

D3.4: Report on TIME4CS Knowledge Transfer from Front-Runners to Implementers

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Table of Contents

EXECUTIVE SUMMARY	6
1. INTRODUCTION	7
1.1 ABOUT TIME4CS	7
1.2 ABOUT THIS DELIVERABLE	8
1.3 STRUCTURE OF THIS REPORT	9
2. ORGANISATION & APPROACH OF WORKSHOPS.....	9
2.1 RELATED WORK	9
2.2 CONTENT OF THE WORKSHOPS	10
2.3 FORMAT	10
2.4 PLANNING & PREPARATION WORK	11
3. PLENARY SESSIONS	13
3.1 WORKSHOP ON IA EDUCATION & AWARENESS (AU)	13
3.2 WORKSHOP ON RESEARCH (UCL)	15
3.3 WORKSHOP ON INFRASTRUCTURE & POLICY (CC-CS).....	17
4. “ASK THE EXPERT” PARALLEL SESSIONS	19
4.1 RECURRING QUESTIONS.....	19
4.2 SPECIFIC QUESTIONS	22
5. EVALUATION.....	25
6. LEARNINGS & CONCLUSIONS	27
APPENDIX A.....	29
AU WORKSHOP: IA EDUCATION & AWARENESS	29
UCL WORKSHOP: IA RESEARCH.....	30
CC-CS WORKSHOP: IA INFRASTRUCTURE & IA POLICY.....	32
APPENDIX B: SUMMARY OF “ASK THE EXPERT” Q&A	33
AU WORKSHOP: IA EDUCATION & AWARENESS	33
UCL WORKSHOP: IA RESEARCH.....	37
CC-CS WORKSHOP: IA INFRASTRUCTURE & IA POLICY.....	40

Table of Figures

Figure 1 – Overview of identified GAs for each IA.....	8
Figure 2 - Examples of Miro Boards templates	13
Figure 3 – Results of first exercise (for illustration purpose only)	25
Figure 4 – Results of second exercise (for illustration purpose only)	26



List of Abbreviations

AU	University of Aarhus, Front-Runner
APRE	Agenzia per la promozione della ricerca europea, Coordinator
CS	Citizen Science
CC-CS	Competence Center Citizen Science, Front-Runner
CRG	Centre for Genomic Regulation, Implementer
ESF	Fondation Européen de la Science
FR	Front-Runner
GA	Grounding Action
IA	Intervention Area
KTU	Kaunas University of Technology, Implementer
PES	Public Engagement in Science
OS	Open Science
RPOs	Research Performing Organisations
R&I	Research and Innovation
Tyndall	Tyndall National Institute University College Cork, Implementer
UCL	University College London, Front-Runner
UniSR	Università Vita Salute San Raffaele, Implementer
WP	Work Package
ZSI	Zentrum für Soziale Innovation



Executive Summary

The current document, titled 'Report on TIME4CS Knowledge Transfer from Front-Runners to Implementers', has been developed within the framework of the TIME4CS project which is funded by the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No 101006201.

The purpose of this Deliverable is to report on the knowledge transfer activities that were organised under Task 3.2. This task ensured the direct and continuous communication and active knowledge transfer and brokerage going from Front-Runners (FRs) to Implementers. To do so, each FR – namely Aarhus University (AU), University College London (UCL), and Competence Center Citizen Science Zurich (CC-CS) – organised one workshop covering one (in the case of CC-CS two) of the four Intervention Areas (IAs). Representatives of each implementing Research Performing Organisation (RPO) attended these workshops. Due to Covid-19 restrictions these workshops were held virtually via Zoom. The three workshops were the following ones:

- 1. Workshop: IA Education & Awareness, led by AU on Tuesday, October 19th, 12–2pm CEST
- 2. Workshop: IA Research, led by UCL on Wednesday, October 27th, 12–2pm CEST
- 3. Workshop: IA Infrastructure & IA Policy, led by CC-CS on Wednesday, November 3rd, 12–2pm CEST

These workshops are seen as sort of kick-off of further support from FRs for the Implementers throughout the project activities, ensuring Implementers to maintain privileged contacts with and access to the FR's know-how, lessons learned and success factors to enhance Implementers' capacity based on their concrete needs. Due to the Covid-19 pandemic restrictions, the TIME4CS consortium decided to hold the workshops online (it was originally planned as one full day workshops) and split it into three sessions.

1. Introduction

1.1 About TIME4CS

TIME4CS aims at facilitating a way in which the scientific ecosystem could better take societal views into consideration by supporting Research Performing Organisations (RPOs) in defining and implementing Institutional Changes that can lead to a better and more effective engagement of citizens in research and innovation. Those Institutional Changes inside RPOs will entail transformation of their governance systems by taking into account both the social (e.g., mindset of people inside the organisation) and the organisational (e.g. norms, protocols, procedures, and policy) aspects of RPOs. To facilitate this process, TIME4CS has identified four Intervention Areas (IAs) that alone or combined can stimulate the Institutional Changes necessary to promote public engagement in Research and Innovation (R&I) activities. The four IAs are:

- **Research:** Acknowledgment by the RPOs' ecosystem of CS as an evolving set of research methods and of its societal and educational benefits, through use of CS in research projects and creation of CS communities of practice;
- **Education and Awareness:** Activities to raise awareness and build capacity amongst researchers, funders and civil society of criteria for successful CS activities in compliance with ethical, legal and privacy regulations. This includes events to promote CS and training programmes within the RPOs (also by establishing links with existing EU projects and training programmes on CS);
- **Support resources and Infrastructure:** Creation within the RPOs of a single point of contact for addressing CS questions and of a system to support researchers implementing CS activities, including support to CS projects for long-term commitment for infrastructure and data repositories;
- **Policy and Assessment:** Assessment of CS contributions and adaptation of research evaluation policies and reputation systems accordingly, taking into account incentives which could foster the implementation of CS activities.

For each IA, the TIME4CS consortium has identified a preliminary set of Grounding Actions (GAs), i.e. concrete actions that are recommended to undertake in order to achieve Institutional Changes. These GAs focus mainly on CS and Public Engagement in Science (PES), but also the more general concept of Open Science (OS) is considered - as Institutional Changes promoting OS are often paving the way to the ones promoting PES and CS. In Task 1.2 the original GAs have been slightly modified and a few additional GAs have been added, which expand the range of possible activities based on the history and direct experience of the FR organisations. Detailed information can be found in the report "D1.2: Best practices repository of TIME4CS frontrunners"¹. The GAs are summarized in the graphic below (see Figure 1).

¹ <https://doi.org/10.5281/zenodo.5017362>

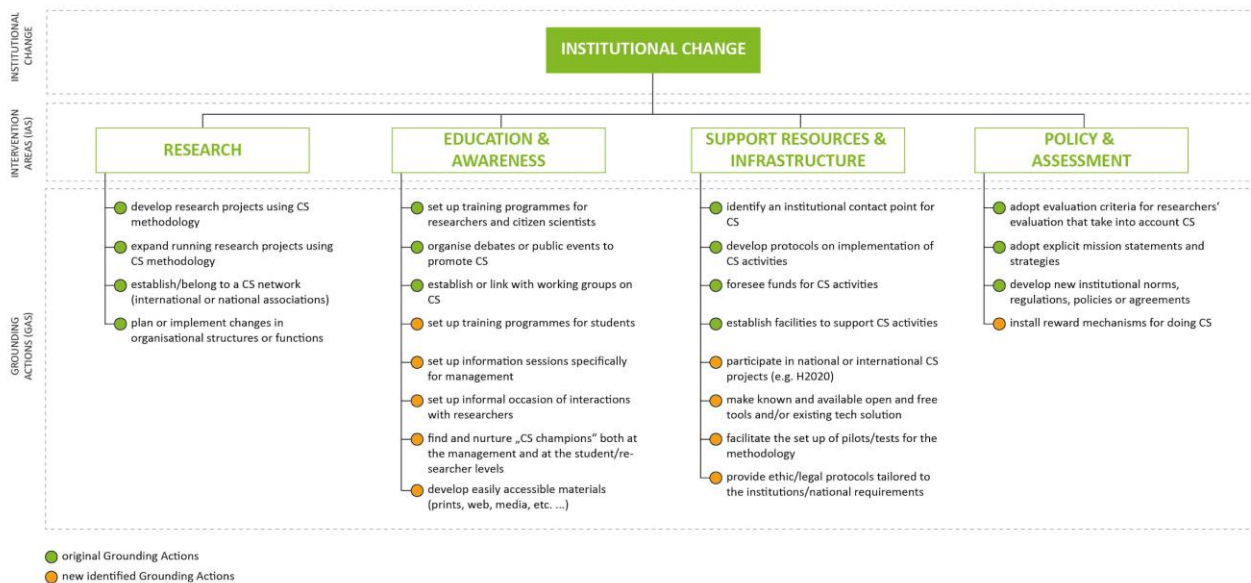


Figure 1 – Overview of identified GAs for each IA

The methodology of the TIME4CS project strongly relies on the knowledge transfer from experienced institutions (Front-Runners, FRs) and those that are at an early stage of adoption of Citizen Science (Implementers). The mutual learning program leads to the development of specific and tailored roadmaps for each implementing organisation and supports the implementation of specific GAs described in the individual roadmaps (as detailed in D2.1: Compilation of roadmaps and Grounding Actions for the Implementers - First Version ²).

1.2 About this deliverable

The purpose of this Deliverable is to report on the knowledge transfer activities that were organised under Task 3.2. This task ensured the direct and continuous communication and active knowledge transfer and brokerage going from FRs to Implementers. To do so, each FR – namely University of Aarhus (AU), University College London (UCL), and Citizen Science Center Zurich (CC-CS) – organised one workshop covering one (in the case of CC-CS two) of the four IAs. Representatives of each implementing RPO – these are Tyndall National Institute University College Cork (Tyndall), Kaunas University of Technology (KTU), Centre for Genomic Regulation (CRG), and Università Vita Salute San Raffaele (UniSR) – attended the workshops. Representatives of the Agenzia per la Promozione della Ricerca Europea (APRE), CC-CS and Fondation Européenne de la Science (ESF) designed the workshops' format and facilitated their smooth and efficient running. Due to Covid-19 restrictions, the workshops, originally planned as one day face-to-face meetings, were held virtual via Zoom. In particular:

- 1. Workshop: IA Education & Awareness, led by AU on Tuesday, October 19th, 12–2pm CEST

² <https://doi.org/10.5281/zenodo.5743299>

- 2. Workshop: IA Research, led by UCL on Wednesday, October 27th, 12–2pm CEST
- 3. Workshop: IA Infrastructure & IA Policy, led by CC-CS on Wednesday, November 3rd, 12–2pm CEST

These workshops are seen as sort of kick-off of further support from FRs for the Implementers throughout the project activities, ensuring Implementers to maintain privileged contacts with and access to the FR's know-how, lessons learned and success factors to enhance Implementers' capacity based on their concrete needs.

1.3 Structure of this report

In the next chapter, the organisational aspects and the approach of the workshops are explained. This includes the methodology, structure, preparation and execution of the workshops (see Chapter 2. Organisation & Approach of Workshops). The concrete outcomes of the three workshops are then summarized in Chapter 3. Plenary Sessions and Chapter 4. "Ask the Expert" parallel sessions, and their evaluation by participants are presented in Chapter 5. Evaluation. Finally, the lessons learned and conclusions are presented in Chapter 6. Learnings & Conclusions.

2. Organisation & Approach of Workshops

2.1 Related work

In the context of the activity of Work Package 2 "Roadmap framework leading to institutional changes", ESF developed (in particular as support for the implementation of T2.1 and T2.2) a "Reflection Tool" aimed at assisting Implementers in developing their own personalised Roadmaps to support Institutional Changes promoting Citizen Science. The tool guides and supports Implementers in their reflections about goals, stakeholders, success criteria, resources, obstacles, previous CS experiences, and facilitates the identification of the concrete steps and actions that need to be carried out throughout the project. When using the Reflection Tool, Implementers are invited to look at the GAs as identified in deliverable D1.2 and select at least four GAs (one for each IA) that they would like to implement in the short term (lifespan of the project).

Thanks to a series of meetings based on the Reflection Tool and run (by WP2) in the period June-September 2021, a first version of the roadmap for each Implementer – including a draft of their selected GAs – was made available to FRs prior to the running of their knowledge sharing workshops. This information provided invaluable insights to support the workshop's content, and the workshops in turn helped to further defining the GAs and the roadmaps, and fed into the co-creation stakeholder events organized by the Implementers. This cross-pollination was beneficial to all parties involved, and ended up feeding the first version of the Roadmaps in Deliverable 2.1 "Compilation of roadmaps and Grounding Actions for the Implementers – First version"³.

³ <https://doi.org/10.5281/zenodo.5743299>

2.2 Content of the workshops

The results of the Reflection Tools exercise, specifically the first selection of GAs to be included in the initial roadmaps, were analysed to identify both common and specific requirements of each Implementer. The ultimate aim of the analysis was to optimize the workshops' content and usefulness by focusing only on the selected actions, and by identifying and inviting all stakeholders potentially involved in all aspects of the implementation activities. The information extracted from the roadmaps was also complemented with the one provided by each Implementer during the presentations at the monthly consortium meeting of September 2021. An overview of the GAs that were chosen by the Implementers (note this was before the final version of the roadmaps, so these GAs may be slightly different from the final ones in D2.1) are listed below.

UNISR

1. Participating in a CS Network [Research; Edu & Awareness]
2. Implementing changes in the organizational structures or functions [Research; Supp Res Infra]
3. Setting-up information initiatives for researchers and training programs for students [Edu & Awareness]
4. Identifying an institutional contact point for CS [Supp Res Infra]
6. Adopting evaluation criteria for researchers' evaluation considering CS [Policy & Assessment]

Tyndall

1. CS postgraduate teaching module [Edu & Awareness]
2. Researcher awareness raising CS [Edu & Awareness]
3. Promoting funding awareness in CS [Supp Res Infra]

CRG

1. To include CS methodology as a regular methodology in research. [Research]
2. Set-up training programs [Edu & Awareness]
3. Supporting implementation of CS projects [Supp Res Infra]
4. Develop policies and guidelines [Policy & Assessment]

KTU

1. Research & Networks [Research]
2. Non-formal education programs [Edu & Awareness]
3. Virtual Hub and Contact Point for CS Projects [Supp Res Infra]
4. To prepare strategic document CS guidelines [Policy & Assessment]

2.3 Format

The format of the workshops was the result of a careful evaluation by WP3 partners of different potential approaches, where differences lay mainly on the diverse ways of mapping the needs of the Implementers to the expertise of the FR, and on the different ways to balance time for general vs specific interactions. The goal was to find a format that would optimize the knowledge exchange by taking advantage of the commonalities while also allowing for some dedicated tailored exchanges.

While most of the GAs selected by the Implementers were the same for the different IA - therefore allowing for a common introduction and collective discussion/sharing - the details of the implementation were extremely specific and dependent on the different academic and geo-cultural situations – requiring dedicated time and attention. Also, while the subject’s knowledge of each FR is quite broad and covers most (if not all) the different IAs, it is also noticeably different in terms of origin, history, and approach. The complementarity of experiences and expertise suggested that each Implementer would profit from the opportunity of a one-on-one dedicated conversation with each FR.

Ultimately, the following solution was deemed optimal to enable effective “knowledge sharing and mutual learning”:

- FRs would run a total of 3 workshops, one each for the IAs of “Research” and “Education & Awareness”, and one for the combined IAs of “Support resources & Infrastructure” and “Policy & Assessment”, as only few GAs were selected in these two IAs.
- Given the global situation with the Covid-19 pandemic, the workshops would be held virtually with a duration of 2 hours each.
- Each workshop would be hosted and led by a FR, and would consist in three parts:
 - **Part 1: General intro on the selected GAs.** This initial part would provide the opportunity to introduce and discuss the specificities of each selected GA in the IA. It would also allow for the contribution of external speakers/stakeholders from different parts of the host FR institution, providing potentially unique insights and first-hand experiences.
 - **Part 2: Individual “Ask the Experts” Q&A sessions.** In the second part, each Implementer would have the opportunity to focus the conversation on its own needs and specificities. Hosted in four separate virtual “rooms”, one per Implementer, the individual Q&A sessions would allow exchanging with all FR experts. Due to the complex structure and limited duration, this part would need to be carefully prepared and planned.
 - **Part 3: Evaluation.** Each workshop would end with an evaluation exercise for the collection of immediate feedback by participants.
- The workshops would be run on the UZH Zoom platform to ensure full control over the settings, to facilitate the implementation and management of breakout rooms, and to allow the smooth moving of participants (FR experts) between the rooms.

2.4 Planning & preparation work

After agreeing on the format, the organizers focused on the detailed plan and preparation work.



2.4.1 Preparation work for FRs

Each FR was assigned to host one workshop, with the IAs pairing based on the specific experience and expertise. AU was asked to host the first workshop focusing on IA Education & Awareness, UCL was selected to host the second workshop on IA Research, and CC-CS was assigned the third workshop covering the combined IAs of “Support resources & Infrastructure” and “Policy & Assessment”.

While the overall responsibility of each specific session laid on the host FR, all FRs were asked to commit to attending all 3 workshops.

The content of each workshop was based on the analysis and GAs mentioned above, and finalized by the host FR, including the choice of guest speakers and experts. This was again done in coordination with WP2 and WP5 partners (ESF and Zentrum für Soziale Innovation (ZSI)) as, due to their work with the Implementers on the stock-taking exercise and the development of the roadmaps, have a deeper knowledge of their individual status and needs.

2.4.2 Preparation of Individual “Ask the Experts”

According to the format design, in Part 2 of each workshop participants are split into four breakout rooms to join four parallel sessions, one per Implementer. In their room, Implementers drive the “Ask the Expert” conversation, focusing their questions on the specificity of their roadmap, including doubts and barriers. In practice, they have 10 minutes of exclusive interaction with representatives of each of the FRs, who can provide individual answers and practical tips. FR experts are moved to a different breakout room after 10 minutes, for a total of 4 rounds so to give the opportunity to all Implementers to meet with all the experts.

Given the ambition of this format, the organizers decided to facilitate the interaction by providing a set of Miro boards prepared by the one of the organizers (APRE) for each Implementer and based on the outcome of the reflection tools exercise. The boards supported a very focused conversation, directly relevant to the Implementer’s work of planning and implementing GAs: a set of red sticky notes was pre-filled with the Implementer’s preferred GA(s) and the corresponding barriers/obstacles as identified in the reflection tool (see Figure 2)

Prior to each workshop, Implementers were asked to review these notes and already formulate relevant questions for the FR experts, adding individual challenges and obstacles they may encounter with implementing the planned GAs. During the workshop, green sticky notes were then filled with the answers, tips and advice of the FR. A facilitator was assigned to each room to ensure a smooth and timely running of the conversation, helping out Implementers with the questions and timing, and taking care of writing down in the green notes all FR’s input. To further enrich the discussion in the breakouts – FR experts were also assigned some pre-reading before each workshop, including a recap of the GAs of choice and an overview of the Reflection Tool outcomes for the IA in focus.

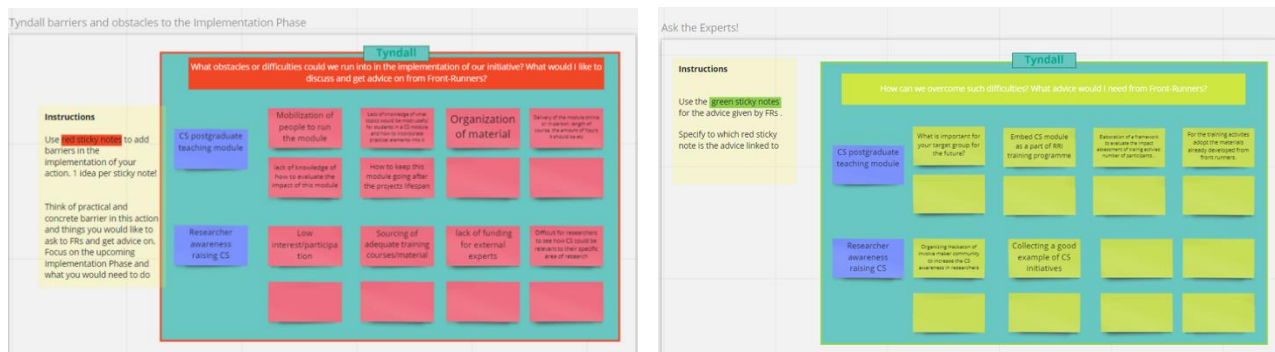


Figure 2 - Examples of Miro Boards templates

2.4.3 Evaluation exercise

At the end of each workshop, ZSI facilitated an "*evaluation of the training*" that could be used for the impact assessment of the project, specifically about the usefulness and set-up of the workshops. Detailed information about the impact assessment of the project can be found in the "D5.1: Evaluation & Impact Assessment Plan"⁴.

In practice, the exercise consisted in rating some aspects of the workshop and answering questions, including:

- open questions such as:
 - What are the most important takeaways from the workshop?
 - What are the highlights of the workshop?
 - What could be improved for the next workshop?
- four rating questions on the Miro board regarding the usefulness and set-up of the workshop.

3. Plenary Sessions

In the following sections, an overview of the content of the first part of each workshop is provided, together with the main points discussed and the summary of key messages. The detailed event report, including the agenda, participants list etc., is available in Appendix A.

3.1 Workshop on IA Education & Awareness (AU)

In the first workshop (19 October 2021), Aarhus University (AU) lead the activities focused on the GAs selected by Implementers in the area of Education and Awareness, namely:

⁴ <https://doi.org/10.5281/zenodo.5805863>

- Set up training programs for researchers, students and citizens
- Set up informal opportunities for interactions with researchers
- Creating public awareness around citizen science
- Promoting institutional changes that are necessary to build sustainable educational and awareness-raising environments

This included some of the following aspects: curricula, learning goals, and means of evaluation for courses, integration of courses into existing educational programs/objectives; networking, seminars, and working groups for researchers; public events and activities; CS champions; strategies and monitoring goals/indicators; additional resources and infrastructures.

Presentations and Speakers	
Awareness raising within RPOs	Gitte Kragh, Department of Mathematics - Center for Science Studies AU
Training for researchers, students and citizen scientists	Kristian Hvidtfelt Nielsen, Department of Mathematics - Center for Science Studies AU
Debates and public events to promote citizen science	Gitte Kragh, Department of Mathematics - Center for Science Studies AU
Connecting education, knowledge exchange and public awareness to institutional resources and structures	Kristian Hvidtfelt Nielsen, Department of Mathematics - Center for Science Studies AU

Table 1 – Plenary presentation and speakers AU workshop

Key messages

Time4CS members Gitte Kragh and Kristian Hvidtfelt Nielsen focused on AU's experience on the selected GAs, which they grouped under 1) Awareness raising within RPOs; 2) Training for researchers, students and citizen scientists; 3) Debates and public events to promote CS; as well as 4) Connecting education, knowledge exchange and public awareness to institutional resources and structures.

Key insights included:

- **Awareness raising within RPOs:** As first activity, the “target” group(s) or individuals need to be identified and the internal stakeholders who are or might be interested in CS need to be mapped. It is important to show them clearly what is in it for them (invitations to collaborate on a proposal, paper, events, project, etc.). They also can be asked directly what they would like to focus on. Different forms of CS should be presented to help them contextualize it to their interest. To meet this goal, easy access to material and knowledge should be provided, including access to existing working groups on CS.

- **Training for researchers, students, and citizen scientists:** It is important to be very clear about who is targeted and training material should be tailored accordingly: experienced CS researchers, researchers with no previous CS experience, citizens and students have different needs, CS skills and interests related to specific areas, topics or projects of CS.

When setting up training programs for students, it is important to include both scientific and societal outcomes, the analysis of specific projects (including their goals, methods used, and expected/actual outcomes), and the plan and design of a CS project based on principles and frameworks presented in the course. About the format, for AU it was fruitful to have a CS course embedded in an existing MSc programme to secure formal recognition and visibility. It was also an opportunity to reach out and to connect to CS researchers at AU, for instance to invite them as guest lecturers.

Other possible formats include Master Classes (for researchers) and talent programmes for students, which can also involve researchers and encourage them to use CS methodology by mentoring small CS (pilot) projects.

- **Debates and public events to promote CS:** AU tried different ways to engage the public, piggybacking bigger events or organizing independent ones. Main learnings include tips on choosing day and languages, and awareness of the heterogeneity of the “public” involved and its level of engagement.

To conclude, AU highlighted two strategies for finding an institutional “home” for CS. One is looking at existing structures within the institution, so that already available resources (i.e., educational programmes and funding schemes) can be used to facilitate and promote CS. Another, more ambitious, option is to change institutional structures to accommodate CS. In this case CS champions are essential.

3.2 Workshop on Research (UCL)

In the second workshop, held on 27 October 2021 and led by University College London (UCL), several invited speakers shared UCL’s experience in driving Institutional Changes in the area of Research and promoting more effective engagement of citizens in Research & Innovation.

The discussed GAs were:

- Expand running research projects using CS methodology
- Belong to a CS network
- Plan or implement changes in organizational structures or functions.

This included aspects of developing research projects using Citizen Science methodology. It also included the challenges and means to expand running research projects using Citizen Science methodology. UCL discussed the role of establishing or belonging to a Citizen Science network (international or national associations). And they finished by discussing the steps required for planning or implementing changes in organisational structures or functions to improve the engagement of the public in the Research and Innovation (R&I) process, and to better embed R&I activities in society.

Presentations and Speakers
Strengths and areas of opportunities when developing research projects using a Citizen Science methodology Dr Alexandra Albert – Researcher, Department of Geography UCL
Challenges and means to run research projects using Citizen Science methodology: an emphasis on engaging with local communities in London and Lebanon Dr Mayssa Jallad and Dr Nikolay Mintchev - Research Associates, Institute for Global Prosperity UCL
Why establish or belong to a Citizen Science network (internal, national, and international) Kirsty Wallis, Head of Research Liaison & Office for Open Science UCL Prof. Muki Haklay, co-director of ExCiteS, Department of Geography UCL
Steps required for the planning and implementation of changes in organizational structures to enhance the engagement of the public in Research and Innovation (R&I) Dr Paul Ayris, Pro-Vice-Provost (UCL Library Services)

Table 2 – Plenary presentation and speakers UCL workshop

Key messages

In the first part, UCL reviewed the bottom-up path adopted by UCL and provided relevant examples of the CS projects developed, the generation of community engagement initiatives, the different internal and external networking efforts in support of CS initiatives, and the organisational changes that have allowed CS to flourish.

Key insights included:

- To expand running research projects using CS methodology:** The first presentation was about the role of researchers in CS and the strengths and areas of opportunities when developing research projects using CS methodology was outlined. The CS project ActEarly UKPRP (<https://actearly.org.uk/>) – a five-year medical research council-funded project which aims to develop city collaboratories in areas of high levels of child poverty was presented. In order to co-produce the project's CS strategy, the project team among others used an appreciative inquiry model which focused on the strengths and resources within the communities, they organized a series of workshops with different community groups as well as in-depth interviews with stakeholders. The aim was to engage established community-based networks and groups. The main learnings were 1) the importance of building trust and reciprocity, as well as a commitment to action; 2) the importance of time to build relationships, adequate resourcing and to work flexibly; 3) the importance of ensuring the community feels listened to; 4) building up peer support, and action and feedback that is visible; 5) adaptability of resources to build capacity within community groups and organisations.

The second presentation provided details on a CS project run in Hamra district of Beirut with the [RELIEF Center](#). Challenges and means of the project were outlined with a special focus on engaging with local communities. To facilitate this engagement, the research team organized many different



activities and had a continuous professional but also personal interaction with their citizen scientists. At the same time in London the project team was working on a CS Academy, which was going to work very closely together with the team in Beirut to develop a training programme to support knowledge exchange between the citizen scientists' teams. As this training will eventually be accredited, researchers are working on a guidemark (a form of accreditation).

- **Citizen Science Networks:** In the third presentation it was outlined why it is important to establish or belong to a Citizen Science network (internal, national, and international). At UCL, CS and Open Science support is centered in two areas – the ExCiteS Group and the Office for Open Science & Scholarship. A potential downside of centralization is that the team needs to have a broad knowledge, so here again networks are important. They can provide a source of support and current awareness but also share knowledge, best practices and provide access to communities. CS Associations are for e.g., the Citizen Science Association (CSA), the European Citizen Science Association (ECSA), Australian Citizen Science Association (ACSA) and the African and Asian Citizen Science networks. Also, local and national networks are emerging across Europe.
- **To implement changes in the organizational structures or functions:** The last presentation focused on the steps required for the planning and implementation of changes in organizational structures to enhance the engagement of the public in Research and Innovation (R&I). The role of the UCL Office for Open Science & Scholarship, which played a crucial role in this, was further highlighted. The office is designed to act as the focal and governance and networking contact for the activities of the 8 pillars of Open Science – including CS – across UCL. One of the purposes is to try to bring a unified narrative together about Open Science activities. The office provides leadership, advocacy and engagement.

3.3 Workshop on Infrastructure & Policy (CC-CS)

On 3 November 2021, in the last workshop of the series, CC-CS introduced some of the challenges that they faced on the way to establish the Center, and some of the solutions adopted to achieve Institutional Changes in the two Intervention Areas of Resources & Infrastructures and Policy & Assessment.

The discussed GAs were:

- Identifying an institutional contact point for CS
- Promoting funding awareness in CS
- Supporting implementation of CS projects
- Developing policies and guidelines

Presentations and Speakers	
A single-entry point for CS in Zurich: how did CC-CS happen?	Prof. Mike Martin, Chair of the Board of Directors CC-CS, University of Zurich
CC-CS: an overview of the offering and infrastructure	Rosy Mondardini, Managing Director CC-CS, University of Zurich
CC-CS at work: tools and community management	Ursina Roffler, Community Manager CC-CS, University of Zurich
CC-CS at work: criteria and guidelines	Rosy Mondardini, Managing Director CC-CS, University of Zurich

Table 3 – Plenary presentation and speakers CC-CS workshop

Key messages

The first part of the workshop provided the opportunity to illustrate some of the founding strategies, current infrastructures, and adopted policies of the CC-CS.

- Prof. Mike Martin, Chair of the CC-SC Board of Directors (and one of the “CS champions” in Zurich) shared some elements of the “secret recipe” to set up a CS center under the roof of an academic institution. For example, to convince the management, a critical mass of professors from several disciplines/faculties that send a clear message to the presidency needs to be created. As professors may have vested interests, a president needs also to hear the same message from outside independent experts (Zurich managed to get LERU’s consensus that CS is the way to go for the future). Changes in management are always an opportunity for innovation, as new management and presidents rightly aim at “making a difference”.

Concerning grants, national funds (around 600M/CHF/year in Switzerland) can be sensitive to “Ivory tower” reputation, a risk that CS can effectively mitigate. An existing CS infrastructure will increase the competitiveness of the institution and open new doors for (innovation) grants. Securing funds from external bodies can also help create leverage, especially when such funds are conditional on equal investments by the institution.

Legal and ethical requirements are often an obstacle for CS. In Swiss academic institutions, for instance, only members of the staff can be voting members of committees, de-facto making it impossible for CS to treat citizens and scientists on equal footing. Ethics approval for health studies is based on standards where data provided by participants are owned by the Institution and not by the people who generated them. Similarly, potential ethical and legal issues impose anonymization of data, decreasing their research potentials and value. But as often happens, difficulties generate opportunities. Universities need to remain competitive and for this they need to unlock the value of personal data. CS provides platforms and tools (for example the CC-CS Project Builder) that allow data ownership and the possibility to easily donate personal data, avoiding such issues.

- Rosy Mondardini, Managing Direct of the CS Center, presented an overview of the mission and goals of the Center, its governance, functioning and main activities. The Center structures its activities around 4 pillars: tools (platforms for the implementation of new projects and advice on the use of

other exiting open tools), methodology (insights into the use of CS at all stages of the research process and of the project implementation), community management (best practices and standard techniques for managing the communities of researchers and volunteers), and network/partnerships (including collaboration for the submission of proposals and grants and connection with the national and global CS networks).

- Ursina Roffler, the Center’s Community Manager, provided details on the community management’s strategy and tools of CC-CS, based on accepted classifications of the possible levels of engagement of participants. The presentation included tips on how to build and manage a community in the different stages of a project design and implementation, and an overview of the many ways CC-CS handles consultation, communication and connection with their community of researchers and citizens in Zurich and beyond.

4. “Ask the Expert” parallel sessions

As previously explained, each workshop featured 4 separate break-out rooms (Zoom) where discussions focused on the specific questions and needs of each implementer. While the general topic changed for each workshop, some of the questions in the parallel discussions kept coming back over and over again in the different rooms (and sometimes independently from the topic of the workshop). To avoid repetitions, firstly such recurring questions and the consolidated experts’ answers are summarized (Section 4.1). Some other relevant questions and answers, although specific to each implementer, are then reported (Section 4.2, for more details see Appendix B).

4.1 Recurring Questions

4.1.1 IA: Education & Awareness

Q: Any recommendations for training? Sourcing of adequate training courses/material

- To set up a CS programme or an entire new course about CS it is important to think about the priorities of the hosting institution. For example, if a priority is to promote scientific excellence, then arguments how CS can benefit scientific excellence need to be emphasized. Also, the Graduate School office in charge of courses and the PhD supervisors could be contacted to learn about their priorities.
- Another possibility is to run informal interviews with researchers to probe their interest and motivation in CS, public engagement, and democratization of science.
- If there is interest, a starting point could be to propose to embed CS in existing courses, for instance the ones which already include parts on science communication, open science, and research integrity. For PhD students, it is important to start this course early because implementing CS projects takes time!

- For training resources, the wheel doesn't need to be reinvented. There is plenty of existing material available on different platforms such as EU-Citizen.Science and other EU projects' platforms. Also other courses exist (e.g. course at UCL and AU , such as "CS and Scientific Crowdsourcing". <https://www.ucl.ac.uk/short-courses/search-courses/citizen-science-and-scientific-crowdsourcing-introduction>)
- For technical resources and tools, there are platforms that can be used by the students for training and piloting projects, such as the one offered by the CC-CS, and many other open solutions available for many kinds of CS projects.
- It is important to include and acknowledge that CS is not the answer to all kinds of research questions. It is crucial to be available to explore with researchers their goals, their data needs, and to help them assess if CS is the right choice. CS-CS published a "CS handbook" (<https://citizenscience.ch/en/about/resources>), and the Center for ecology and hydrology published a guide of how to use CS appropriately: <https://www.ceh.ac.uk/corporate-publications#citsci> . Many more similar resources can be found online.

Q: How do you evaluate the impact of new courses/ training?

- To evaluate the impact of training, questionnaires can be used about student's motivations and interests before the course, and again about their learnings, intentions, and acquired network after the course. This can be repeated after six months for assessing long-term impact, including examples of how they used the knowledge, what new contacts /networks they made, follow up activities, etc.

4.1.2 IA: Research

Q: Insufficient knowledge about the CS methodology often generates a lack of interest by researchers in using it – how can we overcome this?

- It is important to focus on the researchers' perspective and show them how CS can benefit their research in unique ways. CS doesn't have to be an extra burden but an opportunity! To achieve this a bit of theory helps, but examples can be more powerful in providing inspiration on possible applications of the methodology. Therefore, relevant examples and success stories of CS projects in the audience's domain (good sources of examples include Zooniverse and EU-Citizen.Science) should be presented. Also, the terminology they may be more familiar with (e.g., patient involvement, action researcher, participatory approaches, volunteering etc.) should be used.
- Proactive reach out to departments and research groups offering presentations, inspirational talks by other researchers, networking events, seminars. Leave ample space for conversations and questions should be considered. It is recommended to work on the edge of the system if there is no money as these don't need to be expensive. It is important to conclude by offering training opportunities and support (see below).

- A very effective way to generate interest is to assign some funding (for instance seed grants) to researchers and students to engage with CS activities. This shows institutional legitimacy and encouragement. Funds can come from the university or via international collaborations, including EU projects or local funding agencies. To this goal, it may help to organize networking events involving local funding stakeholders (foundations, organizations, etc.) and researchers.
- It might be important to explain the potential impact of experience with CS/public-engagement activities in the researchers' CVs, including how increasingly projects get funded if they include these aspects.

Q: How do you find citizens to participate in projects?

- The collaboration with partner organisations is important to establish links with existing communities and to try to identify the most relevant audience for the project. In case of co-creation, they need to be involved as early as possible in the process. When reaching out it is crucial to emphasise why it is important that citizens participate.
- Once the target group(s) are identified, it is possible to also reach out with Social Media – depending on the topic of the project there may be existing Facebook groups that have an interest in joining the project. Engaging campaigns can be considered in coordination with libraries and museums.
- It is also possible to use existing collaborative spaces (such as maker spaces) or events (such as hackathons) to promote and advance the projects or to simply organize a workshop! Advice and a variety of good practices are available at EU-Citizen.Science or Science at Home (<https://scienceathome.org/>).

4.1.3 IA: Infrastructure and Policy

Q: How/where do we establish a CS contact point, and which are its responsibilities?

- Regarding the location of a CS contact point within the institution's infrastructure, it is recommended to start with looking for opportunities in "neutral" areas which are already there, such as the library, open science, or in the outreach/communication offices. In such places there are not vested interests of specific research domains or groups. However, sitting with outreach/communication activities can be risky, as researchers may perceive CS as science communication and not as a research methodology.
- Concerning the responsibilities of a "CS person", the person doesn't need extensive experience before providing value! The responsibility of the person can be – especially at an initial phase, while building proper expertise in house – to provide support with the methodology and tools by building the right connections. For this it's useful to make a map of "who is doing what" in CS, including info on local and global existing projects, existing resources, training material, case studies, etc. It may also be useful to create an online space to showcase these.

- For hiring, it might be interesting to explore the easier solution for the institution – an administrative position such as project manager may be easier to finance than a research position. Also, funding can be internal or external (foundations, EU projects) and the person can have multiple hats within the organization, and be given the specific mandate to look for additional funding.
- Overall, it is important to raise awareness internally so that all potentially involved – especially at the management level - appreciate the potential of such a role/structure for the entire organization.

Q: How can we (sustainably) fund CS activities?

- Funds for CS can come from different sources, including universities, projects, international collaborations, local foundations, etc.
- Some of these funds can be given directly to researchers to encourage the implementation of CS activities.
- Concerning EU and national funding agencies, increasingly projects get funded by national and international funding agencies if they include public engagement, including specific pots of funding dedicated to CS. In this case, CS can also be seen as bringing funding opportunities.

Q: Any recommendations for guidelines and policy? What should be included?

- It is crucial to provide a general intro, and then the guidelines to the needs of the audiences need to be tailored. There are guidelines available from other platforms/projects/networks (ECSA, EU-citizen.science, ...)
- Ethics comes out often, and it is effective to collaborate with researchers in an ethical group to develop guidelines that would have to be in line with the directives of the ethical committee at the institution. It is also useful to build on the work of existing task forces in CS networks.
- For general policies, it is recommended not to start from scratch (policy development takes time!) but to look at what the institution already has (i.e., GDPR, Open Science policies, partnership agreements, consent forms, etc.) as there is usually a lot of material developed in the institution's legal framework.
- It is important to look at existing documents and policies where aspects of CS / public engagement can be mentioned or referred to, even if the word CS itself is not there! (This is valid also for funding opportunities).

4.2 Specific Questions

Below are some interesting questions discussed within some of the rooms.

4.2.1 IA Education

Room	Question	Answer
Tyndall	How to keep alive modules developed within TIME4CS after the project's lifespan?	The Graduate School office in charge of courses could be contacted to find out their priorities. If they think there is little interest for PhDs in CS, it is recommended to propose to embed CS in existing courses.
UniSR	How to overcome researchers' lack of interest in using CS in the health field?	About specific experience in CS projects in the medical and health sector: UCL has a collaboration with an international fund of medical research the WELLCOME Fund. The fund is particularly interested in strengthening the relationship between scientists and citizens. External funding of UCL can be found here: https://www.ucl.ac.uk/culture/public-engagement/funding . Also, there is the specific working group on Citizen Science for Health (https://ecsa.citizen-science.net/working-groups/citizen-science-for-health/) where people might be found who have a lot of experience.
KTU	What experiences do experts have with the length of training courses?	At the CC-CS the Participatory Science Academy (PWA) offers a variety of academic courses and summer/winter schools on CS. CC-CS also organizes workshops, demos of tools, challenges etc. to show people how easy it is to pilot ideas. UCL produced a MOOC, a free online course which is also embedded in courses at UCL.
KTU	How to motivate researchers to participate in networks (e.g., ECSA)?	Institutions and individuals could consider joining existing working groups, such as the ECSA WG on "Citizen Science in Universities" for shared interests and concerns.

Table 4 – Specific questions Tyndall

4.2.2 IA Research

Room	Question	Answer
UniSR	How can we improve internal communication practices within the institution and internationally?	It is recommended to participate in Working Groups (WG) within ECSA that focus on different topics or even establish a new WG. It is also a good way to get to know other researchers using CS, exchange knowledge and best practices, etc. An interesting incentive for researchers is also that some WG publish papers together.
UniSR	How do you facilitate the process of institutional integration?	To be successful it is important to have 1) an interested senior leadership in the institution otherwise resources and time to implement a successful programme are

		<p>non-existent. Once the place is defined it is important to secure 2) brilliant communication and to define 3) how to win support.</p> <p>It is important to start small and build up, e.g., having CS champions in the field of research. It is recommended to see what resources, information, tools, training and guides are already available in different areas and to signpost to them.</p> <p>Another recommendation is to join projects first and see how it is done instead of creating your own project. E.g., an ecological institution could join BioBlitz or organize a local group to join the once-a-year event “City Nature Challenge”. Volunteer Computing is another example where people can join very easily. Another possibility is to organize “world cafés” where people try out different things.</p>
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Table 5 – Specific questions IA Research

4.2.3 IA Infrastructure & Policy

Room	Question	Answer
Tyndall	How can we better communicate within the Institution?	<p>It's easier to start by building on existing collaboration with other CS projects where Tyndall or UCC are involved, and create a critical mass of researchers in different fields via personal contact or with the organization/ participation in events.</p> <p>Also, it's recommended to organize events/workshops with the local researchers.</p>
UniSR	How can we effectively proceed with establishing an institutional contact point for CS?	<p>It could be useful to adopt a top down and neutral approach identifying a person who people trust with no specific role in research as researchers could distrust other researchers. The contact could be a facilitator, providing information regarding CS at the beginning as building an effective knowledge base requires time.</p>
KTU	How to convince highest level management to set CS as a strategic aim? How to convince researchers to get involved in CS?	<p>Local champions (change agents) within the institutions and/or departments should be identified. Finding someone who already uses CS is very effective for researchers (they can better relate), while for the management an external consultants/expert from outside can be more convincing. These champions should be encouraged to exchange with each other.</p>

Table 6 – IA Infrastructure & Policy

5. Evaluation

At the end of each workshop all participants were asked to join three evaluation exercises prepared by ZSI.

In the **first exercise** they were asked to rate four statements by placing a star in the quadrants of an evaluation circle, as shown in Figure 3. To simplify the rating, we refer to ratings in the inner circle (darker shade, 66-100%) as “strongly agree”, in the second circle (33-66%) as “partially agree”, and in the external circle (0-33%) as “do not agree”.

- **I have learned something important in the workshop:** This was rated similar over the three workshops where the majority strongly agrees and some participants agree partially.
- **The workshop provided concrete answers on how to overcome our potential barriers for implementation:** Whereas the majority strongly agreed in the two workshops of AU and CC-CS, in the workshop of UCL the majority only partially agreed.
- **The time allotted was utilized/filled in an optimal way:** In all three workshops the majority partially agreed. In the first workshop some participants also did not agree (most probably due to the time necessary to get familiar with the format).
- **There was enough time for reflection and discussion:** Also, here the majority agreed partially in all three workshops.

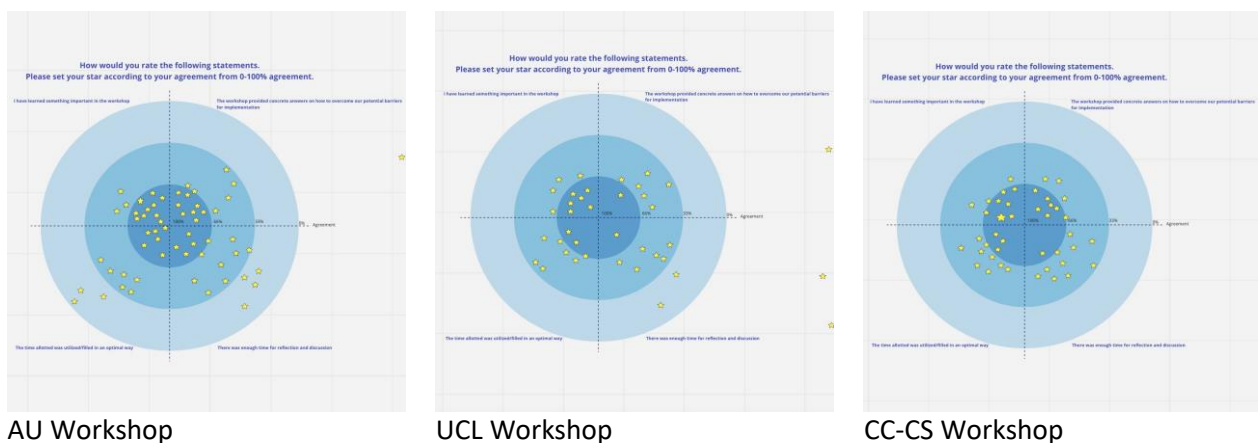


Figure 3 – Results of first exercise (for illustration purpose only)

In the **second exercise** participants were asked to answer four questions (see Figure 4):

- **Which concrete inputs and insights do you take from the implementer workshop?** In the first workshop (AU) participants learned how to organise informal get-togethers, engage people, and motivate researchers. They also learned to link their events to other relevant events and conferences. In the last workshop (CC-CS) participants discovered the difficulty of communicating CS

to the organisation and in particular to the management. They learned to use external funding to leverage internal funding and got a lot of useful inputs.

- **What was surprising?** In the AU workshop participants found it surprising that libraries are an important “home” for CS, that there are examples of CS projects in the health sciences, and that many kinds of barriers exist for training programs and awareness raising. In the CC-CS workshop participants were surprised about the importance of key individuals (professors) in getting CS implemented at the institution. Also, the workshop was very efficient with lots of inputs.
- **What have you missed? What should be improved?** In the AU and UCL workshops participants raised the issue that the 10 minutes discussions in the breakout sessions were too short and that it happened that people were cut off in their discussion. Also, in terms of efficiency, although you get to talk to everyone you always have to start from the beginning when FR experts rotate. In the workshop of CC-CS wishes were to have had more time for discussions.
- **What should be next steps or future focus areas?** In the AU workshop a participant wished for the interconnection between IAs and GAs to be further explored. In the CC-CS workshop it was mentioned to continue the discussions with the FRs.



Figure 4 – Results of second exercise (for illustration purpose only)

In the **third exercise**, participants were asked to indicate their interest and need for further information exchange, including experts and topics. In the AU workshop CRG mentioned two topics to follow up: 1) how to engage post-docs & PIs into training sessions, and 2) evaluation of the courses. For KTU the topic on how to design research projects with CS elements needs further discussion. In the second workshop of UCL CRG would like to follow up on the question of how to engage researchers to run CS projects. KTU wished to have a follow up with AU and UCL about the three topics: CS as add-on projects to the existing research; Finding the institutional framework for CS in a university; Designing research projects with CS elements. In the CC-CS workshop, UniSR would like to have further exchanges with UCL and CC-CS to discuss more about the tools to do CS as well as the role and expertise needed of the contact person/office. CRG wishes to have a follow up about how to develop CS guidelines and policies in a biomedical research centre.

6. Learnings & Conclusions

The goal of the workshops was to provide three well planned and dedicated occasions to strengthen the ongoing exchanges, communication, and active knowledge transfer between the Front-Runners and the Implementers (and ultimately among all partners) to help Implementers pursue the roadmap objectives.

As the process is described in Chapter 2. Organisation & Approach of Workshops , the learnings about supporting Institutional Changes for CS are well detailed in Chapters 3. Plenary Sessions and 4. “Ask the Expert” parallel sessions, and the feedback from participants is reported in Chapter 5. Evaluation, this chapter will focus on the learning the organizer partners got out of the overall experience. This includes aspects related to both the workshops organization and execution.

The three workshops organized by TIME4CS Front-Runners were a valuable moment of the project. Mutual Learning and Knowledge Exchange an essential part of TIME4CS methodology, crucial for the achievement of the project objectives and for the implementation of specific actions leading to Institutional Changes to promote Citizen Sciences. While the Implementers were mainly involved in WP2 and WP5 activities, working with ESF and ZSI, in the development of their tailored roadmaps, their activities strongly relied on the knowledge and outputs of other WPs. Firstly, the GAs themselves were elaborated in the analysis carried out in WP1 (see TIME4CS D1.2 Best practice repository of TIME4CS Front-Runners). Secondly, the workshops were built around the specific actions selected by Implementers in their roadmaps (WP2). Therefore, the collaboration and exchange between different Work Packages was essential to make the workshops as effective as possible. The adaptation to the online format, due to pandemic restrictions, required a significant adaption of the format (in particular time-wise) of the workshops. The Work Packages Leaders coordinated their activities to design the format that would be the most useful to support the Implementers in kicking off the implementation of their activities. It is worth noting that the four Implementers have different backgrounds, experiences and needs (as reflected by the analysis of their roadmaps) so the design of the format had to take into account also these differences, and find the best solution for all Implementers. Again, in this it was essential the collaboration and exchange of information with other WPs, as it helped to shape the workshops and define clear objectives for them.

Based on the status of the selection of GAs, the organizers made a clear distinction between tangible and intangible outcomes of the workshops. While the first were gathering inputs and practical suggestions from Front-Runners regarding the specific GAs (as already detailed in Chapter 3. Plenary Sessions and Chapter 4. “Ask the Expert” parallel sessions), the intangible objective was to build a trustful relationship among partners, essential for the implementation phase of TIME4CS project. In this regard, it was decisive that FRs carefully planned their workshops around the specific GAs chosen by the Implementers, building their presentations around the needs of Implementers and that they invited speakers external to the project, relevant for the Implementers activities. This was not only a valuable learning experience that could inspire the participants, but also showed the real support and interest by members of the FR institutions’ establishment. Moreover, thanks to the informal setting of the parallel sessions, TIME4CS partners got the opportunity to interact and get to know each other taking advantage of the exchange between a small number of participants (room discussions), an opportunity that is otherwise difficult to have in more formal exchanges (such as consortium meetings), especially when held online. The format of the workshops

reflected the need of achieving both tangible and intangible objectives, and in this sense it was an advantage to have several project partners with experiences in facilitation. Thanks to their preparation work the format was optimized to obtain results in an entertaining way.

As pointed out in the Chapter – IA Infrastructure & Policy

5. Evaluation, time constraints (due to the intention of avoiding the “fatigue” induced by a virtual setting) were perceived as an issue, especially in the first workshop. The participants needed time to adapt to the format and at first they felt they missed more time for discussion with Front-Runners. However, once they got familiar with the methodology and they felt reassured that this was not an isolated opportunity, but rather the beginning of the mentoring process accompanying them during TIME4CS lifetime, they managed to make the most of the parallel sessions. They also agreed that overall they got a lot of inputs and suggestions that would require some time to be further elaborated and that helped them to better shape their roadmaps from a concrete point of view.

To summarize:

- Collaboration between WPs was essential for exchange of important knowledge acquired with previous activities and exchanges
- Having somebody with interaction and process facilitation experience is very valuable to optimize the format (efficiency and entertainment)
- Inviting speakers external to the project was not only valuable in terms of experience and learning, but also quite inspiring as it showed real support and interest by members of the FR institutions’ establishment.
- The workshop format took some adaptation time (see feedback from participants), however the informality of the interactions, especially in part 2) really helped with team building, providing valuable occasions for informal exchanges (and some laughter!)
- Overall, both organisers and participants agreed that, despite the limited time available, the workshops were effective in responding to Implementers’ concrete needs.

The above learnings will be considered when organising future knowledge-sharing events and they will certainly help to improve interactions and outcomes. They will also be relevant for WP4’s activities, in particular when designing the training activities later on in the project timeline.

APPENDIX A

AU Workshop: IA Education & Awareness

General Information

Venue	Virtual in zoom
Date	19 October 2021
Organizer	University of Aarhus
Length	2h
Total number of participants	23

Agenda

Time	Activities	Partners
12:00	Arrival and Welcome	AU
12:05	Introduction to the workshop	AU
12:10	Awareness raising within RPOs Gitte Kragh, Department of Mathematics - Center for Science Studies AU	AU
12:20	Training for researchers, students and citizen scientists Kristian Hvidtfelt Nielsen, Department of Mathematics - Center for Science Studies AU	AU
12:35	Debates and public events to promote citizen science Gitte Kragh, Department of Mathematics - Center for Science Studies AU	AU
12:40	Connecting education, knowledge exchange and public awareness to institutional resources and structures Kristian Hvidtfelt Nielsen, Department of Mathematics - Center for Science Studies AU	AU
12:50	Q&A	AU
13:00	Breakout Session working groups Working on Implementers' Grounding Actions	All
13:45	Wrap-up session Presentation of the outcomes of the group discussions	All
13:55	Closure	AU

List of Participants

23 people attended the workshop. Full list is available on TIME4CS internal sharepoint.



UCL Workshop: IA Research

General Information

Venue	Virtual in zoom
Date	27 October 2021
Organizer	University College London (UCL)
Length	2h
Total number of participants	31

Agenda

Time	Activities	Partners
12:00	Arrival and Welcome	UCL
12:05	Introduction to the workshop	UCL
12:10	Strengths and areas of opportunities when developing research projects using a Citizen Science methodology Dr Alexandra Albert – Researcher, Department of Geography UCL	UCL
12:20	Challenges and means to run research projects using Citizen Science methodology: an emphasis on engaging with local communities in London and Lebanon Dr Mayssa Jallad and Dr Nikolay Mintchev - Research Associates, Institute for Global Prosperity UCL	UCL
12:30	Why establish or belong to a Citizen Science network (internal, national, and international) Kirsty Wallis, Head of Research Liaison & Office for Open Science UCL Prof. Muki Haklay, co-director of ExCiteS, Department of Geography UCL	UCL
12:40	Steps required for the planning and implementation of changes in organizational structures to enhance the engagement of the public in Research and Innovation (R&I) Dr Paul Ayris, Pro-Vice-Provost (UCL Library Services)	UCL
12:50	Q&A	UCL
13:00	Breakout Session working groups Working on Implementers' Grounding Actions	All
13:45	Wrap-up session Presentation of the outcomes of the group discussions	All
13:55	Closure	UCL

List of Participants

31 people attended the workshop. Full list is available on TIME4CS internal sharepoint.



CC-CS Workshop: IA Infrastructure & IA Policy

General Information

Venue	Virtual in zoom
Date	3 November 2021
Organizer	Citizen Science Center Zurich (CC-CS)
Length	2h
Total number of participants	27

Agenda

Time	Activities	Partners
12:00	Arrival and Welcome	CC-CS
12:05	Introduction to the workshop	CC-CS
12:10	A single-entry point for CS in Zurich: how did CC-CS happen? Prof. Mike Martin, Chair of the Board of Directors CC-CS, University of Zurich	CC-CS
12:20	CC-CS: an overview of the offering and infrastructure Rosy Mondardini, Managing Director CC-CS, University of Zurich	CC-CS
12:25	CC-CS at work: tools and community management Ursina Roffler, Community Manager CC-CS, University of Zurich	CC-CS
12:35	CC-CS at work: criteria and guidelines Rosy Mondardini, Managing Director CC-CS, University of Zurich	CC-CS
12:45	Q&A	CC-CS
13:00	Breakout Session working groups Working on Implementers' Grounding Actions	All
13:45	Wrap-up session Presentation of the outcomes of the group discussions	All
13:55	Closure	CC-CS

List of Participants

27 people attended the workshop. Full list is available on TIME4CS internal sharepoint.



APPENDIX B: Summary of “Ask the Expert” Q&A

AU Workshop: IA Education & Awareness

CRG

Question	Answer
GA: To set up training programs for researchers and students	
<i>Identified obstacles and difficulties were: a) Lack of time and interest of scientists to join the training programs; b) Lack of funding for inviting external experts for advice and for giving the sessions; c) Lack of knowledge on how to evaluate the impact of this action.</i>	
Advice on training for researchers	<p>Training for PhDs: Examples for good trainings for PhDs are summer schools e.g., engaging environment CS project (UK). In general, if you want to set up a CS programme for PhDs, it is important to have this course early – within the first six months – because to implement CS projects it takes time. For CRG it would make sense to integrate a CS course in the five weeks long course they offer to all new PhD students, which already includes courses on science communication, open science, and research integrity. Also, instead of reinventing the wheel you can sign post to or integrate already existing courses as e.g., UCL’s CS course “CS and Scientific Crowdsourcing”. https://www.ucl.ac.uk/short-courses/search-courses/citizen-science-and-scientific-crowdsourcing-introduction</p> <p>Try to get the PhD supervisors to support CS. And it is important also to find out if CS is the right methodology for the researchers to use. Therefore, the Center for ecology and hydrology published a guide of how to use CS appropriately: https://www.ceh.ac.uk/corporate-publications#citsci</p>
Lack of time and interest of scientists to join the training programs	<p>Find good examples and success stories of CS projects in your field. Organize inspirational talks by other researchers presenting success stories. Peers talking to peers, explaining the advantages of CS. And then afterwards offering these trainings.</p> <p>Copy pasted from KTU as April explained here the same thing: A very effective way is to assign some funding to researchers and students for public engagement activities, i.e. engage the public and citizens in CS projects. Fund can come from the university or via international collaborations.</p>
Lack of knowledge on how to evaluate the impact of this action	<i>see Tyndall or KTU</i>

Tyndall

Question	Answer
GA: CS postgraduate teaching module	



<i>Identified obstacles and difficulties were: a) Mobilization of people to run the module; b) Lack of Knowledge of how to evaluate the impact of this module; c) Lack of knowledge of what topics would be. Most useful for students in a CS module and how to incorporate practical elements into it; d) How to keep this module going after the project's lifespan; e) Organization of material; f) Delivery of the module: online or in-person, length of course, the amount of hours it should be etc.</i>	
How to keep this module going after the project's lifespan?	You may want to contact the Graduate School office in charge of courses to find out their priorities. If they think there is little interest for PhDs in CS, you can propose to embed CS in existing courses.
How to evaluate the impact of this module?	<p>Try to use questionnaires about their motivations and interests before the course, and about their learnings, intentions, and acquired network after the course.</p> <p>Repeat after six months for assessing long-term impact the concrete impact of the training, including concrete examples how they used the knowledge, what new contacts /networks they have from the trainings, follow up activities, etc.</p>
GA: Researcher awareness training in CS	
<i>Identified obstacles and difficulties were: a) Low interest/participation; b) Sourcing of adequate training courses/material</i>	
Sourcing of adequate training courses/material	<p>You don't need to reinvent the wheel! It's perfect to start with existing training resources, available on different platforms (ie. EU-Citizen.Science), including other EU projects.</p> <p>For technical resources, there are platform that can be used by the students for training and piloting projects, such as the one offered by the CC-CS, and many other open solutions available for many kinds of CS projects.</p>
Challenge of how to involve citizens in the co-design	You may want to use existing collaborative spaces (such as maker spaces) or event (such as hackathons). Or simply organize a workshop! Advice and a variety of good practices are available at EU-Citizen.Science or Science at Home (https://scienceathome.org/).

UniSR

Question	Answer
GA: To set up training programs for researchers and students	
<i>Identified obstacles and difficulties were: a) Lack of financial and logistic support; b) Difficulties in designing relevant information and training materials</i>	
Lack of interest	A major challenge is to show researchers how CS can be helpful for what they do. Examples, more than theory, can be powerful to give ideas about possible applications of the methodology. Your "pitch" should include examples relevant to your audience's domain, including results, success stories, distinctiveness of data, publications, etc. (good sources of examples include Zooniverse and EU-Citizen.Science)

	<p>However, it is also important to acknowledge that CS is not the answer to all kinds of research questions, so you should explore with researchers their research question, their data needs, and help them assess if CS is the right methodology.</p> <p>About specific experience in CS projects in the medical and health sector: UCL has a collaboration with an international fund of medical research the WELLCOME Fund. The fund is particularly interested in strengthen the relationship between scientists and citizens. External funding of UCL can be found here: https://www.ucl.ac.uk/culture/public-engagement/funding. Also, there is the specific working group on Citizen Science and Health where you might find people who have a lot of experience.</p>
Difficulties in defining relevant information and training materials	Have a look at other courses as e.g. course at UCL or the course at AU – for the latter Kristian can share detailed information as he is leading the course.

KTU

Question	Answer
GA: Non-formal education programs	
	<i>Identified obstacles and difficulties were: a) Lack of motivation from researchers to participate in the educational sessions; b) Lack of citizens and non-academic stakeholders' motivation to participate in the MOOC educational sessions; c) The committee of the Faculty of Social Sciences Arts and Humanities does not accredit the non-formal education programs; d) Lack of interest in citizen science topic; e) Lack of sustainable funding for the educational trainings; f) how to measure the impact of these trainings; g) What are practices to motivate researchers and citizens to participate in CS training; h) Good practice tips for dissemination of information about trainings.</i>
What are practices to motivate researchers and raise interest in these courses?	<p>A very effective way is to assign some funding to researchers and students for public engagement activities, ie. engage the public and citizens in CS projects. Fund can come from the university or via international collaborations.</p> <p>Then you can show researchers how increasingly projects get funded if they include CS, how they can include their CS experience in their CVs, etc.</p> <p>You can also consider making running informal interviews with researchers to probe their interest and motivation in CS, public engagement and democratization of science.</p>
Good practice tips for dissemination of information about trainings	Dissemination can be done over social media, especially in coordination with libraries and museums.
Lack of interest in CS topic	A major challenge is to show researchers how CS can be helpful for what they do. Examples, more than theory, can be powerful to give ideas about possible applications of the methodology. Your “pitch” should include examples relevant

	<p>to your audience's domain, including visibility, results, success stories, distinctiveness of data, publications, etc. (good sources of examples include Zooneverse and EU-Citizen.Science)</p> <p>However, it is also important to acknowledge that CS is not the answer to all kinds of research questions, so you should explore with researchers their research question, their data needs, and help them assess if CS is the right methodology.</p>
How to measure the impact of these trainings?	<p>Try to use questionnaires about their motivations and interests before the course, and about their learnings, intentions, and acquired network after the course.</p> <p>Repeat after six months for assessing long-term impact the concrete impact of the training, including concrete examples how they used the knowledge, what new contacts /networks they have from the trainings, follow up activities, etc.</p>
What experiences do experts have with the length of training courses?	<p>At the CC-CS the Participatory Science Academy (PWA) offers a variety of academic courses and summer/winter schools on CS. CC-CS also organizes workshops, demos of tools, challenges etc. to show people how easy it is to pilot ideas. UCL produced a MOOC, a free online course which is also embedded in courses at UCL.</p>
Fining a home for CS at your institution	<p>It depends largely on the structure of the institution, look around especially in the context of Open Science activities, or libraries.</p>
How to motivate researchers to participate in networks (e.g., ECSA)	<p>Suggest joining existing working group, such as "Citizen Science in Universities" for shared interests and concerns.</p>
How did you manage to include the CS course into the formal programme?	<p>You may start by trying to integrate CS in existing courses, e.g. responsible research, innovation or science communication.</p> <p>If you want to offer an entire course about CS, it is important to think about the priorities of your institution. For example, if apriority is to promote scientific excellence you need to argue how CS can benefit scientific excellence.</p>

UCL Workshop: IA Research

CRG

Question	Answer
GA: To expand running research projects using CS methodology	
<i>Identified obstacles and difficulties were: a) Lack of interest from researchers to use the CS methodology; b) The CRG performs very basic science, which could be a challenge to include CS methodology in running research projects or even in projects created from scratch.</i>	
Lack of interest from researchers to use the CS methodology	You need to convince researchers that CS is useful for their research and show them what the benefit of CS is to their research (e.g. provide additional data, support in analysis etc.). However CS is not useful for every project. Also it depends on the researchers, their topics and on their motivation. One of these motivations is money, so if possible e.g. provide some Seed Grants or other funding. This also shows institutional legitimacy and encouragement of doing CS. E.g. UCL 's "Grand challenges" fund or CC-CS's Seed Grants. Another issue might be that young scholars are very concerned about publications. So one of the challenges could be that since CS projects take so long to develop, they might be disengaged from this kind of methodology. Do internal outreach activities such as Brown Bag Lunches, seminars etc. to present the CS approach, show benefits and give space for conversations. You can proactively reach and call researchers or departments at your institution who might have an interest in CS, give presentations etc. Also show good examples of existing CS projects in the field. E.g. UCL provides a catalogue of good examples. Also build on already existing networks and CS projects. Change rewards and evaluation framework at your institution. To reward researchers for adopting Open Science and CS activities.

Tyndall

Question	Answer
GA: To expand running research projects using CS methodology	
<i>Identified obstacles and difficulties were: none</i>	
How to engage with and reach out to local communities?	Find and work with partner organisations and existing communities and try to establish links. When reaching out it is important to always emphasis why it is important that citizens participate. In case you choose co-production, try to involve the people as early as possible. You can also work together with e.g. maker spaces. Also it depends on the specific project if co-production of the whole process makes sense or maybe only parts of it. In terms of engaging, identify who the "public" is that is most relevant.
GA: To establish/belong to a CS network (international or national associations)	
<i>Identified obstacles and difficulties were: none</i>	



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UniSR

Question	Answer
GA: Participating in a CS network	
<i>Identified obstacles and difficulties were: a) The lack of interest from researchers, especially in life sciences, could be the main obstacle. The insufficient knowledge of the CS concept and methodology could create a barrier to spreading the new approach; b) The lack of internal communication practices within the institution will make it more difficult to share the experience of the WG and to make the resources of the international CS community available to the researchers interested.</i>	
The lack of interest from researchers, especially in life sciences, could be the main obstacle. The insufficient knowledge of the CS concept and methodology could create a barrier to spreading the new approach	Create a shared understanding of CS and explain what you mean with CS. You also don't need necessarily to call it CS, use the terminologies of the people you're talking to. E.g. patient involvement, action researcher, participatory approaches, volunteering etc.
The lack of internal communication practices within the institution will make it more difficult to share the experience of the WG and to make the resources of the international CS community available to the researchers interested	Participate in Working Groups (WG) within ECSA that focus on different topics or even establish a new WG. It is also a good way to get to know other researchers using CS, exchange knowledge and best practises etc. An interesting incentive for researchers is also that some WG publish papers together.
GA: To implement changes in the organizational structures or functions	
<i>Identified obstacles and difficulties were: a) Lack of institutional support because of a low interest in CS could slow down the process of integration; b) Time will be needed before achieving a real integration of CS in the area</i>	
Lack of institutional support because of a low interest in CS could slow down the process of integration	To be successful you need 1) a senior leadership in the institution otherwise you'll lack resources and time to implement a successful programme. Once you have this in place you need 2) brilliant communication and 3) how do you win support.
Time will be needed before achieving a real integration of CS in the area	Start small and build up, e.g. having CS champions in the field of research. But it is also good to look what resources, information, tools, trainings and guides are already available in different areas and singpost to them. And also look for good examples of CS projects in the field of interest. Another recommendation is to join projects first and see how it is done instead of creating your own project. As it is a lot of learning by doing

	in CS. Think about relevant projects within the areas of activities of different researchers and find a way to incentivise researchers to join existing CS projects. E.g. for an ecological institution you could join BioBlitz or you organize a local group to join the once a year event “City Nature Challenge”. Volunteer Computing is another example where people can join very easily. Or you could also organize “world cafés” where people try out different things.
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KTU

Question	Answer
GA: To establish/belong to CS networks (international or national associations & GA: To expand running research project using CS methodology)	
<i>Identified obstacles and difficulties were: a) Low interest from KTU researchers; b) low interest from external partners to participate in project proposals; c) No interest using guidelines about citizen engagement into research on the Faculty of Social Sciences, Arts and Humanities level; d) how to make funding sustainable; e) how to promote interdisciplinary research projects; f) how to encourage other stakeholders on national level to join project proposals.</i>	
Low interest from KTU researchers	Important to acknowledge that CS is a relatively wide umbrella term. So not all CS projects need to be co-created. So it always depends what suits which researcher and research topic. And it is important that researchers are interested in using CS.
How to make funding sustainable	<p>UCL has the “grand challenges” programme which funds interdisciplinary projects. This encourages people to use CS. Another important fact is having champions. Link these champions and make sure they are exchanging with each other. Then other researchers might get interested in CS too and want to integrate it in their projects too. And given the successes like in Horizon 2020, you can communicate to researchers that there are specific pots for funding dedicated to CS. This creates opportunities.</p> <p>Being part of larger projects such as the EU projects is another strategy. What the CC-CS proposes, is before looking at money to find a place within the university where the CS hub can be placed. There are two places – one is the library and the second one is the Open Science office. So the recommendation is: before looking at money, find an infrastructure or a place to stay.</p> <p>Look also to private organisations or associations to sponsor projects. Or look at national funding.</p>
How to promote interdisciplinary research projects	Difficulty to have cooperations between engineering sciences and social sciences. This is why it is important to have funding reserved for such projects. Through this they get legitimacy to use CS or interdisciplinary approaches. The recommendation is to set small amounts of funding which is suitable for early career researchers. And use an escalator scheme. So if they are successful with the project they can get an additional amount of funding and so on.

How to encourage other stakeholders on national level to join project proposals	Being clear what the benefits are and support them in all the administrative things.
How to find citizens to participate in projects	First of all you need to define who you target. Also think about Social Media – there are many different existing facebook groups who might have an interest in joining the project.

CC-CS Workshop: IA Infrastructure & IA Policy

CRG

Question	Answer
GA: To consolidate the CS facilitator position, for addressing CS questions and to support researchers implementing CS activities	
<i>Identified obstacles and difficulties were: a) Lack of funding for a new position; b) If a new position is not created and another person assumes the role: lack of expertise and time</i>	
How to secure funding for the person to coordinate? How to engage higher management and give funding for a position?	<p>A good start is to raise awareness internally so that all potentially involved – especially at the management level - appreciate the potential for the entire organization (for example external funding).</p> <p>Funding can be internal or external (foundations, projects) and the “CS person” can have different profiles. You may want to explore the easier solution for hiring in your institution – an administrative position such as project manager may be easier than a research track. Also, the person can have multiple hats within the organization, and be given the specific mandate to look for funding (grants, partners, etc.).</p> <p>Again, tap into open science and/or libraries to find a location, people and funding ...</p> <p>Keep CS in a “neutral” context (i.e. library) so there are not vetted interests of specific research domains/groups.</p>
GA: To develop a CRG institutional policy and guidelines for researchers about CS projects	
<i>Identified obstacles and difficulties were: a) Different needs and expectations of the internal stakeholders involved to include in the policy and guidelines; b) Lack of interest or difficulties from researchers to incorporate the principles of the guidelines to their research projects</i>	

Any recommendations for guidelines and policy? What should be included?	<p>Ethics comes out often, and it is effective to collaborate with researchers in an ethical group to develop guidelines that would have to be in line with the directives of the ethical committee at your institution. It is also useful to build on the work of existing task forces in CS networks.</p> <p>For general policies, don't start from scratch (policy development takes time!) but look at what your institution already has (i.e GDPR, Open Science policies, partnership agreements, consent forms, etc.) as there is usually a lot of material developed in the institution's legal framework.</p>
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Tyndall

Question	Answer
GA: Raising funding awareness for researchers in order to stimulate the up taking of CS-based projects	
<i>Identified obstacles and difficulties were: communication between Tyndall and UCC</i>	
How can we better communicate within the Institution?	It's easier to start by build on existing collaboration with other CS projects where Tyndall or UCC are involved, and create a critical mass of researchers in different fields via personal contact or with the organization/ participation in events.
How do we get funds?	Also, show how CS brings funding opportunities. It can be EU projects or local funding agencies. To facilitate local networking, organize events/workshop with the local funding stakeholders and researchers.
How can we attract researchers?	Proactively reach out to researchers, be available to help for funding or methodology, create events (work on the edge of the system if you have no money as these don't need to be expensive). Above all, think about their perspective – CS doesn't have to be an extra burden but an opportunity – provide inspiration with example of successful projects.

UniSR

Question	Answer
GA: To implement changes in the organizational structures or functions	
<i>Identified obstacles and difficulties were: a) Lack of institutional support because of a low interest in CS could slow down the process of integration; b) Time will be needed before achieving a real integration of CS in the area.</i>	
How can we integrate CS?	<p>Look for opportunities in “neutral” areas which are already part of the infrastructure, such as the library, open science, or in the in the outreach/communication offices (note: mixing outreach/communication with research is risky – researchers may perceive CS not as a research methodology - better to associate it to open science)</p> <p>The same is valid for funding opportunities.</p>
GA: To identify an institutional contact point for Citizen Science	
<i>Identified obstacles and difficulties were: a) CS related to PE - for researchers, not necessarily research - should we put it as an evaluation criteria?</i>	
	<p>Find the right profile, the person doesn’t need to know everything – while building the knowledge can provide support researchers with tools and contacts - and a methodology and science – by pointing to the right experts/examples/knowledge/tools.</p> <p>To build the knowledge, this person should hang out with CS people, participate in networking and events.</p>
GA: Adopt evaluation criteria for researchers’ evaluation that consider CS	
<i>Identified obstacles and difficulties were: a) Researchers’ reluctance in accepting this change of mind-set. b) evaluation criteria - any suggestion?</i>	
How can we include CS in evaluation criteria?	<p>Look for opportunities in existing policies. What exists doesn’t have to explicitly mention CS or be perfectly aligned. For example, for career evaluation and development, UCL mentions public engagement in their criteria for promotion – so it was a question of getting in touch and making sure CS was within the scope. AU found reasons for CS in the main university mission, which includes facilitating connections and shaping the society of the future.</p>

KTU

Question	Answer
GA: Virtual Hub and Contact Point for CS Projects	
<i>Identified obstacles and difficulties were: a) Finding a competent person to become the CS Contact Point; b) integrating the activities of the CS Virtual Hub with other activities of the Faculty and the Center for Data Analysis and Archiving (DATA center).</i>	
What are the responsibilities of a contact point?	The responsibility of the person can be – especially at an initial phase when you are building expertise in house– to provide support with the methodology and tools by building the right connections. For this it's useful to make a map of “who is doing what” in CS, including info on local and global existing projects, existing resources, training material ,case studies, etc. You may want to create an online space to showcase these.
Does hub applies for external funding or id supported by university EU-projects?	(same as above) Also, show how CS brings funding opportunities. It can be EU projects or local funding agencies. To facilitate local networking, organize events/workshops with the local funding stakeholders and researchers.
GA: To prepare strategic document CS guidelines	
<i>Identified obstacles and difficulties were: a) No motivation to adopt CS guidelines; b) No interest from researchers to use CS guidelines.</i>	
How to convince highest level management to set CS as a strategic aim? How to convince researchers to get involved in CS?	Find the local champions (change agents) within the institutions and/or departments. Finding someone who already uses CS is very effective for researchers (they can better relate) , while for the management an external consultants/expert from outside can be more convincing.

Strategic documents cannot be changed too frequently. How to solve this challenge?	<p>Look at existing documents and policies where aspects of CS / public engagement can be mentioned or referred to, even if the word CS itself is not there! (This is valid also for funding opportunities)</p> <p>See examples at : (Academic career programme) (https://www.ucl.ac.uk/human-resources/sites/human-resources/files/academic_careers_framework.pdf), CS strategy Public engagement strategy: https://www.ucl.ac.uk/culture/sites/culture/files/ucl_public_engagement_strategy_2017.pdf</p>
CS guidelines, what are the main features to cover? How do you suggest to motivate faculty to use CS guidelines?	<p>Make sure you provide a general intro, and then tailor the guidelines to the needs of your audiences. There are guidelines available from other platforms/projects/network (ECSA, EU-citizen.science, ...)</p>