



# Contributing to Urban Sustainability Transformation – TU Wien Library's Approach

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Nova Gorica, 14 May 2025



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# Strategic priorities of TU Wien library



- Providing free access to digital publications of TU Wien
- Strengthening the participation of society in the research process



## Urban Knowledge Space



## Open Science



## Green Library



## Trustworthy Digital Infrastructures

- Establishing the library as a central social infrastructure
- Offering low-threshold access to scientific knowledge
- Working with schools, libraries, museums and local initiatives
- Providing spaces that support learning, information and data literacy and the co-creation of knowledge
- Adopting a sustainability concept with carbon monitoring and measures to reduce emissions
- Contributing to the UN SDGs
- Advancing local sustainability transformation in cooperation with the City of Vienna



# Our OPUSH project objectives

OPUSH = Open Urban Sustainability Hubs

## Objectives

- **Advance sustainable urban transformation** with a focus on social and environmental justice
- **Empower local communities** by granting permanent access to open knowledge ecosystems
- **Enhance the role and capacity of local libraries** in open science and citizen science **as drivers of sustainable development**



# Urban sustainability transformation



**Sustainability transformation:** process for shaping a more sustainable future, geared towards climate protection, promotion of biodiversity, resilience of ecosystems as a basis for life

Transformative change as **profound systemic change**, establishing of new patterns of action with local and/or global impact

In relation to cities, it is about change towards **fairer, more liveable, climate-resilient cities**



Making cities inclusive, safe, resilient and sustainable is a wide framing: green neighbourhoods, public spaces, urban air quality, wellbeing and health, transport etc.

Indicator 11.2.1 Public transport access

Indicator 11.3.2 Urban planning management

Indicator 11.6.2 Urban air pollution

Indicator 11.7.1 Open spaces in cities

Indicator 11.a.1 Urban and regional planning

# Social and environmental justice



Providing open data, open access publications, open software, access to learning spaces etc.

Improving education and training

Indicator 4.3.1. Affordable and quality education, including university, for all

Indicator 4.4.1. Youth and adults with ICT skills



Involving marginalised groups such as the poor, the elderly, single parents, large families etc.

Integrating diverse perspectives in citizen science projects

# Our OPUSH project in brief



International partners: 6  
Cooperation partners: 14

April 2022 –  
March 2025

ENUTC-Call

Project website  
[www.opush.net](http://www.opush.net)



## DELFT

TU Delft: Faculty of  
Architecture and the Built  
Environment,  
University Library

## BARCELONA

UB OpenSystems,  
Learning and Research  
Resources Centre (CRAI)



## TALLINN

TalTech: Academy of  
Architectural and  
Urban Studies

## VIENNA

TU Wien future.lab  
Research Center (PI),  
TU Wien Bibliothek,  
Wunderbyte





# Citizen science



## Contributory citizen science

(Majority of early online citizen science projects)



Scientist as  
project designer

Participatory  
technology  
or strategy

Citizens as  
data gatherers

VS.



Citizens' & CSOs'  
real-world  
problems

Scientist as  
co-designer and  
facilitator

Shared, open, and  
reflexive research  
process

# Citizen science



## A set of methods to advance sustainability transitions

- Participatory project design to address people's real-life problems
- Increasing knowledge of all stakeholders and enabling mutual learning
- Collecting data at the micro or meso level
- Creating a direct impact on urban planning measures at the local / community level

## In OPUSH we gained experience through two pilots

- Gumpi
- Urban Heat Stories



# Gumpi: Urban transformation



- Redesign of a central city road in the 6<sup>th</sup> district (Gumpendorfer Str., Gumpi) commissioned by the city
- Participatory process designed/managed by PlanSinn (planning office) and Carla Lo (landscape architect)
- **Reason for us to get involved:** Lucky coincidence
- City officials involved: district council, Municipal Department (MD) 19 – Architecture and Urban Design



Graphic: CC-BY Charlotte Reiff



# Gumpi: Challenges



- How to reduce social inequalities in urban transformation processes
- Lack of data on under 20-year-olds: What are their needs regarding the use of public space and infrastructure?
- Lack of data on the needs of single parents: How can the design of public spaces provide relief and support?

Participation in online survey 2023  
by age and gender 2023, n=1302

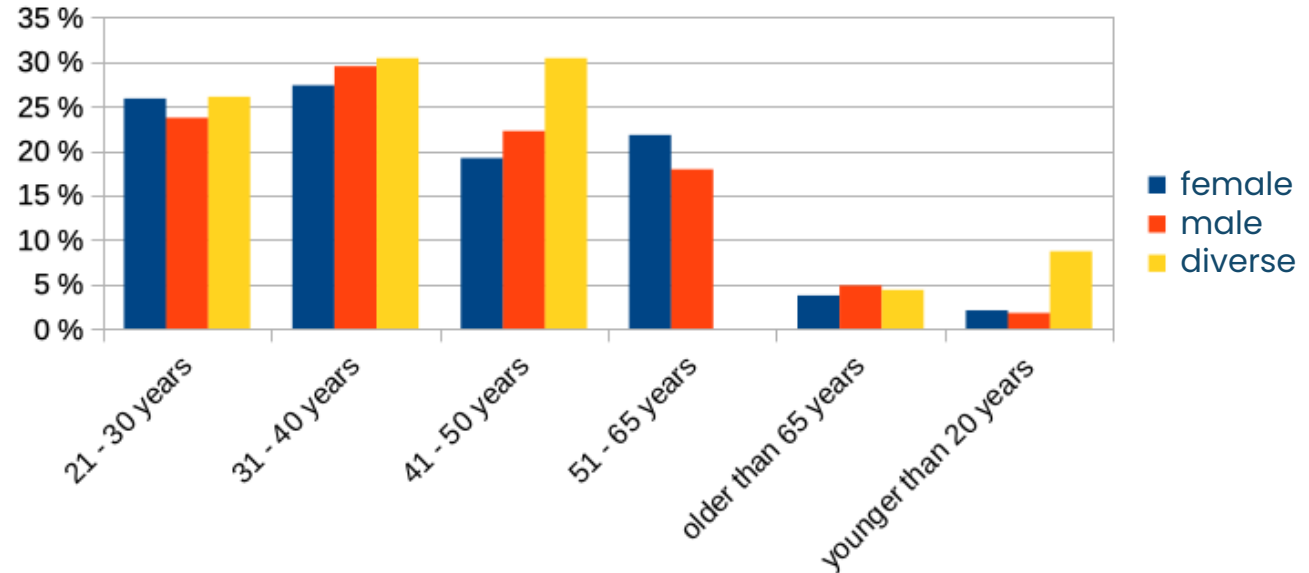


Figure: Online survey results

# Gumpi: Goals and implementation



## Goals

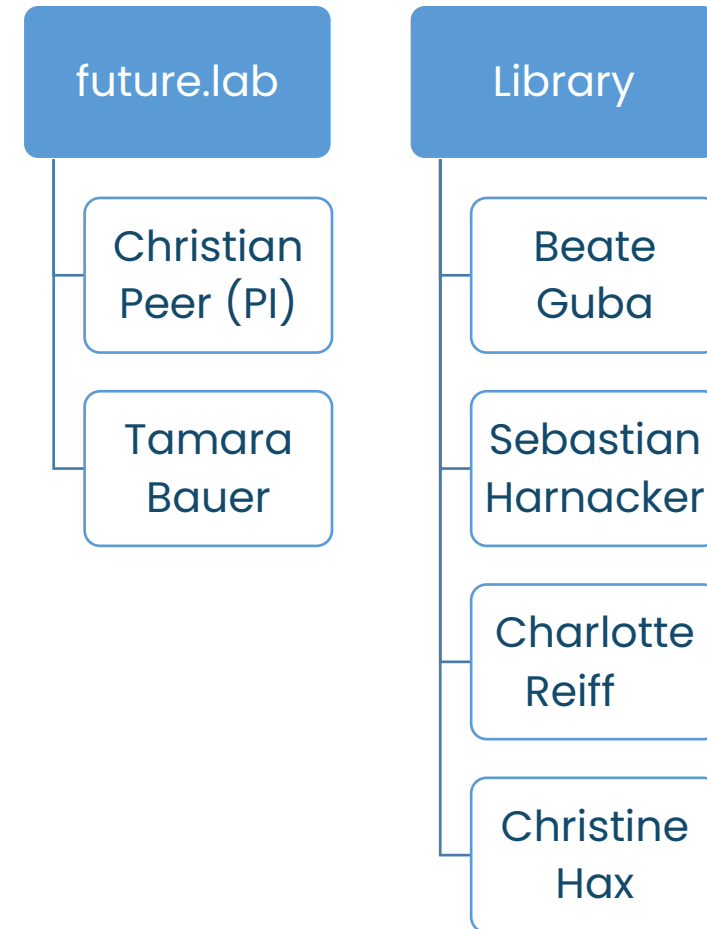
To give marginalised groups a voice in urban transformation

- **Identify the needs** of adolescents and single parents
- **Generate data** to be forwarded to the district administration, planning office and landscape architect
- **Test methods** for low-threshold participation in planning processes
- **Motivate** citizens to engage in research and democratic practices

## Approach

- **Workshops** with co-researchers (students aged 14-16, single parents)
- Community **mapping** exercises

## Research group



# Gumpi: Suggestions



**Sports ground** for outdoor sports lessons, especially for the boys of WMS  
Loquaipplatz

**Free scooters**  
near underground stations and bus stops

**24/7 shop** in the area of the U6 station

**Free Wi-Fi** at bus stops or benches and other seating areas



Graphic: CC-BY Charlotte Reiff





# Gumpi: Timeframe

## Process phases

- 1 Jan-Feb 2023: Online survey (district council)
- 2 March-April 2023: Street interviews and info booths (PlanSinn)
- 3 May-June 2023: Workshops with various stakeholders (PlanSinn)
- 4 Sept-Oct 2023: Feedback to citizens by info booths and mini-exhibition
- 5 Nov-Dec 2023: Elaboration of the preliminary design (Carla Lo)
- 6 Jan-April 2024: Exhibition, afterwards detailed planning  
2025 Start redesign

## Our research activities

Nov-Dec 2022: Conversations with city administration (head of district), PlanSinn

**March 2023:** Discussion of the survey results and start of our pilot

**End of June 2023:** Final presentation of the findings of our research with students (end of school year)

} **3 months**

Sept-Oct 2023: Evaluation

Dec 2023: Thesis by Tamara Bauer

<https://doi.org/10.34726/hss.2024.116582>





# Urban Heat Stories: Wellbeing



## Background

- Exploring the health effects of heat islands, doing research on the perception of heat in densely built-up urban areas
- **Reason for us to get involved:** relevant issue in Barcelona and Vienna, network of Christian Peer (PI)
- **City officials involved:** MD 22 – Environmental Protection (responsible for Vienna's [Urban heat island strategy](#), the SDG monitoring process and alignment at the national level), MD 21 – Urban Development and Zoning, Urban Renewal Office

## Challenges

- Lack of data about the effects of high temperatures in the city and its impact on peoples' wellbeing
- Lack of knowledge about the phenomenon of small-scale urban heat islands

## Our research activities

Jul 2023: Preparation

**Mar 2024:** Start of the pilot

**Oct 2024:** Final presentations

Two awards: Citizen Science Award 2024, Austrian State Prize for Climate Change Adaptation 2024



# Urban Heat Stories: Goals and implementation

## Goals

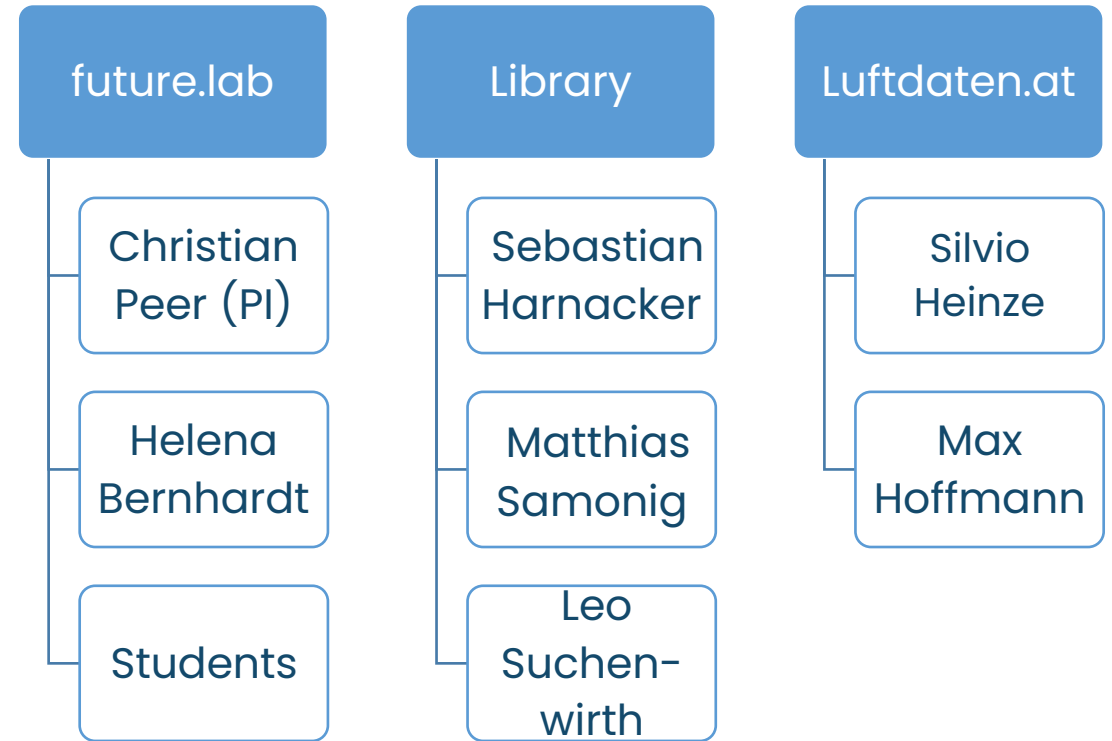
To compile knowledge on urban heat islands to develop policy recommendations

- **Identify urban spaces** affected and **vulnerable groups**
- **Collect data** and complement qualitative and quantitative data on heat

## Approach

- Temperature measurements with **sensors**
- Collecting **micro-stories on people's experience** with extreme heat (retirees aged 65+, students aged 12-18)
- Further developing a **chatbot** with our project partner Wunderbyte

## Research group



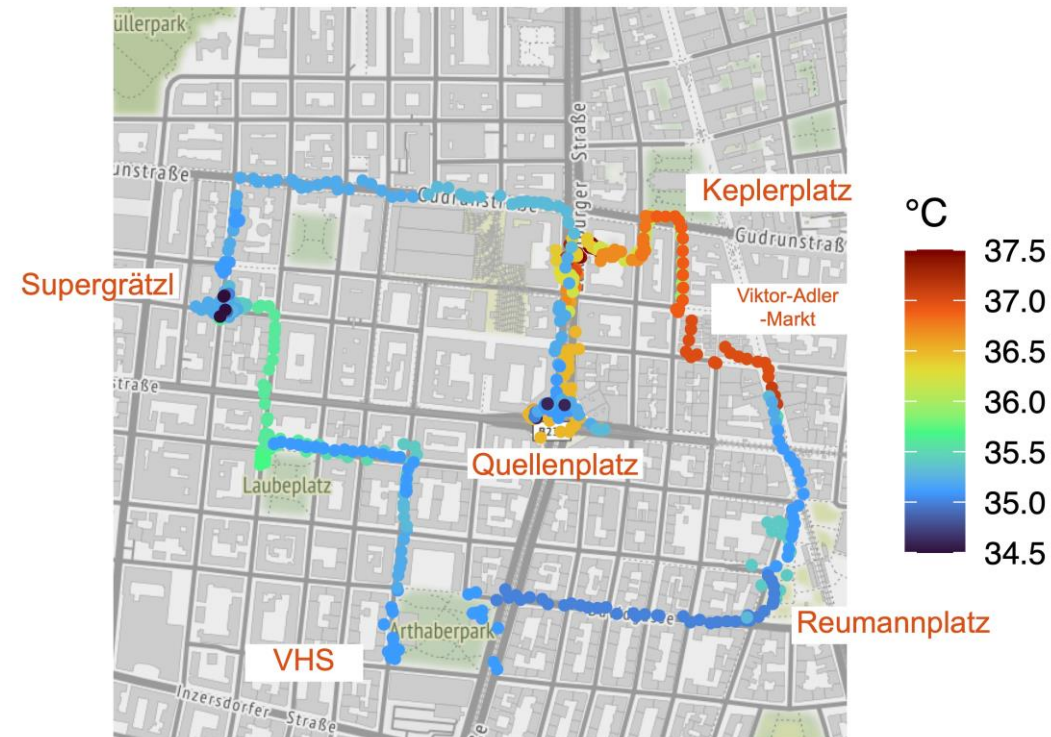


# Urban Heat Stories: Temperature Map



TEMPERATURMESSUNGEN  
24.08.2023, 14:00 - 16:00

Woraus ergeben sich unterschiedliche Temperaturen?  
Warum nehmen wir die Temperaturen verschieden wahr?



Graphic: CC-BY Silvio Heinze, Luftdaten.at, adapted  
by Helena Bernhardt

# Citizen involvement



Gumpi

- **Amerling-gymnasium:**  
2 teachers
- **WMS Loquaipplatz:**  
2 teachers

Teachers: 100% female  
Students: 37% female  
102 students in total  
Age 14-16



Urban Heat Stories

- **OMS Pfeilgasse:**  
1 teacher
- **BRG6 Marchettigasse:**  
2 teachers
- **Diefenbach-gymnasium:**  
1 teacher

Teachers: 75% female  
Students: 35% female  
65 students in total  
Age 12-18



Gumpi

- **Lobby organisations:**  
JUNO, FEMA, Mamilein & Papilein
- **Municipal library**

80% female  
5 single parents in total  
Age 31-50



Urban Heat Stories

- **Pensioners' club**  
Herzgasse
- **Co-housing initiative**  
Kolokation

87% female  
8 residents in total  
Age 73-83



# Intensified collaboration



## Museums & libraries

NHM Vienna,  
Art museums,  
Stadt Wien Büchereien,  
AK Bibliothek

## City administration

District council,  
MD 19, 21, 22,  
Renewal Office

## Schools

High schools,  
middle schools

## Civil society

ScienceCenter-Netzwerk,  
Pensioners' club,  
Kolokation, luftdaten.at



# Urban sustainability transformation: Challenges for citizen science



Establishing / intensifying strategic partnerships (city administration and other stakeholders)

Identifying and addressing challenges

- Reaching out to diverse groups (multiple publics)
- Building trust
- Using data visualisation to support insights
- Joint reflections

Local networks and alliances

Coordinating complex multi-actor constellations

- Making time for communication
- Inviting stakeholders (quadruple helix)

Inclusiveness

Values and attitudes

Capacity building

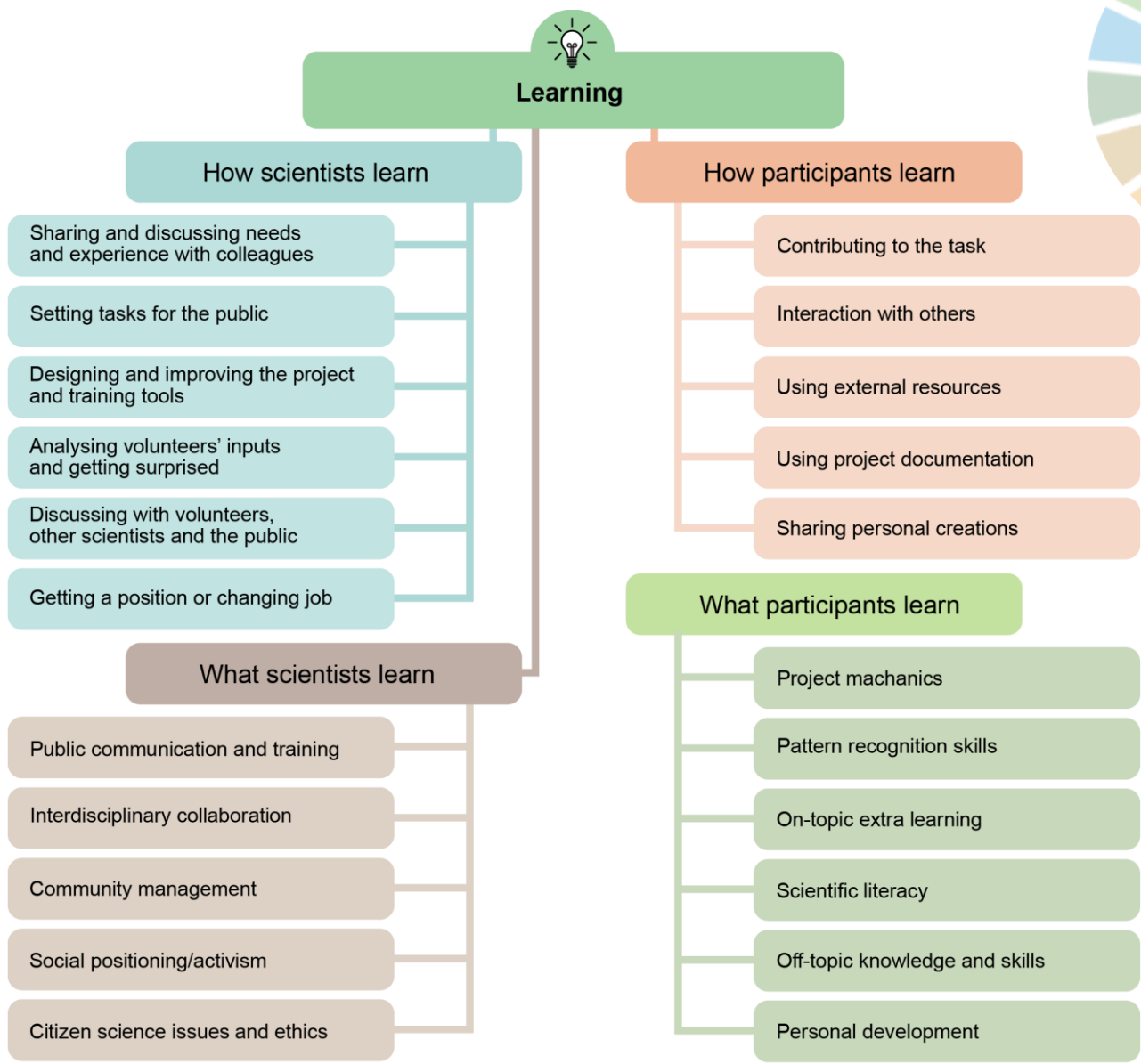
Strengthening 21<sup>st</sup> century competencies

- Agility in methodological approaches, tools and communication
- Data and information literacy training by research libraries
- Providing open space (e.g. AR/VR labs)

# Why is citizen science effective?

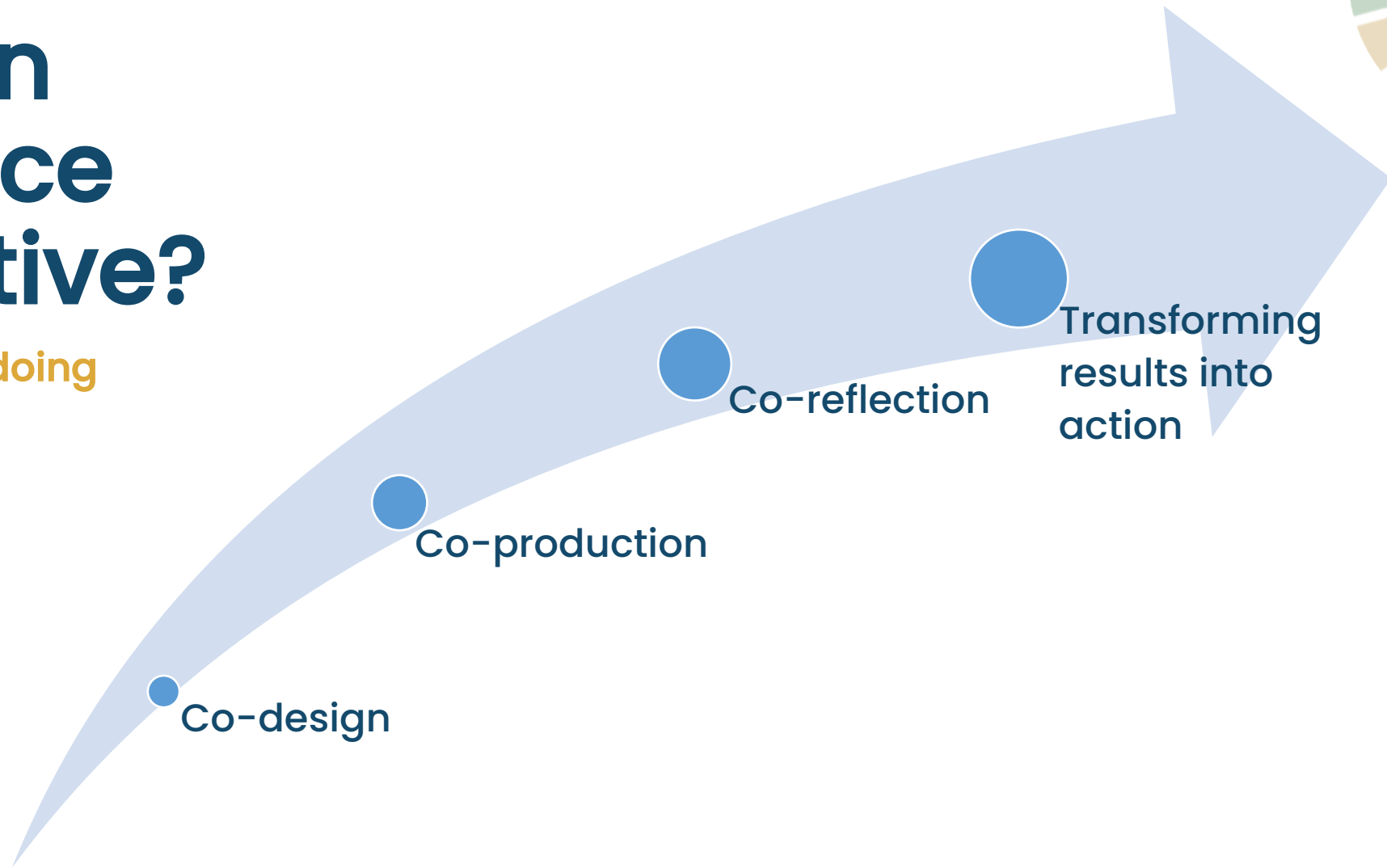
## Learning dimensions

- **Individual** competency development
- **Social** learning: in collaboration with actors and institutions
- **Inter- and transdisciplinary** collaboration: to face societal / sustainability challenges in urban contexts



# Why is citizen science effective?

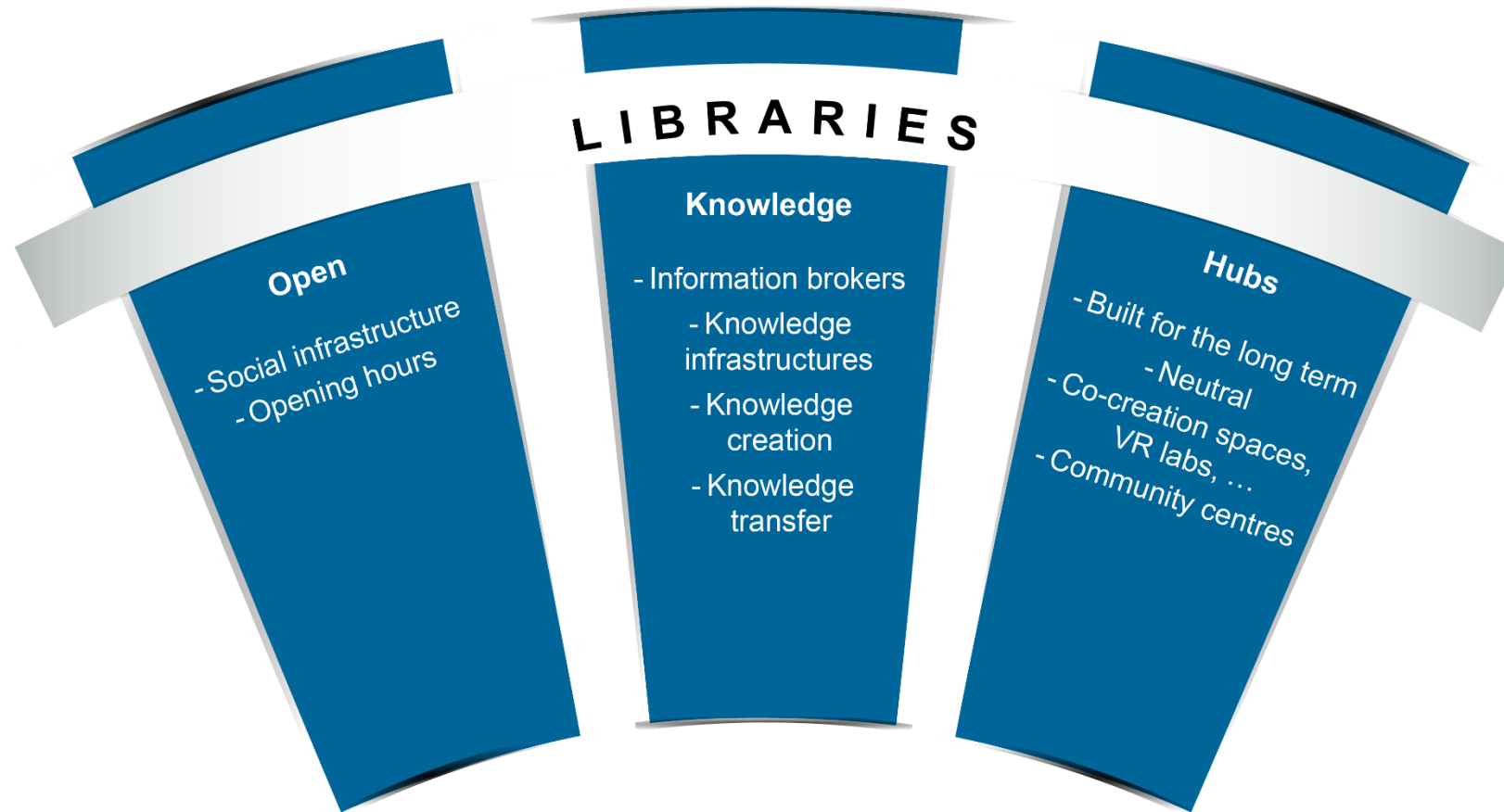
Learning by doing



Graphic: CC-BY Beate Guba



# Why libraries matter







# Thanks for your attention!

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# Further reading



Peer, C., Bonhoure, I., Perelló, J., Panigyrakis, P., Guba, B., and van der Hoeven, F. (2024). Report on landscape analysis of open science related urban sustainability practices in Barcelona, Delft, Tallinn and Vienna – Part I. <https://doi.org/10.5281/zenodo.10684391>

Bernhardt, H., Yankelevich, T., & Peer, C. (2024). Open science skills and competences for OPUSH. <https://doi.org/10.5281/zenodo.10684511>

Bonhoure, I., Perelló, J., Labastida, I., Guba, B., and Peer, C. State of the art report on conceptual citizen science and sustainable urban transformation intersection. Report 2024. <https://doi.org/10.5281/zenodo.10684447>

Senabre Hidalgo, E., Perelló, J., Becker, F., Bonhoure, I., Legris, M., Cigarini, A. (2021). Participation and Co-creation in Citizen Science. In: Vohland, K., et al. The Science of Citizen Science. Springer, Cham. [https://doi.org/10.1007/978-3-030-58278-4\\_11](https://doi.org/10.1007/978-3-030-58278-4_11)

Kloetzer, L., Lorke, J., Roche, J., Golumbic, Y., Winter, S., Jõgeva, A. (2021). Learning in Citizen Science. In: Vohland, K. et al. The Science of Citizen Science. Springer, Cham. [https://doi.org/10.1007/978-3-030-58278-4\\_15](https://doi.org/10.1007/978-3-030-58278-4_15)

Nielsen, K. H., Kaarsted, T., Overgaard, A. K., Okholm, A. L., Martek, A., Hastrup, M. F. (2024). Transforming research and public libraries into catalysts for citizen science. Proceedings ECSA-ÖCSK-2024, 0153-0158. <https://doi.org/10.3897/ap.e126471>

