



This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement n° 101037648 – SOCIO-BEE



Grant Agreement No: 101037648
[H2020-LC-GD-2020-3]

Wearables and drones fOr City Socio-Environmental Observations and Behavioral Change

Deliverable

D6.4 The Knowledge Powerhouse for Citizen Science on Law and Ethics - 1st release

Workpackage No.	WP6	Workpackage Title	WP6 - SOCIO-BEE Law and Ethics: Data Protection and Privacy
Task No.	T6.2	Task(s) Title(s)	Task 6.2 Ethics requirements management and guideline development
Lead beneficiary	VUB		
Dissemination level	PU		
Nature of Deliverable	R		
Delivery date	30 September 2022		
Status	F		
File Name:	[SOCIO-BEE] D6.4 The Knowledge Powerhouse for Citizen Science on Law and Ethics - 1st release.pdf		
Project start date, duration	01 October 2021, 36 Months		

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Document History			
<i>Date</i>	<i>Version</i>	<i>Author</i>	<i>Description</i>
1/08/22	0.1	LVDV	Draft ToC
11/08/22	0.2	LVDV	First draft of content
1/09/22	0.3	LVDV	Working on draft version
28/09/22	0.4	LVDV	Finalizing draft
30/09/22	0.5	LVDV	Comments from the peer review are included



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List of definitions & abbreviations

Abbreviation	Description
DOI	Digital Object Identifier
EC	European Commission
ECSA	European Citizen Science Association
GA	Grant Agreement
GDPR	General Data Protection Regulation
KPH	Knowledge Powerhouse
LSTS	Law, Science, Technology & Society Research Group
VUB	Vrije Universiteit Brussel

Executive Summary

This deliverable consists of two main points, namely: the Knowledge Powerhouse (KPH) report describing its creation and functions, and the repository of the various resources on the SOCIO-BEE website.¹

The KPH is a platform to communicate to the public the variety of resources related to ethical and legal aspects of citizen science. This is part of the VUB's project work on ethics and law that we want to disseminate in a clear and inclusive way so that we can provide additional value to the citizen science community.

The development of a citizen science repository complements existing repositories and seeks to overcome both platform challenges (such as problems with its maintenance and further dissemination) and the need for clear sources related to ethics and law within citizen science. With the increasing popularity and complexity of citizen science, and with it an increase in different sources, the KPH also provides a starting point for consulting relevant documents.

For the design and structure, inspiration was drawn from other existing platforms. Based on further brainstorming sessions with partner IBERCIVIS, further steps were taken to realise the repository on SOCIO-BEE's website so that a first version went online on 30 September.

The categorisation of sources was based on insights from the literature reviews and existing repositories. The actual collection was done by working with a reference programme Zotero².

Finally, a second release with general improvements and new resources is planned in M33 of the SOCIO-BEE project, together with the follow-up deliverable D6.5 The Knowledge Powerhouse for Citizen Science on Law and Ethics – 2nd release.

¹ https://socio-bee.eu/?page_id=486

² <https://www.zotero.org/>

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1 Introduction

1.1 Purpose of the document

Deliverable 6.4 is part of Task 6.2 Ethics requirements management and guideline development where VUB-LSTS is the lead partner.

This task partly aims to communicate the project's work in relation to law and ethics, its cross-disciplinary impact assessment and subsequent lessons learnt to the general public, encouraging the uptake of citizen science, by creating a publicly available knowledge hub hosted on the project's website. The Knowledge Powerhouse will attract stakeholders with guidelines, useful resources, and best practice, focusing on law and ethics and compacting and expanding the existing knowledge basis. The guidelines will be developed by VUB, based on the work of T6.1 and will benefit from the toolkit developed in T2.5. The outcomes of Task 6.2 are D6.4 and D6.5

1.2 Relationship with other deliverables

The Knowledge Powerhouse collects a variety of sources that are in close connection to the VUB deliverables: D1.5 Data Management Plan; D3.1 Report on Legal and Regulatory Requirements; D6.1 Impact Assessment Model; D6.2 1st Report on Impact Assessment and Recommendations for consortium partners; D6.3 2nd Report on Impact Assessment and Recommendations for stakeholders. It may also benefit from developments in T6.3 Inclusive participation in SOCIO-BEE, the first result of which D6.6 is expected in M22.

2 The Knowledge Powerhouse

2.1 Structure of the deliverable

This deliverable differs from previous delivered works for the VUB-LSTS as this time it consists of two separate items.

2.1.1 Report

. Firstly, D6.4 The Knowledge Powerhouse for Citizen Science on Law and Ethics consists of a short report describing the origins and functioning of the online repository on the project's website. An explanation is also provided as to why we set up this Knowledge Powerhouse (KPH) and what we want to achieve by doing so. The report also focuses on future plans after the first version comes online and on the 2nd edition, to be delivered in M33 of SOCIO-BEE.

2.1.2 The online repository

Second, this deliverable consists of the creation of an online repository for sources collected throughout the first year of the project, so that they could be shared in the first version of the powerhouse at the end of M12. This repository will also be discussed in detail in this deliverable. Currently, its implementation can be found on the following webpage³: https://socio-bee.eu/?page_id=486

2.2 Introduction to the Knowledge Powerhouse for Citizen Science on Law and Ethics

With the Knowledge Powerhouse for Citizen Science on Law and Ethics, we want to communicate a variety of resources for citizen science on law and ethics to the general public (ranging from interested stakeholders, citizens, public authorities, media and scientific institutions etc.). This is part of a larger vision in which we want to bring out our project work related to law and ethics in SOCIO-BEE in a clear and inclusive way so that we can create added value for the citizen science community. However, it takes the concepts of ethics and law into a broader perspective by bridging to overlapping issues and problems that lie at the nexus of ethics and law in citizen science. The decision is found in the literature and daily practice of citizen science, where the increasing popularity and adoption of new technologies require more flexibility to address complex challenges.⁴ Therefore, in the theme of ethics and law, KPH will provide good practical examples, offer guidelines, recommend academic resources, relevant toolkits and other interesting documents. In essence, the KPH will be a repository for knowledge exchange and mutual learning.

2.3 The online repository

2.3.1 The need for a citizen science platform

2.3.1.1 Current status

Currently, several repository sites for citizen science resources already exist. These focus on different issues such as within a particular scientific discipline, specific to a particular country or for a specific project. These repositories sometimes face certain limitations such as “infrequent or no updates, unclear

³ The website may undergo changes in the meantime, so the hyperlink may be changed along with it.

⁴ Liu et al. (2021). Chapter 22 – Citizen Science Platforms. In K., Vohland, A., L.and-Zandstra., L., Ceccaroni, R., Lemmens, J., Perelló, M., Ponti, R., Samson, & K., Wagenknecht (Eds.). *The Science of Citizen Science*. (pp. 419-437) New York: Springer

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selection criteria, difficulty in understanding their usefulness for the community, et cetera”.⁵ To address these challenges, different repositories are currently being created in other European projects that serve as inspiration for the KPH for SOCIO-BEE. A good example is the *EU-Citizen.Science project*, that wants “to develop criteria to define and identify (1) citizen science resources and best practices and (2) the relevant criteria used to select them”.^{6,7} SOCIO-BEE’s KPH seeks to fill the gap by focusing specifically on categories (in)directly related to law and ethics within citizen science. The need for a KPH can be placed in the wider trend within citizen science where the concept is growing in popularity and this is on top of strong technological developments. As SOCIO-BEE uses innovative technologies such as AI, drones and wearables, this will create new challenges within our project work and specifically for citizen science activities. As a result, there is an increasing need for solid supporting infrastructure such as apps and platforms (and within this, therefore, possible repositories for resources). In parallel with this need for digital infrastructures, the following trend has emerged: a wide range of tools such as guidelines, data manuals, metadata management, metadata standards, quality assurance and control and ethical data practices have been published. These previous developments ensure that the need for a platform is relevant to address (new) challenges within citizen science.

2.3.1.2 Towards a citizen science platform for the repository

Before describing the KPH further, it is important to briefly discuss the definition and characteristics of citizen science platforms. The KPH can be seen as a citizen science platform and can be described as follows: “web-based infrastructures with one single entrance point that contain one or several of the following functionalities: (1) present active citizen science projects and activities; (2) display citizen science data and information; (3) provide overall guidelines and tools that can be used to support citizen science projects and activities in general (e.g. recruitment strategies including motivational and marketing approaches, data quality assurance and control methods, guidelines for dealing with data security issues, resources, and opportunities to network with other relevant activities and upscale the project results); (4) present good practice examples and lessons learned; and (5) offer relevant scientific outcomes for people who are involved or interested in citizen science”.⁸ If we adopt this definition of Liu et al. (2021) to the KPH, then essentially number (3) - provide overall guidelines and tools that can be used to support citizen science projects and activities in general - and (4) - present good practice examples and lessons learned – will apply. Still, as the project progresses, other functionalities may occur.

2.3.2 Benefits for the citizen science community and the need for a repository in law and ethics

2.3.2.1 Law and ethics

The focus on law and ethics is in the first place because the VUB is the work package leader for law and ethics in SOCIO-BEE. Beyond the administrative role in the project, the academic literature shows that citizen science is characterised by specific ethical challenges that go beyond traditional research ethics and regulatory practices.⁹ For example, a citizen scientist can both have an active role (e.g. collecting data

⁵ Ibid, p. 428

⁶ Ibid.

⁷ Another good example is the *JRC Citizen Science Platform* of the EC’s Joint Research Centre (JRC). The aim of this platform is to improve the relationship between citizens and European policymaking by offering new ways to contribute to the supporting scientific processes. Available at: <https://ec.europa.eu/jrc/communities/en/community/citizensdata>

⁸ Liu et al. (2021). Chapter 22 – Citizen Science Platforms. In K., Vohland, A., L.and-Zandstra., L., Ceccaroni, R., Lemmens, J., Perelló, M., Ponti, R., Samson, & K., Wagenknecht (Eds.). *The Science of Citizen Science*. (pp. 419-437) New York: Springer, p. 440

⁹ Ficorilli et al. (2021). Investigating the process of ethical approval in citizen science research: the case of Public Health. *Journal of Science Communication*, 20(A04). Doi:10.22323/2.20060204. ; Rasmussen, L. M., & Cooper, C. (2019a). Citizen science ethics.

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, designing the research, ...) and a passive role (as a research participant scrutinised by researchers). The reason why citizen scientists also play an active role is that, to varying degrees, they are allowed to actively co-decide on the research. These challenges were discussed in D1.5 Data Management Plan and are an important starting point for the various sources on legal and ethical issues in citizen science. On top of this, the use of new technologies and data also raises a variety of legal challenges such as intellectual property rights, privacy, etc. which were addressed in D3.1 Legal and Regulatory requirements and D1.5. These issues mean that the citizen science community could benefit from a repository that focuses around ethical and legal issues in citizen science.

2.3.2.2 General impact of platforms

From the academic literature, the impact of a citizen science platform is currently difficult to measure because no systematic evaluation of its impact has taken place yet. However, there is the idea that platforms can act as catalysts for citizen science, by promoting collaboration between stakeholders for example.¹⁰ It is for this reason that SOCIO-BEE wants to take a first step with the KPH to disseminate the project work on law and ethics and other new knowledge to the citizen science community. By doing so, not only the consortium but also the citizen science community can benefit. Knowledge sharing is an important component within the citizen science community and the KPH is trying to further support this. This is also what recent experience in workshops and conferences related to citizen science has taught us.

2.3.3 Creation of the platform and its structure and content

2.3.3.1 Design and structure

In creating the KPH platform, one of the challenges is that it must be user-friendly to work with and the design must be attractive (Giuliana 2017)¹¹. For this, there is no ideal one-size fits all design approach because each citizen science project will have different objectives and resources. Its structure is also vital because "platforms strive to provide a stable and structured framework in which more dynamic and adaptable processes can evolve".¹²

2.3.3.2 Top-down and bottom-up approaches

For the initial establishment of the platform, we worked in a top-down approach because the VUB is the responsible partner for T6.2 in the Grant Agreement (GA). In the future, there may be a leeway for possible bottom-up participation of citizen scientists in this process. This could relate e.g., to the choice of new sources that are more applicable to them within law and ethics. In this way, there could be room for a possible sense of "ownership", so that the KPH also fulfils more fully the democratising promise of citizen science. This could be done by engaging with citizen scientists interested in this through workshops. Meanwhile, the KPH does remain open to all kinds of comments about the repository, as we have provided a contact point at the end of the webpage. In any case, it is important to stress that this is an ongoing process that can be improved throughout the life of the project.

Citizen Science: Theory and Practice, 4(1), 5. <https://doi.org/10.5334/cstp.235>; Resnik, D. B., Elliott, K. C., & Miller, A. K. (2015). A framework for addressing ethical issues in citizen science, *Environmental Science & Policy*, 54, doi: 10.1016/j.envsci.2015.05.008.

¹⁰ Liu et al. (2021). Chapter 22 – Citizen Science Platforms. In K., Vohland, A., L.and-Zandstra., L., Ceccaroni, R., Lemmens, J., Perelló, M., Ponti, R., Samson, & K., Wagenknecht (Eds.). *The Science of Citizen Science*. (pp. 419-437) New York: Springer, p. 451

¹¹ Giuliana, D. (2017). *Designing an interface for citizen science platforms ensuring a good user experience*. Munich: Ludwig-Maximilians-Universität München, Institut für Informatik.

¹² Liu et al. (2021). Chapter 22 – Citizen Science Platforms. In K., Vohland, A., L.and-Zandstra., L., Ceccaroni, R., Lemmens, J., Perelló, M., Ponti, R., Samson, & K., Wagenknecht (Eds.). *The Science of Citizen Science*. (pp. 419-437) New York: Springer, p. 455

2.3.3.3 Maintenance of repository

This platform will remain online until the end of the project and we are looking at how to keep updating it after that. Currently, there are several possibilities, including merging with existing European platforms such as the EU-Citizen.Science platform, which is also managed by IBERCIVIS and ECSA, among others. More information on this will be available in the following deliverable D6.5. Maintenance often remains a challenge with any kind of citizen science project. Specifically, this means challenges such as updating the platform regularly (or, in the case of SOCIO-BEE, at least once more by the end of the project) and keeping the collection site relevant. The KPH strives to always collect quality resources so that it remains relevant, but is thus also open to feedback, e.g. feedback via the webpage or by organising events on the KPH, mentioning it in papers, etc.¹³

2.3.3.4 Dissemination of KPH

Disseminating the KPH is an important element if it is to achieve the permissible goal as agreed in the GA, namely: “[...] to communicate the project’s work in relation to law and ethics, its cross-disciplinary impact assessment and subsequent lessons learnt to the general public, encouraging the uptake of citizen science, [...]”.¹⁴ For this, it is important that when the KPH is created, a strategy for further dissemination is also considered¹⁵. First, there will be a launch event later in 2022 regarding the KPH to increase visibility as it will be presented to a targeted audience. We will organise this together with research groups within the VUB that are also involved in citizen science and law and ethics, which could have a positive effect. During the launch event, some topics will be specifically addressed to stimulate debate on ethical and legal issues with citizen science and in SOCIO-BEE in general. Furthermore, the KPH will be disseminated through SOCIO-BEE’s various communication channels such as the LinkedIn profile¹⁶, Facebook page¹⁷ and Twitter profile¹⁸. Furthermore ECSA’s newsletter with over 2000 subscribers is the perfect media to reach the citizen science community. An ECSA webinar specifically talking about law and ethics and the KPH can be an excellent way of disseminating not only the KPH but the law and ethics research performed within the project. There is also the further possibility of presenting the KPH at cluster events with other EU projects that also work with citizen science, such as the cross-Swafs¹⁹ meeting for Citizen Science among others.

2.3.3.5 Actual creation of the platform

As a starting point, brainstorming was done on how best to approach the design and operation of the online platform. Inspiration was gained partly by looking at the approach of existing similar platforms. First, we looked at what knowledge already existed within our own university. For instance, the Law, Science, Technology & Society (LSTS) research group at the Vrije Universiteit Brussel (VUB) was able to offer some interesting examples such as VULNERA²⁰ and Data Protection Law & Covid-19: An

¹³ Heigl, F., Dörler, D., Bartar, P., Brodsc Hneider, R., Cieslinski, M., & Ernst, M., et al. (2018a). Quality criteria for citizen science projects on *Österreich forscht*. Vienna, Austria. <https://osf.io/48j27/>

¹⁴ GA, ANNEX 1; part A, p. 41

¹⁵ Ansell, C., & Gash, A. (2018). Collaborative platforms as a governance strategy. *Journal of Public Administration Research and Theory*, 28(1), 16–32

¹⁶ <https://www.linkedin.com/company/socio-bee/>

¹⁷ <https://www.facebook.com/sociobee.h2020/>

¹⁸ https://twitter.com/socio_bee

¹⁹ Horizon 2020 Science with and for Society

²⁰ The International Observatory on Vulnerable People in Data Protection. Available at: <https://brusselsprivacyhub.com/vulnera/>

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Observatory²¹. Next, we looked at platforms within the citizen science community. Some important websites that were consulted are: the Citizen Science Association website²², the EU-Citizen.Science project²³, and the European Citizen Science Association²⁴. The platforms from the citizen science community were especially important for the work in the KPH because they show what is already there and it made us think about what we could offer as added value with our platform. Afterwards, we collaborated with the partner IBERCIVIS to establish the final design. IBERCIVIS was responsible for putting the web page online and implementing the initial structure. Once this was online, the first texts, categories, images and resources could be uploaded until the first version became ready for distribution.

2.3.3.6 The structure and content of the platform

When creating the website, we created an additional page that can be accessed from the home page where reference is made to 'The Knowledge Powerhouse' at the top right. The webpage of KPH is divided into five sections:

General information

This section briefly describes exactly what the Knowledge Powerhouse is. The following description is on the website:

The Knowledge Powerhouse for Citizen Science on Law and Ethics is part of a task dissemination from SOCIO-BEE and aims to communicate the project's work as well as existing resources in relation to law and ethics and subsequent lessons learnt to the general public, encouraging the uptake of citizen science, by creating a publicly available knowledge hub hosted on the project's website.

The content of the KPH

This briefly describes the sources the KPH consists of and describes the various categories of the KPH. The following description is on the website:

The Knowledge Powerhouse is made up a wide variety of resources, ranging from guidelines, blog posts, policy document to academic works etc. They are arranged by different thematic categories.

In this way, we can summarise, compact and expand the existing knowledge base intended for diverse audiences.

The actual repository

This section shows all the resources that make up the KPH. The repository has three categories, namely: 1) ethics; 2) law; 3) additional resources. From the main menu in the middle of the webpage, you can click on the desired category, which will take you to this part of the webpage. These categories are thereby further divided into a number of subcategories depending on the three categories. The sources generally

²¹ The Data Protection Law & Covid-19 Observatory. Available at: <https://lsts.research.vub.be/en/data-driven-approaches-to-covid-19-data-protection-law-dpl-x-covid-19#feb5e757-03c7-4997-b32f-e096eb8b3f23>

²² <https://citizenscience.org/>

²³ <https://eu-citizen.science/>

²⁴ <https://ecsa.citizen-science.net/>

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follow the APA 7th Referencing style²⁵. For academic sources, the Digital object identifier (DOI)²⁶ will include a hyperlink to an open access version of the reference. For other sources, there will be a separate caption that goes as follows: '*Click here to view*' after the title of the work (whatever type of source, if it is not an academic source) and this then contains a hyperlink to the exact location of the source on the internet. Otherwise, the title of the work itself will have a hyperlink (this may be more appealing with tools, guidelines and principles, for example).

The disclaimer

Herein, potential limitations and other important information such as KPH's methodology are briefly cited. The following text is displayed on the web page:

The source list below is continuously updated throughout the project phase. This repository consists of a variety of sources arranged by thematic category to facilitate consultation. We are, however, aware of their commonalities and overlaps. There will be a greater focus on sources more relevant to the European context because of our work in different member states, but we will also cite sources beyond the EU where relevant.

Although this repository focuses primarily on law and ethics within citizen science, it may also cover adjacent topics that may be useful within this framework. On top of this, there is also a further brief focus on certain innovative technologies such as drones, wearables and artificial intelligence as these are used within the SOCIO-BEE project.

The information in the Knowledge Powerhouse is non-exhaustive and we will continue to add resources that are relevant throughout the project. We are open to new resources and suggestions on how to enrich the platform (see contact form below).

It is always possible that in the meantime, some sources may change domain or be taken offline. This will be checked every so often and in the run-up to the second release in M33.

Contact form

With the contact form at the end of the webpage, we provide a way to contact us on matters relating to KPH. Any questions, comments or other points can be raised here. The contact form consists of two textboxes: one for the name and one for the message and there is also a privacy-friendly reCAPTCHA.

2.3.4 Collection and categorization of the resources

2.3.4.1 The methodology for collection

2.3.4.1.1 Legal and ethical desk research during previous deliverables

The methodology consisted of a central legal and ethical desk research. This research relied on several elements: the previous work delivered within deliverables D3.1, D1.5 and D6.1 provided an initial

²⁵ This is a reference style used by a large number of scholars in different fields. Available at: <https://apastyle.apa.org/about-apa-style>

²⁶ "A DOI is a unique alphanumeric string that identifies content and provides a persistent link to its location on the internet. DOIs can be found in database records and the reference lists of published works". Available at: <https://apastyle.apa.org/style-grammar-guidelines/references/dois-urls>

opportunity to research and collect relevant sources for the platform. This is because those deliverables dealt with both legal and ethical issues within the SOCIO-BEE project. Moreover, there was also a chapter specifically dedicated to citizen science in D3.1 Legal and Regulatory Requirements and D1.5 Data Management Plan. The work done in D6.1 Impact Assessment Model was less related to citizen science, but may later serve for inspiration on the use of Impact Assessments in projects where there is also citizen science. This will become clearer leading up to the second release of the KPH as there will have been a follow-up to the SOCIO-BEE Impact Assessment Model by then.

2.3.4.1.2 EU projects and documents

To strengthen possible synergies between similar EU projects, other projects that deal with citizen science in an (in)direct way were also followed closely. Relevant published deliverables or other documents were collected and are now in a first phase shared on the KPH. This sharing of each other's work is only expected to increase as the SOCIO-BEE project progresses. Several synergies have already been initiated from SOCIO-BEE to strengthen communication in different areas, and the KPH is a component that can be used to potentially centralise certain best practices and results of these projects related to law and ethics. A specific search was also made for substantively useful European documents such as various guidelines, working papers, other studies focusing on topics within ethics and law. If they were not directly related to citizen science, the extent to which it could be relevant to citizen science projects was assessed before adding them to the repository.

2.3.4.1.3 Existing platforms

As mentioned earlier, inspiration was drawn from existing repositories in terms of format. However, this was also used to find various sources that could be relevant to KPH, as good work has already been done in this regard and in this way, it is possible to build on existing knowledge. The following platforms were therefore consulted for further collection of resources:

- Resources page of Citizen Science Association²⁷
- Resources page of EU-Citizen.Science project²⁸
- ECSA Working Groups²⁹

These repositories will also be referenced in the KPH so that we give visitors an immediate opportunity to learn about these platforms.

2.3.4.1.4 General literature study

However, much of the research methodology undertakes a general literature review of relevant sources for KPH. This includes both the overlap in the previous sections as well as a situation where we searched for the literature related to ethics and law in citizen science through various (academic) portals. To a large extent, this involved consulting specific citizen science academic journals including *citizen science: theory & practice*.³⁰ Beyond that, the focus was also broadened to relevant guidelines, and other documents (of any material, including, for example, videos), which could enrich the KPH and although the focus is on ethics and law, guidelines that discuss these challenges and thereby other related issues well are also worth considering. What the search quickly ran into, however, was the number of varying guidelines on

²⁷ <https://citizenscience.org/>

²⁸ <https://eu-citizen.science/resources>

²⁹ <https://ecsa.citizen-science.net/working-groups/>

³⁰ Citizen Science Association. Available at: <https://theoryandpractice.citizenscienceassociation.org/>

the internet for citizen science, which may or may not be of good quality as we were looking for both in-depth sources as well as sources with an intuitive layout that could therefore appeal to multiple target groups in the project. This challenge was also discussed and explored in a recent chapter by García et al. (2021) in the book *The Science of Citizen Science*.³¹ With the growing popularity of citizen science, more guidelines are naturally appearing as well. With this chapter, the authors try to offer a clear overview in the various guidelines they consider relevant for the citizen science community. What is also interesting here is that they consulted and recommended non-English-language sources, which gave us the idea of offering this as an EU project as well. The categorisations from their work brought us more clarity and therefore found a reflection on the further development of the KPH's categories.

2.3.4.2 The categorization of the resources

2.3.4.2.1 Overview

Based on the previous different methodologies applied in collecting relevant sources and by the content of the sources themselves, further categorisation of them took place. The KPH for this release will consist of three main themes namely:

- ❖ Ethics
- ❖ Law
- ❖ Additional resources

From these three themes, further breakdowns are made as follows:

- ❖ Ethics
 - Academic resources
 - General
 - Additional resources
 - Blogposts and other commentaries
 - Guidelines
 - General
 - EU
 - Principles and codes of ethics
 - Tools
 - Use of innovative technologies
- ❖ Law
 - Academic resources
 - General
 - Additional resources
 - Guidelines
 - EU
 - Other
 - EU case law

³¹ García et al. (2021). Chapter 21 – Finding What You Need: A Guide to Citizen Science Guidelines. In K., Vohland, A., L. and Zandstra, L., Ceccaroni, R., Lemmens, J., Perelló, M., Ponti, R., Samson, & K., Wagenknecht (Eds.). *The Science of Citizen Science*. (pp. 419-437) New York: Springer

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- ❖ Additional resources
 - Academic resources, blog posts and other commentaries
 - EU projects and documents

The process of this classification is dynamic, meaning that it can always be changed depending on a wide range of factors such as: finding new sources, feedback on the KPH during the project, etc.

2.3.4.2.2 Categorisation technique

The categorisation is done using a reference programme, in this case Zotero³². Resources are stored in it and then given the appropriate destination. Important here is that only sources that are open access are shared. Finally, as mentioned earlier, sources on ethics and law have a (strong) overlap, so in the case of the law theme, we chose to stick to specific sources on law to minimise confusion.

Please find below some screenshots of the KPH.

³² <https://www.zotero.org/>
September 2022

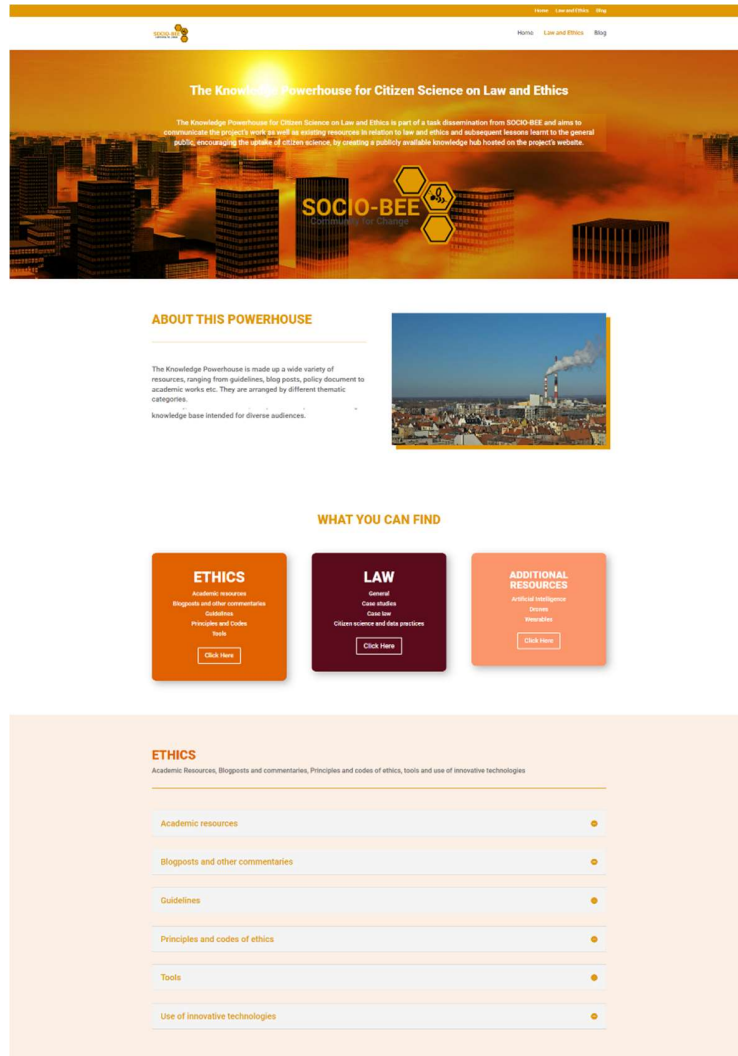
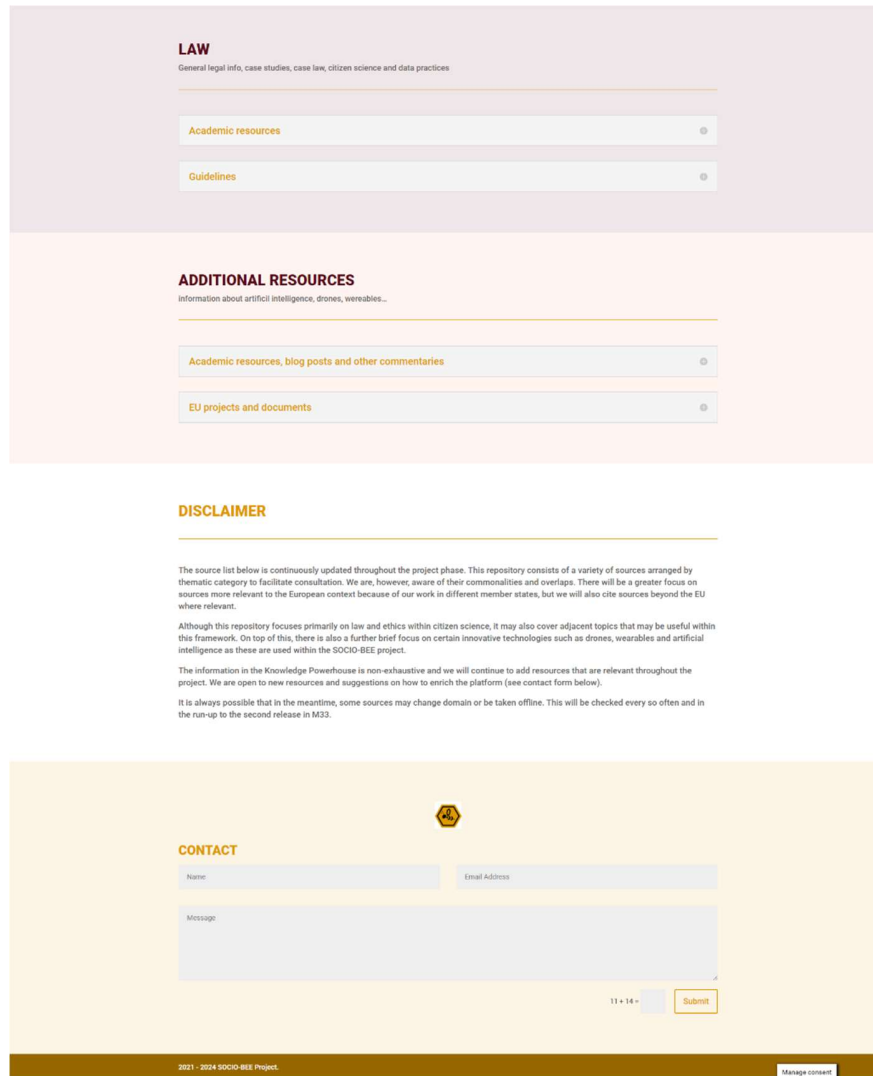


Figure 1. Overview Knowledge Powerhouse - part 1

GA No: 101037648



LAW
General legal info, case studies, case law, citizen science and data practices

- Academic resources
- Guidelines

ADDITIONAL RESOURCES
Information about artificial intelligence, drones, wearables...

- Academic resources, blog posts and other commentaries
- EU projects and documents

DISCLAIMER

The source list below is continuously updated throughout the project phase. This repository consists of a variety of sources arranged by thematic category to facilitate consultation. We are, however, aware of their commonalities and overlaps. There will be a greater focus on sources more relevant to the European context because of our work in different member states, but we will also cite sources beyond the EU where relevant.

Although this repository focuses primarily on law and ethics within citizen science, it may also cover adjacent topics that may be useful within this framework. On top of this, there is also a further brief focus on certain innovative technologies such as drones, wearables and artificial intelligence as these are used within the SOCIO-BEE project.

The information in the Knowledge Powerhouse is non-exhaustive and we will continue to add resources that are relevant throughout the project. We are open to new resources and suggestions on how to enrich the platform (see contact form below).

It is always possible that in the meantime, some sources may change domain or be taken offline. This will be checked every so often and in the run-up to the second release in M33.

CONTACT

Name: Email Address:

Message:

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Figure 2. Overview Knowledge Powerhouse - part 2

ETHICS
Academic Resources, Blogposts and commentaries, Principles and codes of ethics, tools and use of innovative technologies

Academic resources

General

Ficorilli, A., Maccani, G., Balestrini, M., Biggeri, A., De Marchi, B., Froeling, F., Gignac, F., Grazuleviciene, R., Hoek, G., Kanduć, T., Kocman, D., Righi, V., & Basagana, X. (2021). Investigating the process of ethical approval in citizen science research: The case of Public Health. *Journal of Science Communication*, 20, A04. <https://doi.org/10.22323/2.20060204>

Goodwin, J., & Roberts, L. (2019). Citizen Science Ethics: It's a Community Thing. *Narrative Inquiry in Bioethics*, 9(1), 35–40. Retrieved from https://www.researchgate.net/publication/332725062_Citizen_Science_Ethics_It%27s_a_Community_Thing

Groot, B., & Abma, T. (2022). Ethics framework for citizen science and public and patient participation in research. *BMC Medical Ethics*, 23(1), 23. <https://doi.org/10.1186/s12910-022-00761-4>

Ficorilli, A. (2020, September 14). Ethical Aspects of Citizen Science Projects at ECSA 2020 Conference. *Cities Health*. Retrieved from <https://citieshealth.eu/2020/09/14/ethical-aspects-of-citizen-science-projects-at-ecsa-2020-conference/>

Figure 3. Example resources - part 1

Blogposts and other commentaries

Guidelines

General

[Citizen's Guide to Open Data](#)

[International Compilation of Human Research Standards](#)

[Ethics and privacy guidelines by SCIVIL \(Knowledge center for citizen science in Flanders\)](#)

[Citizen science at universities: Trends, guidelines and recommendations](#)

EU

European Union Agency for Cybersecurity. (2021). Data pseudonymisation: Advanced techniques and use cases : technical analysis of cybersecurity measures in data protection and privacy. Publications Office. <https://data.europa.eu/doi/10.2824/860099>

Figure 4. Example resources - part 2



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2.4 Further updates

2.4.1 The second release of the Knowledge Powerhouse in D6.5 in M33

This deliverable is the first version of two KPH deliverables in T6.2. A new version will come online on the website in M33. In the meantime, sources will be checked for availability, and new files will also be added and adjustments made where necessary (if, for example, new insights have arisen from the event, from project work or from people's comments via the contact form). All steps after the first release will be noted and tracked for inclusion in the second deliverable D6.5. By then, a first impact assessment report will also have been prepared, which will provide further interesting resources and insights for the SOCIO-BEE KPH.

2.4.2 Other updates

Where possible, it may be interesting to contact existing repositories for possible synergies. However, the bottom line for the KPH remains primarily related to ethics and law for citizen science.

3 Conclusions

The creation of the first version of the KPH was an iterative and dynamic process resulting both from the VUB's previous work in SOCIO-BEE and from an in-depth analysis of existing repositories and ethical and legal sources related to citizen science. The need for a KPH is evident from the increasing popularity (and complexity) of citizen science and the accompanying proliferation of sources that sometimes make it difficult to find specifically relevant material.

The KPH seeks to fill the gap within existing repositories by focusing primarily on state-of-the-art resources that are (in)directly related to citizen science law and ethics and by putting a strong emphasis on the synergies between EU projects involved in citizen science. In addition, the KPH provides resources that may be relevant to a variety of stakeholders by offering not only academic resources, but also guidelines, blogs, tools and principles that also go beyond citizen science but may be useful for this purpose.

Further dissemination is also seen as an important component. There will be several opportunities to increase the reach of the KPH, such as using the SOCIO-BEE communication channels, creating events about the KPH and establishing new links with other EU projects during cluster events such as the cross-SwafS meeting for Citizen Science among others.

References

- [1] Ansell, C., & Gash, A. (2018). Collaborative platforms as a governance strategy. *Journal of Public Administration Research and Theory*, 28(1), 16–32. doi:10.1093/jopart/mux030
- [2] Ficorilli et al. (2021). Investigating the process of ethical approval in citizen science research: the case of Public Health. *Journal of Science Communication*, 20(A04). doi:10.22323/2.20060204. ;
- [3] Heigl, F., Dörler, D., Bartar, P., Brodsc Hneider, R., Cieslinski, M., & Ernst, M., et al. (2018a). Quality criteria for citizen science projects on *Österreich forscht*. Vienna, Austria. <https://osf.io/48j27/>
- [4] Giuliana, D. (2017). *Designing an interface for citizen science platforms ensuring a good user experience*. Munich: Ludwig-Maximilians-Universität München, Institut für Informatik
- [5] Liu et al. (2021). Chapter 22 – Citizen Science Platforms. In K., Vohland, A., L.and-Zandstra., L., Ceccaroni, R., Lemmens, J., Perelló, M., Ponti, R., Samson, & K., Wagenknecht (Eds.). *The Science of Citizen Science*. (pp. 419-437) New York: Springer
- [6] Rasmussen, L. M., & Cooper, C. (2019). Citizen science ethics. *Citizen Science: Theory and Practice*, 4(1), 5. doi.org/10.5334/cstp.235.
- [7] Resnik, D. B., Elliott, K. C., & Miller, A. K. (2015). A framework for addressing ethical issues in citizen science, *Environmental Science & Policy*, 54. doi:10.1016/j.envsci.2015.05.008.
- [8] Socio-Bee Grant Agreement Annex I – “Description of Action” (DoA)