

Change – The transformative power of citizen science

Transforming research and public libraries into catalysts for citizen science

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Abstract

This paper reports the outcomes of an interactive workshop held at the ECSA2024 Conference in Vienna, focusing on the evolving role of libraries in supporting and advancing citizen science initiatives. Participants examined libraries as proactive stakeholders in citizen science, detailing their potential as catalysts and knowledge brokers. Key discussions include the need for dedicated library staff roles, specialized training, and enhanced connections between public and research libraries for resource sharing. The workshop also explored alignments between open science and citizen science, emphasizing community engagement through locally relevant projects to boost public participation and impact. Overall, the workshop underscored the critical role libraries play in the ecosystem of citizen science, providing strategic and operational insights for their enhanced involvement.

Keywords: citizen science, libraries as catalysts, knowledge brokering, community engagement, open science.

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Introduction

In a world experiencing swift changes due to technological advancements, environmental challenges, and societal shifts, the conventional roles of libraries and research performing organizations are in flux. Kaarsted et al. (2023) delved into European research libraries' understanding and application of open and citizen science, unveiling profound awareness but scant enactment in services and infrastructure. Key barriers are resources, funding, and policy constraints. To counter these, strategic enhancements in partnerships, institutionalization, and policy frameworks are vital. In this paper, we report the findings of an interactive workshop conducted at the ECSA 2024 Conference, which focused on exploring the opportunities and challenges for both research and public libraries to engage in, and potentially become catalysts for, citizen science.

Though existing research on the roles of research libraries and public libraries in citizen science is limited, it clearly indicates that these institutions play a significant role by offering a comprehensive suite of services designed to enhance project initiation, execution, and collaboration (Kaarsted and Overgaard 2018; Ignat et al. 2018; Kragh et al. 2020; Cigarini et al. 2021; Martek et al. 2022; Kaarsted et al. 2023):

- Research libraries may assist researchers in securing funding by identifying potential opportunities and aiding in the creation of citizen science grant proposals. This financial support is vital for the sustainability and expansion of citizen science projects.
- Furthermore, research libraries can utilize their existing competencies by managing research data for citizen science projects, adhering to FAIR Data principles and GDPR regulations, which highlights their commitment to data integrity and privacy.
- They can play a crucial role in facilitating project management and coordinating volunteer efforts, ensuring smooth and efficient project progression.
- Research libraries as well as public libraries are also key in communicating project updates and systematically evaluating ongoing projects, which helps maintain transparency and measure impact.
- Beyond administrative and evaluative tasks, research libraries and public libraries act as community hubs by organizing and hosting events that engage citizen science participants and attract the broader public. These events foster community spirit and stimulate public interest in citizen science.
- Finally, they focus on cultivating and expanding networks. Leveraging their institutional positions, research libraries connect with a broad spectrum of stakeholders both within and outside their research organizations, thus enriching the citizen science ecosystem and enhancing collaborative opportunities. Moreover, public libraries are strategically positioned to bridge the gap between researchers and local communities, facilitating meaningful exchanges and partnerships.

Method

This 90-minute workshop featured panel contributions, breakout group work, and an ideation session, all designed to equip participants with a deep understanding of the challenges and opportunities involved in

integrating research and public libraries into citizen science. Attendees were encouraged to develop tangible, operational solutions to these challenges.

Specific objectives were to underscore the urgent evolution required by research libraries to champion citizen science; to identify unique services and resources that research libraries can furnish to propel citizen science forward; and to collaboratively formulate innovative strategies, ensuring research libraries' pivotal role in the citizen science ecosystem.

During the preparation of this abstract, the authors used ChatGPT 4.0 to enhance the readability and language. After using this tool, the authors reviewed and edited the content. They assume full responsibility for the content of the article.

Results

In this section, we report the results of the work that was done in the breakout groups and during the ideation session.

The breakout groups engaged deeply with the current challenges and opportunities that research libraries – and public libraries – face in becoming pivotal agents for citizen science. The discussions were structured around five key questions, designed to prompt reflection on the evolving landscape in which these libraries operate. The ideation session followed up on this activity in challenging the participants to come up with ideas for research libraries in becoming active citizen science participants. These are our summaries of the input received from the participants:

- **Significant cultural, social, and technological shifts affecting research libraries today:** Among these, the increasing demand for accessibility by researchers, the challenges of providing training data for AI models, and defining standards for what constitutes good and bad data were highlighted. The discussions underscored the reality that capturing the attention of researchers and the public is becoming more demanding. This necessitates that libraries enhance their communication strategies to effectively promote their services. A noted tension exists between the specialized demands of citizen science projects and the generally broad focus of research libraries. This tension calls for libraries to evolve from their traditional passive roles to adopt more proactive stances in seeking collaborators and initiating project ideas.
- **Current collaborations between libraries and citizen science projects:** Participants highlighted the evolving roles and expanding opportunities for libraries to engage more deeply with their communities. These collaborations have led to an increase in research activities, outreach efforts, and community building. Professional development programs for librarians were emphasized, equipping them with the skills necessary to support and lead citizen science projects. This training could include writing guidelines for library involvement in such projects, ensuring that librarians are well-prepared to handle the complexities of these initiatives. Through various outreach activities and engaging students and the public, libraries could become pivotal centers for community engagement in citizen science projects.

- **Ensuring impact in citizen science projects through library collaboration:** Participants agreed that citizen science projects represent a unique intersection of community involvement and scientific research, where ensuring meaningful impact beyond academic metrics is a fundamental goal. Research libraries, with their extensive networks and deep knowledge of assessment, play a crucial role in maintaining the focus on impact throughout such projects. To maximize the effectiveness of their involvement, libraries first need to define what constitutes relevant impact and determine whom it benefits.
- **Identifying stakeholders in citizen science:** Participants recognized that citizen science projects engage a broad spectrum of stakeholders, each contributing unique perspectives and resources. For libraries, the challenge lies in effectively identifying and understanding the diverse roles these stakeholders play, which is crucial for the success of any citizen science initiative. However, this also presents a significant opportunity: by engaging these varied groups, libraries can foster a more inclusive and collaborative approach to scientific research. This not only enriches the research process but also enhances the quality and applicability of the findings, making the results more relevant and beneficial to a broader community.

Discussion

The final discussion of our workshop focused on the broader implications of the groups' contributions, delving into both strategic and operational considerations for libraries engaged in citizen science.

- **Libraries as active research entities:** Libraries are increasingly recognized as research-performing institutions. As such, they should actively participate in defining policies related to citizen science. This involves advocating for the comprehensive integration of citizen science's core principles across all facets of their operations and outreach. Libraries are positioned to champion these pillars, ensuring that their potential as catalysts for citizen science is fully realized. The Citizen Science Knowledge Center at the University of Southern Denmark (SDU), hosted by the university library, exemplifies how research libraries can serve as active research entities in citizen science. This center is a collaborative hub, which facilitates knowledge sharing, enhances public engagement through education, and supports community-based research practices. The center has initiated several citizen science projects in collaboration with researchers, covering a diverse array of topics including public health, cultural heritage, biodiversity monitoring, and e-garbage collection.
- **Enhancing library support and staff development:** The discussions suggested that libraries could designate specific staff members as points of contact for citizen science projects, ensuring dedicated support and smoother project integration. It was proposed that such roles should be formally integrated into project budgets to ensure their sustainability. Additionally, the training of library staff via methods such as Massive Open Online Courses (MOOCs) on citizen science could enhance their capability to support these initiatives effectively. The training provided by the Office for Open Science and Schol-

arship at University College London (UCL) serves as a notable example. The Office has partnered with FutureLearn to offer a series of short online courses. Additionally, the EU-Citizen.Science platform functions as an online resource for sharing knowledge, tools, training, and resources related to citizen science. A stronger connection between public and research libraries was also recommended to foster mutual learning and resource sharing.

- **Strategic implementation and community engagement:** Strategies should further intertwine open science with citizen science, enhancing the efficacy and reach of both. For example, LIBER's Open Science Roadmap underscored the importance of strategically connecting open science and citizen science to enhance the efficacy and reach of both initiatives (Ayrís et al. 2018). LIBER advocated for research and national libraries to lead in citizen science by leveraging their position as champions of Open Science. The CeOS_SE Project (Citizen-Enhanced Open Science in Southeastern Europe Higher Education Knowledge Hubs), led by LIBER, aimed to empower academic libraries in Southeastern European countries to develop further as knowledge hubs by upskilling staff when it comes to the connections between OS and CS (Dakić and Trotovac 2023).
- **Libraries as knowledge brokers:** Libraries should also function as knowledge brokers, mapping existing resources and stakeholders, and facilitating connections between researchers, librarians, and other stakeholders around specific project ideas. This role is vital in leveraging libraries' unique positions within the research and community ecosystems. The UCL Office for Open Science and Scholarship and the SDU Citizen Science Knowledge Center exemplify libraries that serve as brokers of knowledge and network facilitators. Both institutions have coordinated training and knowledge-sharing events, bringing together researchers engaged in citizen science or participatory research projects to exchange best practices and experiences, thereby supporting others within their universities to do the same.
- **Building knowledge infrastructures:** In terms of infrastructure, libraries should provide robust Research Data Management (RDM) and FAIR Data services (Hansen et al. 2021). Organizing internal workshops and training sessions can bolster staff expertise and engagement. Libraries can enhance community engagement by focusing on projects that offer significant community value. Methods such as participatory sessions for needs assessments, the creation of advisory boards, and conducting focus groups can deepen community involvement and ensure that library services meet the actual needs of their users. Lastly, establishing libraries as both conveners and brokers of information and creating bespoke models for information delivery can greatly enhance their role in citizen science.

The workshop concluded that libraries, by stepping up as proactive participants and facilitators in citizen science, can significantly impact both the scientific and community landscapes. This expanded role not only capitalizes on their traditional strengths but also positions them as essential pillars in the evolving domain of citizen science.

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