CITIZEN SCIENCE:
THEORY AND PRACTICE

Public Space, Youth Participation, and the Limits of Citizen Science in Local Decision-Making

COLLECTION:
CITIZEN SCIENCE FOR EVIDENCE-BASED POLICY AND DECISION-MAKING

RESEARCH ARTICLES

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ABSTRACT

This article examines Eichstätt – A City for All, a youth citizen social science project that combined participatory research on public space with civic education in Eichstätt, a small Bavarian university town. It investigated how different groups use public spaces, experience inclusion or exclusion, encounter barriers, and assess the need for change. It also examines why the resulting knowledge had limited influence on municipal decision-making. Twelve secondary-school students (grades 8–12) worked as young citizen scientists alongside a teacher and university staff. They conducted four semi-structured interviews with representatives of youth, children, senior citizens, and people with disabilities, and accompanied a public collective mapping event. Interview and mapping data were analysed using qualitative content analysis. Findings show that needs often overlapped across groups, particularly regarding accessibility, mobility, and non-commercial meeting places. An urgency–feasibility matrix translated these situated perspectives into policy-relevant priorities and implementation challenges. Municipal uptake remained limited because of weak institutional anchoring, scarce administrative capacity, unclear responsibilities, and the restricted epistemic authority granted to youth-generated knowledge. The article conceptualises policy uptake as a structural and epistemic problem and connects youth citizen social science with small-municipality governance and civic education.

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INTRODUCTION

Public spaces shape everyday urban life: They are places of mobility, encounter, recreation, and participation, but also sites where inclusion, exclusion, and competing needs become visible. How such spaces are designed, whose needs are considered, and which barriers remain unaddressed are therefore closely linked to questions of social justice and municipal decision-making. Citizen social science offers a participatory approach to exploring these questions by involving citizens not merely as data providers, but as co-researchers in the production of situated knowledge (Chilvers and Kearnes 2020; Albert et al. 2021). This makes citizen social science relevant for local transformation processes by integrating situated perspectives into debates on urban and social change. In practice, however, citizen-generated knowledge is often difficult to integrate into municipal decision-making and may encounter structural and epistemic barriers.

While young people are increasingly addressed in debates on political participation, they are still rarely given an active role as co-researchers in citizen social science projects. Where they are involved, their contributions may encounter limits of institutional recognition, within scientific and political institutions (Borgström et al. 2024). Against this background, this article examines Eichstätt – A City for All, a youth citizen social science project on the use and design of public spaces in Eichstätt, a small university town in Bavaria, Germany. It asks why policy uptake of the generated knowledge remained limited and what democratic learning processes emerged for the young participants. We argue that the project's limited policy uptake was not primarily due to a lack of data quality or practical relevance, but to structural and epistemic barriers within municipal governance that limited the recognition and integration of citizen-generated knowledge. From a political education perspective, the case also shows how young people experience and reflect on the possibilities and limits of democratic participation.

The article makes a threefold contribution. First, it expands scholarship on policy uptake in citizen social science by focusing on small municipalities and their specific governance logics. Second, it connects debates on epistemic justice and participatory knowledge production with municipal decision-making and institutional recognition. Third, it highlights the potential of citizen social science for political education when democratic participation is understood not merely as a normative ideal, but as a conflictual social practice.

The article develops the conceptual background on citizen social science, policy uptake, epistemic challenges, and political education before introducing the case and methodological approach. It then analyses the knowledge generated by the young citizen scientists and the reasons for its limited uptake. The discussion relates these findings to governance barriers and democratic learning, before the conclusion outlines practical implications for future citizen social science projects.

CONCEPTUAL BACKGROUND

This section introduces citizen social science as a form of participatory knowledge production and discusses its relevance for local policy uptake. It then addresses epistemic challenges in the recognition of citizen-generated knowledge before outlining political education as the framework for interpreting the project's democratic dimension.

CITIZEN SOCIAL SCIENCE, PARTICIPATORY KNOWLEDGE PRODUCTION, AND PUBLIC SPACE

Citizen social science describes approaches to participatory knowledge production in which citizens are involved not merely as data providers, but as active co-creators of research processes. In contrast to many citizen science approaches that primarily focus on standardised forms of data collection, citizen social science focuses more strongly on the joint addressing of social problems, the reflection on social inequalities, and the development of context-sensitive knowledge (Albert et al. 2021; Hecker et al. 2018). This perspective draws on concepts of situated and co-produced knowledge: Haraway's (1988) concept of situated knowledge emphasises that knowledge is always socially situated and can make social realities visible. Jasanoff (2004), by contrast, highlights how knowledge and social order are co-produced, linking questions of public legitimacy and governance to the ways in which knowledge is generated and recognised. Citizens thus possess experiential or socially situated knowledge that emerges from local contexts and experiences and enables specific insights into social problems.

Particularly regarding public spaces, citizen social science can foreground perspectives that often remain underrepresented in municipal planning. Citizens, and marginalised groups in particular, often possess detailed knowledge of barriers, exclusions, and conflicts of use that is not immediately accessible to institutional actors. Studies on participatory urban research and critical cartography show that such forms of knowledge often provide more nuanced perspectives on urban problems than purely administrative or planning-based approaches (Bittner and Michel 2018; Klaus, Germes, and Guarascio 2022).

The citizen social science literature repeatedly emphasises the transformative potential of participatory research. Citizen social science aims not only to generate knowledge, but also to promote democratic participation and empower citizens to shape their living environments (Bonney et al. 2016; Chilvers and Kearnes 2020). It is precisely here that important intersections with political education arise. Both fields share the assumption that democratic societies depend on the active participation of citizens in addressing social problems. Citizen social science can be understood not only as a research approach, but as a democratic practice in which questions of knowledge, participation, and social change are intertwined.

EPISTEMIC CHALLENGES IN POLICY UPTAKE

Beyond issues of institutional capacity and governance structures, the question of epistemic legitimacy also plays a central role. Participatory research approaches such as citizen social science generate knowledge that is highly context-specific, experience-based, and socially situated. This knowledge often stands in tension with established knowledge hierarchies in administration and politics, where scientific and technical expertise or administrative experience-based knowledge are considered more legitimate. Citizens, and young people in particular, are often accorded only limited epistemic authority (Fricker 2007; Borgström et al. 2024). This can lead to implicit scepticism towards the findings generated and make it even more difficult to take them into account. Such epistemic hierarchies do not merely operate at the level of individual attitudes, but are also embedded in institutional routines, responsibilities, and forms of local responsiveness. In small communities in particular, these dynamics are shaped by limited administrative capacities, informal decision-making structures, and weak institutional interfaces between municipalities and external knowledge actors (Haus et al. 2004). Under these conditions, policy uptake is closely intertwined with questions of epistemic legitimacy and institutional recognition. This broadens the question of policy uptake from a rather technical issue of knowledge transfer to an epistemic and democratic problem: Which knowledge actors and forms of knowledge are considered legitimate and relevant?

Such questions are discussed in the context of research on epistemic injustice. Fricker (2007), for instance, describes how certain social groups are systematically attributed less credibility. Similar dynamics emerge in the context of participatory research: Conflicts that arise are often less due to a lack of quality in the knowledge produced than to institutional preconceptions about who is legitimately permitted to produce knowledge. Citizen social science thus intervenes not only in processes of knowledge production, but simultaneously in existing epistemic orders and power relations. This perspective also connects to Science and Technology Studies, which emphasise that socially relevant knowledge encompasses different forms of expertise beyond scientific institutions (cf. Collins and Evans 2002). Against this backdrop, policy uptake appears not solely as a technical question of knowledge transfer, but as a process shaped by institutional structures, epistemic recognition, and the capacity of governance contexts to engage with and integrate citizen-generated knowledge (cf. Nutley, Walter and Davies 2007; see also Parkhurst 2017). Only through the interplay of resources, institutional structures, epistemic openness, and organisational processing capacity can knowledge from participatory processes be translated into municipal action. The central challenge therefore lies in actively establishing connectivity with specific governance contexts.

POLITICAL EDUCATION AS A FRAMEWORK FOR TRANSFORMATIVE AND EMANCIPATORY YOUTH CITIZEN SCIENCE

To understand why the project was situated within political education, it is necessary to briefly clarify how political education is understood in the German context. Shaped by Germany's historical experience with National Socialism and the socialist dictatorship of the GDR, political education in Germany explicitly distances itself from indoctrination, ideological mobilisation, and state-centred legitimation. Its central normative orientation is political maturity (ger.: Mündigkeit), understood as the competency to think and judge politically for oneself and to participate in public life as an autonomous and responsible citizen. Political maturity also encompasses the individual's capacity to develop their own ideas about desirable forms of social coexistence, which the project sought to foster among the young citizen scientists (Sander 2013, pp. 144–147). Political education therefore aims not at conformity, but at critical judgement and democratic agency. It fosters three interrelated dimensions of competency: (1) political judgement, (2) methodological competencies, and (3) the ability to act and participate in public affairs (Sander 2022, pp. 25–26).

Eichstätt – A City for All provided a practical learning environment for the young citizen scientists in which these dimensions could unfold. By exploring how public spaces are used and contested, the project enabled the young citizen scientists to develop (1) political judgement by reflecting on inclusion, exclusion, inequality, and the social production of space. It strengthened (2) methodological competencies through qualitative interviews, participatory mapping,

collaborative interpretation, and public presentation. Most importantly, the project addressed (3) the ability to act and participate in public affairs by involving young people as co-researchers who articulated concerns, produced publicly relevant knowledge, and encountered both the possibilities and limits of local participation (GPJE 2004). In this understanding, participatory competence refers not only to learning about formal opportunities for participation, but also to fostering the ability and willingness to articulate one's own perspectives and engage with social and political processes. This participatory dimension is closely linked to experiences of self-efficacy, which Widmaier describes as a "central motor of political participation" (Widmaier 2011, p. 106, translated by the authors). Because the young citizen scientists were themselves part of the urban community under investigation, participation became directly linked to experiences of self-efficacy and the perception that their own perspectives could matter in shaping their social environment.

From the outset, the project followed a critical-transformative orientation. It aimed not only to generate knowledge about public space, but to enable young people to analyse the inequalities embedded in its design and use. The project asked how just public space in Eichstätt is, whose needs are taken into account, how accessible public space is, and who has the authority to decide how it is used. This orientation corresponds to critical political education, which explicitly addresses the "underlying relations of domination, power, and inequality" (Chehata et al. 2024, p. 12; translated by the authors). Rather than treating the city as a given environment, the project thus approached public space as socially produced, unequally accessible, and politically contested. The young citizen scientists were encouraged to identify barriers and exclusions, ask whose interests these arrangements served, and consider how they might be changed through democratic action (Lösch and Eis 2024, pp. 40–49).

The project can also be understood as an instance of research-based learning in political education. The young citizen scientists did not merely receive predefined knowledge, but worked through a real problem by developing questions, applying qualitative methods, interpreting empirical material, and presenting their findings publicly. This process involved both reconstructing already known or expected connections and generating new insights, thus combining reproductive and exploratory dimensions of research-based learning (Detjen 2022, pp. 507–508) by enabling the young citizen scientists to investigate a real local problem through qualitative research and public presentation. In this respect, the project differed from a purely instructional use of research methods: It addressed an actual local concern and pursued the intention of contributing to social change.

The aspects outlined above show that Eichstätt – A City for All, in its specific design, offers valuable insights for the didactics of political education, while, conversely, expertise in political didactics could generate both reflective and practical benefits for the project.

THE CASE: EICHSTÄTT – A CITY FOR ALL

This section introduces the empirical case of Eichstätt – A City for All. It first describes the local context and project objectives, before outlining the project design and methodological approach.

LOCAL CONTEXT AND PROJECT OBJECTIVE

Eichstätt is a small town in Upper Bavaria, Germany, with a population of around 10,000–20,000 residents, where municipal decision-making is characterised by comparatively close and informal governance relations. Due to the presence of the Catholic University of Eichstätt-Ingolstadt, the town has a comparatively high proportion of students and well-educated residents, while remaining embedded in a predominantly Catholic and rather conservative region with comparatively little ethnic diversity.

Public spaces represent central venues for social interaction, civic participation, and local negotiation processes. Issues of accessibility, use, and design of public spaces are therefore of particular relevance to the opportunities for participation of different population groups. In the project, public spaces were not understood as neutral infrastructure, but as socially produced and socially negotiated spaces in which power relations and participation dynamics become visible (cf. Lefebvre 1991; Löw 2022).

Against this backdrop, the project aimed to examine public spaces in Eichstätt from the perspective of various user groups and to highlight potential for a more inclusive design. The guiding question was how public spaces should be designed to meet the needs of different population groups. Together with the young people, sub-questions were developed that related to perceptions of participation and exclusion, barriers to mobility, conflicts of use, and the need for change in public spaces.

The project was developed at the intersection of citizen social science and political education. It sought both to generate local knowledge about public spaces and to involve young people as "young citizen scientists" in a reflective research and participation process. In doing so, the project

combined the production of social science knowledge with approaches to democratic participation and political self-efficacy. The project also aimed to foreground perspectives that are often only marginally represented in local planning and decision-making processes.

PROJECT DESIGN

The project took place in Eichstätt between 1 August 2023 and 30 September 2024. It was developed by the Chair of Civic and Political Education at the Catholic University of Eichstätt-Ingolstadt and the University's Citizen Science Lab, in cooperation with the Politics Working Group at Willibald-Gymnasium, a local secondary school, and its teacher. The project Eichstätt – A City for All was funded by the Hans Sauer Stiftung. Project design combined qualitative data collection with participatory formats and public dissemination. Its aim was to make different forms of local experiential knowledge visible and, together with the young participants, translate them into findings that could be communicated to the wider public.

Figure 1 provides an overview of the stakeholder constellation and participating groups. The student co-researchers were twelve voluntary members of the school's Politics Working Group from grades 8 to 12. They were accompanied by their teacher, who acted as a continuous point of contact and mediator. Throughout the project, the students participated as young citizen scientists in a guided research process. Their involvement ranged from refining the research design to collecting, interpreting, and publicly presenting data. They were thus addressed not merely as learners, but as co-producers of locally relevant knowledge, while receiving continuous methodological and didactic guidance.

Responsibility for ensuring scientific quality and providing didactic support lay with the Chair of Civic and Political Education at the Catholic University of Eichstätt-Ingolstadt. A research associate at the Chair accompanied the young participants continuously throughout the course of the project and was responsible for the methodological design of the individual working phases.

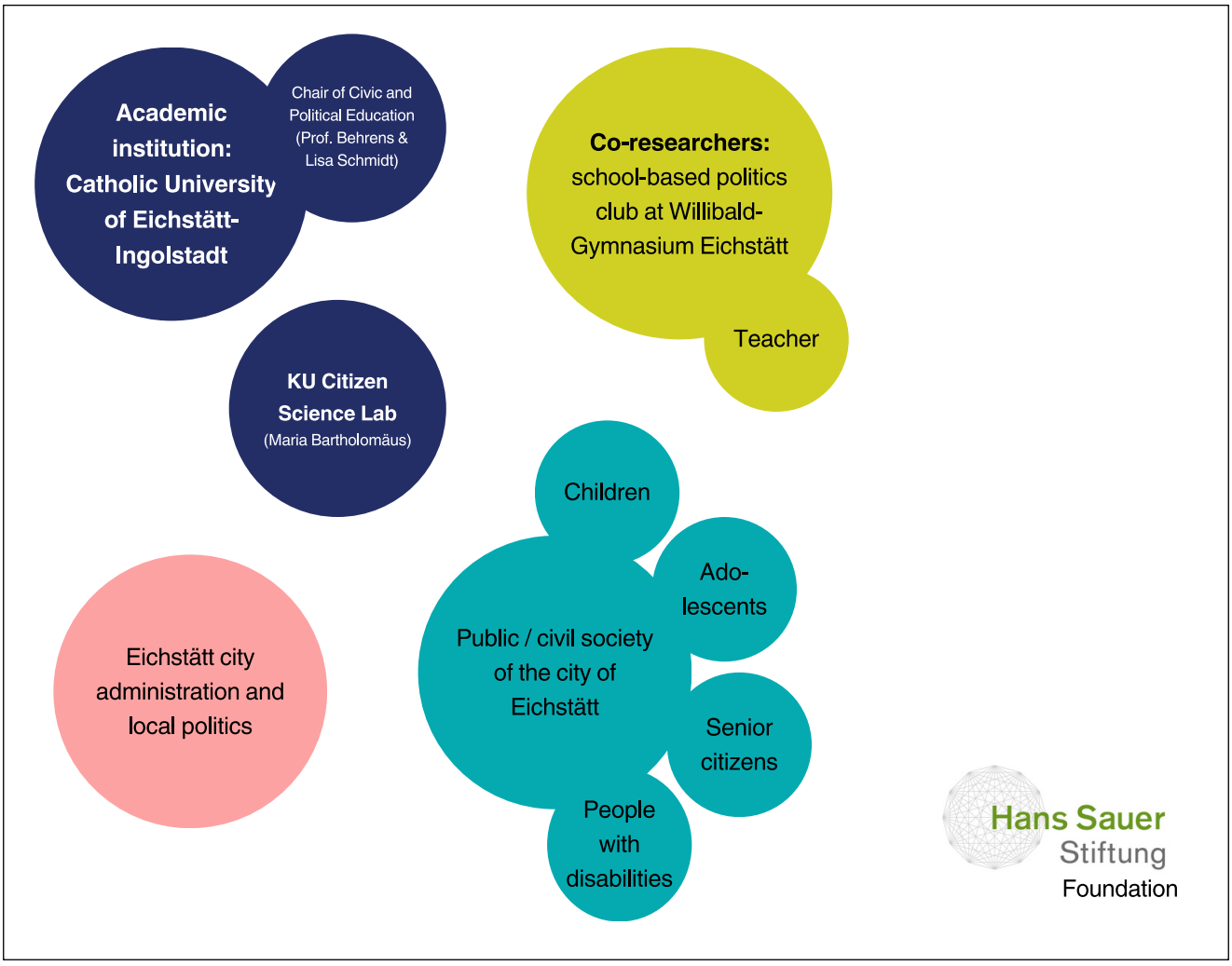

Figure 1 Stakeholder constellation and participating groups.

Together with the chair holder, the data analysis and the progress of the project were reflected upon on an ongoing basis. Methods and objectives from civic and political education played a central role in this process: The young participants received methodological guidance, but they were also supported in reflecting on municipal decision-making structures and on the possibilities and limits of democratic participation.

The team also included a staff member from the Citizen Science Lab at the Catholic University of Eichstätt-Ingolstadt, who contributed expertise in participatory formats and science communication, and established contacts with municipal actors.

Figure 2 summarises the project phases from the initial refinement of the research question to mobilisation, methodological training, data collection, analysis, public presentation, and final reflection. After the research cycle had been specified, the young citizen scientists were introduced to the thematic field and prepared for data collection. They then conducted four expert interviews and participated in a city-wide collective mapping activity in April 2024, while the academic research team carried out the systematic qualitative analysis.

The project concluded with a public event in July 2024, where the young citizen scientists presented the findings to municipal actors, civil society representatives, local media, and interested citizens.

METHODS

METHODOLOGICAL TRAINING OF THE YOUNG CITIZEN SCIENTISTS

Methodological transparency is particularly important in citizen science, since citizen-generated data are often accompanied by questions concerning their trustworthiness. Kennedy describes this as a "perennial question" of citizen science, namely "whether its data can be trusted" (2016, p. 34). This challenge is especially relevant in youth citizen social science projects, where young people without prior training in empirical social research participate as co-researchers and are not always readily recognised as legitimate producers of knowledge.

In Eichstätt – A City for All, the methodological design had to balance participation and quality: Young people were to take an active role in the research process, while the data generated needed to remain traceable, analytically robust, and suitable for interpretation. To address this tension, methodological training did not begin with interview techniques alone, but with a theoretical

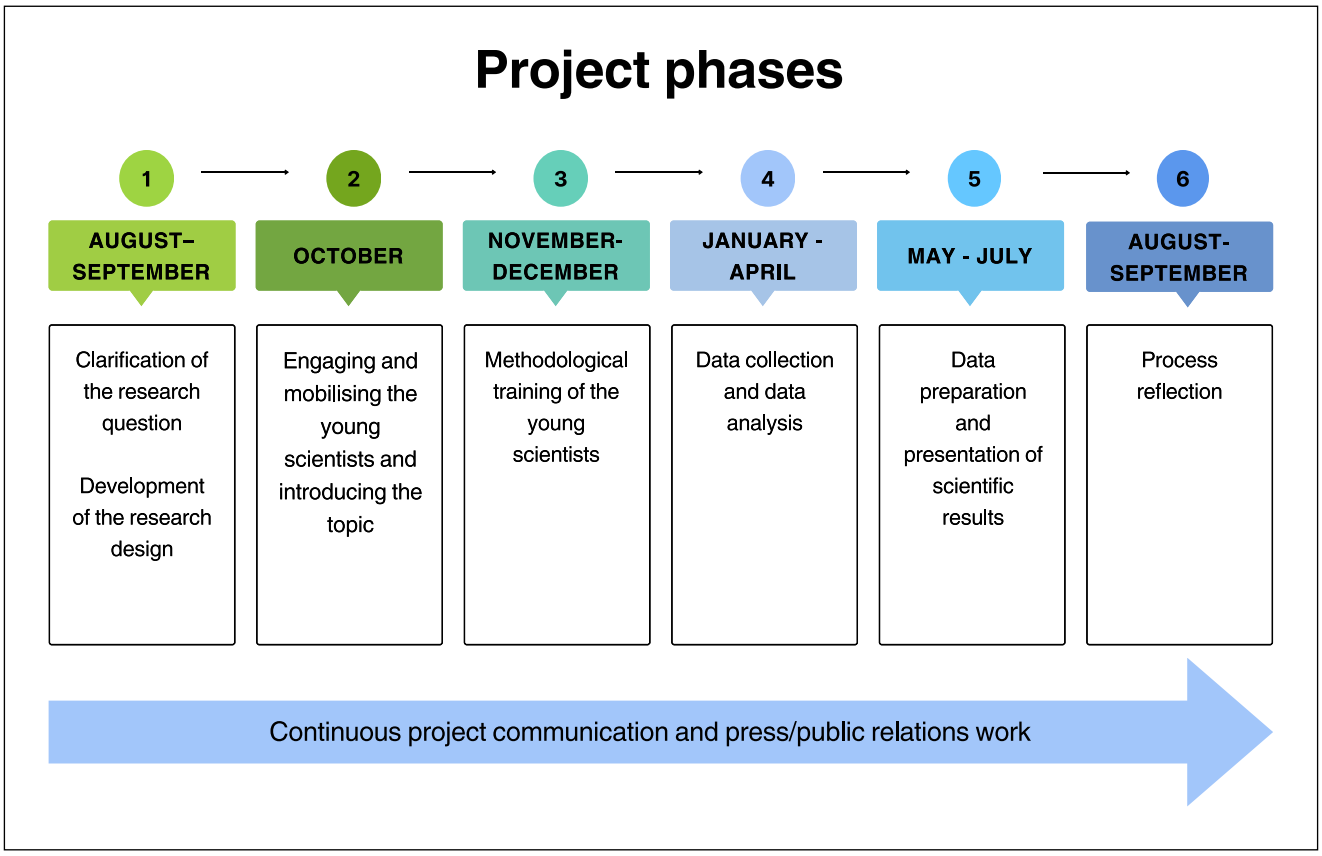

Figure 2 Overview of the project phases.

sensitisation to the research object itself. The young citizen scientists were introduced to a socio-spatial understanding of public space as socially produced, relational, and shaped by power relations (Löw 2022). This theoretical grounding was important because the project did not aim merely to collect everyday impressions of places in Eichstätt, but to enable the young co-researchers to recognise questions of access, appropriation, exclusion, and participation as analytically relevant dimensions of public space.

In a second step, they received practical training in qualitative interviewing, including the use of the interview guide, active listening, follow-up questions, time management, and role-play exercises with fictional perspectives on public space in Eichstätt (Misoch 2015, pp. 120–129; Przyborski and Wohlrab-Sahr 2021, pp. 154–164).

EXPERT INTERVIEWS

The young citizen scientists conducted four semi-structured expert interviews. Using criterion-based purposive sampling, the research team selected actors from existing local networks who, by virtue of their locally grounded experience and formal representative or organisational roles, were attributed specific role-based knowledge concerning young people, children, senior citizens, or people with disabilities (Przyborski and Wohlrab-Sahr 2021, pp. 154–164). Only a limited number of actors met these criteria in the bounded local context. The interviewees were the head of the municipal youth centre, a municipal senior citizens' representative, the chair of the local child protection association, and a representative of the disability advisory board. These interviews provided one information-rich perspective on each group, consistent with Akremi's observation that a small number of well-conducted interviews may yield more insight than a larger number of poorly selected cases (2022, p. 420). All interviews were audio-recorded with consent and transcribed.

The young citizen scientists conducted the interviews themselves using semi-structured interview guides that they had iteratively refined together with the research team (see Supplementary File 1: Semi-Structured Expert Interview Guides). The interview guides focused on how different groups use and perceive public spaces, which barriers they encounter, where conflicts arise, and what changes they consider necessary. This format ensured thematic comparability across the interviews while leaving room for interviewees to raise issues not anticipated by the project team.

COLLECTIVE MAPPING

Another central method of data collection was collective mapping, a participatory qualitative approach rooted in geography and critical cartography. The method was used to bring together residents of Eichstätt around a large-scale map of the city and to capture their perspectives on public spaces, everyday spatial practices, perceived barriers, and possible improvements (Bittner and Michel 2018, pp. 297–312; Klaus, Germes, and Guarascio 2022, pp. 37–55). The use of maps also created a format closely connected to established practices of urban planning, making spatial experiences and perceived barriers more visible to public and administrative contexts.

The mapping took place in April 2024 as a public event near Eichstätt's central market square. The event was open to the public and publicly advertised to ensure broad accessibility, while representatives of local initiatives and associations as well as actors from the municipal context were specifically invited by the project team. Guided by a prepared legend and discussion prompts, participants marked places on the map, commented and discussed where they felt welcome or excluded, which places they experienced as inaccessible or problematic, and where they saw potential for change. The mapping thus generated experiential knowledge about the use, accessibility, and contested character of public spaces in Eichstätt.

The young citizen scientists participated in the event through structured participant observation. They documented not only what was marked on the map, but also how participants talked about public space, how they responded to one another, and which conflicts, agreements, or emotional reactions became visible (Lamnek and Krell 2016, pp. 515–521). A structured observation template supported this process (Supplementary File 2: Structured Observation Template). With consent, selected conversations were audio-recorded, transcribed, and included in the analysis.

DATA ANALYSIS, INTERPRETIVE REFLECTION, AND PRESENTATION

The analysis drew on a heterogeneous data corpus comprising interview transcripts, the annotated city map, written comments and notes from the mapping event, observation protocols produced by the young citizen scientists, and transcripts of conversations held during the collective mapping process.

Data analysis combined collaborative interpretive reflection with systematic qualitative content analysis. In guided analytical sessions inspired by Mayring's approach, selected interview passages were discussed with the young citizen scientists to identify recurring themes, compare perspectives across the four need groups, and reflect on emerging patterns (Mayring 2015). The full coding process,

however, was carried out by the academic research team, which also helped ensure consistent coding and data quality.

Building on collaborative interpretive sessions with the young scientists, the academic research team analysed the full corpus using a qualitative content analysis that incorporated procedures from Mayring's summarising qualitative content analysis. The analysis combined deductive category application with inductive category formation (Mayring 2015, pp. 85–86). Four research questions (perceived fairness, the needs of different groups, existing deficits, and possibilities for redesigning public spaces), which had previously been developed together with the young scientists, were operationalised as deductive main categories, while subcategories were developed inductively from the empirical material. The coding process was guided by the iterative model proposed by Kuckartz and Rädiker (2022, p. 132), which means that one complete interview was pilot-coded in a first coding cycle. Within the four deductive main categories, relevant units of meaning were labelled in a material-near, open manner and paraphrased. Through repeated comparison and grouping, inductive subcategories were derived from the material and incorporated into the coding framework (Mayring 2015, pp. 69–72).

One example illustrates how deductive categories were combined with inductively developed subcodes. The statement "But first you have to get there. Because you can't get there with a wheelchair and public transport" (Collective mapping, disability advocacy participant) was assigned to the deductive category *Perceived Fairness in the Distribution and Use of Public Space*, and the inductive subcode G2, *Unequal Access and Accessibility*. The observation that "it actually starts with the streets, which are either completely covered with cobblestones […]" (Expert interview, disability representative) was assigned to the deductive category *Perceived Deficits* and the inductive subcode M1, *Unsuitable Surfaces and Topography*. Finally, the proposals for "smoothed cobblestones […]" (Expert interview, disability representative) and "A walker route […] a circuit through the entire town […] where people can genuinely travel on paving." (Expert interview, senior citizens' representative) were assigned to the deductive category *Proposals for Redesign and Implementation*, and the inductive subcode U2, *Suitable Surfaces, Guidance Systems, and Continuous Routes*.

After the analysis, the findings were jointly prepared for a public exhibition intended to foster public reflection, exchange, and encounters between different social and institutional actors.

RESULTS I: GENERATED KNOWLEDGE ON PUBLIC SPACE IN EICHSTÄTT

The collaborative interpretation of the empirical material by the young citizen scientists and the academic research team yielded several findings, three of which are highlighted here:

- First, the findings challenged the research team's initial assumption that public space would mainly appear as a field of conflicting needs between different user groups.
- Second, the findings were organised in a perceived urgency–feasibility matrix, which became the project's central analytical outcome.
- Third, the matrix shows that participants not only articulated situated needs, but also assessed urgency, feasibility, and implementation barriers in ways relevant for policy uptake.

A first important insight is that many needs identified in the project could not be assigned to one user group alone. Rather, they cut across group boundaries and were relevant for different people in different ways. While the project initially worked with the idea of different user groups and their potentially conflicting claims to public space, the empirical material showed that many needs were connected rather than opposed. This is particularly evident in the case of accessibility and mobility. During the collective mapping process, one participant explicitly rejected a narrow understanding of accessibility as an issue concerning only wheelchair users: "It is not only about wheelchairs. It is also difficult with any pram, with a rollator. People often forget that. They often think that disability only means wheelchair." (Collective mapping, disability advocacy participant). A similar pattern appeared in one of the interviews, where car-centred mobility was described as a barrier not only for children, but also for other users of public space: "Why is it always only about cars?" she asked, adding that "rollator users, parents with prams, and the children themselves" are often not sufficiently considered because "only the car is in view." (Expert interview, children's representative). The material thus showed that the needs of different groups often overlapped, as illustrated in Table 1.

At the same time, the findings did not suggest that public space is free of conflict. This became particularly visible in relation to young people's use of public space, where conflicts around noise, litter, or evening gatherings intersected with residents' legitimate need for quiet. However, the empirical material also showed that these

NEED	PEOPLE WITH DISABILITIES	YOUNG PEOPLE	CHILDREN	OLDER PEOPLE
B1 Social interaction and belonging	●	●	●	●
B2 Retreat and unobserved spaces	—	●	●	—
B3 Play, physical activity, and sport	—	●	●	●
B4 Creativity, culture, visibility, and self-efficacy	—	●	●	●
B5 Nature, greenery, and quiet	—	—	●	●
B6 Accessible mobility and orientation	●	—	●	●
B7 Safety and protection	●	●	●	—
B8 Staying, comfort, and basic amenities	●	●	—	●
B9 Political participation and representation	●	●	●	●
B10 Free time and flexible, non-commercial use	●	●	—	●

Table 1 Comparison of needs identified across the four need groups.
Notes: ● = the need was articulated; — = no need articulated.

conflicts often pointed less to fundamentally incompatible needs than to a lack of accessible and non-commercial meeting spaces. During the collective mapping process, participants repeatedly referred to the limited availability of spaces for "free access for everyone in the city, without commercial interests" (Collective mapping, participant). This need was not limited to young people, but also concerned other groups affected by expensive, time-restricted, or inaccessible spaces. In this sense, conflicts around youth presence in public space revealed a broader need for low-threshold and accessible places for leisure and everyday social gatherings.

To move from these general insights to a more action-oriented understanding of what was missing in Eichstätt's public spaces, the project brought together the identified needs, concerns, and possible interventions in an urgency–feasibility matrix (Figure 3). Rather than presenting these points as a simple list of demands, the matrix organises them along two dimensions: perceived urgency and perceived feasibility. The vertical axis captures the perceived need for action, based on the frequency and intensity with which issues appeared in the empirical material, while the horizontal axis reflects how feasible possible interventions appeared to the participants. In this way, the matrix translates situated experiences of public space into a structured form of local knowledge. By relating urgency and feasibility, the matrix identifies four socio-emotional constellations: Concerns perceived as urgent but difficult to realise indicate a potential for resignation; concerns perceived as both urgent and feasible point to a potential for incomprehension or frustration if no action follows; issues perceived as feasible but less urgent indicate a latent desire for change; and issues perceived as neither urgent nor easily feasible suggest a latent acceptance of the status quo.

This becomes visible in the placement of selected issues within the matrix. Highly urgent but less-feasible concerns, such as the accessible train station and barrier-free routes, were interpreted as carrying a potential for resignation, because they involved larger infrastructural or financial barriers. By contrast, issues perceived as both urgent and feasible, such as accessible public toilets, improved waiting areas such as bus stops, or small-scale play opportunities for children, pointed to a potential for incomprehension or frustration if no action follows. Other ideas, including greener public squares, picnic tables, or recreational areas along the local river, were located in the field of latent desire for change, while less urgent and less feasible ideas such as a shuttle bus between the train station and the castle, suggested a latent understanding of the status quo.

The third key finding concerns the analytical function of the matrix. It shows that participants not only articulated situated experiences of public space, but also developed differentiated assessments of urgency, feasibility, and possible implementation barriers. In this sense, the matrix represents a potential interface for policy uptake: It translates citizen-generated knowledge into a form that is already attentive to governance logics. If such knowledge is nevertheless only weakly taken up in local decision-making, this cannot be explained solely by structural limitations of municipal governance. It also points to a problem of recognition: Certain forms of experiential, situated, and citizen-generated knowledge remain less institutionally visible and recognised within established hierarchies of decision-relevant knowledge.

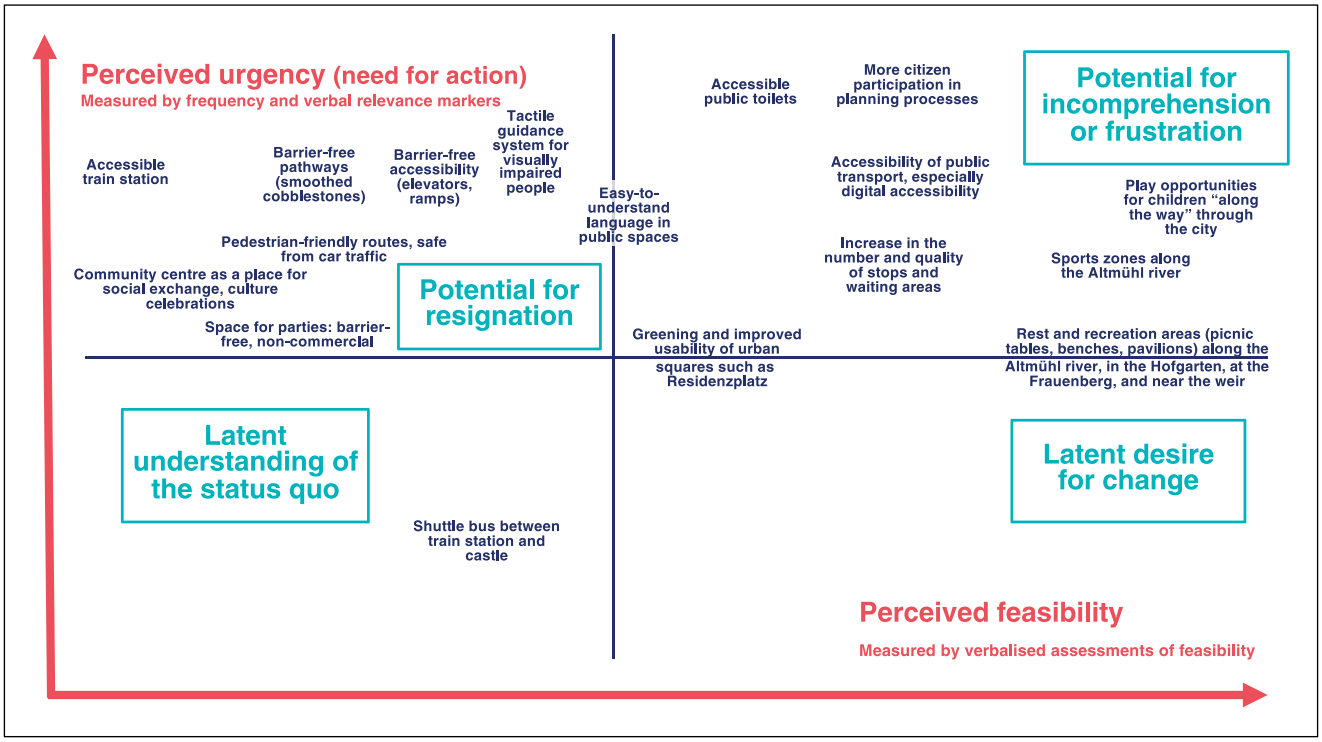

Figure 3 Urgency–feasibility matrix of identified needs and potential interventions in Eichstätt's public spaces.

RESULTS II: THE REALITY OF LIMITED POLICY IMPACT: GOVERNANCE BARRIERS

Unlike the collaboratively interpreted findings presented in Results I, the analysis of policy uptake in this section was led primarily by the academic research team; its interpretations were nevertheless shared and reflected upon with the young citizen scientists and discussed jointly.

LIMITED INSTITUTIONAL INVOLVEMENT AND WEAK UPTAKE STRUCTURES

Despite the project yielding nuanced results that could be adapted to local contexts, the integration of the knowledge generated into municipal decision-making processes remained limited. Even before the project began, a characteristic tension was evident. Although the city administration signalled its support for the project in principle, the request for confirmation in the form of a letter of intent was not met. This resulted in a situation of limited institutional commitment coupled with symbolic recognition: While support for the project was expressed in principle, no shared structures for cooperation, coordination, or the further integration of findings were established. In retrospect, this initial constellation proved to be formative of the project. Empirical observations point to an interplay of structural and epistemic challenges: In the context of a small municipality, limited human and time resources, informal governance structures, weak institutional interfaces, and low processing capacities made it difficult to integrate the results. These structural limitations were closely intertwined with questions of epistemic recognition: The knowledge generated by the young people was granted only limited epistemic authority.

This was particularly evident during the closing event and exhibition, to which, among others, the Lord Mayor, members of the City Council and administrative officials had been invited. The local authority did endeavour to send a representative in place of the mayor, and ultimately dispatched a city councillor who was also the city's integration officer. The local representatives present also acknowledged the young people's achievements and, in some cases, confirmed the relevance of the issues raised. At the same time, it remained unclear how these perspectives could have been translated into political or administrative processes.

The exhibition was conceived as more than public science communication: It was intended as an interface between research, citizenship, and local practice, creating opportunities for exchange between citizens and local decision-makers. Nevertheless, the response to the findings remained limited. Particularly revealing in this context was the informal feedback from the press officer: They were

relieved that the group had not uncovered anything that was not already known. The relevance of the findings was thus not fundamentally disputed; however, they were not regarded as a sufficient impetus for local planning or decision-making processes.

STRUCTURAL AND EPISTEMIC BARRIERS TO KNOWLEDGE INTEGRATION

The challenges outlined above highlight a key issue in participatory knowledge production: The citizens involved did not merely express subjective wishes, but provided nuanced assessments of needs, priorities, and feasibility. The results thus challenged broader epistemic hierarchies in which citizens' knowledge is frequently regarded as too particular, emotional, or insufficiently relevant for decision-making (cf. Collins and Evans 2002; Fricker 2007).

Nevertheless, even in this case, these perspectives were not recognised as a form of knowledge relevant to decision-making. The challenge here, therefore, lay less in a lack of alignment of content and more in the limited recognition of participatively generated knowledge within established knowledge hierarchies and political orders. The central problem consequently lay in the limited ability or openness of institutional structures to attribute epistemic authority and relevance to citizens—particularly young people (Jasanoff 2004; Fricker 2007). The project's lack of institutional anchoring within the local authority also meant that hardly any stable points of contact for regular feedback and coordination processes emerged. As no clear interfaces or shared working structures could be established, it remained unclear how and at what points the project results could have been incorporated or further developed. Their adoption thus remained dependent on the interest of individual actors; the results could not be systematically translated into organisational processes. In this sense, epistemic hierarchies did not operate separately from institutional structures, but became materialised through the absence of stable interfaces, responsibilities, and procedures for integrating citizen-generated knowledge. Similar tensions between participatory knowledge production and institutional uptake have also been discussed in citizen social science and participatory governance research (cf. Chilvers and Kearnes 2020).

The case thus highlights a central challenge of participatory research: even locally relevant and politically nuanced citizen knowledge has limited impact if institutions neither recognise it as legitimate nor possess structures for integrating it. This was particularly visible in the context of a small municipality, where limited administrative capacities and informal governance relations further restricted the institutional uptake of externally generated knowledge.

DISCUSSION: LIMITED POLICY UPTAKE AND DEMOCRATIC LEARNING IN YOUTH CITIZEN SOCIAL SCIENCE

The findings point to a tension at the heart of youth citizen social science: Participatory research can generate locally relevant knowledge and open spaces for democratic learning, yet its transformative potential depends on whether institutions are willing and able to recognise and integrate this knowledge.

STRUCTURAL AND EPISTEMIC CONDITIONS

The case raises a broader question for citizen social science: Under what conditions can participatory knowledge become relevant for local decision-making? The case study illustrates that limited policy uptake cannot simply be explained solely by limited resources or individual willingness to cooperate.

Rather, the case points to a complex interplay of structural and epistemic factors in local governance. At the structural level, numerous challenges described in the literature were confirmed: limited human and time resources, informal decision-making structures, and a strong orientation towards existing routines and responsibilities (Haus et al. 2004). It was precisely the project's lack of institutional anchoring that meant hardly any robust structures for feedback and integration of the results were established.

At the same time, the case shows that these structural conditions cannot be separated from epistemic orders. The matrix developed in the project indicated that the participating groups reflected on political conflicts of interest, resource constraints, and feasibility, and thus already translated their findings into a form relevant to municipal decision-making. Yet the results were only weakly treated as decision-relevant knowledge. This is where the central challenge lies: Citizens, and young people in particular, did not automatically appear as legitimate epistemic actors in municipal knowledge production. Policy uptake is therefore not merely a technical problem of knowledge transfer, but also a question of epistemic recognition, institutional reflexivity, and democratic responsiveness.

DEMOCRATIC LEARNING UNDER CONDITIONS OF LIMITED POLICY UPTAKE

From the perspective of political education, this raises a central question: What happens to democratic learning and political self-efficacy when young people participate in knowledge production, but experience only limited institutional responsiveness? Numerous youth studies indicate that young people do not simply lack political

interest or willingness to participate. Rather, their relationship to democratic participation is often marked by an ambivalent combination of relatively high personal self-efficacy and doubts about political institutions. Young people tend to regard their immediate lifeworld as something they can shape, while holding more sceptical views regarding national and global political processes. The municipal context of the project therefore provided a bridge between everyday experiences in family, school, friendships, and neighbourhoods and the collective task of shaping coexistence within a local community (Vodafone Stiftung Deutschland 2022, pp. 11, 15; Schneekloth and Albert 2024, p. 67).

Against this background, the hesitant uptake of the project's findings by Eichstätt's municipal administration and local politics limited the project's intended bridging function. The project aimed to connect young people's everyday experiences with municipal decision-making, but this connection remained fragile. However, the limited uptake of their proposals does not necessarily mean that the students experienced the project negatively or lost confidence in their political capacity to make a difference. We did not measure such effects systematically, yet the reflection sessions with the young citizen scientists suggest a more ambivalent picture. The final reflection points in the same direction: On a scale from 0 to 10, the statement "Our project can make a difference" received an average rating of 5. We interpret this as indicating neither strong confidence in direct impact nor complete resignation, but rather a realistic assessment of both the relevance and the limits of their own contribution, while acknowledging that the midpoint may also reflect uncertainty.

Beyond this ambivalent experience of limited policy uptake, the project can also be discussed in relation to the key competencies outlined in the section on political education. In this dimension, the young co-researchers were able to gain important experiences that can be differentiated in relation to the competency framework outlined above. With regard to the ability to act and participate in public affairs, they encountered both the possibilities and the limits of civic engagement: Their research generated relevant knowledge, but this knowledge was not automatically translated into municipal action. In terms of political judgement, the project offered opportunities to analyse public space as a field of overlapping and conflicting interests. Shared needs, such as non-commercial and accessible places to spend time, became visible alongside more specific youth-related claims to public space. This made questions of power, communication, publicness, and municipal decision-making more tangible. Finally, the project also fostered methodological skills through interviews, collective mapping, collaborative interpretation, and public presentation. In this sense, we interpret the project as contributing to more differentiated and reflective forms of democratic participation, without claiming to have measured learning effects in a strict empirical sense.

The educational value of the project therefore lies not only in successful participation, but also in the reflected experience of its limits. At the same time, such learning processes cannot replace institutional responsibility to create meaningful participation, recognition, and knowledge transfer. From a political education perspective, disappointment does not have to remain a sign of failure. If it is pedagogically accompanied and connected to questions of power, procedures, resources, and institutional responsibility, it can become a productive learning moment. In this sense, the project shows that encounters with institutional limits can become part of democratic learning processes when they are critically reflected upon and connected to questions of power, responsibility, and institutional change.

CONCLUSION

Eichstätt – A City for All shows that the limited policy uptake of youth citizen social science cannot be explained primarily by a lack of data quality or practical relevance. The young citizen scientists generated locally grounded knowledge about public space, accessibility, mobility, non-commercial meeting places, and social participation. Yet this knowledge was only partially integrated into municipal decision-making. This case highlights a central challenge for citizen social science: Participatory knowledge does not become decision-relevant simply because it is relevant, situated, or publicly communicated. Its uptake depends on institutional conditions that allow such knowledge to be recognised and connected to existing decision-making structures.

In small municipalities, these conditions are shaped by limited administrative capacities, established routines, unclear responsibilities, and the absence of stable interfaces between research, civil society, and local government. Further, epistemic hierarchies matter: Knowledge generated by young people is not automatically treated as legitimate or actionable. Policy uptake is therefore not only a question of better communication, but also of institutional openness, epistemic recognition, and democratic responsiveness.

From the perspective of political education, however, limited policy uptake does not mean that the project failed. Rather, it made democratic participation tangible as a situated and conflictual practice. The young citizen scientists experienced that democratic processes can be slow and marked by tensions between articulated concerns and

institutional responsiveness. Feelings of disappointment, frustration, or anger can become important occasions for political learning when they are pedagogically reflected upon and connected to questions of power and institutional responsibility. At the same time, such learning processes cannot replace meaningful opportunities for participation, institutional responsiveness, and the knowledge integration into political decision-making. Youth citizen social science can nevertheless support participants in reflecting on the social relevance and legitimacy of their own knowledge and in developing more confident forms of democratic articulation and participation.

The case points to several considerations for future (youth) citizen social science projects involving local politics and municipal administration:

- create stable institutional interfaces between participatory research, civil society, and municipal administration in order to support the long-term integration of citizen-generated knowledge;
- clarify institutional commitments early, ideally through a letter of intent or a similar cooperation agreement;
- communicate realistic expectations without undermining the young citizen scientists' motivation;
- connect project results to existing municipal arenas, such as committees, workshops, or planning processes;
- pedagogically accompany experiences of limited responsiveness, so that disappointment or frustration can be reflected in relation to power and democratic agency.

DATA ACCESSIBILITY STATEMENT

The qualitative data generated and analysed in this study are not publicly available because they contain sensitive information from a small local context and cannot be fully anonymised without compromising participant confidentiality.

SUPPLEMENTARY FILES

The supplementary files for this article can be found as follows:

- **Supplementary File 1.** Semi-Structured Expert Interview Guides. DOI: https://doi.org/10.5334/cstp.1078.s1
- **Supplementary File 2.** Structured Observation Template. DOI: https://doi.org/10.5334/cstp.1078.s2
- **Supplementary File 3.** Ethical Considerations and Research Procedures. DOI: https://doi.org/10.5334/cstp.1078.s3

ETHICS AND CONSENT

We assessed the nature and potential risks of our research in light of the German Research Foundation's (DFG) guidance on ethics committee statements (https://www.dfg.de/en/research-funding/proposal-funding-process/faq/ethics-committee-statements) and concluded that formal ethics committee review was not required in this case. The project was designed as a citizen science research project involving young people as co-researchers in a voluntary extracurricular school activity. We approached our ethical responsibility by placing particular emphasis on informed consent, voluntary participation, the protection of minors, and confidentiality. Students and their legal guardians were informed about the project's aims, procedures, and intended use of the data, and their consent was obtained prior to participation. Information was provided in an age-appropriate manner, and participants were informed of their right to withdraw their consent at any time without disadvantage. Adult interviewees and participants in the collective mapping activity were likewise informed about the research and consented to participation. Research data were handled confidentially and anonymised for analysis and publication. Further details on our ethical considerations and procedures are provided in Supplementary File 3: Ethical Considerations and Research Procedures.

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COMPETING INTERESTS

The authors have no competing interests to declare.

AUTHOR CONTRIBUTIONS

All authors contributed to the conception of the project and the article.

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