

## ■ CITIZEN SCIENCE AND LIBRARIES: WALTZING TOWARDS A COLLABORATION

by *Tiberius Ignat, Darlene Cavalier and Caroline Nickerson*

**Abstract:** *The authors of this paper present context and case studies to illuminate several current policies, recommendations, and practices from the United States and Europe in support of libraries seeking to engage with citizen science, with the goal of encouraging librarians in Europe to leverage existing citizen science resources and take inspiration from successful international examples to make their libraries hubs for citizen science.*

**Keywords:** *Citizen Science; Libraries; Collaboration*

## CITIZEN SCIENCE UND BIBLIOTHEKEN: WALZER TANZEN AUF DEM WEG ZUR ZUSAMMENARBEIT

**Zusammenfassung:** *Die Autor\*innen dieses Beitrags präsentieren Kontext- und Fallstudien, um verschiedene aktuelle Strategien, Empfehlungen und Praktiken aus den USA und Europa zur Unterstützung von Bibliotheken zu beleuchten, die sich mit Citizen Science befassen, mit dem Ziel, Bibliothekar\*innen in Europa zu ermutigen, die vorhandenen Citizen Science-Ressourcen zu nutzen und sich von erfolgreichen internationalen Beispielen inspirieren zu lassen, um ihre Bibliotheken zu einem Drehkreuz für Citizen Science zu machen*

**Schlagwörter:** *Citizen Science; Bibliotheken; Zusammenarbeit*

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### **1. The general context of Citizen Science**

Citizen science is a developing method for enhancing the scientific endeavour, increasing scientific literacy, supporting education, and better addressing societal needs through scientific evidence. A citizen scientist shares observations or analyzes data to address a research question. The research question is typically designed by a professional scientist, although concerned or curious members of any community may initiate the research question. Though the term “citizen science” is a recent one, this form of public engagement in science has been around for as long as the field of science. Ample literature already speaks to the origin and history of citizen science as well as its successes and challenges<sup>1</sup>.

### **2. Citizen Science: Quantified and Qualified**

Researchers at the University of Washington in the United States quantified the value of citizen science activities in biodiversity fields<sup>2</sup>. They surveyed 388 USA projects and found that the projects’ combined 1.3–2.3 million citizen scientists provided 667 million–2.5 billion worth of labor to those projects United States Dollars, annually. For these and many other reasons, in Austria and across Europe, institutions are taking citizen science seriously. Tables 1 and 2 provide examples of European support for citizen science.

### **3. Citizen Science Defined**

What is Citizen Science? It depends on whom you ask. In fact, currently there is an ongoing debate about this. Earlier this year, five Austrian authors proposed an international definition of citizen science<sup>3</sup>. Their paper triggered a flurry of online discussions and ultimately resulted in the

Name	Description	Online Resources
<b><i>Center for Citizen Science</i></b> <sup>4</sup>	Established by the Federal Ministry of Education, Science and Research. The Center supports researchers developing citizen science projects.	<a href="https://www.zentrumfuercitizenscience.at">https://www.zentrumfuercitizenscience.at</a>
<b><i>Österreich forscht (Citizen Science Network Austria)</i></b> <sup>5</sup>	Established under the coordination of the University of Natural Resources Life Sciences (Universität für Bodenkultur). Aims to improve the quality of the citizen science methods and processes.” <sup>6</sup>	<a href="https://www.citizen-science.at">https://www.citizen-science.at</a>
<b><i>Austrian Citizen Science Conference</i></b> <sup>7</sup>	Organized by the Citizen Science Network and the University of Innsbruck, the fifth iteration of this conference took place on June 26–28, 2019 in Obergurgl. <sup>8</sup>	<a href="https://www.cs-eu.net/events/external/5th-austrian-citizen-science-conference-2019">https://www.cs-eu.net/events/external/5th-austrian-citizen-science-conference-2019</a>

Tab. 1: Citizen Science in Austria

Name	Description	Significance
<b><i>The European Association of Research Libraries (LIBER)'s Open Science Roadmap</i></b> <sup>9</sup>	This Open Science Roadmap was established by LIBER in 2018. Recommendations from this roadmap broadly endorse libraries as partners in citizen science, guiding the development of the field.	This roadmap emphasizes the importance of citizen science as part of cultural change.
<b><i>LIBER Citizen Science Working Group</i></b> <sup>10</sup>	Launched in March 2019, the working group is intended to explore, among other questions, what the role of libraries will be in terms of citizen development, education, and instruction, especially relating to citizen science.	This working group is intended to connect colleagues across Europe to explore citizen science opportunities and best practices.
<b><i>The League of European Research Universities (LERU)</i></b>	Comprises over 23 research-intensive European universities. They published a paper <sup>11</sup> that analysed trends in citizen science and provided guidelines that ranged from raising awareness to developing assessments for citizen science in research funding and evaluation processes.	Demonstrates institutional support for citizen science at the university level.
<b><i>Science Europe</i></b>	Released a Briefing Paper on citizen science <sup>12</sup> in 2018, endorsing the ten key principles of citizen science developed by the 'Sharing best practice and building capacity' working group of the European Citizen Science Association <sup>13</sup> .	Represents major research funding and research performing organisations across Europe.

Tab. 2: Citizen Science across Europe

publication of a response titled, “The problem with delineating narrow criteria for citizen science”<sup>14</sup>. The exchanges have been useful in reminding us of the multiple complexity of defining citizen science and, more importantly, of the critical importance of designing opportunities that provide access and power to participants, support for facilitators, and trust-worthy data for researchers.

With thousands of scientists already leading citizen science projects, and millions of participants, already participating in citizen science, we turn our attention to facilitators; in particular, libraries. Libraries offer safe spaces with access to information, resources, and communities. Similar to the waltz, a triple-time dance performed by partners dancing closely together, the collaboration of citizen science and libraries requires a close triangulation between researchers, libraries, and the public. Introducing the library as new dance partner may result in skepticism or hesitation. However, a recent case study demonstrates how libraries in the United States are finding their rhythm in the world of citizen science. Libraries in Europe can adapt this choreography. It’s theirs for the taking.

#### **4. Case Study: “Libraries as Community Hubs for Citizen Science”<sup>15</sup>**

An ongoing project in the United States, entitled “Libraries as Community Hubs for Citizen Science,” demonstrates the potential for libraries as partners in the citizen science field. With support from the Institute of Museum and Library Services, the project team for “Libraries as Community Hubs for Citizen Science,” which included (1) SciStarter (an online citizen science hub), (2) Arizona State University faculty, researchers, practitioners and evaluators, (3) librarians/staff, (4) citizen science project leaders, (5) web designers/developers, and (6) advisors, collaborated to:

1. Develop and evaluate citizen science toolkits available for and through the public library partners,
2. Create associated resources to train, support, and communicate with librarians and citizen scientists

This team is now working with stakeholders to create a plan to scale the model among interested libraries, statewide and then nationwide across the United States. “Libraries as Community Hubs for Citizen Science” has enabled and continues to work with libraries to build upon their existing, successful STEM programs, capacity, and infrastructure to offer their communities sustained, engaging, and meaningful opportunities to participate

in scientific research through citizen science. In addition to empowering librarians and their libraries to serve as leaders and community hubs for STEM learning, this project addresses known critical barriers in citizen science infrastructure, including lack of access to necessary instruments and opportunities to connect with other citizen scientists, which prohibits sustained participation in citizen science.

The initial portion of this project centered on citizen science kits, and it followed a multi-phased approach. These phases included content development and evaluation, instrument packaging, and creation of print and online resources for the toolkits. The team has provided the kits to pilot libraries and tested them to 1) learn how they are used to build or support citizen scientists at the libraries; 2) measure if and how the kits are used; and 3) identify components (tools, projects, instructions/resources) that are/are not working. The project team quickly discovered the need to support librarians and staff in learning about--and introducing--citizen science as a new concept. Staff turn-over was an issue the project team hadn't previously considered (50% of the original partner librarians changed jobs the launch of the project). The combination of these points guided the team's approach to ensure they supported the librarians as facilitators and that they co-created kits and supporting resources (including a new build-out of a [SciStarter.org/library](https://www.scistarter.org/library) microsite) designed to be as turn-key as possible. Recent evaluations and user-surveys demonstrate very promising results and led to national scaling up of the project. In the initial phases of the project, the team also produced the Librarian's Guide to Citizen Science<sup>16</sup> to provide a list of case studies and resources for librarians around the world, especially centering on collective effort around and on Citizen Science Day 2019, which was on April 13, 2019. The "Libraries as Community Hubs for Citizen Science" project team was recently awarded a supplemental grant from IMLS to expand the program, in addition to new support from the National Library of Medicine (part of the National Institutes of Health) to develop programs, events, and resources to support libraries during Citizen Science Month (April 2020).

## 5. Encore!

Where might European partners start to leverage and build on the choreography of the ASU/SciStarter project? We can begin at home by combining these efforts with specific areas of needs, as outlined at the 2017 LIBER Annual Conference in Patras and later published in a journal article<sup>17</sup>:

- Training and evaluation on the method and protocols for volunteers and scientists.
- Infrastructure for networking, for physical spaces, for ICT and for data collection, storage, processing and preservation. This could include a single institutional point of contact for citizen science.
- Collection building for templates of protocols, data sheets, volunteers' notebooks, and checklists.
- Communication: both peer-reviewed and ordinary communication to the public.
- New roles like recruitment, marketing and advocacy around citizen science and the Third Mission of universities.
- Masterclasses and workshops<sup>18</sup> to help librarians identify services and programs they'd need in order to support citizen science in their communities.

Any library can take the first step. This can be anything as simple as including citizen science books in a library catalog or as complex as conducting a citizen science project and answering scientific research questions. European libraries can leverage resources already existing in Europe and international examples to deftly dance in the citizen science waltz, with researchers and the public as partners.

The invitation to participate in these exercises remains open, and we hope it contributes in such a way that more libraries become hubs for citizen science activities within their communities. Please feel invited to contact the authors for more information.

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- 15 Co-authors of this paper, Darlene Cavalier and Caroline Nickerson, synthesized portions of this section of the paper from internal correspondence, evaluation reports, and related blogs.
- 16 A copy of the Librarian's Guide is available online here: [https://s3-us-west-2.amazonaws.com/orrery-media/misc/CitSci\\_Librarians\\_Guide\\_02\\_22\\_r1.pdf](https://s3-us-west-2.amazonaws.com/orrery-media/misc/CitSci_Librarians_Guide_02_22_r1.pdf)
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- 18 Including *Citizen Science Explained: Developing Citizen Science Support Service for Research Libraries*, a pre-conference workshop of LIBER Annual Meeting in Dublin, June 2019.