European Digital UniverCity

EDUC-SHARE

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DELIVERABLE D 3.2 –

REPORT ON CITIZEN SCIENCE STRATEGIC FRAMEWORK

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Abstract	Report on the fostering of citizen engagement and proposed actions for the long-term support of Citizen Science and the integration of citizens into the innovation process of the EDUC Alliance
Keywords	Citizen Science, Strategic Framework, Citizen Engagement, Research and Innovation process

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Executive Summary

The European Digital UniverCity (EDUC) has the aim of fostering potential and innovation routes not only in education and research, but also in the societal realm. Catering to and learning with society is increasingly becoming a mission for universities. An ambitious example of the interaction between society and university is the work with citizens in the realm of Citizen Science. There is not one but many definitions of what Citizen Science could entail – all centered around the idea of involving non-academic individuals in research. The heterogeneity of methods and diversity of involvement illustrate the newness but also the potential that lies within this field of action.

The following framework to include citizen scientists in the innovation process is a first step and suggestion based on the work carried out in the Horizon 2020 project "EDUC-SHARE", which provided the European University Alliance EDUC with the possibility to explore the research, innovation, and societal engagement side of a university's mission.

In this context, the work done by the partners is in many ways piloting EDUC's approaches towards society and its citizens by:

1) Building an overview of the partner universities' outreach and engagement units
2) Providing knowledge transfer into the Alliance as a whole
3) Piloting events for and with citizens
4) Exploring the partners' approaches toward citizen science and citizen-led innovation
5) Identifying access routes towards a long-term implementation of the piloted events and citizens' participation in the scientific process.

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1. Introduction: A Strategic Framework in the Context of EDUC

The EDUC Alliance has been established in 2019 as an Alliance of six partner universities answering to the European Commission‘s call within the framework of the Commission's Directorate General for Education and Culture’s (DG EAC) Erasmus line. In 2020, the Alliance partners decided to apply for the Directorate General for Research and Innovation’s (DG RTD) Horizon scheme providing funding to existing Alliances for a period of three years (2021-2024) for their research and innovation components. While the EDUC Alliance as a whole is coordinated by the University of Potsdam, the research component, EDUC-SHARE, is coordinated by the University of Rennes. Since 2023, the EDUC partners receive renewed funding by DG EAC for another four years (2023-2027) and have enlarged the Alliance by two new members, the University of Jaume I (UJI) and the University of South-Eastern Norway (USN) – who bring additional Citizen Science approaches to the Alliance. From 2024 onward, EDUC receives funding from the European Excellence Initiative in order to develop its research and innovation side further while putting an emphasis on the so called „widening countries“ and four core topics – among them the further support and development of Open Science (and with-it Citizen Science) approaches in EDUC.

This context is important for EDUC-SHARE’s work package 3 (WP3) “Citizen Engagement“ as it forms a basis for further work regarding citizen engagement and Citizen Science and allows for the WP’s main goals to take roots. WP3 has piloted activities and exchanges focusing on the opening of the EDUC universities towards citizens and their engagement in the universities. The goals of the work plan have been addressed via five tasks:

1) Stocktaking of services and initiatives catering to citizen engagement
2) Proposal of an action plan for EDUC events to raise awareness for science among the citizens
3) Use and creation of citizen events
4) Establishment of a strategic framework to include citizen scientists in the innovation process
5) 5) Promotion of sustainable campuses through a citizen-centered strategy

Building heavily on results and the work process in these tasks, the following document provides a strategic framework for the inclusion of citizen scientists in the innovation process of the EDUC Alliance. It is based on the experiences drawn throughout the work on citizen engagement in the WP3 as well as on the pursuit of the EDUC Alliance to deepen its ties toward citizen engagement and interaction with its diverse stakeholders.

The vision this document seeks to provide is to support all EDUC universities with conceptual suggestions to allow for innovation that takes into account citizen scientists and Open Science criteria in the European University Alliance context.
The framework does not intend to substitute or overwrite the universities’ already existing

respective strategic documents. Rather, it aims to provide a European layer over the institutional-level strategies by combining strengths and identifying new, European alliance-level goals (chapters 6 and 7). It is built by the EDUC-SHARE universities under coordination of the University of Potsdam. Potsdam had, until 2023, a strategic unit focusing on the involvement of citizens' perspectives into the university ("Innovative Hochschule" – "Gesellschaftscampus") and builds on these experiences while chiefly taking into account the member universities' relevant strategies and activities.

2. Conceptual Bases

The establishment of a strategic framework to include citizen scientists in the innovation process is part of a work package piloting citizen engagement activities in general. Over the past three years, the work package aimed at finding entry points to establish citizen engagement activities and – in the long run – support Citizen Science projects within the Alliance.
Under the umbrella of the term 'citizen engagement', a whole range of activities have been carried out and experimented with. From informational events at local festivals to a Citizen Science strategy, the work package has opened a spectrum of knowledge and activities to EDUC and its stakeholders. They encompass citizen engagement events and the fostering of institutional knowledges of how to tap the innovation process in an inclusive way. With the aim of providing an orientation, we would like to first establish and define key focal points.

Citizen Science in the Context of Citizen Engagement

It is to be underlined that Citizen Science activities are rich in prerequisites and wide in focus and intent. What have we learned while working on citizen engagement in EDUC-SHARE that is to be taken into account for this?
Citizen Science promotes the *active* involvement of interested, non-academic individuals in the research process and is an element of an Open Science approach. However, to activate all interested parties, citizen engagement plays a key role: How to open up universities and fuel their research and innovation processes with novel perspectives, approaches and data, is tackled by a variety of citizen engagement activities. Their goal need not be fully-fledged citizen scientist recruitment, but by providing entry points to the university, citizen engagement activities increase the likelihood of the evolvement of Citizen Science projects.

Citizen Engagement Activity ——————————> Citizen Science Project Involvement

Figure 1: ***From Citizen Engagement to Citizen Science.***

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Citizen Science is a broadly used term referring to citizens participating in a variety of ways in research processes. The European Citizen Science Association (ESCA) describes two mandatory characteristics to be fulfilled when we want to speak of Citizen Science: "(1) citizens are actively involved in research, in partnership or collaboration with scientists or professionals; and (2) there is a genuine outcome, such as new scientific knowledge, conservation action or policy change." (ESCA, 2024[1]).

Building Awareness

Now of course to introduce change and arrive at outcomes is the ideal state during and after the conduction of a Citizen Science project. What stands out at all EDUC-SHARE partner universities though is that there is no dedicated strategic unit supporting Citizen Science. Activities in this respect mostly stem from faculty engaged in Citizen Science approaches for their research. That means that at all universities we can identify researchers fostering citizens' participation in their research, but the activities depend on the individual researcher's initiatives. Looking from the individual level to the university-wide strategic level, most EDUC-SHARE universities connect Citizen Science approaches to their Open Science activities (e.g. Masaryk University and the University of Potsdam). Some universities offer support and visibility for Citizen Science projects via the university library (e.g. University of Pécs), some adhere to national Open Science plans or policies and in a first step focus on the openness of research publications and data (e.g. University of Rennes).
We thus identified the strong need to build awareness for the existence and support of Citizen Science projects at all partner universities. The University of Paris-Nanterre is building special expertise in this field by its on-going "Science pour et avec la société" project, co-creating events, meetings and installations with local stakeholders (museums, city and university libraries, theatres). For now, however, the EDUC-SHARE universities are at the beginning of this development. EDUC-SHARE also promotes the introduction of Open Science practices more generally and long-term with the aim of 1) increasing the visibility of Open Science practices and Citizen Science projects as well as 2) offering more targeted support and recognition to researchers working in such a way methodologically.
As a multi-level perspective of change (Geels, 2002) underlines, structural adaptations go often back to individual practices or niche developments, but structurally grounding them requires institutional involvement. This taps into the mission that European University Alliances work toward in general as well: Piloting and experimenting with changes over a longer period contribute to more sustainable changes in the long run.

[1] https://www.ecsa.ngo/ (Last accessed 13/03/2024).

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3. Framework Component Collection

However, to concretely implement changes towards the inclusion of citizen scientists in the innovation process and to support researchers in making such a practice part of their research process when seen fit, more concrete components need to be identified and put into practice. Within the work process of WP3, all EDUC-SHARE partners have collected citizen engagement activities and nominated the most promising ones in order to engage with citizens. In dedicated interviews with all partners, promising Citizen Science projects or actors were named and their use for the European Alliance level discussed.

Three Key Implementation Suggestions

All EDUC-SHARE partners shared an overview of their implementation suggestions for a strategic framework to engage citizen scientists in the universities. What stands out is that all partners could identify three key needs:

1) Raise awareness for Citizen Science within the institutions (internal awareness)
2) Create events that engage citizens with universities, with a focus on research activities (visibility of science)
3) Compare structural support systems inside and outside universities and have a regular roundtable to establish institutional support mechanisms (Open Science Working Group and Board of Research)

These three focal points stem from detailed feedback and ideas shared by all EDUC-SHARE partner universities that are summarised below and reflected upon with regard to their potential for the EDUC-level.

Formats and Perspectives of Partner Universities

Masaryk University's scientific exhibition "Get Brno ready for Climate Change" involves private and public institutions as well as a number of NGOs, a combination of actors that works well for this format as they all share the goal of becoming part of the regional communities. Presence in e.g. regional innovation centres or open collaboration spaces are underlined as a useful step to increase local visibility. In line with this observation on successful formats, the activities carried out in the WP3 for EDUC-SHARE offer a lot of knowledge and starting points. You will find an overview of the events carried out through WP3 in figure 2 below. We have experimented and learned during the past three years that local events can often be successfully linked to the EDUC Alliance.

Figure 2: ***Overview of WP3 Events***.

Examples of this are the Europe Festival, the Campus Festival and the Researchers Night/Sharpers Night that all allowed WP3 to engage with local audiences and show the missions of EDUC-SHARE and the possibilities of getting involved with research (WP1 research agenda thematic focuses). In these three events, a survey developed by WP3 was run. It is designed to allow for feedback from citizens and to be easily answered. The results are promising and interesting in the context of EDUC-SHARE as they show that the research focuses identified by the Alliance partners attract interest among a diverse audience.

What also stands out is that various formats attract interest: Local events and direct contact with university members are valued, but also online events are named in the survey as adequate and attractive format to open up the university to citizens.

The task to include citizens in the innovation process is seen as very ambitious by all partners, also because the mission is broad and often the institutions do not have sufficient staff to provide additional expertise. Despite this, all EDUC-SHARE partners agree on the need to find starting points such as the piloted events and capacity building that are taking place through EDUC-SHARE activities. Another example of institutional knowledge acquired through the work of WP3 is the task 3.5: In order to promote sustainable campuses, the Alliance needed to start locally and organise concrete events and actions, e.g. a stroll (as organised in Paris-Nanterre) as it is something accessible that is linked to the everyday life of students and citizens. The interaction with campuses and the identification of sustainable practices at our universities also expands to the digital realm, which is why task 3.5 held a workshop focused on developing a more sustainable virtual campus. The workshop results show that in conceptualising the digital, interaction possibilities and spending leisure increases identification with the university. What has been observed in the local formats is also that

linking events to family time and developing events that might be suitable for families (e.g. providing games, producing something) lowers the barriers to start a conversation. This then often allowed us to inform with more focus and time about the university and ways of connecting with it.
Another route that was debated upon during WP3's work process is the possibility of interlinking more with artistic approaches such as performances or installations (strongly put forward by UPN and UP). Artists often work as translators and their different crafts offer diverse entry points and allow for a step towards universities. Including different actors and working together with different stakeholders is a best practice identified.

Another observation shared by the partners is that researchers and non-academic citizens are often very distant entities and thus need intermediaries. The EDUC-SHARE partners agree that cities play a key role here by providing spaces that allow engagement with knowledge and science (e.g. libraries, science centres, or the above-mentioned regional innovation centres or open collaboration spaces often used by MU). To facilitate this further, the framework suggestions (chapter 6 and 7) take into account city's participative budgets. Another point to be underlined in this respect is that faculties and disciplines have a hard time motivating staff to engage with the process of making Citizen Science a concrete objective and offering structural support. In order to motivate faculty, the respective research assessment would have to be measured in a more qualitative way. The goal to increase Citizen Science thus becomes a question for research assessment services also. Moving towards more qualitative and discipline-based overall evaluation criteria will be tackled by the Research Assessment Expert Group within EDUC-WIDE. The researchers involved in WP3's workshop underlined that sharing best practices and showing Citizen Science projects in order to share examples among academic colleagues and university management is an indispensable step to raise awareness and interest in becoming active in this respect. A suggestion voiced in this respect and to be taken into account in the future is the establishment of awards to "Citizen Science" ambassadors. In a first step, regular roundtables via the Open Science Working Group and the Board of Research could increase visibility of Citizen Science actors.

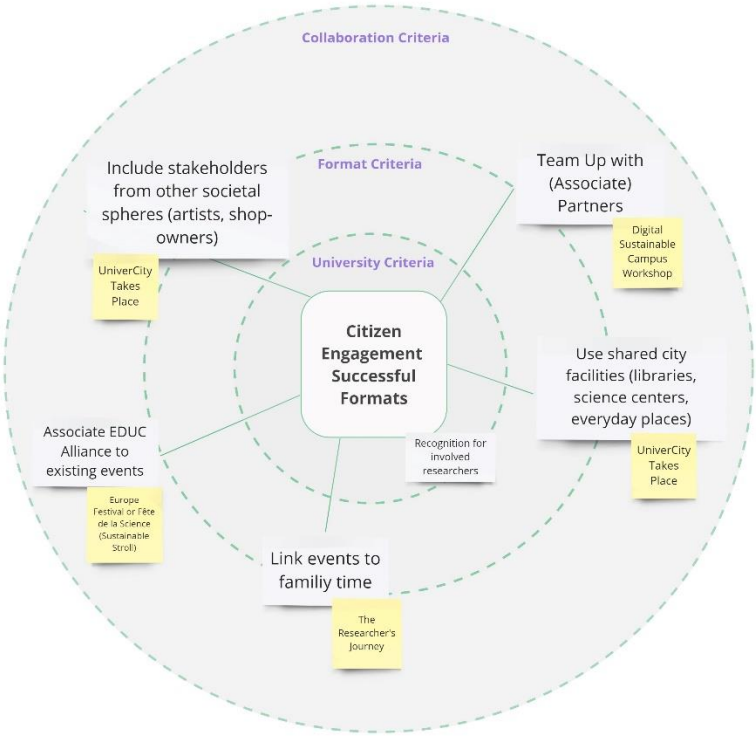

Figure 3: ***Successful Formats and Criteria.***

Summary of Identified Goals

Based on these suggestions, a first step for the strategic framework could be supporting researchers and taking their needs and constrictions into account regularly. Another aspect is that it is an identified goal for the EDUC Alliance to become part of the regional communities: By engaging in shared formats, this goal can be attained while at the same time informing locally about the Alliance and showing possibilities offered by this European network. A learning as well as a goal is that formats and information shared about research should be kept accessible and transferable (meaning that showing applications of research or potential lying in specific fields makes the involvement of more stakeholders more likely). Showing research and opening the innovation process taking place through universities means that access needs to be provided: The events carried out through WP3 offer entry points to this. A further goal will be to keep some of the formats piloted by the WP active.

The WP also discussed the circumstances it had to deal with: Trying to open up our universities to society while the Covid19 pandemic closed possibilities of interaction has been challenging. However, these circumstances also highlighted the role of science and the importance of it and have left many actors - in university and civil society alike - with the wish to move toward more engagement with science and society. Cooperations of moving science closer to society were

established with the commitment of keeping them active beyond EDUC-SHARE's project time (e.g. the Europe festival, innovation challenge workshops and the *UniverCity takes place* format).This is in our institutions' interest as the visibility of science and the university as institution will, we hope, increase. Likewise, new talent can be attracted to become involved with the university.

Below you will find a summary of the observations and entry points shared by the EDUC-SHARE partners:

	Local level	*Regional level*	*Alliance level*
Format	• Campus Festival Potsdam	• Europe Festival • Researcher's Night • Sustainable Stroll	• UniverCity Takes Place • Education meets Research: The Researcher's Journey • Digital Sustainable Campus Workshop – Innovation Challenge
Space	• Campus	• City of Potsdam • City of Cagliari • Campus Nanterre – Paris-Nanterre	• City of Potsdam (shops, offices, open spaces) • Le Diapason (cultural space, City of Rennes) • University of Rennes/ Campus
Collaboration	• University level	• Berlin-Brandenburgische Auslandsgesellschaft (BBAG) • Commune di Cagliari • Fête de la science	• Press office, local shop-owners/ City of Potsdam • Researchers from four of the six partner universities and high schools • Hochschulforum Digitalisierung (HFD)
Citizen Survey	• Not many non-academic citizens, low survey feedback	• Broad, non-academic audience, high interest in alliance's research topics (esp. Sustainable Changes and and Lifelong Health and well-being, see WP1, D.1.1) (events 1 and 2)	• Survey adapted to event formats (selection of questions)
Relevance for Citizen Science Strategic Framework	➢ Low	➢ High	➢ Medium-High

Figure 4: ***Strategic event analysis.***

The goal of the framework suggestions based on these observations shared among the partners is to operationalise the collected needs and suggestions into concrete steps for the EDUC Alliance (chapters 6 and 7) in line with its overall Open Science approach. Apart from the identified needs and suggested steps, this report summarises the support instruments

developed within the WP3 with the aim of providing these findings to the whole Alliance and to continue to build on them.

Capacity Building Strategy

To concretely support actions fostering Citizen Science, the work package has established two guideline documents building on the experiences derived from events, from the Citizen Science survey conducted during some of the events, and from strategic dialogue inside and outside our institutions (other alliances, associated partners and local and regional authorities).

What stands out very much is the need of the institution to build expertise in pursuing the mission of all universities to engage and interact with society at large. Generally, the partner universities have anchored their outreach work in the press office of the university, with collaborations with the university libraries. The formats of engagement we found, however, are often classical formats informing about the university and its research, but not a two-sided engagement work that would organize the structural involvement of interested citizens in research. The initiative and information in this realm stem most of the time from researchers themselves or from Citizen Science associations.

With the aim of providing quick entry points into an engagement work that involves Citizen Scientists more structurally in the university, WP3 provides two guideline documents catering to two identified needs: 1) informing about Citizen Science and engaging citizens and 2) providing institutional knowledge and key information on what Citizen Science.

1) ***Citizen Science Guidelines, Flyer Blueprint (Annex 2)***

   The Citizen Science guideline flyer collects general information and show formats from the respective partner university. The aim is to provide a quick and up-to-date overview of successful citizen science activities and engage citizens.

2) ***Citizen Science Project Support Guidelines for Institutions (Annex 3)***

   The Citizen Science project guidelines build on extensive work carried out during Potsdam's Innovative University "Gesellschaftscampus" project. They are a translation from findings and advise focusing on a local environment (UP) with the aim of providing entry points for all EDUC partners.

Both documents form a basis for building capacity in the establishment of citizen engagement activities and their visibility and recognition. The second document is a first step toward bringing structural Citizen Science support into a European University Alliance's practices. What needs to be underlined here, however, is the factor of regional connections that are indispensable when wanting to build a European network of Citizen Science actors with the aim of providing a more powerful backbone to research projects. This is a process that takes time and is a long-term mission for EDUC.

Regional Connection

Throughout the work package's tasks, sharing among the Alliance, but also connecting with other alliances on specific formats has proven indispensable. The University of Potsdam, in the state of Brandenburg, took the occasion of having practice sharing meetings with the European University Alliance for Customised Education (EUNICE) in the beginning of 2023 and 2024.

Through regular roundtables with the Brandenburg's ministry for science and culture, formats to engage with society and joining forces in regions are being more steadily implemented, making direct policy dialogue a focus for the coming years.

4. Citizen Survey

In order to establish not only policy dialogue, but a more dialogical and steady exchange with citizens, the work package has begun to rely on a survey to be carried out during its events. The aim of this survey is to facilitate feedback and interest collection from citizens directly. The questionnaire is brief in order to generate more completed surveys as they already stand a low chance of being answered and we aim at increasing the number of fully completed surveys. Increasing proper survey feedback is also the goal behind joining survey and events: WP3 has selected several events during which it seemed promising to run a survey. In order to keep getting feedback on the research topics identified in EDUC-SHARE (WP1) for the EDUC Alliance to focus on, WP3 has established a survey blueprint to be of use during future events. Use cases so far have been events organised within the WP3:

- Europe Festival (Potsdam, May 2023)
- Campus Festival (Potsdam, May 2023)
- Researcher's Night/ Sharper (Cagliari, September 2023)
- Researcher's Journey (Rennes, February 2024)
- Upcoming: Europe Festival and Science Festival Potsdam (May 2024)

5. Supporting Tools

To support and facilitate interactions with citizens, EDUC-SHARE and with it the EDUC Alliance rely on two strategic choices: The use of the Open.Up tool (especially WP1, WP2 and WP4) and the potential of the digital proficiency EDUC has chosen as a pillar in its strategic overall focus.

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1) Open.Up

The Open.Up network has been chosen to be a platform for connecting researchers and key actors of our respective universities' ecosystems. During EDUC-SHARE, a number of activities have been performed with the help of the network. Since WP3 reaches out to society and external actors in its events, some measures still need to be established in order to guarantee an adequate community management on the platform. However, the WP has assessed the potential of Open.Up for outreach to society and for providing a platform for Citizen Science projects and considers it to be of high value to the alliance partners in the future.

2) The Digital in EDUC

Citizen engagement and the fostering of more Citizen Science projects go, as we have seen throughout WP3's events, hand in hand with seeking direct contact with citizens, local actors and policy-makers. However, direct contact does not exclude the use of digital infrastructures the Alliance has put emphasis on. While during the city-based formats WP3 members have relied on printed survey versions and direct interaction and conversations with citizens, the Alliance-level event in Rennes was supported by direct interaction possibilities using the survey tool Mentimeter (adapted survey, see figure 4, *Strategic Event analysis*). During the evening event, high-school students, university staff, and city and regional audience could give feedback on EDUC's research topics and missions. WP3 assesses such formats as promising steps towards more interaction.

Not a tool, but an indispensable step toward citizen engagement and the visibility and advertisement of Citizen Science is the close cooperation with the Communication Working Group that has been founded during the project time of EDUC-SHARE. Its main aim is the smooth communication of all the EDUC Alliance's achievements and offers to its target groups. With this comes a need for disseminating key steps in societal outreach and citizen engagement activities. Also, the Citizen Science guidelines and strategic framework suggestions are part of the portfolio EDUC offers to its stakeholders. Another point is that citizen engagement activities need to be interlinked with an encompassing community management. This has been pushed by the WP3 by involving community managers in its working group and by building the *UniverCity takes place* format in cooperation with Potsdam's press unit. This format includes the Alliance level by inviting researchers and will open up research further and show Citizen Science approaches.

6. Objectives and Goals of the Citizen Science Strategic Framework

In the process of outlining overarching objectives and specific goals we aim to achieve through citizen involvement in research and innovation, the work package has agreed on concretely

summarising key objectives in two areas of action: The first is identifying **points of action** that can work on a European Alliance level. The second is defining **focal areas** and their strategic links, with the aim of providing them to the Open Science working group, research support services and the Board of Research of the EDUC alliance.

A Strategic Framework in the EDUC Alliance

WP3 has identified key points of action for the inclusion of citizens in the innovation process. In a first step, however, it needed to be defined what a strategic framework could entail in a European University Alliance. Where should the Alliance put its focus and benefit from the unique set-up of a European University Alliance?

Goals

Breaking down the *1) Strategic Framework to 2) include 3) citizen scientists in the 4) innovation process,* all partners provided specific examples of how to include Citizen Science into our universities and the EDUC Alliance. The strategic involvement with the Board of Research (following EDUC-SHARE's WP1) and engagement with key research topics of the Alliance (see surveys WP1 and WP3) is crucial for the further development of the Alliance's profile. What should be aimed at is to provide internal visibility of engagement events and research projects already engaging citizens (mapping of WP3), while allowing for the continuous fuelling of the Research and Innovation Agenda through interaction with citizens during events. Structurally, WP3 suggests that the Board of Research, which will continue to bring together the Vice-presidents for Research that have so far mostly been involved in WP1 of EDUC-SHARE, will take citizen engagement events and Citizen Science actors and the discussion of recognition and support mechanisms onto its agenda regularly.

Identified Thematic Focus

The analysis of all partner's feedback, the survey returns and EDUC-SHARE's commitment to developing its research and innovation components to tackle key global challenges all underline that a thematic focus on the Alliance's two research topics *Sustainable Changes: Climate and Resources* and *Lifelong Health and Wellbeing* would be well founded. Both topics match research interests in the Alliance and have likewise attracted interest from citizens. This forms a good basis for the fostering of Citizen Science activities in these areas of research. However, it is to be underlined that no top-down set-up will work in this context (see also guidelines, annex 3). Rather, we suggest the fostering of events and (structural, recognition-based) support of already engaged academic actors in the respective fields. Should other actors and thematics emerge, they should be included as also foreseen in the Research and Innovation Agenda of WP1 (D 1.1).

Researcher Support (Goal 1)

We already hinted at the need to support researchers more structurally. Another goal is then to develop structurally implemented recognition mechanisms that value the conduction of Citizen Science projects as a strong pillar of the academic career development. With a working group on CoARA and the reform of research assessment, the EDUC Alliance pushes for the testing and the implementation of new and more qualitative indicators to assess research performance. This is where the goal to support researchers engaging in Citizen Science projects should be addressed.

UniverCity: Local and Regional Community Building (Goal 2)

Teaming up with the city level has proven a good access route toward more regional connections: innovation centres, open spaces entertained by the EDUC universities' cities, but also places of everyday life (as used by the *UniverCity takes place*-format, e.g. hair salons, wine shops) offer visibility that should continue to be fostered by events taking place there. WP3 has piloted a series of events with the aim of moving science closer to society (see figure 2 for an overview). Such formats should be kept and woven into a larger community building strategy, a goal that is already under way through the EDUC II task 6.1 and its associated Communication Working Group.

Accessibility (Goal 3)

Accessibility is a requirement in order to keep science relatable and relevant to societal challenges (see EDUC-SHARE Objective 2). WP3 has tested various event formats, and in terms of accessibility and contact points with non-academic citizens, two formats stand out: 1) regionally existing events (e.g. Europe Festival), that allow low-threshold contact with a regional audience and 2) holding EDUC citizen engagement events in places that are usually not associated with science. Not only does the format *UniverCity takes place* give visibility to researchers from the EDUC Alliance, but it also answers the need voiced by the partners to keep citizen engagement activities accessible. Additionally, promotional barriers and efforts are lowered: Promoting an event to the right target audience requires a specific strategy and a lot of efforts. We avoid this challenge by associating ourselves to an already existing event with the right target audience.

Events as Entry Points (Goal 4)

The WP3 has established that by way of events, entry points to further engagement with universities are being opened for non-academic citizens. Keeping citizen engagement events is thus a crucial success factor when wanting to increase Citizen Science projects. More detailed guidelines are shared in annex 2. The variety of piloted events (figure 2) provide tested formats to work with in the future. All formats showed opportunities to get engaged with science as citizen.

Survey to Take in Ideas and Feedback on Research Engagement (Goal 5)

Great potential for finding future Citizen Science actors lies in our regions. In formats taking place on this regional level, we found a high interaction possibility with citizens who have not been in touch with our universities and EDUC yet. Survey return was significant here, which provides us with feedback on the Alliance's research topics and wishes for future modes of involvement. As shown above in figures 3 and 4, the high relevance of the regional-level formats to inform about citizen science activities and support structures is to be underlined and should thus be kept and further developed. The survey could also be adapted to work for sub-clustering research events or training workshops as piloted in WP1 and WP2.

Connecting the Regions by Citizen-Science City Funding

A route that WP3 could not explore during EDUC-SHARE's project span but that has been identified by the partners, especially by Masaryk University, is the tapping of participative budgets on a city level to fund Citizen Science projects. Most of the projects funded by such city budgets are community projects, but some are of scientific nature. With a strong emphasis on the testing and application of climate change measures, bringing such projects closer to the EDUC Alliance could be a route to explore further in the future as they open debate and empower both researchers and citizens. Similar structures exist in Paris-Nanterre, and all EDUC universities are middle-sized, close-to-capital universities. These similarities might provide the Alliance with the possibility to connect regions by teaming up and connecting such city-based projects with a common European Citizen Science project. To engage further with European Citizen Science projects in the field of driving sustainable campuses, a Blended Intensive Programme (BIP) organised by USN offered a place to the WP3 coordinator and the task lead of 3.5. This was a good test-bed that brought together sustainable campus experts. A first step to build favourable conditions for the establishment of an EDUC Citizen Science project will be to build stronger partnerships with the city level. This is foreseen via EDUC-WIDE (EEI, 2024-27), where a registration system and the connection to EOSC will be explored as a possibility to further develop EDUC's Open Science focus.

Summary: What is added to Citizen Science by a European Dimension?

In order to clarify and underline the potential that lies within the EDUC Alliance to strategically set-up support mechanisms for Citizen Science, WP3 has identified key assets of the EDUC Alliance setting.

Citizen Science + EDUC =	***Registration system*** ***Knowledge Pool*** ***Comparative Studies*** ***Meta-level analysis***

Figure 5: ***The EDUC Dimension of Citizen Science.***

Partners agree that the European dimension could be of interest for actors outside of the Alliance. Especially at Masaryk University, a Citizen Science registration system is seen as advantageous by the Open Science service unit and by the university library as it would allow for the matchmaking of actors from different partner universities and societal spheres. Also the creation of a knowledge pool that would be created by engaging citizens from different countries in Citizen Science is a promising incentive to foster Citizen Science further.

On a more content-oriented side, the potential for comparative studies stands out. The partners named them as promising examples where the European connectedness makes a big difference. Disciplines named in this respect were e.g. Geography, Urban Studies and the specialisation of Smart City research, but also Sociology and Mobility studies. Likewise, Citizen Science projects tracking sustainable changes and analysing the impact of sustainable practices are seen as an example where the set-up of a European Alliance offers favourable conditions.
Additionally, meta-level analyses on how Citizen Science is done and supported are made possible by the European dimension EDUC entails.

To interconnect and show research in our regions, the *UniverCity Takes Place* format will be kept and continue to bring Alliance researchers into the city level. Structural support is in a first step provided by Potsdam University in cooperation between EDUC and the UP's press office, which will share organisational aspects. However, the rollout of the format to other regions shall be considered by the Communication Working Group. A key potential of the Alliance is that the connection of our university also brings our cities closer to one another and connects our regions.

Coming back to the goal of opening the innovation process of our universities to citizens, two factors stand out as key: 1) Supporting the researchers and faculty already engaged with Citizen Science by way of taking these activities structurally into account in research assessment and career development; 2) The continuation of citizen engagement events (in a first step *UniverCity Takes Place*) to allow for the visibility of research and interaction with the alliance and possibilities of further engagement towards Citizen Science.

7. Plan for Achievement

In order to guide and ensure the achievement of the goals identified and defined by the EDUC-SHARE partners above, a summary of steps and connected tools underpin the Alliance's journey toward more citizen scientist-led innovation. In the following summary of our plan for achievement, goals and steps are put into a timeframe corresponding to overall EDUC Alliance strategic goals.

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To underline: This report on the Strategic Framework to include citizen scientists in the innovation process promotes collaboration between the EDUC universities (and key local stakeholders) to foster Citizen Engagement and Science *in the long-run*. It gives an overview of key ambitions and suggests a timeframe and monitoring of progress towards the achievement of a deeper involvement in Citizen Science at all our universities. Its goal is to serve as a baseline document with the aim of further opening the EDUC Alliance to society. Its steps aim at strengthening occasions and means of citizen engagement activities to foster Citizen Science and regional policy cooperation.

Context EDUC Alliance

As referred to in the introduction of this report, the EDUC-WIDE project is taking the Open Science aspect to be one of its core focuses (see figure 6, below). In this context, Citizen Science approaches will be further developed with the aim of establishing a Citizen Science registration system. In the Erasmus funding line, three tasks are going further into specific citizen engagement aspects: 1) the societal outreach agenda setting (4.1); 2) the involvement of youth and civil society partners via the “Youth Integration Lab” (4.2); 3) the community building approach (WP6).

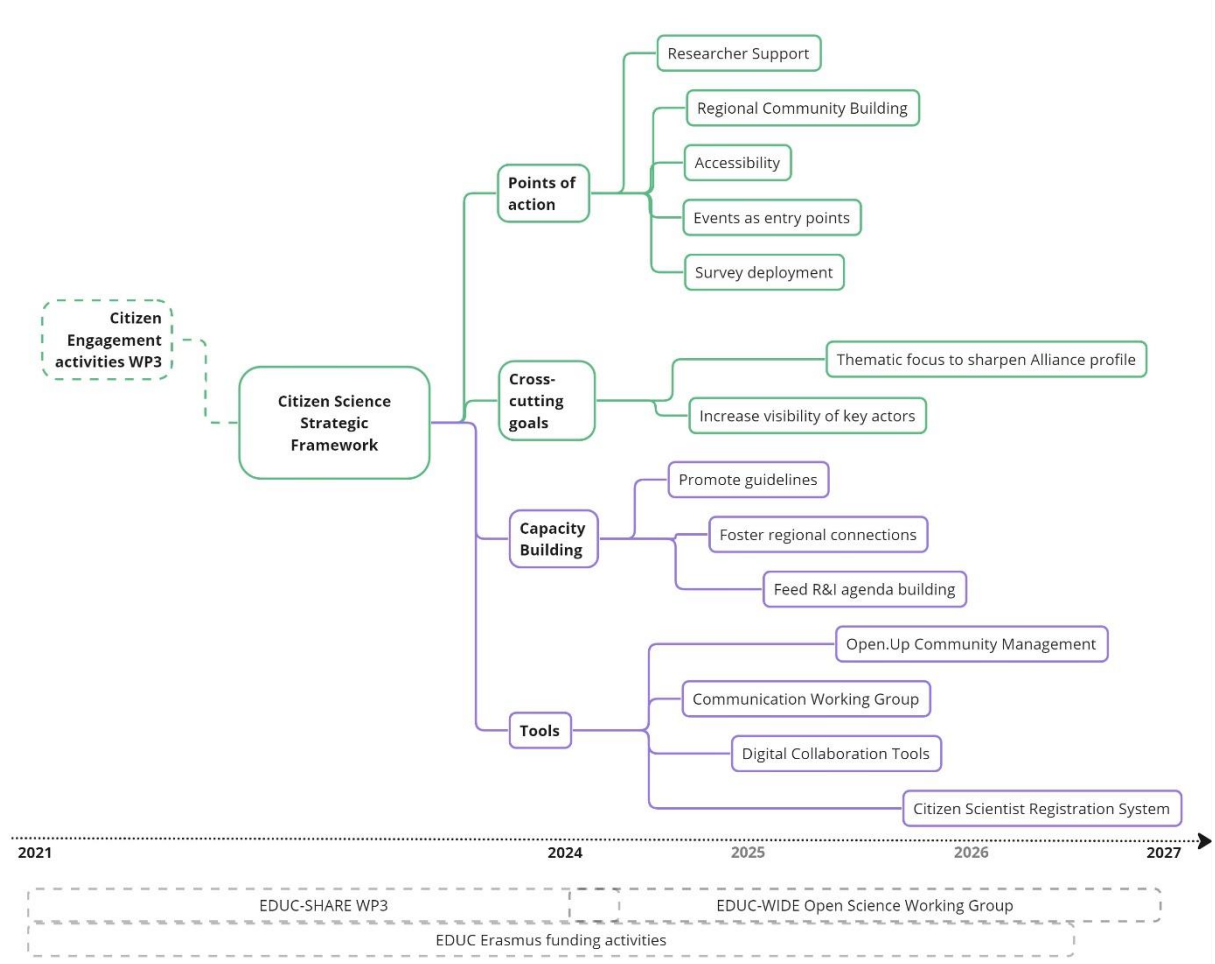

Figure 6: ***Visualised plan for achievement of strategic goals identified by WP3.***

To summarise: Until 2024, WP3 has identified and established goals and objectives for fostering citizen engagement and Citizen Science in the EDUC Alliance. From 2024 onward, its strategic suggestions further promote the inclusion of citizens in the innovation process. Some of the activities proposed will be anchored in the Communication Working Group (event series *UniverCity takes place*), some will be taken up as strategic discussion points by the Board of Research (EDUC Governance) and the Research Assessment Expert Group (EDUC-WIDE), especially the research recognition mechanisms. Until 2025, some of the points of actions are planned to be more institutionalised, while ambitions like the Citizen Science registration system are scheduled for 2027. An important pillar is, of course, the further funding of the initiatives proposed – though the key points of actions and cross-cutting goals are firmly intertwined with EDUC's general work program. However, the discussion in WP3 has underlined needs for exploring additional funding frameworks until 2026 in order to guarantee the continuation of activities.

As is good practice in the EDUC Alliance, tasks and working groups and task teams carry out the work plan in collaboration with all partners. What will continue to be important is to keep WP3's work accessible for the different tasks and working groups in EDUC and in EDUC-WIDE and – if need be as foreseen – establish a subgroup for Citizen Science actions and local cooperations.

Conclusion

The proposed strategic framework components as well as this report in general build strongly on the experiences made through the WP's tasks and especially on the piloting of the events. The work package in general is event-focused, with the exception of task 3.4 and this deliverable. As already hinted to during the project review meeting in Rennes in February 2024, the spectrum between citizen engagement activities and fully-fledged Citizen Science project support is wide. Yet we propose that citizen engagement and building steady links with societal actors will provide an ecosystem that engages citizens in science also on a more structural level. We hope that the document convincingly connects our practical experiences to the strategic steps proposed. The steps and goals laid out in this report provide a European layer over the institutional-level.The report has defined key goals, cross-cutting focal points and capacity building activities, but also provides an overview over useful tools to support citizen engagement and Citizen Science in the long-run.

Citizen Science + EDUC is a promising field of action. Still, the difficulty of finding formats suitable for the Alliance level and of implementing them long-term need to be taken into account. Also, among the many strategic endeavours the Alliance tackles, Citizen Science is not the sole or central focus. However, work package 3 endeavours are already continuing in other tasks of the EDUC Alliance, with knowledge transfer being ensured by the Alliance's governance. The work throughout the past three years shows that the European connectedness and integration of citizens and citizen scientists in the innovation processes are not just an extra layer, but a component to be taken into account for a European University's goals.

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Annexes

You will find supporting documents, templates, and additional information relevant to the framework below.

1) *Mapping of citizen engagement activities within EDUC-SHARE (see Annex 3, RPI)*
2) *Citizen Science guidelines (Flyer Blueprint)*
3) *Citizen Science Project Support Guidelines for Institutions*
4) *Citizen Engagement Survey Blueprint (EN and DE versions)*

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Citizen Science

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EDUC-SHARE

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101017526

What is Citizen Science?

Citizen Science is one form of the current trend towards more **Open Science**. Approaches with citizen participation have become indispensable, as examples like Wikipedia show, and are a new mode of knowledge generation and distribution. Researchers increasingly want to make their research data and results easily accessible so that knowledge can be generated and circulated more quickly. Collecting, evaluating and interpreting data is thus no longer reserved for institutionalised science. Another essential approach is therefore the active involvement of interested target and user groups in research.

Citizen Science is a collaborative and inclusive approach to scientific research that engages everyday individuals, or "citizen scientists," in various aspects of the scientific process. These enthusiastic volunteers, often with diverse backgrounds and expertise, actively participate in data collection, analysis, and even project design. Citizen Science projects span a wide range of fields and offer numerous benefits. They not only increase the quantity and diversity of data available to researchers but also promote public engagement with science, foster a sense of community, and empower individuals to contribute meaningfully to scientific discoveries. Citizen Science exemplifies the idea that science is not confined to the lab or academic institutions but can thrive through the collective efforts of curious and passionate people from all walks of life.

Open Science

Open Science refers to a collaborative and transparent approach to research, where scientific knowledge, data, and methodologies are freely accessible to the public, promoting innovation and the sharing of knowledge across borders. It embodies principles such as open access publishing, data sharing, and citizen engagement to advance scientific progress and address societal challenges.

[Contact QR Code]

Who can be a Citizen Scientist?

Citizen Science projects encompass a broad spectrum of participants, including the general public, students, educators, specialised interest or hobbyist groups, and even children. These initiatives aim to democratise scientific research, enabling people from all backgrounds to actively contribute to scientific endeavors, fostering hands-on learning experiences in schools, and tapping into the expertise and enthusiasm of specialised communities, such as birdwatchers, astronomers, and environmental enthusiasts, to collect valuable data and advance research within their respective domains.

Topics

Examples from [insert partner university]

Just so you know, if you want to get involved: Citizen Science projects encompass a wide array of topics and scientific disciplines, each harnessing the collective power of volunteers from the public to advance research and knowledge. Examples include bird migration tracking, where enthusiasts help ornithologists understand migration patterns. Urban biodiversity initiatives engage city dwellers in monitoring local flora and fauna. Climate change observation relies on citizens to measure climatic variables. Archaeological excavations enlist citizen archaeologists to uncover history, while art enthusiasts help to describe works of art.

Here you can find Citizen Science projects at [insert partner university]

[Contact QR Code]

Guidelines for participatory science

Guidelines for participatory science

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Photo: *iStock ID: 1336244030, lena_volo*

Foreword

New scientific findings are published every day that can influence our social and personal lives now and in the future. For example, developing new and safe medicines would not be possible without the participation of volunteers in clinical trials. It is therefore all the more important that those affected are not only informed about research, but that they can also contribute their questions and perspectives to science. Today, **science** is understood as the triad of **research, teaching** and **transfer**. For some years now, we have seen scientists and academics interacting more productively with social actors in order to make research, teaching and transfer more relevant to real life, more problem-orientated and therefore more relevant. A lot is also happening in society. Current developments towards a science-based society mean that new sources of knowledge and methods are gaining in importance. More and more people are interested in opportunities for participation in science. Through approaches such as "participatory research", "co-creation" and "human-centred design" under the currently popular English term *"Citizen Science",* new methods are also developing to link scientific practice with real-life practice.

With this guide, we therefore want to support scientists in participatory projects, because alongside museums, associations and foundations, universities and research institutions are natural initiators and partners for *Citizen Science projects*. The involvement of citizens not only increases the possible scope of data, but also the relevance of scientific processes and results. In addition to the interests and motives of the stakeholders, the respective university system plays a very important role here. This is where they can find support and funding. This is also the aim of this guide, which was created as part of the **Innovative University Potsdam** project. Here you will not only find scientific analyses and definitions, but also helpful examples, recommendations and contact persons for participation in science at the University of Potsdam.

The Innovative University Potsdam project - **Inno-UP** for short (2018-2022) - is part of the federal-state initiative "Innovative University". The Inno-UP sub-project **Gesellschaftscampus** is intended to become a fascinating place of multifaceted dialogue in cooperation with other civil society actors, such as the proWissen e. V. association or the Universitätsgesellschaft Potsdam e. V. (Potsdam University Society). Citizen participation plays a central role here and should therefore be expanded and professionalised.

Since 2018, we have been analysing the requirements and possible approaches for *Citizen Science* at the University of Potsdam. The aim is to provide recommendations for the implementation of *Citizen Science projects* and to build a network with interested partners and stakeholders. To ensure that the most common answer to the question "Would you take part in a participatory *Citizen Science project*?" is no longer "No, that would only make my scientific work more difficult", but rather "We already work intensively with civil society partners", the recursive transfer idea must take centre stage: The quality, relevance and scope of research and development projects should be improved through dialogue, participation and reflection.

This is currently the main goal of the *Citizen Science community and* this is where we would like to start with these guidelines. We want to promote and support the players in the region so that more citizen science projects are created. In the best case scenario, this will give the area of co-operation between science and society a new quality in the long term. We therefore wish you and us a lot of participation.

With cooperative greetings

Prof. Dr. Dieter Wagner
Mentor of the Inno-UP sub-project Gesellschaftscampus,
Chairman of the Board of the Universitätsgesellschaft Potsdam e. V

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right Severe weather chasing: Citizens can report weather observations in real time using a photo and a short description on an Internet platform.
Photo: *iStock ID:691538284, Jurkos*

1 Introduction

Open Science approaches with citizen participation have become indispensable, at least since Wikipedia. They are a new way of generating and sharing knowledge. *Citizen Science* is one form of the current trend towards more open science. In this context, but also increasingly beyond it, science is understood as a coupled triad of research, teaching and transfer. Researchers in particular are increasingly keen to make their research data and results open and easily accessible so that knowledge can be generated and circulated more quickly. Collecting, evaluating and interpreting data is therefore no longer the sole preserve of institutionalised science. Another key approach is therefore the active involvement of interested target and user groups in research.

In the meantime, international, European and German *Citizen Science* networks have developed that exchange ideas, formulate strategies and prepare core aspects such as communication and participation for society and science with recommendations and examples. As a result, a large number of publications have now been produced on the topic of *Citizen Science*. In the first chapter, we would therefore like to point out a few fundamental works, as well as narrow down and explain the definition we use for *Citizen Science* and its levels of participation. In the second chapter, we present quality criteria, methods and recommendations for project implementation. The focus here is on questions of leadership, internal and external communication and possible incentives.

Anyone interested in participatory research and development approaches in science has usually already gathered initial experience or role models. However, it is also often the case that one does not know which working group in the regional science community is currently designing or already implementing innovative approaches. The third chapter therefore describes and categorises successful examples from the University of Potsdam and its partner organisations.

New research and experimental spaces need funding. Since 2011, the EU has invested hundreds of millions of euros in innovative, participatory research networks and -projects. Citizen-generated science is an attractive field of action that is being strategically expanded and promoted by foundations, the Federal Ministry of Education and Research and the European Commission in particular (Chapter 3).

Legal issues cannot be ignored, especially in the context of research and external cooperation. Therefore, in the fifth chapter, we provide some basic information on the rights of the participating stakeholders.

Finally, we provide you with a checklist for planning and realising a *Citizen Science* project as well as an overview of important *Citizen Science networks* in German-speaking countries - Germany, Austria and Switzerland.

2 Key literature and definition of Citizen Science

The term *Citizen Science* first appeared in 1989 in the **Technology Review** of the Massachusetts Institute of Technology (MIT), although this does not mean that similar participatory approaches, e.g. in organisational research and organisational development, have not already existed under other names. Listing and analysing all of the publications that have appeared since then would certainly be too much for a guide with a more internal university orientation. For a deeper dive, the *Bürger schaffen Wissen* network has created a constantly growing online database for *Citizen Science* literature[1] . You will also find a comprehensive overview of the literature in the bibliography.

However, some important strategies should be mentioned here. One currently very important strategy document is certainly the Green Paper on **Participation** published by the Federal Ministry of Education and Research (BMBF) in 2021. According to the Federal Ministry, high-quality and promising citizen participation should be anchored in research policy and research. In addition to the political categorisation, the Green Paper also contains challenges, thematic maps and numerous examples. Based on a strategy process with the Citizens' Council of the BMBF, a White Paper is to be published in 2023.

1 Citizen Science Literature: Key Publications Societal Impact, Citizen Science Literature - Google Drive.

We also recommend the Green Paper - **Citizen Science Strategy 2020 for Germany,** published in 2016, as introductory reading. It formulates three key recommendations for action, namely the integration of *citizen science* into scientific processes, educational concepts and decision-making processes. It thus goes beyond participatory research and is therefore an important guideline for the German *Citizen Science* community "Citizens create knowledge". This Green Paper was followed by a White Paper in 2022.

All of the publications mentioned so far highlight the fundamental goal of *Citizen Science*: that citizens and scientists from different disciplines work together on relevant topics in a transdisciplinary manner, making use of each other's expertise. The **Green Paper Citizen Science Strategy 2020** for Germany published in 2016 defines the term Citizen Science as follows:

> *"Citizen science describes the* ***participation of people*** *in scientific processes who are not institutionally bound to this field of science. Participation can range from the short-term* ***collection of data to*** *the* ***intensive use of free time to delve into a research topic together with scientists and/or other volunteers".***[2]

The definition is one of 34 commonly used definitions worldwide (Haklay et al. 2021:13). Most definitions emphasise the voluntary nature of citizen participation and data processing. Most definitions essentially express the independence of the actors from scientific institutions and their decision-making and action premises (Haklay et al. 2021). The authors of the article Citizen Science Terminology Matters: Exploring Key Terms[3] address the fact that the term *citizen scientist* cannot be clearly identified. As fixed terms can also include or exclude ideas, activities or people, Eitzel et al. suggest that particular care should be taken when defining the term *citizen scientists.* This is because the naming of participants in participatory projects can influence how they are treated, e.g. whether and how they participate in the project.

2 Bonn et al. (2016): Green Paper Citizen Science Strategy 2020 for G e r m a n y . Link to PDF, p. 14 (last opened: 21 June 2021).

3 Eitzel, M V, et al. (2017) Citizen Science Terminology Matters: Exploring Key Terms. Citizen Science: Theory and Practice, 2(1): 1, pp. 1-20, DOI: https://doi.org/10.5334/cstp.96 (last opened: 24.06.2021)

The European Citizen Science Association provides a clarifying definition in its ten principles under point one: "[...] Citizens can act as contributors, collaborators, project leaders or in other relevant roles"[4] . Generally, experts often come from fields other than the respective sciences. People from, for example, manual professions, hobby natural scientists or scientists without institutional affiliations are often experts in their fields and can therefore be integrated into a project on an equal footing with an institutionalised scientist. The great added value is that citizen researchers bring a different perspective to the research work, have a practical orientation and years of experience in their field (see also Polanyi, 1966). In **The Tacit Dimension**, Michael Polanyi emphasises the importance of a broad definition of scientific knowledge. If you are not sure which components make up a *Citizen Science* project, you can check the ten principles of *Citizen* Science from the European Citizen Science Association (ECSA).

The term is also defined more narrowly or more broadly by some organisations. Service learning in teaching, student labs for science dialogue, purely observational participation, the involvement of test subjects and participation in surveys, as well as the provision of resources (e.g. data capacities, crowdfunding of projects) are excluded from the Stifterband in relation to *Citizen Science*[5] . For the Stifterverband, *Citizen Science* encompasses "the active participation of citizens in research projects in various phases of the research process (development of the research question, design of the study, data collection, data analysis, communication of research results)". Incidentally, crowd science is not automatically *Citizen Science,* especially if the participants only come from academia or a company. However, as soon as citizens are involved in their free time, it is a *Citizen Science* project (Franzoni et al. 2021:8).

After we have tried to define the term *Citizen Science* and *Citizen Scientists*, we want to work out how participation can be organised in research, transfer and education. In the further explanations in the guide we refer in particular to the

4 ECSA (European Citizen Science Association) 2015, Ten Principles of Citizen Science, Berlin, http://doi.org/10.17605/OSF.IO/XPR2N (last opened: 24 June 2021)

5 Transferbarometer, "Research and development with society", link to website

Citizen Science *Participation Level Model* by Jennifer L. Shirk[6] . The model categorises *Citizen Science* according to five levels of participation. These levels are not clearly definable categories and can also occur in combinations, which is why we refer to them as approaches.

Basically, scientists, science managers and project managers must ask themselves how intensively the cooperation should be organised. Will citizens only be consulted briefly, publicly and anonymously or should they possess or learn certain skills so that they can actively participate in the medium to long term?

5 Forms of participatory science approaches

Approach 1. ***Contract***	Scientific institutions publicly ask for new ideas. Citizens can suggest research topics and possibly even vote on the best research approaches and thus indirectly or directly commission scientists to carry out a study.
Approach 2. ***Contribution***	Citizens are asked by researchers to collect data and contribute in a variety of ways. In return, the participants receive individual results and further information. One example is the Baby Lab at the University of Potsdam. Citizens can also financially support low-threshold research, e.g. via crowdfunding platforms.
Approach 3. ***Collaboration***	Citizens help with study design, data collection and analysis. The most common methods here are workshops and cooperative field research. However, co-determination is limited by the project specifications.

6 Shirk, J. et al. 2012. Public participation in scientific research: a framework for deliberate design. Ecology and Society 17(2): 29. http://dx.doi.org/10.5751/ES-04705-170229 (last opened: 23 July 2021)

Approach 4. ***Co-creation***	Citizens develop a study, have a say in the timetable and/or project budget and work on a research question or problem with the help of scientists.
Approach 5. **Collegial cooperation** ***(Colleagues)***	Citizens conduct research largely or completely independently and generate new knowledge in a field of research that they also present according to the standards of good scientific communication. Ideally, this results in open innovation processes. The results can flow into science. If science validates the methods and results, a transdisciplinary research and innovation community can emerge that jointly scales new findings, processes and results.

3 Quality criteria and recommendations for action

3.1. Quality criteria for citizen science projects

The increasing number of funding programmes with participatory approaches and the growing popularity of Citizen Science required the establishment of quality criteria for Citizen Science projects. The working group Quality Criteria for Citizen Science Projects was founded back in 2017 as part of the Österreich forscht platform meeting. Potential citizen science projects for the Österreich forscht platform are to be assessed on the basis of these criteria, which are as objective, comprehensible and, above all, publicly accessible as possible[7] . The Swiss Federal Institute of Technology in Zurich and the University of Münster have also defined quality criteria for Citizen Science projects in their transfer areas and published them on their websites. A catalogue of quality criteria can be found in the following guidelines. These are good to use to check whether the planned research project contains Citizen Science components or what needs to be considered in order to conduct research together with citizens.

7 Österreich forscht, AG Qualitätskriterien, link to the website (last opened: 14 June 2021)

Catalogue of quality criteria, based on the catalogue of the University of Münster[8]

Scientific area	The Citizen Science project (CS project) is based on a scientific question that can be answered in a participatory manner and within the project framework.
	The methods used in the CS project are presented in a subject-specific, appropriate and comprehensible manner.
	The CS project generates new knowledge, new products (e.g. patents or prototypes) and/or develops new methods.
Cooperation area Co-operation/Integration	The CS project generates a scientific and idea-socially relevant added value.
	Without the cooperation of citizens, it is not possible to achieve the goals of the CS project (soft criterion).
	Citizens are involved in at least one of the following project elements a. Identifying the topic and formulating the research question, b. Method design, c. Data acquisition and collection, d. Data analysis and interpretation, e. Publication of the results, f. Project governance (control, administration and monitoring).
Governance area	The distribution of tasks and roles of all parties involved in the CS projects are presented clearly and transparently on a home page.

8 Westfälische Wilhelms-Universität Münster, Quality criteria for CS projects at the WWU Link to website (last opened: 21 June 2021)

	The implementation of the CS project is documented.
	The CS project generates new knowledge, new products (e.g. patents or prototypes) and/or develops new methods.
Open Science area	All data and metadata will be made available to the public, unless or research ethics arguments against it, are made publicly available as open data with reference to the licence.
	The results of the CS project are presented in such a way that they a. findable, b. comprehensible and c. are reusable.
Internal communications	The precise expectations of those involved in the CS project, in particular the citizen scientists, are clearly described and explained. Particular emphasis is placed on using language that is appropriate for the target group.
	The participating Citizen Scientists receive feedback on the progress of the project, interim results and final results.
	Contact options are easy to find. Interaction between project management and citizen scientists is possible at any time.
External communications	The task, the planned process and the objectives of the CS project are presented on a homepage. a. transparent, b. quickly findable and c. generally understandable (ideally also barrier-free and in plain language) communicated.

	The results of the CS project will be published, provided there are no legal or ethical arguments to the contrary a. on the project homepage, b. in a standard format, c. in public formats (exhibition, lectures, podcasts, booklets, games, etc.) in an understandable way.
Ethics area	The CS project follows the rules of good scientific practice. practice and specialised ethical standards and makes them transparent.
	As part of the CS project, generally understandable information on the handling of personal data and research data is published, which the participants, or their parents (in the case of children and adolescents), must agree to before participating in the project.
	In the CS project, aspects of equality, diversity and inclusion are taken into account and reflected upon by the project management.
	In the CS project, the principle of controversy is observed throughout the entire duration of the project, i.e. scientific controversies are possible until the end of the project.

3.2. **Recommendations for project implementation**

For the guideline for participatory research and Citizen Science at the University of Potsdam, we would like to briefly discuss three key project phases here: **Application**, **implementation** and **evaluation**. Collaboration with citizen researchers can take place in all three phases or in individual completed phases. In principle, the type of participation by citizens depends on the research question and/or the project design.

APPLICATION PHASE Funding programmes should be checked regularly in order to start the planning phase in good time. Public research funding is often characterised by short application deadlines. Here it is usually important to have a concept already "in the drawer", so the consortium partners, the project idea and the scientific basis should already be largely brought together before the call for proposals. Once a suitable funding programme with participation requirements has been found, the group of people who are to be active in the application phase is defined. Both institutionalised scientists and citizen scientists can work together here. In workshop formats, topics such as research question, research design and role allocation can be discussed and jointly agreed upon.

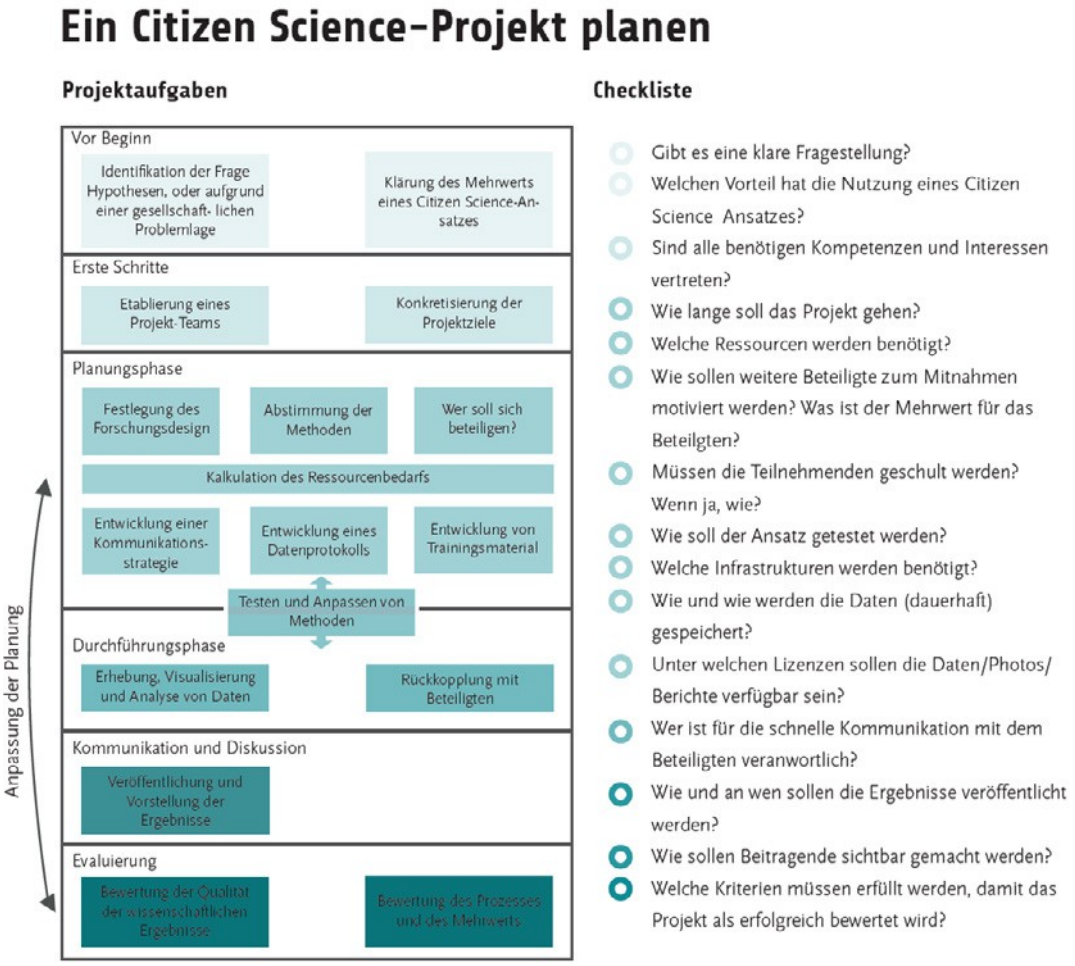
RESEARCH DESIGN In addition to scheduling, an important aspect is the early involvement of external stakeholders (schools, associations, etc.), as this results in the allocation of roles and communication - both inside and outside a Citizen Science project. Care must be taken to ensure proper communication with all participants throughout the course of the project. The participants may have no prior knowledge at all, while the scientists usually have a lot of prior knowledge and experience in the field of work (research, teaching or transfer). It therefore makes sense to provide mentor training (train-the-trainer) in advance, in which the relay staff can receive many helpful tips on how to behave correctly towards the participants and how to integrate them ideally into the scientific work. This can be more time-consuming and costly in such a project than in conventional research projects.

Therefore, this should definitely be factored into the resource planning (human and material resources). Citizen researchers can already be involved in this phase. It should be checked to what extent participation is possible and whether it serves the research question and fits the project. The costs and benefits of involving citizen scientists must, of course, be assessed in advance in as interdisciplinary a manner as possible. Coordination or training processes may be more complex due to a larger group of participants and the necessary sensitisation in the collection and evaluation of scientific data. As a reminder, experts do not always come from paid science per se. People from manual professions or scientists without institutional affiliation are experts in their field and can be equivalent to an institutionalised scientist. It is advantageous that non-scientific experts are recognised.

This allows us to bring a different perspective to the research work.

CALCULATION OF RESOURCE REQUIREMENTS When calculating resources, additional aspects for citizen scientists must be taken into account. This list is not exhaustive, but it provides an initial point of reference:

Personnel planning: How many people work full/part-time? Do these people work for free and/or are they institutionally bound?



The originator of the project tasks and the checklist at GEWISS-KOORDINATION (BürGEr schaffen WISSen - Wissen schaffl Bürger). Further information can be found at www.buergerschaffenwissen.de

Material resources for IT infrastructure (devices, licences, software development), further education/training material, workshops (to qualify citizen scientists for scientific work), events (network meetings for joint identification and exchange at eye level), PR advertising, marketing/scientific communication, communication and discussion: publication of data and presentation and anchoring of results.

IMPLEMENTATION PHASE The implementation phase begins after the final approval of the application and is ideally divided into several years and phases.

In this phase, strategies and tactics need to be developed to steadily increase participation. The Green Paper Citizen Science Strategy 2020 mentions, for example, the possibility of seeking contact with schools. The expertise of a Senior Fellow can also be an advantage here. On the one hand, for the above-mentioned reasons of time freedom, as well as knowledge of budget management, project work and scientific jargon. Participants without a scientific background but with expertise in the respective subject area, depending on the content of the application, should also be given the opportunity to collaborate here. Many things are possible, but the facts of daily work determine the quality of implementation.

It is therefore important that the central agenda setters and implementation centres have the right basic attitude. Mistakes will certainly be made during the first project and it may be necessary to reorganise accordingly. If necessary, a citizen science project can also be reorganised into a "classic" science project as it progresses. After all, these are people who are volunteering for the first time, or who are simply not available as flexibly as they would like.

Once the go-ahead has been given for a citizen science project, the partnership between researchers and stakeholders/users that was successfully established during the conception phase should be further consolidated. Sometimes a representation of interests is recommended for both the citizen scientists and the scientists. On the scientific side, this task is often taken on by a project coordinator. The perspective for the citizen scientists can also be taken on by a senior fellow. The Münster University of Applied Sciences has dealt with the topic of "Stumbling blocks in citizen science".

By involving a Senior Fellow, the "Translation" between institutionalised researchers and citizen researchers can be coordinated. Possible misunderstandings can be counteracted and potential obstacles recognised in good time. An additional benefit lies in the expertise of the scientific work of the senior fellows. A common criticism of Citizen Science projects, that data is not collected or analysed scientifically, can thus be counteracted. The fact that further training and workshops can be an important component in projects with a participatory approach is described in more detail in the "Recognition culture" chapter.

PROJECT INTERNAL COMMUNICATION Regular dialogue within the team is very important, as transparent and open communication promotes mutual trust. Internal communication in citizen science projects can sometimes be more complex. It is important to agree on "one language" in advance in order to communicate with each other as equals. A "co-operation contract", which contains the interests and participation opportunities of both sides as well as mediation rules for any conflicts that may arise, can also be useful.

Project progress is documented and the next steps are defined in joint meetings. As volunteer participants and professional researchers have different schedules (meetings only after work or at weekends), it is not always necessary to involve all participants in all activities. However, this must be discussed with everyone in advance.

Wiki can be used to provide all the necessary information to everyone involved. With the forum format function, it is easy to see who has communicated something. Communication in regular e-mails is another option. In order to exchange information on a personal level, a monthly jour fixe between citizen scientists and professional scientists is recommended.

EXTERNAL COMMUNICATION External communication can depend on the project and the respective objective**.** If as many people as possible are to be addressed, for example to collect data, a lot of external communication is necessary. Different target groups must be addressed and various information channels utilised. The use of social media channels can be useful. However,

you need to be aware of the target group to be addressed. Content must therefore be structured appropriately for the respective information channel. Access to the internet and the use of smartphones now seem to be commonplace. Nevertheless, information should also be made available online.

There are groups of people whose communication channels are different from social media, for example. Calls for participation in Citizen Science projects or general project information can also be published in print media, on the radio or (local) television. The professional use of all these channels is not a matter of course and cannot be done on the side. In the best case scenario, a media partner and/or a position for communication design should be included in an application. The situation is often different with "*patient science*" projects. As it involves handling personal patient data, a large external communication is less meaningful or rather possible at the end. However, an appealing communication strategy with communication goals should always be considered in advance. The stakeholders involved should answer the following questions in advance:

a) Who are the main players in the project and, accordingly, who are the contact persons?
b) Who communicates with whom and who coordinates? For example, is there a helpdesk as the first point of contact?
c) Do researchers work independently or closely together?
d) Who has the mandate to represent the project externally?
e) Can the press office or journalists provide support in communication?
f) Should a project website be set up: yes/no, who should it address?
g) At what interval should communication take place: weekly/ monthly output? Newsletter, etc.

A project website is usually the first point of contact and must therefore be clearly and simply structured. The following points must be taken into account for the website:

a) What is it about? How can I participate as a citizen?
b) What happens to my data?
c) What do I gain from taking part? For example, will my participation be recognised? What can I learn?
d) Who carries out the project? Who is the contact person?

Another good starting point for external communication within the citizen science community is the Citizens Create Knowledge platform. In addition to information on the topic of Citizen Science, projects can be placed online there in order to address interested parties. It also increases the reach of a particular Citizen Science project. A list of CS networks can be found in the appendix.

Contact persons for communication at the University of Potsdam:

- Press and Public Relations Department
- Online editorial team in the Press and Public Relations Department: Twitter and Instagram
- Department 2 - Student Marketing and, if applicable, MINT Department
- ZIM - Centre for Information Technology and Media Management (application for a UP project website)

University of Potsdam, Department of Press and Public Relations
Am Neuen Palais 10, Haus 9, 14469 Potsdam, Tel. 0331 977-1474
presse@uni-potsdam.de

University of Potsdam, Department of Student Affairs
Am Neuen Palais 10, House 8, 14469 Potsdam, Tel. 331 977-
1016 sabina.bieber@uni-potsdam.de

University of Potsdam, ZIM - Centre for Information Technology
and Media Management
Am Neuen Palais 10, House 8, 14469 Potsdam. Tel. 0331 977-
4444 zim-service@uni-potsdam.de

CULTURE OF RECOGNITION AND POSSIBLE APPROACHES

The results should be adapted to the specific target group and reviewed at regular intervals. In particular, if the scientific results are to be published, this should be clearly discussed and agreed with all participants in advance. This prevents misunderstandings from the outset.

The opportunity for further (scientific) training represents a high added value and provides a high degree of motivation and identification with the citizen science project. Further training and workshops improve *scientific literacy*, i.e. the *scientific fluency/scientific knowledge* of citizen scientists. Depending on the participation model, the form of recognition can also be applied differently.

Recognising volunteers in particular is an important aspect of citizen science projects. Forms of recognition can include celebrating milestones or thanking volunteers. Sharing the scientific results with the citizen scientists is one of the most important forms of recognition. Mentioning the volunteer participants in scientific publications is another form of recognition and also helps to promote the Citizen Science movement.

Celebrating milestones achieved is an important part of working together. It is an opportunity to show appreciation for the individual team members and recognise their commitment, some of which is voluntary. Last but not least, it is a motivation for further collaboration. When planning the budget at the start of a project, it is advisable to take the above points into account.

EVALUATION PHASE Evaluation can be understood in two different ways here. On the one hand, it is the evaluation of the scientific results based on the data provided by citizen scientists. On the other hand, it is the accompanying research in general.

The evaluation of the scientific results is usually carried out by the researchers. A presentation of the results prior to publication and possible peer review procedures, possibly with the stakeholders involved, is recommended. The perspective of the participating laypersons can represent a surprising added value.

to be published. At best, the results should be published, naming the citizen scientists. At the very least, the use of citizen science data should be mentioned.

In addition to evaluating the scientific results, the focus is particularly on learning and impact effects for the actors involved and for society as a whole (Lynch 2018). The impact evaluation should take place in the entire team in order to obtain feedback and generate learning effects. They also provide information about the success/failure of the project. Milestones and previously defined key performance indicators (KPIs) for measuring success are reviewed and evaluated together. Even a negative project evaluation can provide clues for a new, more realistic research initiative in the future.

4 Current Citizen Science approaches at the University of Potsdam

Establishing contact between scientists and citizens is not always an easy task because most scientists have no experience with this. This is still a gap, or a "blindspot" in science. Especially when it comes to the question of how this contact can be established, we therefore see a lot of potential to learn from successful projects. It is often the case that even on your own campus, you don't always know which working group in the regional science community is currently designing or already implementing innovative approaches. Therefore, in addition to a pool of methods, we also want to use best practices to initiate networking and partnerships in the field of citizen science. To this end, we have selected and categorised current science projects with citizen participation. The authors do not guarantee that the list is complete, as scientists often do not use the term citizen science in their descriptions. On the one hand, there is no reason or incentive to do so and, on the other hand, the terms participatory research and citizen science are not yet established in the scientific community. It is often necessary to search for other terms, including the inclusion of target and user groups (patients, children, immigrants, etc.), participation, crowdsourcing (outside of science), dialogue-based approach, multi-stakeholder approach, transdisciplinary civil society research, non-technical innovation,

social innovation, service learning - learning through engagement, etc. This shows that a citizen science community must first be actively formed. Anyone interested in participatory science can find initial contacts and approaches here, depending on the faculty.

4.1. **Faculty of Mathematics and Natural Sciences**

Urban forest gardens - the participatory research and development project
In three project forest gardens in Berlin and Kassel, environmental education, social interaction and a near-natural and long-term form of *urban gardening* are to be trialled so that important social functions for urban green spaces can be combined in synergy with ecological functions (biodiversity, etc.).

Type: Joint project with the Bezirksverband Berlin-Süden der Kleingärtner e. V., the Freilandlabor Britz e. V. and the Umwelt- und Gartenamt der Stadt Kassel
Approach: 2nd contribution, 3rd co-operation, 4th co-creation
Participation: Development of questions, data collection, communication of research results
Methods: Negotiation and site development with municipal authorities, acceptance-building measures,
Public relations, process support, participation formats such as workshops, collaborative planning, realisation and operation of forest gardens, ecological, climatic and social monitoring, personal responsibility
of the parties involved
Contact: Dr Jennifer Schulz, Landscape Management Working Group, Institute of Environmental Sciences and Geography at the University of Potsdam *Project website:* **https://urbane-waldgaerten.de**
Funding and project period: Federal Programme on Biological Diversity, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (2018-2020, 2021-2027)

Computer friends book
Computers have become so ubiquitous that they are no longer recognised and appreciated as such, but are taken for granted as singular artefacts The *Computer Friends Book* is an approach to awakening a sense of this universality in primary school children. It is based on their experiences and concepts that they are familiar with from their everyday lives and which are specifically transferred to the computer. The book is created by the children themselves.

Type: School project

Approach: 2. contribution, 3. cooperation, 4. co-creation
Participation: Development of the research question, design of the study, data collection, data analysis, communication of research results
Methods: Explanation of the basics through preceding teaching units, independent book design, use of various media
Contact: Prof. Dr Ulrike Lucke, Chair of "Complex Multimedia Application Architectures" at the Institute of Computer Science and Computational Science
Website: Chair of Complex Multimedia Application Architectures, Projects - University of Potsdam (**uni-potsdam.de**)

RUNA - miiConsent modular iconographic informed consent Informed consent forms for (medical) examinations, interventions, tests, research projects, etc. are often unclear and too long. They therefore fail to fulfil their purpose of providing sufficient information. The website makes it possible to simplify the content of these documents and thus increase their transparency and effectiveness.

Type: Educational and evaluation website, developed with the Evangelische Hochschule Nürnberg (EVHN) and the Inno-UP sub-project Gesellschaftscampus
Approach: 2nd contribution
Participation: Data collection
Methods: Testing with user groups, upload of forms and direct evaluation
Contact: Prof. Dr Ulrike Lucke, Chair of "Complex Multimedia Application Architectures" at the Institute of Computer Science and Computational Science
Website: **https://runa-01.soft.cs.uni-potsdam.de**
Funding and project period: Federal Ministry of Education and Research (BMBF) (2019-2020) as part of the Innovation and Technology Analysis (ITA) and the topic area "Participation capability"

Introducing Big-Data and Crowdsourcing to seismic hazard assessment
The density of regional seismological sensors is to be increased. Low-cost environmental monitoring systems, smartphone apps and fibre optic cables offer new possibilities for assessing the intensity of seismic movements. New "Crowdsourcing" data sets with exponential growth. These datasets are very heterogeneous, but they provide an opportunity to increase data density in urban centres and develop a hazard assessment at regional and city level.

Type: Crowdsourcing into the seismic hazard assessment
Approach: 2nd contribution
Participation: Data collection
Methods: Collection and consolidation of releasing public and individual seismographic data on a global scale
Contact: Chen-Ray Lin, DFG - Research Training Group "NatRiskChange" - Institute of Environmental Sciences and Geography
Website: Project P9: Introducing big-data and crowdsourcing to seismic hazard assessment - PhD Projects - DFG - Research Training Group "NatRiskChange" - University of Potsdam (**uni-potsdam.de**)
Funding and project period: German Research Foundation (DFG) (2021-2024)

oKat-SIM - optimised disaster management using simulation (BMBF 2020-2022) The aim of oKat-SIM is to use augmented reality (AR) in professional training for disaster management and civil security in order to provide technical and methodological training for managers in administration and state authorities for crisis situations. The aim is to visualise major emergencies and simulate crisis management scenarios in a mobile and interactive 3D environment. AR enables the visualisation of realistic on-site situations on the one hand and the cooperative action of the crisis management team in possible real-time scenarios on the other. This makes the variety of options for action directly tangible and the consequences of the resulting decisions visible.

Type: Joint project with the University of Lübeck and the Babelsberg Film University, as well as the districts of Görlitz, Garmisch-Partenkirchen, the Geretsried State Fire Service School, the city of Leverkusen and the Hochwasser Kompetenz Centrum e. V. (Flood Competence Centre).
Approach: 2. contribution, 3. cooperation, 4. co-creation
Participation: Development of the research question, design of the study, data analysis, communication of research results
Methods: prototyping, exchange formats, workshops, professional training didactics, natural hazard research, 3D visualisations in the laboratory and outdoors, validation partnerships on site, use of public data, translation of disaster prevention checklists into virtual settings, practicability and impact assessment with administrations
Contact: Dr Gerold Zeilinger, Institute of Geosciences
Website: **https://okat-sim.geo.uni-potsdam.de/Aktuelles.htm**
Funding and project period: Federal Ministry of Education and Research (BMBF) (2020-2022)

4.2. **Faculty of Economics and Social Sciences**

Mobile Fablabs - WI+R Verbundwerkstat Lausitz (2021-2023)

Local problems from the citizenry are to be worked on with modern technologies and six demonstrators developed from them. The local repair culture is brought back to life and strengthened. The result is a social innovation model and concrete solutions from the community. Open workshops are once again moving closer to the centre of attention and creating added social value in the context of maintenance, servicing and repair.

Type: Joint project with Open Knowledge Foundation Deutschland e. V., AWO Brandenburg Süd e. V., Wissenschaftsladen Potsdam e. V., Netzwerk offene Werkstätten Brandenburg, Verein Gubener Kunstgilde, Stadtbibliothek Guben

Future scenarios are developed together in workshops. This is where citizens and experts can communicate their needs. Actual situations are also analysed and potentials and weaknesses are illustrated. Photo: *iStock ID: 1342429241, Portra*

Approach: 2. contribution, 3. cooperation, 4. co-creation

Participation: Data collection, data analysis, communication of research results *Methods:* Repair projects, open source, open hardware, 3D printing, *Contact:* Martin Koll, UP-Alumni, Wissenschaftsladen Potsdam e. V., Bonny Brandenburger, Julia Brüsch, Magnus Busch, Chair of Information Systems, esp. processes and systems,

Website: Mobile Fablabs: WI+R Verbundwerkstatt Lausitz | LSWI

Funding and project period: Federal Ministry of Education and Research (BMBF) 2021-2023

DiReBio - Methodology, infrastructure and nationwide initiation of discourse to develop local future strategies for the bioeconomy (developed 2020-2021, still in use)

The economy as a whole needs to become more sustainable and regional, but where do we start? And how can new technologies be used to support the transformation towards an extensive bioeconomy? To this end, bioeconomic technologies and approaches will be explained in regional workshops in order to then jointly develop future scenarios. Representatives from the fields of industry, agriculture, trade, logistics, education, administration, research, structural development, ecology, citizenship and youth work will be invited. In this way, local strategies and projects for bioeconomic change can be derived. The methods and instruments of the DiReBio project will continue to be used in seminars and in the chair's haptics laboratory.

Type: Workshops on strategic foresight, in co-operation with the Leibniz Institute for Agricultural Engineering and Bioeconomy (ATB) and the Wissenschaftsladen Potsdam e. V.
Approach: 2. contribution, 3. cooperation, 4. co-creation
Participation: Development of the research question, design of the study, data collection, data analysis
Methods: Workshops, methods of system and changeability analysis, haptic methods of idea development, collective evaluation procedures, participative decision-making, decision-making, project initiation and planning *Contact:* Dr Edzard Weber, Chair of Information Systems,
esp. processes and systems
Website: Decision Management | LSWI
Funding and project period: Federal Ministry of Education and Research (BMBF) 2021-2023

Research Group 9 - Digital Technologies and Wellbeing -
Project in the BMBF joint project "Weizenbaum Institute for the Networked Society - The German Internet Institute"

Digitalisation - from smartphones and fitness trackers to interactive web platforms - is omnipresent in everyday life. The aim of the research is to provide the public with a better understanding of how the use of digital technologies affects the well-being, behaviour and decision-making processes of users. In addition to society in general, special status groups with specific characteristics should also be taken into account. How does the use of digital media affect well-being (e.g. sleep, social behaviour)?

Type: empirical research project
Approach: 2nd contribution
Participation: Data collection
Method: Collection of personal health and behavioural data, survey *Contact:* Hanna Krasnova, Professor at the Chair of Information Systems, in particular Social Media and Data Science
Website: https://www.weizenbaum-institut.de/forschung/fg9
Funding and project period: Federal Ministry of Education and Research (BMBF) 2017-2022

Measuring migration behaviour through WhatsApp use (launched in 2021) This project investigates the potential of WhatsApp for follow-up panel surveys in low-income developing regions to measure migration behaviour. In this methodological study, the team compares response rates across different survey modes. The research focusses on migration decisions and the impact analysis of policy measures, based on a quantitative research design.

Type: empirical research project through crowd sourcing
Approach: 2nd contribution
Participation: Data collection
Method: Uncovering peer-to-peer communication on the topic
Contact: Prof. Dr Jasper Tjaden, Chair of Applied Social Research & Public Policy
Website: https://www.uni-potsdam.de/de/socrespolicy/lehrstuhl/prof-dr-jasper-tjaden
Funding: International Organisation of Migration, IOM

4.3. **Faculty of Health Sciences**

The Faculty of Health Sciences was established in June 2018 as a faculty of three supporting universities - the University of Potsdam, the Brandenburg University of Technology Cottbus-Senftenberg and the Brandenburg Medical School Theodor Fontane. The projects presented here are not based at the University of Potsdam, but at the Brandenburg Medical School Theodor Fontane. However, they illustrate very well the potential for participatory research in the health sciences.

Krankheitserfahrungen.de

krankheitserfahrungen.de is the licensed website of the Database Project for Individual Patient Experiences Germany (DIPEx Germany), which is based at the Institute for Social Medicine and Epidemiology at the Brandenburg Medical School Theodor Fontane. For the *DIPEx database,* interviews are conducted in scientific studies with people affected by various diseases. The empirical data is then analysed and made available in the database. Thanks to the methodologically sound survey, the narratives of those affected can be further processed in subsequent scientific studies and thus provide insights into the subjective experiences and decision-making processes of people with illnesses.

Type: Collaborative project
Approach: 2nd contribution
Participation: Data collection, communication of research results
Methods: Platform with personal blog posts, videos
Contact: Prof. Dr Christine Holmberg, M.A., M.P.H., Brandenburg Medical School
Website: **https://www.krankheitserfahrungen.de**
Funding and project period: Federal Ministry of Health (2012), then Stiftung Krebsallianz gGmbH until today

NAVICARE - Development of a patient-oriented navigation programme including the patient perspective (BMBF 2020)

Patient navigation is an innovative care model that is intended to support patients in receiving patient-centred healthcare and navigating the complex healthcare system. However, when developing and implementing such navigation models, the patient's perspective as a target group has not yet been sufficiently taken into account.

Type: Joint project with six Charité institutes
Approach: 2nd contribution, 3rd co-operation
Participation: Data collection, design of the study
Methods: individual support for patients over the course of a year, support in care coordination, joint design/co-design and co-creation of care, survey
Contact persons: Prof Dr Christine Holmberg, M.A., M.P.H., Brandenburg Medical School, PD Dr Nina Rieckmann, Institute of Public Health, Charité - Universitätsmedizin Berlin
Website: **https://navicare.berlin/de/forschung**

Funding and project period: Federal Ministry of Education and Research (BMBF)
2020-2023

Opportunities and Barriers of Telemedicine in Rheumatology - A Participatory, Mixed-Methods Study (2021)
Telemedicine is intended to improve care for rheumatic and musculoskeletal diseases (RMDs). However, it is not widespread. The aim of this study is to investigate opportunities, barriers, acceptance and preferences regarding telemedicine among RMD patients and professional stakeholders.

Type: empirical research project
Approach: 2nd contribution
Participation: Data collection
Methods: Workshops, survey
Contact: Dr rer. medic. Felix Muehlensiepen, Brandenburg Medical School
Webseite: **https://doi.org/10.3390/ijerph182413127**

4.4. **Faculty of Philosophy**

Jewish cemeteries in Brandenburg and western Poland
The project "Jewish Cemeteries in Brandenburg" brings together the documentation of 23 cemeteries in Brandenburg in an internet-based database in order to make the results of the research available for genealogical, local historical and sociological research. On the other hand, this database should be an offer to the worldwide scattered descendants to find their relatives buried and honoured in the Jewish cemeteries in today's state of Brandenburg.

Type: Joint project with the Chair of Monument Studies at the European University Viadrina, Jewish Studies at the Jagiellonian University in Krakow, the Museum of the Meseritz Land (Muzeum Ziemi Międzyrzeckiej) in Międzyrzecz and the Institute of Applied History in Frankfurt (Oder)
Approach: 2nd contribution
Participation: Data collection
Methods: Science communication, genealogy, heritage conservation, school projects
Contact: Dr Anke Geißler-Grünberg, Modern History (German-Jewish History)
Website: **https://www.uni-potsdam.de/de/juedische-friedhoefe-pl/index**

Funding and project period: The Federal Government Commissioner for Culture and the Media (2019-2021)

Critical Cultural Literacy Online

The target group are structurally disadvantaged people (e.g. people with refugee backgrounds) who potentially aspire to study cultural studies. The aim is to make the complex theoretical content of their subject accessible, interesting and tangible for potential students. Ideally, educational equity is increased at university level. Challenges: Accessibility of complex theories and technical terms, enthusiasm for basic principles, heterogeneity of initial knowledge

Type: Outreach project
Approach: 4th co-creation
Participation: Data collection, data analysis
Methods: Surveys, interviews
Contact: Dr Carly McLaughlin, Cultural Studies of Great Britain (focus: Urban Britain) and Mohammad Dalla, Cultural Studies, Digital Humanities
Funding: Brandenburg State Teaching Award 2020

Database on actors, sources and places of folklore of the Age of Enlightenment, Riga 2019

As part of the project "Media Practices of the Enlightenment", a specific database (repository) on the folklore of the Enlightenment era was created at the Archives of Latvian Folklore (ALF, founded in 1924). Source collections and editions are progressively transcribed and annotated through crowd-sourcing. The ALF is one of the largest folklore collections in Europe with a total of around 3 million folklore articles. Everyone is invited to participate in the further development of the digital content: Transcribing manuscripts to make them automatically searchable, translating the materials into other languages, recognising and describing the people and places depicted, adding personal details of folklore informants and collectors.

Type: Collaborative project
Approach: 2nd contribution
Participation: Data collection, data analysis
Methods: Translation and interpretation through crowd sourcing
Contact: Vinzenz Hoppe and Kaspar Renner, Chair of Cultures of Enlightenment, Prof. Dr Iwan-Michelangelo D'Aprile
Website: https://www.uni-potsdam.de/de/mda/outputs/datenbank-zu-akteuren-quellen-und-orten-der-folklo- ristik-des-aufklaerungszeitalters-riga-2019
Project period: 2016-2019

4.5. **Faculty of Human Sciences**

Early risk detection of speech development disorders in babies

As part of this project, researchers want to develop a child-friendly and playful system that can be used to determine in the first year of life whether a child is at risk of developing a speech development disorder (SES). It is estimated that up to 19% of all children suffer from SES. The method would be easy to integrate into the paediatric U6 examination and could also be used for therapeutic purposes.

Type: Pilot project with various cooperation partners, in particular other baby labs, paediatric practices, speech therapists and parents
Approach: 2nd contribution
Participation: Data collection
Methods: trialling, prototyping, testing
Contact: Prof. Natalie Boll-Avetisyan,PhD, Developmental Psycholinguistics *Website:* https://www.uni-potsdam.de/de/ling/researchgroups/developmental-psycholinguistics *Funding:* "Promotion of Knowledge and Technology Transfer" (FöWiTec) of the University of Potsdam

4.6. **Faculty of Law**

Cooperation between the local advisory councils and the city administration and the City Assembly (State Capital of Potsdam 2021)

The report deals with the current state of co-operation and the problems that have become apparent between the local advisory councils and the city administration of Potsdam, as well as how the Potsdam city council deals with the resolutions of the local advisory councils. In the first chapter, the legal, representative-democratic and settlement-specific framework conditions of the districts of the state capital Potsdam are analysed. This is followed in the second chapter by a presentation of the quite controversial views of the local councillors, city councillors and managers of Potsdam's city administration on mutual cooperation. The third chapter then identifies the framework conditions for improved co-operation between the aforementioned stakeholders in the future. The report culminates in a series of suggestions by the rapporteur on how the cooperation between the districts and the city of Potsdam can be made more efficient, transparent, resource-saving, solution-orientated and thus visibly more successful for the citizens.

could. These proposals will then be discussed at a workshop. As the final step of the project, the rapporteur will then present a handout containing proposals for practical changes to the procedures.

Contact: Prof. habil. Jochen Franzke, Institute of Municipal Sciences at the University of Potsdam

Participation: Data analysis, communication of research results

4.7. **Digital Engineering Faculty**

HPI School Cloud

The digital education platform enables teachers and students to access digital teaching and learning content and tools flexibly and to work together collaboratively and across schools. The HPI School Cloud was designed to be technically scalable and interoperable from the outset and is an open source project. At the end of the project in July 2021, the HPI School Cloud offered around 4,000 schools and thus 1.4 million users throughout Germany and German schools abroad a protected, secure digital learning space. The school cloud was handed over to Dataport AöR for use in regular operations.

Type: interactive web platform for schools

Approach: 2nd contribution

Participation: Design of the study, data collection, data analysis

Methods: Stakeholder involvement, testing

Contact: Prof Dr Christoph Meinel, Institute Director and CEO Hasso Plattner Institute

Website: **https://hpi.de/open-campus/hpi-initiativen/hpi-schul-cloud.html**

Funding and project period: BMBF 2017-2021

Learning at Scale (L@S)

L@S invites examples of highly scalable learning from open educational software, educational games, citizen science communities, collaborative programming communities (e.g. Scratch), community tutorial systems (e.g. StackOverflow), collaborative critique communities (e.g. DeviantArt), and countless informal learning communities (e.g. the sub-reddit Explain It Like I'm Five). These examples of 'learning at scale' share the common goal of enhancing human potential by utilising data collection, data analysis, human interaction and various forms of computer-assisted assessment, adaptation and guidance.

https://emoocs. hpi.de/index.php/programme

For a further understanding of participatory research, there are also open lectures at the Faculty of Digital Engineering/HPI, the open lecture platform Tele-Task: **https://www.tele-task.de/search/lecture/citizen%20science%20participation** and the open learning platform for human-centred research and development methods: **https:// open.hpi.de**.

To summarise this brief collection of projects, it can be emphasised that participatory research can be very diverse. It can be short and intensive or long and comprehensive. Participatory research can certainly address highly complex questions. However, it can also tackle individual human challenges. In both cases, this guide is intended to provide inspiration and support.

5 Support structures at the University of Potsdam

The University of Potsdam offers numerous supporting institutions with projects and structural starting points for initiating, networking and communicating participatory projects, see also Transfer Atlas. Here is a list of some of the organisations at the University of Potsdam that can currently provide support.

Potsdam Transfer

The website **www.inno-up.de contains** all the latest information on Citizen Science in the Gesellschaftscampus sub-project. In matching events such as the

In the "Idea Converter" workshop, active researchers can discuss their research question or project with interested fellows. Various creative methods are used to work out the research question and the research design together.

Contact person: **NICOLAS RODE (Transfer Officer)**

EDUC-SHARE - European Digital UniverCity - WP3 Citizen Engagement (2021-2024)

EDUC-SHARE is developing an alliance-wide open science and participation strategy and actively incorporating it into existing local structures. With an action plan for events and new study and research formats, science is increasingly being thought about and opened up with and for society.

Contact: **KATHARINA KLOSS (Project Manager)**

Participation & patient involvement - a topic area at the Brandenburg Congress for Health Services Research

Together with the Centre for Health Services Research (ZVF-BB) at the MHB, Profile Area II of the Faculty of Health Sciences (FGW) organised the Brandenburg Congress for Health Services Research. Among other things, the event emphasised the relevance of networking all relevant stakeholders in Brandenburg - from citizens and care providers to politics and science - in order to advance care and health services research in the state.

Contact: **GÜNTHER PEINE (Transfer Officer Faculty of Health Sciences)**

Potsdam University Society e. V.

At the University of Potsdam, the Universitätsgesellschaft Potsdam e. V. mediates between alumni, network partner organisations and the university. In its chapter "Senior Fellows Network (SFN) aims to create discourse between scientists and representatives from society, politics, business and culture. One of the SFN's goals is the reciprocal transfer of knowledge to society. The network also offers potential experts for citizen science projects from a wide range of scientific disciplines. The network of scientists, some of whom are emeritus, and experienced practitioners have the relevant expertise for advising, supporting and implementing citizen science projects. Thanks to their scientific careers, they are ideally familiar with the needs and language of science. In this role, they can support research projects in the application phase and also liaise with active researchers. In total, more than 200 professors are members of the Potsdam University Society.

Contact: **PROF. DR. EM. DIETER WAGNER (Chairman of the Board)**

Department 1: Planning, Statistics, Research Affairs of the University of Potsdam The Research Department of the University of Potsdam has published important funding databases on the Research Funding website. We therefore only want to present and explain a specific selection of funding programmes here. Specific to participatory research, we have included item 6, Funding programmes with a participatory focus, in this guide.

Contact: **RICO JANKE (Head of Division, Research Affairs, Research Promotion, reporting, co-operation agreements)**

6 Funding programmes with a participatory focus

6.1. National funding programmes for participatory science projects

The field of funding programmes expands when citizen research is included and/or considered in the research project. It is helpful to know where the exact funding requirements lie. This could include personnel, communication, further training or equipment. A first option is to seek funding from education-orientated foundations. The foundation search of the Association of German Foundations can certainly help here. The foundation search is the most comprehensive information platform on foundations in Germany. Foundations can also be considered as direct project partners. It is therefore worth getting in touch with them. There are also crowdfunding platforms such as Scistarter.org where smaller research and development projects can find financial sponsors and supporters.

The **BMBF** has set up targeted research programmes and funding announcements to open up new avenues for transdisciplinary collaboration. We would therefore like to present and link to three funding programmes as examples. In addition to the BMBF's annual calls for proposals, e.g. for the respective Year of Science, there are numerous project management organisations such as the DLR, PTJ, Zukunft-Umwelt-Gesellschaft as well as *foundations* and *other ministries* that promote citizen science approaches or citizen participation processes in research projects. We would like to present four funding lines below:

Guideline for the funding of clinical studies with high relevance for patient care (since 2020)

This guideline is intended to incentivise the integration of participatory elements into the research process. The purpose of the funding initiative is to promote clinical studies and systematic reviews of clinical studies in accordance with international standards. In particular, projects that aim to close evidence gaps and are highly relevant for the patients concerned and the healthcare system are to be funded. Funding is provided for concept development phases in which patients and users play an active role in the planning and design of a clinical study (exploratory or confirmatory) or a systematic review.[9]

9 Federal Ministry of Health, Directive on the funding of clinical studies with high relevance for patient care, link to website

"Software Sprint" funding guideline - funding for open source developers

"The aim of this measure is to realise the creative ideas of freelance programmers with regard to socially relevant solutions in the data-driven world and thus support the potential of this group to act as innovative thought leaders. This is done by promoting manageable innovation projects whose results are quickly made available as prototypes on open source platforms in the form of novel software modules and transferred into practice. These projects support the responsible and sustainable handling of public, municipal data in the sense of an open data approach. By participating in the evaluation through the established accompanying research, the group of people to be supported contributes to the generalisation and dissemination of the approaches and prototype results. In addition, suitable training and further education programmes, such as topic-specific workshops, can be developed on the basis of the knowledge gained." [10] Projects can be submitted every March and September until 2024.

Funding guideline for the thematic area "SifoLIFE - Demonstration of innovative, networked security solutions" as part of the "Research for Civil Security 2018-2023" programme

Innovative solutions from security research help to prepare for crises, manage them and reduce their consequences. However, they need to be put into practice even more effectively and quickly. With the "SifoLIFE - Demonstration of innovative, networked security solutions" competition, the Federal Ministry of Education and Research (BMBF) is supporting local authorities in particular in developing holistic concepts for the use of security solutions and testing them in practice.

6.2. European funding programmes

As part of its Horizon 2020 (2014-2020) and Horizon Europe (2021-2027) framework programmes for research and innovation, the EU has already launched over 100 funding programmes for citizen participation with a funding volume of over EUR 234 million (Vohland et al. 2021:45). The basic requirement for EU funding is always that

10 Federal Ministry of Health, guideline on the "software sprint" Promotion of open source developers, link to website

at least three EU member states are involved. Until 2020, such projects in the Horizon 2020 framework programme usually ran under the title *Responsible Research and Innovation* or under the term "Science with and for Society (SwafS)". In 2022, a "HORIZON Recognition Prize (INVOLVE)" will be awarded for the first time to recognise innovative Citizen Science projects. Comparable prizes have been awarded by the European Commission since 2014.

Under Horizon Europe, missions are being set up for the first time as EU-wide research and development instruments. The mission-orientated approach is intended to achieve and fulfil particularly ambitious goals for overcoming current social challenges through interdisciplinary solutions. The missions are divided into five mission arenas, the "mission areas"[11] :

- Adaptation to climate change, including societal changes
- The fight against cancer
- Healthy oceans, seas, coastal and inland waters
- Climate-neutral smart cities
- Soil health and nutrition

Large-scale research and development projects with citizen participation within the framework of the EU's five main missions are already being tendered, e.g:

- Innovative governance, environmental observations and digital solutions in support of the Green Deal (HORIZON-CL6-2022-GOVERNANCE-01)
- Mission Enabling activities: Digital knowledge system, public mobilisation and engagement, dynamic investment ecosystem (HORIZON-MISS-2021-OCEAN-05); on this funding page of the European Commission you will find further calls for proposals: https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls_en

EU projects are always particularly complex. At the University of Potsdam, the European Digital University City (EDUC) serves as a contact point for support alongside the Research Department.

11 Federal Ministry of Education and Research, "Missions–a new approach in the EU Framework Programme", link to website

European Digital UniverCity

The universities of Potsdam, Cagliari (Italy), Brno (Czech Republic), Paris-Nanterre (France), Pécs (Hungary) and Rennes 1 (France), South-Eastern Norway (Norway) and Jaume I (Spain) have joined forces to form a European university alliance, the "European Digital University City (EDUC)". The aim of this alliance is to create an integrated European university that enables students, researchers, teachers and administrative staff to utilise a wide range of opportunities for learning, teaching and working in the European Higher Education Area. Shared digital infrastructure and services will ensure networking between universities and stakeholders. The alliance is strongly interlinked with the regional experts and networks of the individual universities, e.g. seeking partnerships with industry, public institutions and civil society activists. In addition to innovative learning, teaching and mobility formats, EDUC areas of work include research infrastructure, civic engagement, knowledge and technology transfer and communication with society (EDUC-SHARE). The research, teaching and transfer topics of the EDUC university alliance are

1. Lifelong health and well-being,
2. Cybersecurity and artificial intelligence,
3. European Studies
4. Climate and resources,
5. Justice, inequality and inclusion,
6. Mobility/Smart Cities,
7. Culture and cultural heritage.

The "citizen engagement" work package, which is funded as part of EDUC through the Horizon 2020 component EDUC-SHARE, is being developed together with the Inno-UP "Gesellschaftscampus". In addition to networking the participating universities, EDUC-SHARE aims to involve local organisations, political decision-makers and, above all, citizens. One focus here is on young people. In addition to the individual work packages, EDUC-SHARE is developing an open science and participation strategy and actively incorporating this into the existing structures. The development of an action plan for events and new study and research formats should help the participating universities to increasingly integrate social challenges and impulses - locally and at the same time on a European level, which is the speciality and ambition of EDUC.

7 Citizen science and legal issues

The Green Paper "Citizen Science Strategy 2020 for Germany" identified options for legal and ethical framework conditions. These legal and ethical issues are not only part of established research, but also of Citizen Science. Due to the increased use of digital structures and the use of apps, the issues of data and insurance protection in projects have become particularly important. In order to fulfil the options for action identified in the Green Paper, the **"Guidelines for legal issues in citizen science projects"**[12] was published by the Museum für Naturkunde Berlin in January 2021. This provides all interested parties with very good assistance on basic questions of copyright law, data protection and the protection of citizen scientists. Due to the changing basis in legislation, this guide is being continuously developed and, through open access, is becoming an open and dynamic document. In addition, the network "AG Citizen Science and Law"[13] has developed, including a. with the aim of identifying the need for support services, structures and framework conditions and exchanging ideas with other project managers. Information events on this topic are regularly organised on the "Citizens create knowledge" platform.

The authors point out that legal issues can arise at various points in a citizen science project. It is therefore important to consider aspects of the General Data Protection Regulation, insurance protection and copyright law as early as possible.

7.1. **Copyright**

Copyright issues can arise again and again in citizen science projects. When are contributions protected by copyright and who is entitled to them? Can Citizen Science activities infringe third-party copyrights and who is liable? All of these questions are governed by the **Copyright Act**[14] , which protects the works of authors in literature, science and art.

12 Museum Naturkunde Berlin, Citizen Science Legal Guide, link to PDF (last opened: 11.02.2021)
13 Citizens create knowledge, Network AG Citizen Science & Law, link to website, last opened: 21 October 2021)
14 Federal Ministry of Justice, laws on copyright and related rights, link to website

If works or services from a project are used (commercially), **rights of use must** also be granted and the regulations of industrial property rights must be observed. In principle, moral rights must be checked. Once this has been clarified for Citizen Science projects, the question arises as to the utilisation conditions for corresponding works and services. The "Guidelines for Legal Issues in Citizen Science Projects" also address the protection of works and performances. Protected performances can be particularly relevant for Citizen Science projects, such as the protection of works in perpetuity (§71 UrhG[15]), photographic image protection (§72 UrhG[16]) and data producer rights (§§87 a ff. UrhG[17]). The extent to which property rights and third-party rights[18] are affected must be discussed specifically for each application. The "Guidelines for legal issues in citizen science projects" provide an initial overview of this in the "Example catalogue of copyright for contributions in citizen science projects"[19] .

It is not only in Citizen Science projects that moral rights must be taken into account. Care should be taken at an early stage to ensure that this right is not affected by an appropriate project and product design. If this is not possible, it must be agreed with clear regulations regarding authorship. The above-mentioned guideline advises agreeing clear rules regarding moral rights or ensuring that contributors are aware of the specific restrictions and accept them with their contribution by means of waivers.[20]

Sections 60a et seq. of the German Copyright Act (UrhG) are important in citizen science projects, as they describe the limits of legally authorised use for science, education and institutions. The "Guidelines for Legal Issues in Citizen Science Projects" point out that a contractual licence is not always required. However, further details must be examined in each individual case.

15 Federal Ministry of Justice, Laws on copyright and neighbouring rights (Copyright Act) § 71 Nachgelassene Werke, link to website

16 Federal Ministry of Justice, Laws on Copyright and Related Rights (Copyright Act) § 72 Photographs, link to website

17 Federal Ministry of Justice, Laws on Copyright and Related Rights (Copyright Act) Section 87 Broadcasting organisations, link to website

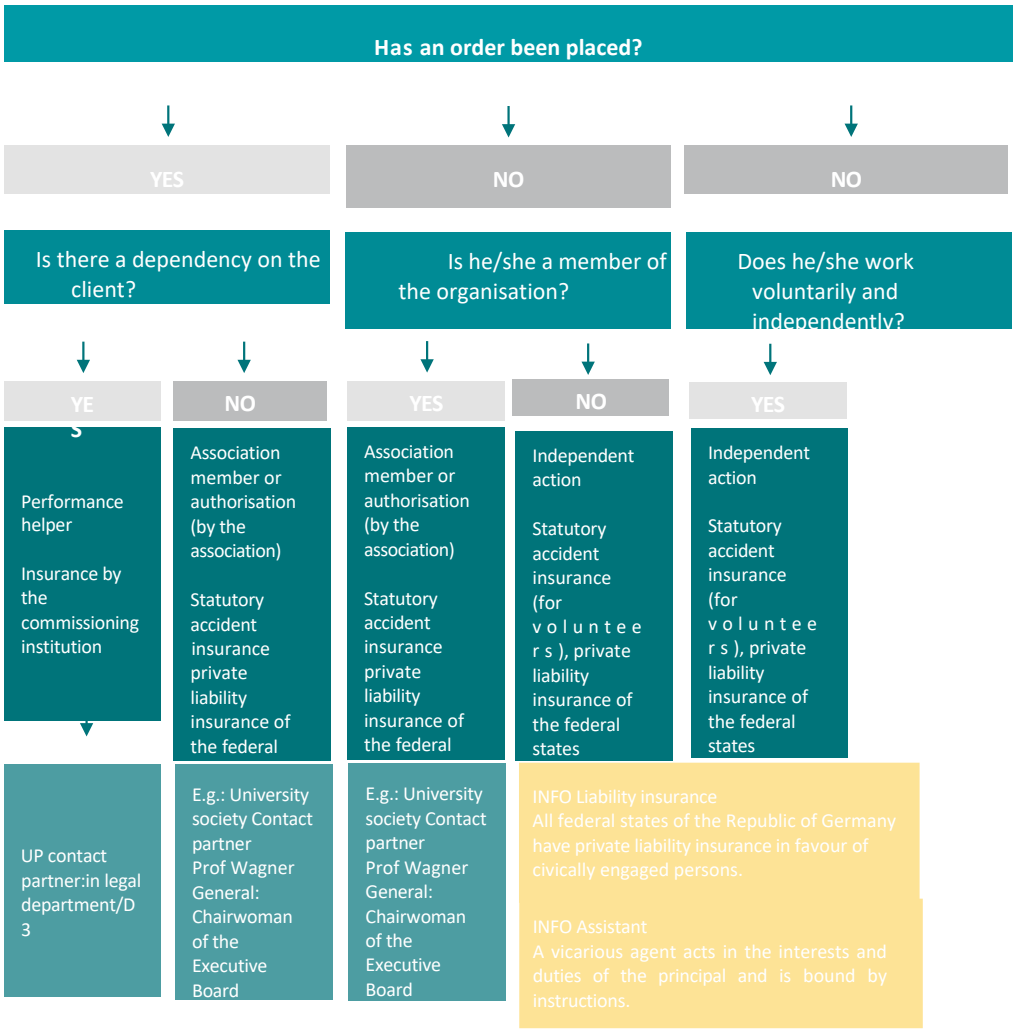
18 Museum für Naturkunde (2020), Guidelines for legal issues in citizen science projects, https://doi.org/10.7479/c3y1-fw50 p. 52 ff.

19 Museum für Naturkunde (2020), Leitfaden für rechtliche Fragestellungen in Citizen Science Projekten, https://doi.org/10.7479/c3y1-fw50 p.50.
https://doi.org/10.7479/c3y1-fw50 p. 55.

20 Museum für Naturkunde (2020), Leitfaden für rechtliche Fragestellungen in Citizen-Science-Projekten.

The extent to which rights of use must be granted depends on the respective project objective. If third parties are to be able to use copyright-protected works and services, care must be taken to regularly obtain rights of use from the author. If the Citizen Science project pursues exploitation intentions, licence agreements for usage rights must be concluded. In addition, the purpose, type and scope of use must be precisely defined in order to make it clear to those involved.

How are citizen scientists protected?



Based on: Museum für Naturkunde Berlin (2020). *LeiGaden for legal issues in citizen science projects. https://doi.org/10.7479/c3y1-fw50. (last opened: 25 April 2021). S.18.*

Contact persons at the University of Potsdam:

- D3, Unit3. J. Legal department
- Chair of the Faculty of Law

municate that rights will be granted and to what extent[21] . Obtaining rights of use or licence agreements should be included in the budget planning. The infringement of copyrights in the context of Citizen Science projects can never be ruled out. In the worst case, the consequences of copyright infringement can be claims for injunctive relief, damages or removal (§§ 97 ff UrhG). Possible consequences under criminal law are regulated in §§ 106 ff. UrhG. These only apply in the case of corresponding responsibility.

7.2. **Insurance cover**

Citizen scientists can act as individuals on a voluntary basis or as a group. Commissioning by an institution (e.g. an association) is also an option. In principle, citizen scientists are covered by **statutory accident insurance** in all models of activity. Accident insurance is part of social insurance and protects against the consequences of an accident at work or occupational illness. All activities in connection with the professional relationship are insured. If volunteers work in public institutions, e.g. in the education sector, they do not have to be insured individually. The prerequisite is unpaid voluntary work. If citizen scientists are self-employed and not bound to an institution or a member of an association, statutory accident insurance does not apply in this case. However, citizen scientists can insure themselves.

Damage to other persons or damage to property is not covered by statutory accident insurance, but by **liability insurance**. In each case, the person's function must be checked. As a vicarious agent, the citizen researcher is not personally liable for damages; instead, the managing director is liable. As a member of the association, the citizen researcher is covered by the association. The insurance must therefore be checked with the association.

If the Citizen Scientist does not act as a vicarious agent, member of an association or on behalf of an organisation, they are personally liable for damages.[22] All federal states of the Federal Republic of Germany have taken out private liability insurance in favour of citizen scientists.[23] Volunteers are insured, not the organisation they work for.

21 Museum für Naturkunde (2020), Leitfaden für rechtliche Fragestellungen in Citizen-Science-Projekten, https://doi.org/10.7479/c3y1-fw50 p.70.

22 Museum für Naturkunde, Guidelines for legal issues in citizen science projects, link to PDF

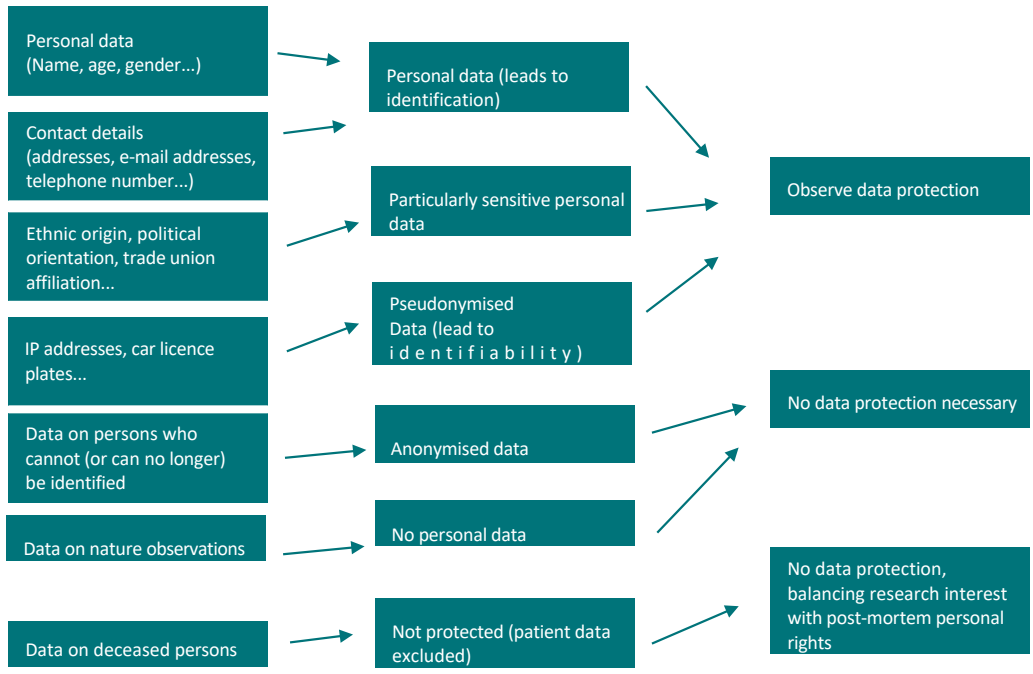
23 Federal Ministry of Labour and Social Affairs, "Zu Ihrer Sicherheit - Unfallversichert im freiwilligen Engagement", link to PDF

7.3. **Data protection**

Data protection can be relevant in all phases of a Citizen Science project if it concerns the collection, processing and publication of personal data. The processing of personal data is only permitted with the consent of the person concerned or on the basis of legal authorisation. These requirements are regulated in the General Data Protection Regulation (GDPR). The **data protection officer** at the University of Potsdam is the first point of contact for questions relating to data protection.

At the beginning of a Citizen Science project, the question of whether personal data will be collected at all should be clarified. It is also very helpful to appoint a person responsible for data protection in the team at the start of a project, or to clarify who is responsible for data protection.

Data worth protecting



Based on: Museum für Naturkunde Berlin (2020). *LeiGaden for legal issues in citizen science projects.* https://doi.org/10.7479/c3y1-fw50. (last opened: 25 April 2021). S.25.

who is responsible for data collection or is commissioned to do so. The designated person is the first point of contact for these questions, especially for citizen scientists. Other regulations may apply depending on the country. The material scope of application of the GDPR applies as soon as personal data is processed.[24] Examples of processing include Organising and arranging, adapting and modifying, matching and linking or erasing and destroying. Personal data is not always collected. This applies in particular to data that results from observations from nature and technology or data that relates to people but is anonymous. The GDPR does not apply to data with no personal reference. The graphic (p. 38) is based on the "Guidelines for legal issues in citizen science projects"[13] and illustrates in a simple way when data is worth protecting and when it is not. The following regulations apply to institutions conducting and/or coordinating citizen science:

- Brandenburg Data Protection Act (BbgDSG) for data processing by Brandenburg universities
- Federal Data Protection Act (BDSG)[25] for data processing by private individuals
- General Data Protection Regulation (GDPR) as an overarching regulation

Different regulations (in particular the BbgDSG) apply to public organisations in the state of Brandenburg than to private individuals to whom the BDSG applies. The following diagram shows answers to the question "When does the General Data Protection Regulation apply?"

Sources of personal data

Two types of personal data can be collected in citizen science projects: Data about the citizen researchers and third-party data. Citizen researchers sometimes collect their research data themselves. They can also collect data about themselves, for example by using an app or taking photos and videos with their smartphone[26] . If the data remains with the citizen researcher, the GDPR does not apply. However, as soon as this data is transferred to another organisation, the provisions of the GDPR must be taken into account.

24 Intersoft Consulting, General Data Protection Regulation, Art. 4 GDPR definitions, link to website (last opened: 22 June 2021)

25 The Federal Data Protection Act only applies to public federal institutions and private individuals, not to data processing by the universities of the State of Brandenburg.

26 Within a captured image, metadata can provide information about the camera model, location or IP address. This data makes it possible to identify the citizen scientists.

Another way to generate third-party data is if they appear as "by-catch". For example, if the person is in the background of a photo and is clearly recognisable. This also includes the identification of vehicle licence plates, for example. In addition to visual images, it is also possible to generate data of persons involved in sound recordings. Uninvolved persons may not be recorded without being asked. The recording of words not spoken in public is even punishable under § 201 StGB. Even conversations between people who are talking privately and not loudly on a park bench, for example, may therefore not be recorded.

Pseudonymisation increases the security of data processing by storing research datasets under a code and not with the real name of the person concerned. However, it is still possible to assign the data to the participants of a study via a list of clear names with the codes and the clear names. In the case of anonymised data, it is no longer possible to assign the data or only with a disproportionate amount of time, cost and manpower.

There is an obligation to provide information in accordance with Art. 14 GDPR. Article 14 contains the obligation of the controller to provide data subjects with information on data protection in the case of data collection that does not take place from the data subjects themselves. For example, a potential employer must inform applicants in data protection information that it collects data via the internet or other sources and which data it collects. Art. 14 GDPR is not applicable if private individuals are involved in data collection for research projects by the UP.

Pseudonymisation increases the security of data processing by storing research datasets under a code and not with the real name of the person concerned. However, it is still possible to assign the data to the participants of a study via a list of clear names with the codes and the clear names. In the case of anonymised data, it is no longer possible to assign the data or only with a disproportionate amount of time, cost and manpower.

There is an obligation to provide information in accordance with Art. 14 GDPR. Article 14 contains the obligation of the controller to provide data subjects with information on data protection when collecting data that is not collected from the data subjects themselves. For example, a potential employer must inform job applicants in data protection information that and what data it collects about them.

the internet or other sources. Art. 14 GDPR is not applicable if private individuals are involved in data collection for research projects by the UP.

If a person is specifically photographed, according to the "Guidelines on legal issues in citizen science projects", the exceptions from Art. 14 GDPR[27] do not apply. Consent must be obtained. When photographing crowds of people or people as accessories, Art. 14 GDPR and its exceptions can be used. However, image data of the "accessories", e.g. recognisability of the face or other clear features that lead to identification and are therefore person-related, should be anonymised as early as possible (e.g. pixelated or blackened).

If registration forms (online) are used at the University of Potsdam, the data protection notice must be observed. This is agreed in consultation with the data protection officer and prepared individually for each case. Important principles to be taken into account, such as consent, revocation, transparency and the temporal storage of data, are taken into account.

Contact persons at the University of Potsdam

- Data Protection Officer of the University of Potsdam
- Centre for Information Technology and Media Management (ZIM):
  Release form for image rights (photo, video, sound recordings)

8 Perspectives for participatory research

Instead of summarising, we want to ask ourselves the question: Where can participatory research lead? How does a citizen science project become a social entrepreneurial approach? We would now like to expand on this guideline with two examples that exemplify the growing importance of participatory research. In recent years, a variety of formats have been established that bring science and citizens together. In the federal government's High-Tech Strategy

27 Intersoft Consulting, Art. 14 GDPR, link to the website (last opened: 21 June 2021)

participation formats and citizen participation processes play a significant role. Under the heading "Transparency and participation", they are among the five core elements of the High-Tech Strategy[28] . Since 2021, the BMBF has been developing its policy paper on participation with the "Citizens' Council for Research". The result of this participatory process will be a citizens' report. In the Citizens' Assembly for Research, around 50 citizens have the opportunity to contribute their ideas, receive advice from experts and engage in intensive discussions in order to further strengthen participation in the field of research in the future. The participation process outlined in the current Green Paper should result in a White Paper by 2023 at the latest.

The IdeenLauf in the Science Year 2022 In demand!

The IdeenLauf is the central participatory event in the Science Year 2022 - Nachgefragt! The aim is to initiate a dialogue between the public and science and to identify new future fields for research and research policy. Under the motto #MeineFragefürdieWissenschaft (#MyQuestionForScience), the IdeenLauf invites all citizens to contribute to and help shape key topics in science and research policy. Questions submitted from 14 January to 15 April 2022 will be included in the IdeenLauf. The questions will be discussed by scientists and selected members of the public, bundled and placed in their specialist context by means of supplementary texts. Afterwards, the citizens are asked again. They can discuss previous results in an online participation process. The end result will be a pool of ideas. In autumn 2022, the best approaches will be presented to politicians and researchers in a report.

Acker e. V. - from an EXIST scholarship at the University of Potsdam to a social innovation

Another further example is the "Acker" association, which was conceptualised with the founding team's knowledge of agriculture and economics. Launched as Ackerdemia e. V. in 2014 as a team of four with the help of Potsdam Transfer, the "dynamic, non-profit social enterprise that emphasises openness, trust and appreciation" now has around 160 employees and over 480 freelancers and volunteers. Ackerdemia e. V. was renamed Acker e. V. in 2021. The association works to promote greater appreciation of nature and food. With award-winning educational programmes GemüseAckerdemie and AckerRacker, the team promotes vegetable growing throughout Germany.

28 Wissenschaftsrat (2015), "Zum wissenschafts-politischen Diskurs über große gesellschaftliche Herausforderungen", position paper, link to website (last opened: 3 June 2021)

in schools and daycare centres. In 2021, over 1000 learning centres in Germany, Austria and Switzerland are cooperating, and the number is rising. The concept is based on teaching children and young people to appreciate food, as they are increasingly losing access to natural food production and the processes on which it is based. As a consequence, the appreciation of food is decreasing, which in turn leads to a reduction in food consumption.
a. unhealthy diets are on the rise. Acker e. V. counteracts this with the year-round, practice-oriented educational programme "GemüseAckerdemie". The programme is aimed at schools and kindergartens as well as all educational institutions for children and young people. By growing vegetables, children and young people learn basic agricultural knowledge, develop an understanding of healthy eating and learn how nature works. The subsequent marketing of the harvest provides initial insights into market economy processes.

Smart City - a potential urban platform for Citizen Science

From 2021, the state capital of Potsdam wants to make greater use of the opportunities presented by the digital transformation to enable the socially just, sustainable, future- and citizen-orientated development of the city. The central goal of Smart City Potsdam is to promote the quality of life of all citizens. To achieve this goal, the state capital is working together with other partners in the municipality, including the University of Potsdam. To this end, the partners are building on preliminary work from previous years. Existing initiatives are being brought together and new solutions developed in a targeted manner. The funding comes from the Federal Ministry of the Interior, Building and Community, KfW (2021-2026).

Smart City solutions can relate to various science-intensive areas - from urban planning and mobility to scientific solutions for climate protection in the city. The first smart city measures have been implemented in Potsdam since 2019. Examples of current participatory projects include

- The open data portal of the state capital Potsdam, which provides data to increase the transparency of the administration. In particular, data from the areas of construction, housing, statistics, cadastre, environment and geodata are available.
- The participatory budget of the City of Potsdam, which allows citizens to participate in the planning of savings measures, income and expenditure. The 20 most important citizen ideas are determined on the basis of several rounds of voting.
- Digital services such as Maerker Potsdam: the online portal for reporting grievances and infrastructure problems

The Smart City project opens up new opportunities for participation and mobility for citizens.
Photo: *Unsplash, okai-vehicles-Wxh0LOPeUo-unsplash*

The planned projects from 2022 include

- The **Potsdam Lab.** In the urban laboratory, innovative solutions are to be developed in collaboration with the scientific community and then anchored in urban society.
- The **Smart Neighbourhood Potsdam-Schlaatz**. Future-oriented projects are being trialled in the Schlaatz district. If the projects are successful, they will be trialled in other areas of the city.
- The **LoRaWAN** project aims to further digitalise the urban infrastructure. LoRaWAN stands for a long-range wireless network that is energy-efficient, freely available and expandable. It is to be implemented in cooperation with municipal companies.
- As an informative and interactive hub, a Regio Hub will link the state capital with Berlin and rural areas in Brandenburg. This can promote joint solutions for sustainable urban-rural relationships.

The joint project of the City of Potsdam with Potsdam companies, civil society and academia pursues a total of four approaches (2nd contribution, 3rd cooperation, 4th co-creation, 5th collegial collaboration). Citizenship and science are brought together in various participation formats.

As you can see, inspiring participatory research projects are currently sprouting up in large numbers and having an impact in many different ways. This guide has hopefully aroused your curiosity so that you have been able to find starting points for your questions, ideas and projects and are now developing them further. Our guide is intended to serve as a stimulus and information basis for participatory research. We would therefore be delighted to receive your ideas and feedback. We wish you and ourselves successful participatory research.

Your "Gesellschaftscampus" of the Innovative University Potsdam!

Photo: iStock ID: *1255023898, dmphoto*

Appendix

Citizen Science networks and platforms often have excellent websites. They list interesting projects and are ideal contact points for information and networking. They usually offer strategy papers, conferences, workshops, training courses and networking events.

Citizens create knowledge (BRD)	https://www.buergerschaffenwissen.de
Austria researches	https://www.citizen-science.at
Switzerland researches	https://www.schweizforscht.ch

Working groups:

AG Science of Citizen Science	https://www.buergerschaffenwissen.de/netzwerk/ag-scienceofcitizenscience
AG Citizen Science in schools	https://www.buergerschaffenwissen.de/netzwerk/ag-citizen-science-in-schools
AG White Paper	https://www.buergerschaffenwissen.de/netzwerk/ag white paper
AG Citizen Science and Law	https://www.buergerschaffenwissen.de/netzwerk/ag-cs law
AG Evaluation of Citizen Science	https://www.buergerschaffenwissen.de/netzwerk/ag-evaluation
AG Citizen Science in Medicine and Health Research	https://www.buergerschaffenwissen.de/netzwerk/ag-cs-medical-health-research

AG Citizen Science Berlin area	https://www.buergerschaffenwissen.de/netzwerk/ag-berlin
Expertise network "CitizenScience@Helmholtz"	https://www.helmholtz.de/transfer/citizen-science
Network of game animal researchers in Berlin	https://berlin.stadtwildtiere.de

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Survey: Points of contact with the University of [insert name]

This survey i s anonymous and voluntary. You can decide individually for each question whether you would like to answer it.

Have you ever been to one of the following university locations? (multiple choice possible)

- ○ Location 1 [insert name]
- ○ Location 2[insert name]
- ○ Location 3 [insert name]
- ○ Location 3 [insert name]
- ○ On none
- ○ I was not aware that the University of [insert name] was represented at these locations in the city

Do you use the university library(s)?

- ○ Yes
- ○ No
- ○ I was not aware that this option existed

Do you use the canteen or cafeteria at one of the university locations?

- ○ Yes
- ○ No
- ○ I was not aware that this option existed

Are you familiar with the *EDUC UniverCity Takes Place* event series?

- ○ Yes
- ○ No
- ○ I have heard about it, but have not yet taken part in an event

Which of the following thematic focuses do you find interesting? (multiple choice possible)

- ○ Lifelong health and well-being
- ○ Culture and heritage
- ○ Justice, inequality and inclusion
- ○ Mobility / Smart Cities
- ○ European Union Studies
- ○ Sustainable changes: Climate and resources
- ○ Cyber security and artificial intelligence
- ○ None of this

Are there any (research) topics that currently interest you specifically?

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Which event formats would you like to take part in? (multiple choice possible)

- ○ Lecture Panel discussion
- ○ Open round table
- ○ Workshop/interactive course
- ○ Guided visit
- ○ Open day

Do you have any suggestions or ideas for other event formats?

Which age group do you belong to?

- ○ 17 or younger
- ○ 18 - 20
- ○ 21 - 29
- ○ 30 - 39
- ○ 40 - 49
- ○ 50 - 59
- ○ 60 or older

What is your highest educational qualification?

- ○ No school leaving certificate Basic/
- ○ main school leaving certificate
- ○ Realschule (Mittlere Reife)
- ○ Gymnasium [insert applicable name]
- ○ Completed vocational training
- ○ Applied Sciences University
- ○ (Diploma/Bachelor) University
- ○ (Magister/Master) University
- ○ Doctorate

Thank you for your participation!

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Umfrage: Berührungspunkte mit der Uni Potsdam im Alltag

Diese Umfrage ist anonym und auf freiwilliger Basis. Sie können bei jeder Frage individuell entscheiden, ob Sie diese beantworten möchten.

Waren Sie schon einmal an einem der drei Unistandorte? (Mehrfachauswahl möglich)

- ○ Campus Neues Palais
- ○ Campus Griebnitzsee
- ○ Campus Golm
- ○ An allen drei
- ○ An keinem
- ○ Mir war nicht bekannt, dass die Uni Potsdam an diesen Standorten in der Stadt vertreten ist

Nutzen Sie die Unibibliothek(en)?

- ○ Ja
- ○ Nein
- ○ Mir war nicht bekannt, dass diese Option besteht

Nutzen Sie die Mensa oder Cafeteria an einem der Unistandorte?

- ○ Ja
- ○ Nein
- ○ Mir war nicht bekannt, dass diese Option besteht

Kennen Sie die Veranstaltungsreihe "Uni findet Stadt" der Uni Potsdam?

- ○ Ja
- ○ Nein
- ○ Ich habe davon gehört, aber bisher noch nicht an einer Veranstaltung teilgenommen

Welche der folgenden thematischen Schwerpunkte finden Sie interessant? (Mehrfachauswahl möglich)

- ○ Lebenslange Gesundheit und Wohlbefinden
- ○ Kultur und Erbe
- ○ Gerechtigkeit, Ungleichheit und Inklusion
- ○ Mobilität / Smart Cities
- ○ Studien der Europäischen Union
- ○ Nachhaltige Veränderungen: Klima und Ressourcen
- ○ Cybersicherheit und künstliche Intelligenz
- ○ Nichts davon

Gibt es (Forschungs-)Themen, die Sie aktuell beschäftigen?

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An welchen Veranstaltungsformaten würden Sie gerne teilnehmen? (Mehrfachauswahl möglich)

- ○ Vortrag
- ○ Podiumsdiskussion
- ○ Offene Gesprächsrunde
- ○ Workshop/interaktiver Kurs
- ○ Führung
- ○ Tag der offenen Tür

Haben Sie Vorschläge oder Ideen für weitere Veranstaltungsformate?

Welcher Altersgruppe gehören Sie an?

- ○ 17 oder jünger
- ○ 18 - 20
- ○ 21 - 29
- ○ 30 - 39
- ○ 40 - 49
- ○ 50 - 59
- ○ 60 oder älter

Was ist Ihr höchster Bildungsabschluss?

- ○ Kein Schulabschluss
- ○ Grund-/Hauptschulabschluss
- ○ Realschule (Mittlere Reife)
- ○ Gymnasium (Abitur)
- ○ Abgeschlossene Ausbildung
- ○ Fachhochschulabschluss
- ○ Hochschule (Diplom/Bachelor)
- ○ Hochschule (Magister/Master)
- ○ Hochschule (Promotion)

Vielen Dank für Ihre Teilnahme!