that can be developed in order to promote the institutionalization of Science Engagement. All actions presented below resulted either from the discussion during the "Institutionalizing Science Engagement" workshop, or from the literature consultation[7] undertaken to complete this report.

7 | *Borrow, J., & Russo, P. (2015). A Blueprint for Public Engagement Appraisal: Supporting Research Careers. arXiv, Physics and Society. https://arxiv.org/abs/1510.02017*

Actions for scientific institutions

- Create or expand Science Engagement departments and create more Science Engagement officer positions.
- Create workshops, for scientists and the heads of the scientific institutions, about the benefits of Science Engagement[a].
- Support and develop institutional Science Engagement initiatives.
- Show scientists that several skills which come with Science Engagement training (e.g. leadership, communication skills) are also beneficial for grant writing and communication with funders.
- Give grant writing workshops, focused on the impact section of grant proposals, specifically highlighting the portfolio of existing local, national and international Science Engagement initiatives.
- Reward scientists that develop Science Engagement initiatives, with a favourable evaluation in their performance review process or their tenure evaluation.
- Create an institutional one-pager and workshops for scientists, about the societal impact of research.
- Promote Science Engagement leadership and advocacy programs.
- Provide Science Engagement training to scientists.
- Create a portfolio of local, national and international Science Engagement initiatives in which scientists can get involved.
- Create ambassador programs that pair Science Engagement practitioners and scientists, as a way to pass on Science Engagement expertise, as well as provide support and inspiration.
- When discussing performance review process, tenure evaluation, lead pay, promotion, job interviews, etc., have present an experienced scientist that is also an experienced Science Engagement practitioner[b].

Figure 5: Actions for scientific institutions.

a | Scientists: Science Engagement is rewarding and can give a feeling of relevance and purpose; undertaking Science Engagement work helps researchers with teaching and even research itself.

Scientific institutions: Science Engagement work can raise the profile of an institution with the public, leading to higher application rates for undergraduate and postgraduate courses and increased brand awareness;

Scientists & scientific institutions: science articles that appear in the media are more likely to be cited; scientists that undertake in Science Engagement about the research conducted in their institution are more engaged and productive, as well as have more pride in the organisation they work for.

b | This person will be able to evaluate the applicants not only for their research achievements, but also by their Science Engagement efforts.

Actions for
funding institutions

- Provide more monetary funds for Science Engagement initiatives.
- Fund collaborative and co-creative research projects, with a strong Science Engagement component, that foster the involvement of the public in the scientific process and scientific-knowledge production.
- Provide monetary funds for training scientists in Science Engagement initiatives.
- Provide monetary funds for Science Engagement initiatives that are embedded within research projects.

Figure 6: Actions for funding institutions.

Actions for governmental institutions

- Create more Science Engagement bachelor and master degrees.
- Make Science Engagement a mandatory discipline in all bachelor science programmes, with a theoretical and practical component.
- Make Science Engagement a project component of all master and doctoral thesis.
- Make sure there is a good distribution of Science Engagement bachelor and master degrees, countrywise.

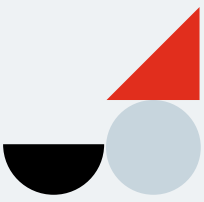


Figure 7: Actions for governmental institutions.

06.

Examples of implemented actions.

Please find below several examples of implemented actions that have been trying to push for the institutionalization of the Science Engagement field over the years:

- In the nineties, the American National Science Foundation implemented a criterion in its grant application process stating that researchers seeking funding should provide a description of how a proposed research project would affect the broader society via teaching, the inclusion of underrepresented groups, the creation of outreach relationships, public discussion of research findings, and general social benefits of the project[8].
- Wellcome Trust's Engaging Science grant program offers £3 million per year to raise public awareness of biomedicine[9].
- The Declaration on Research Assessment (DORA)[10], a document created in 2012 at the annual meeting of the American Society for Cell Biology, aims at improving the assessment of scientists and their outputs, specifically moving away from the use of the impact factor as a way to evaluate the merit of academics. One of the changes that is proposed in DORA is the consideration of qualitative indicators of research impact, such as influence on policy and practice. DORA has been signed by more than 20.000 individuals and institutions.

8 | *Ecklund, E. H., James S. A., Lincoln A. E. (2012). How Academic Biologists and Physicists View Science Outreach. PLoS ONE 7(5): e36240. doi:10.1371/journal.pone.0036240*

9 | *Poliakoff, E., & Webb, T. L. (2007). What factors predict scientists' intentions to participate in public engagement of science activities. Science Communication, 29(2), 242–263. https://doi.org/10.1177/1075547007308009*

10 | *https://sfdora.org/read/ (24.10.2021)*

- A recent paper[11] advises Marie Skłodowska-Curie Actions (MSCA) policymakers to:
  - reward MSCA applicants and organisations that engage in open and responsible research through public engagement, science education, open science and ethical research;
  - offer training within the MSCA programme, to prepare scientists and organizations for open and responsible academic, as well as non-academic, careers. This includes a focus on transferable skills such as leadership and community engagement, and attention to societal challenges.
- As part of a new Recognition and Rewards scheme, the Utrecht University, in the Netherlands, recently announced that by early 2022, every department of the university will judge its scholars by standards beyond the impact factor[12], like researchers' commitment to teamwork and efforts to promote open science. Scientists will be evaluated by their open science progress, namely progress in open-access publishing, public engagement and data sharing[13].
- A policy brief[14] from the EC-H2020 NewHoRRIzon project states that new funding rules and incentives that guide and enable researchers to engage in socially oriented and responsible research and innovation practices must be introduced. "Evaluators and research performing organizations that make decisions on funding and promotion of outstanding researchers should recognize and reward the importance of societal impact and engagement beyond bibliometric impacts. They should provide (early career) researchers with options for capacity building to implement activities that enhance science literacy, public engagement and societal impact of research and innovation across Europe."
- On the local level, researchers and the university management of the serbian University of Novi Sad, created a dedicated team that came up with new institutional measures to promote Public Engagement, among other elements of Responsible Research and Innovation[15].

11 | *Cohen, J. B., et al. (2019). Towards Responsible Research Career Assessment. OpenAIRE. 10.5281/zenodo.3560479*

12 | *A scientist's impact factor is a score that takes into account the number of publications and the citation rate of the journals where those papers are published.*

13 | *Impact factor abandoned by Dutch university in hiring and promotion decisions: https://www.nature.com/articles/d41586-021-01759-5*

14 | *EC H2020 New Horrizon – Policy Brief #5: https://newhorrizon.eu/wp-content/uploads/2021/10/newhorrizon_policy_brief_2021_October.pdf*

15 | *EC H2020 New Horrizon – Policy Brief #5: https://newhorrizon.eu/wp-content/uploads/2021/10/newhorrizon_policy_brief_2021_October.pdf*

07.

Conclusion.

Science Engagement holds the key to fighting global challenges through promoting public trust in science, evidence-based decisions and policy-making that follows scientific recommendations. However, in order for this to happen more effectively, we need to further foster the growth and development of the Science Engagement field. But what can be done?

This Commitment to Action aimed at sparking the dialogue on the institutionalization of Science Engagement topic within the international community of practitioners and come up with conclusions on potential actions on how to solve it, at the scientific, funding and governmental level:

01. Actions for scientific institutions:

Create and expand Science Engagement departments and job positions; support the development of Science Engagement initiatives and advocate for their benefits, both to society and scientists; focus action on providing information (e.g. about available Science Engagement initiatives that scientists can easily join) and Science Engagement training; create programmes to assess and reward scientists for their Science Engagement efforts.

02. Actions for funding institutions:

Provide more monetary funds for Science Engagement initiatives, including funds for Science Engagement training and initiatives embedded within research projects.

03. Actions for governmental institutions:

Create and nationally expand Science Engagement bachelor and master degrees/programs; integrate Science Engagement as a mandatory component of all research thesis.

Let's collectively foster the institutionalization of Science Engagement further, more action is needed!

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