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THE ROLE OF LIBRARIES IN CITIZEN SCIENCE

Citizen science is part of open science, which is about engaging the public through research, collecting and using scientific data, and applying science-based knowledge to solve problems of public interest. The development of citizen science activities opens up opportunities for the involvement of libraries, which are already recognised as experts in providing information, support, assistance and communication services to the academic community. Libraries are often seen as facilitators of citizen science projects, organising and providing communication and information dissemination, organising and delivering training and coordinating other activities. These activities require the ability to adapt librarians' competences to new activities, different contexts and audiences, and to develop new skills and competences. Librarians need to acquire the competences to participate effectively in citizen science projects. This presentation introduces the experience from the development of an online training course for librarians and a full-day training courses in three Baltic countries.

Keywords: libraries; citizen science; librarians' competences

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РОЛЬ БІБЛІОТЕК У ГРОМАДЯНСЬКІЙ НАУЦІ

Громадянська наука є частиною відкритої науки, яка полягає у залученні громадськості через дослідження, збір та використання наукових даних, а також застосування науково обґрунтованих знань для вирішення проблем, що становлять суспільний інтерес. Розвиток громадської наукової діяльності відкриває можливості для залучення бібліотек, які вже визнані експертами з надання інформації, підтримки, допомоги та комунікаційних послуг академічній спільноті. Бібліотеки часто розглядаються як посередники проектів з громадянської науки, організовуючи та забезпечуючи комунікацію та поширення інформації, організовуючи та проводячи навчання та координуючи інші види діяльності. Ці заходи вимагають здатності адаптувати компетентності бібліотекарів до нової діяльності, різних контекстів та аудиторій, а також розвивати нові навички та компетентності. Бібліотекарі повинні набути компетентності для ефективної участі в громадських наукових проектах. Ця презентація знайомить з досвідом розробки навчального онлайн-курсу для бібліотекарів та навчальних курсів повного дня в трьох країнах Балтії.

Ключові слова: бібліотеки; громадянська наука; компетентності бібліотекарів

Citizen science (CS) is a part of open science. The convergence of open science and citizen science is evident in their shared emphasis on transparency, public engagement, and the inclusive contribution of the broader community to scientific research. CS is a common name for a wide range of activities and practices, in which members from public are involved. CS concept is still open to interpretation, but the most basic definition describes it as research involving members of the general public, usually non-professional amateur scientists. Participants from the

general public collect, share, analyse, or transcribe data and observations, often over large geographic areas or extended periods, generally using mobile applications and the internet. CS is also known as community science, crowdsourced science, voluntary monitoring, or simply public participation in scientific research. CS offers many opportunities for research, harnessing the collective power of individuals with diverse experiences. This approach not only broadens the scope of research, but also brings research closer to society, fostering a sense of shared responsibility and engagement in scientific discovery. It also fosters a deeper understanding of complex issues and encourages collaboration between citizens and professional scientists, ultimately benefiting society as a whole. CS is a flexible concept which can be adapted and applied within diverse situations and disciplines.

In 2015, the European CS Association Working Group 'Sharing best practice and building capacity' developed a best practice guideline on what constitutes good citizen science. These guidelines – the 10 Principles of Citizen Science – were presented at the ECSA General Assembly 2015 in Barcelona. They are translated into many languages.

The level of citizens' engagement can differ from contributing data to shaping the entire research project:

- Crowdsourcing (Contributory Projects) – citizens contribute data or information, usually in large numbers, but are not involved in the research design.
- Distributed Intelligence (Collaborative Projects): citizens perform a more active role, such as data analysis or interpretation, but still do not design the project.
- Participatory Science (Co-created Projects): citizens and scientists work together to define questions, collect data, and analyse the results.
- Extreme Citizen Science (Collegial Projects): the most involved level where citizens might even lead the research process, including defining the problem and developing methodologies.

Citizen science facilitates and encourages widespread participation in science and scientific research, with a highlighted role assigned to libraries in promoting the potential of citizen science. Libraries play a role in handling and preserving research data and metadata, enabling the organization, skills, and collaboration necessary for citizen science.

All types of libraries – public, academic, research, and school libraries – can engage in citizen science projects. Each type has unique strengths that can be leveraged:

- Public libraries are often more connected to their communities and can effectively attract participants for citizen science projects. They provide access to resources and tools necessary for participation.
- Academic libraries support research initiatives by connecting students and faculty with citizen science opportunities. They can also facilitate data management and provide access to scholarly resources.
- Research libraries have extensive collections that can be utilized in citizen science projects. They also have the expertise needed to manage complex data sets generated through these initiatives.

Engaging in citizen science offers numerous advantages for libraries:

- Attracting new users
- Enhancing community engagement
- Improving library visibility
- Professional development for staff
- Enriching collections

In CS activities, librarians usually play the role of a facilitator and mediator between CS participants (scientists, citizens, and other stakeholders) through communication, information gathering and distribution, training, and activities coordination processes. These activities require additional competencies and the ability to adapt them to different contexts and audiences. Librarians need competencies in scientific and digital literacy, communication, mentoring and coordinating activities, and education to become involved in CS projects.

The role of a librarian as a facilitator in citizen science involves a combination of core, operational and community engagement skills, and a strong foundation in information management:

- Core understanding of citizen science: librarians need to grasp the fundamentals of citizen science, including what it is, its objectives and methodologies; familiarity with various citizen science projects, from environmental monitoring to data collection and analysis.
- Operational skills: training in data collection, data management, and interpretation, as these are central to citizen science initiatives; learning to use platforms, databases, and software commonly used in citizen science projects.

- Community engagement skills: communication skills: to effectively promote citizen science within the community, librarians need training in outreach and engagement strategies; facilitation: librarians should be adept at organizing workshops, guiding citizens through the process of joining and contributing to citizen science projects, and facilitating discussion groups or learning sessions; equity and inclusion: training on how to engage diverse groups within the community, ensuring equitable participation and overcoming potential barriers.

KTU researchers and librarians have been involved in citizen science projects since 2016. The project activities and events also involve faculties, non-academic staff, NGOs, schools, municipalities, etc. Information about projects and events is disseminated at the University internally and outside, and presented at international events. The Library is involved in four citizen science related projects:

The aim of the LibOCS project – to enhance the role of libraries in promoting citizen science projects in higher education institutions. One of the objectives of this project was to develop a citizen science training course and provide training to improve the skills of library personnel in the Baltic countries (Estonia, Latvia and Lithuania). An online citizen science training course has been developed; training is being organised to improve the citizen science skills of library staff in partner institutions.

To help librarians to support CS projects, the LibOCS project partners developed a self-paced online learning course "Citizen Science for Librarians" on the Moodle platform. The framework of the course was developed in a unified way, with the cooperation of all project partners. The learning materials and assignments were prepared in English. The online course is available in KTU open course platform open.ktu.edu. It consists of 5 modules.

As a project activity the Library has started and maintained a dialogue among Higher Education teaching and research staff and librarians in the three Baltic states. The aim – to promote institutional changes by setting up a citizen science single point of contact in participating LibOCS universities. At the university level the Library has established a strong partnership and has started discussions on future cooperation with researchers working on citizen science projects, as well as with university administrations.

The Library together with staff from other departments submitted a project proposal to obtain funding to support CS Hub activities. The proposal has been funded. It started in June 2024 and will last until the end of 2025. The aim of the project is to develop the Citizen Science Hub through outreach, communication and coordination of citizen science related activities in

order to increase the involvement of the University community in citizen science projects. It will also promote the involvement and participation of members of the public in scientific research, and the collaboration between scientists and the public in addressing issues and challenges of public interest. The Hub is located in the Library and consolidates the scientific, technical and administrative potential of the Faculty of Social Science, Art and Humanities, the Library and other departments.

The Library is involved in the project AGILE ”Higher education resilience in refugee crises: forging social inclusion through capacity building, civic engagement and skills recognition”. The project partners are a consortium of 8 institutions – 7 higher education institutions and 1 research-oriented company from different European countries, including Ukraine. The project duration is 3 years, from December 2022 to May 2025. The project involves capacity building, roundtable discussions, a summer school, local educational experiments, international meetings.

Within the BALTICS4UA project, the library organised various events to support Ukraine and the Ukrainian community in Lithuania: public lecture on cyber-security crimes; the art exhibition “Fighting Ukraine”; screening of the documentary “A Letter to Ukraine”; event about volunteering “Discover yourself as a volunteer“. These are only some examples of our initiatives, as the Library keeps planning and organising new ones. Together with international partners the Library also organizes workshops, world café discussions and so on.

The lessons learnt from the experience while participating in CS projects:

- Libraries recognise the great potential of CS. Libraries can play an important role in managing and preserving research data and metadata, and in enabling the organisation, skills development and collaboration necessary for citizen science.
- Low level of libraries engagement is related with lack of funding and human resources, lack of knowledge and skills.
- Communication and collaboration with a wide range of stakeholders – researchers, teachers, administrators, and citizens – is essential.
- When organizing events, it is very important to connect with the community and the target group for which the events are organised. We need to involve them and make them co-organisers of these events.