

# **'This is a Great Place for Children. Here, They Can Play, Do What They Want, Have Fun and Other Things.'**

Mapping Primary School  
Children's Everyday Spaces

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## **Abstract**

This article presents empirical findings from a learning environment based on education for Spatial Citizenship (Gryl & Jekel, 2012; Schulze et al., 2015) conducted with primary school children (6 to 10 years of age) in the city of Essen, Germany. In workshops comprising three stages, participants used an easy-to-use mapping application to trace significant places and objects in their school surroundings in relation to the workshops' overall topic of envisioning designs and features of a 'city for children'. This paper focuses on the analysis of collaborative maps created from children's perspectives on urban space in their own life-worlds.

## **Keywords:**

mapping, spatial citizenship, primary school, digital geomedial, VGI

## **1 Introduction**

Digital media are a ubiquitous element of our information society and familiar tools in children's everyday life-worlds, not only for communication purposes but also as sources of information for extra-curricular or educational purposes (GDSU, 2013). According to a study on the media use of primary school children (Prasse et al., 2017), half of primary school pupils in Germany stated that they use the internet at least once a week for information research. It is this exposure to and interaction with media content that calls for media-related education in primary schools, and therefore also within the subject of Primary Social and Science Education ('Sachunterricht'). Media-related Primary Social and Science Education has to react to changing, mediatized life-worlds through pupil-centred adaptation of the subject contents (Peschel, 2015). The changes in structure and type of media always go along with changes in the ways that the media are used. This is particularly evident in the omnipresence of (mobile) digital media, especially social media, in private and public spaces (Gervé & Peschel, 2013). Kanwischer & Schlottmann (2017) describe social media and their relation to physical space as 'both part of the world and "creators of world"' (p. 62; authors' translation). This relation

also becomes evident in the structural media education approach of Jörissen and Marotzki (2009), who describe how everyday life is permeated by digital media, and the educational implications of this for self–world relations. This permeation, or ubiquity, of digital media provides a fruitful opportunity for Primary Social and Science Education to draw on pupils’ experiences and interests in an action-oriented way (Gervé & Peschel, 2013), especially in the context of digital geomeia education.

The focus of this paper is to present an outline for, and an analysis of, a learning environment that links an education for Spatial Citizenship (Schulze et al., 2015) with a life-world-centred approach in Primary Social and Science Education. The aim is to provide an insight into children’s spatial perceptions as a starting point for fostering reflexive spatial-appropriation processes. We will first provide a brief explanation of the link between digital geomeia education and Primary Social and Science Education, and then delve into the methodology of subjective neogeography, which derives from the paper-based approach of subjective mapping (Daum, 2010) (Section 2). We next present our methodology (Section 3), and in Section 4 analysis and discussion of and reflection on a geomeia-based research project: during workshops comprising three phases, participants from primary schools in Essen, Germany used tablets equipped with an easy-to-use mapping application, based on Survey123 by ArcGIS, to create maps of their schools’ surroundings. The data gathered from these collaborative maps were analysed to explore the children’s perspectives on spatial challenges in their life-worlds.

## 2 Digital geomeia in Primary Social and Science Education

Digital geomeia, as representations of ‘digitally coded, spatially-referenced data [...] as well as the technological devices and software necessary for their administration, analysis and visualization’ (Rinschede et al., 2020: 372), hold a crucial position in the geographical dimension of Primary Social and Science Education. The need for appropriate, reflexive and critical use of omnipresent digital geomeia supports the subject’s aim of fostering elementary geographical literacy skills for the longer term (Schmeinck, 2013). In the context of digital geomeia as cultural technology, Schulze et al. (2020) emphasize the need to foster communication aspects, such as negotiation, reflection and mature participation through the use of digital geomeia, rather than exclusively focusing on competences in the realm of ‘simple’ data processing. The aim of contextualizing the use of digital geomeia as cultural technology within the users’ own life-worlds is in line with an education for Spatial Citizenship (Gryl & Jekel, 2012),<sup>1</sup> which aims to achieve a mature appropriation of space and participation through the use of digital geomeia. Spatial Citizenship is based on three pillars: 1) relational concepts of space that regard spaces as socially constructed and, thus, changeable (Lefebvre, 1991); 2) neocartography, which aims to re-centre everyday geographical problems rather than focus on the use of high-tech approaches, which used to dominate GIS education; 3) a contemporary understanding of citizenship education that pays more attention to informal

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<sup>1</sup> The concept of Spatial Citizenship education has also been embraced by Shin & Bednarz (2019), who emphasize the importance of geographical knowledge in relation to formal citizenship competences.

participation paths, such as in fluid web entities (Bennett et al., 2009). Gryl (2016) developed the first theoretical and empirical approaches for interlinking Spatial Citizenship and primary education, especially opportunities for mapping practices, with children of primary school age. Following the Spatial Citizenship competence model, Bach and Peschel (2019) examined primary school children's mapping competences using a mapping application within the kidipedia platform, which is intended specifically for use in primary school contexts. They showed that, for final-year primary school students, digital maps had a stronger positive effect on the acquisition of both media- and geography-related competences than analogue maps.

## 2.1 Digital (geo)media and Spatial Citizenship in primary school curricula

The German Primary Social and Science Education curriculum (GDSU, 2013) comprises five subject-specific 'perspectives'. Each represents one of the subject's reference subjects in secondary education (geography, history, natural sciences, social sciences and technical instruction). Additionally, the curriculum features five topics (one of which is called 'media') that relate to two or more of the 'perspectives'. In the curriculum, media education follows an integrated approach that aims to incorporate the complexity of 'traditional' and digital media into classroom practice, focusing both on learning with and learning about media as relevant competences for discovering the world (Gervé & Peschel, 2013).<sup>2</sup>

In geomeia-based learning within the curriculum's spatial perspective, the central aim is to foster students' spatial orientation competences, including through the production of maps:

*'Students are confronted with maps, images and large- and small-scale 'constructions' and orientate themselves in their own ways following different strategies. [...]*

*Students become increasingly familiarized with spatial phenomena and situations of their natural and built environment by actively engaging with them through [...] making observations, gathering data, mapping, interviewing individuals and presenting their results.'*

*(GDSU, 2013: 46; authors' translation)*

However, the importance of the consumption and production of *digital* geo-media is not explicitly emphasized within the framework.

As an important feature of early geographical education, the acquisition of media-related competences (notably the prosumption [production and consumption] of geomeia) can be subsumed under the term of 'cartographic/geomeia-based learning' (Gryl & Naumann, 2016: 20; authors' translation). Acquiring media-related competences should be embedded more

<sup>2</sup> Other approaches incorporate these two dimensions into the dimension of learning through (geo)media (e.g. Demirci 2015; Kanwischer 2014; Gryl & Schulze 2013). This focuses more on the use of (geo)media as a tool for world-exploration than as an end in itself.

fully within the framework in face of the everyday digital geomeia that are already embedded in children's life-worlds.

## 2.2 Subjective neogeography in primary schools

With the paradigm shift in the school subject of Geography that impacted not only subject-related modes of thinking and acting but also the choice of subject-related media to incorporate into teaching and learning, Kanwischer (2013: 80) proposes a 'shift of leading media' from analogue to digital maps. Maps have always been the central medium of geography (or geography education) and play a central role in human orientation. Based on individual perceptions, they represent the spatial constructions of a single cartographer or of a collective, and communicate individually-perceived perspectives on imagined (spatial) realities (Gryl, 2010). The shift from analogue maps to digital geomeia provides opportunities to create convincing forms of lay cartography (as opposed to those of 'expert' cartographers), as has already been acknowledged in the Spatial Citizenship approach, paving the way for digital forms of subjective mapping (Daum, 2010), or 'subjective neogeography'.

In subjective mapping, children draw maps of their life-worlds based on their cognitive models, which can then be analysed, deconstructed and discussed. Reflection on these mental representations of space provides insights into children's appropriation of space and how they attach meaning to physical-material space. By observing, giving expression to, and reflecting on one's own perception of one's (constructed) life-world, a shift of perspective becomes possible and conscious (Rhode-Jüchtern, 2004; Daum, 2010). This process is crucial for children's spatial appropriation as they position themselves, or 'stage themselves' (Daum, 2010: 125; authors' translation), in their life-worlds through cartographic practice (Löw, 2001).

Subjective neogeography incorporates central elements of Volunteered Geographic Information (VGI) into the method of subjective mapping. The aim is to incorporate easy-to-use digital geomeia applications into primary school education in the context of Spatial Citizenship to foster the mature appropriation of space and spatial/public participation. In the wake of neogeography, the possibility for spatial and public participation in the construction of space has already been greatly enhanced by the rise of VGI (Elwood & Mitchell, 2013), as have emancipatory approaches that provide 'new spaces of civic engagement' (ibid.: 276). Using VGI, Spatial Citizenship can offer increased access to, and promote credibility in, traditional processes of spatial negotiation through competences in geomeia prosumption, reflection and communication (Schulze et al., 2015). Because these spatial communications are articulations of identity that are capable of promoting 'social and political awareness' (Elwood & Mitchell, 2012: 4), they have the potential to visualize subjective perceptions (e.g. children's maps), and to question power (im-)balances and interpretational sovereignty in planning processes (Ramasubramanian, 2010). The digital context, in which spatial representations are shared and negotiated using various platforms, has already changed the scope of children's participation, making way for new forms of 'global citizenship' (Tuukkanen et al., 2012: 144). At the same time, critical reflection on processes of inequality that emerge from the interplay of the prosumption of geomeia, constructions of childhood, participation and intersectional power relations must be taken into consideration in the context of VGI (Pokraka, 2016; Pokraka & Gryl, 2017; Pokraka, 2021).

### 3 Methodology and research design

#### 3.1 Research context

The empirical research was conducted at before- and after-school childcare facilities at three schools in two different neighbourhoods of Essen, Germany: Altenessen and Rüttenscheid. As a former coal-mining city in the heart of the Ruhr, Essen has been transformed structurally since the pit closures of the late 1980s. The city itself is divided economically and socially by the A40 motorway. To the south is a high-income, almost bourgeois area, where Rüttenscheid is located; north of the motorway lies a low-income area that includes Altenessen. According to data derived from the education report published by Essen municipality in 2011, there are striking socio-economic and educational differences between the two neighbourhoods: in Rüttenscheid, almost 50% of primary school students will continue to higher secondary education, compared to only 25% in Altenessen. 11% of Altenessen's pupils leave school after lower secondary education ('Hauptschule'), in contrast to only 2% of the pupils in Rüttenscheid (Essen, 2011: 113).<sup>3</sup>

The seven groups participating in the project consisted of 40 children in total, ranging in age from 6 to 10. The participants joined the workshops voluntarily after one of the authors had run information sessions, at before- and after-school childcare facilities, about the workshops' topics and research context. As the participants spent time with each other at school and in the before- and after-school settings, they knew each other. All the groups except one were mixed-age and mixed-gender.

#### 3.2 Workshop design and data analysis

The learning environment consisted of workshops, with three stages each, that aimed to establish a space for reflection on, and the communication of the participants' perspectives on their own neighbourhoods, and the perceived spatial challenges and power-relations therein. In a participation-based environment, the aim was to gather the participants' life-world experience through geomeia-based communication and negotiation (see Figure 1).

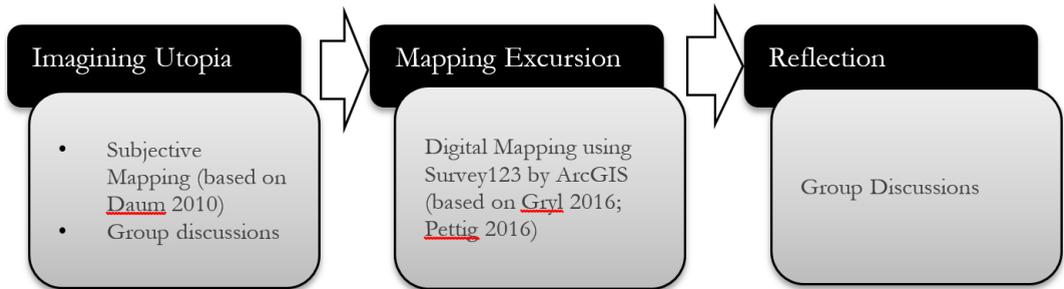
The initial phase was a group discussion based on the creation of paper-based subjective maps (Daum, 2010): the participating children drew their own visions of a 'Perfect city for children'. The subjective maps were presented and compared for the central elements they contained, so that central issues and points of discussion evolved spontaneously from the participants' own materials. The issues and subjects of discussion were noted on paper for later reference during the final phase of reflection.

During the workshop's second phase, the participants conducted a mapping excursion (Pettig, 2016; Gryl, 2016) based on the approach of subjective neogeography. Using tablets equipped with Survey 123 by ArcGIS, the children discovered and mapped places and objects in their

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<sup>3</sup> The different neighbourhoods for this research were chosen not in order to reproduce negative, mediatized stereotypes, but rather in order to avoid research bias and to tackle the connotations associated with the northern part of the city.

schools' surroundings that were significant in their life-worlds. The choices were based on the participants' positively or negatively connoted perceptions. To support the mapping process, the app featured a tool for geo-localization, the possibility of taking and uploading pictures of the geo-localized object or place, and a text field to include a description of the place or object.<sup>4</sup> Thus, the app supports the communication of issues and of the spatially ascribed meanings of the children's life-worlds (Gryl, 2010). It also allows for the analysis (by the researchers) of the data gathered, in the context of geomeia-based communication in primary school settings (Schmeinck, 2013).



**Figure 1:** Workshop design (own figure)

The third and final stage of each workshop was another group discussion, aiming for reflection on, and connection between, the findings of the first two phases. During this stage, participants explored the collaboratively created digital maps and their notes from the initial discussions. They then created posters of their research environments, pointing out positive features and issues that they felt had to be addressed. The posters were then exhibited inside the school buildings for the attention of the wider school community.

The workshops were accompanied by student assistants whose role was to observe the participants (Bachmann, 2009). They also transcribed the audio recordings of the group discussions for analysis. Pokraka (2021) focuses on the oral processes that emerged in the group discussions. In this context, the students' subjective paper and digital maps had served as the basis for oral, spatial reasoning and negotiation (Kanwischer & Gryl, 2012; Vogler, 2012).

The focus of this paper now lies on the children's perspectives on the spatial conditions of their everyday life-worlds, as derived from the analysis of their collaborative maps. The maps' text-based entries and photographs (approx. 420 map entries in total) were interpreted by comparing cases with each other (Kelle & Kluge, 1999). That is, all the map entries were first considered as individual, single, cases. Case-specific categories and subcategories were then formed (see Section 4), and these then underwent an inter-case comparison to identify thematic differences and similarities.

<sup>4</sup> For reasons of data privacy, user accounts were created for the children by the workshop organizers using blank e-mail addresses.

## 4 Results

During the mapping excursion, the participating children researched their spaces of everyday experience (Kogler, 2019). These spaces and places are significant for children’s continuous processes of the appropriation of space; they are the children’s residential environment and familiar stretches of road (ibid.). During the mapping process, participants researched, discovered and mapped aspects of their environment and points of reference that might not have come to their consciousness in their everyday movements. As a result, they exposed spatial challenges but also aspects of their life-worlds that they really appreciated. In many cases, the children also formulated specific demands for spatially related changes in their environments.

**Table 1:** Category system

Categories	Subcategories
Environment / environmental protection	Waste of resources
	Increase of e-mobility Increase of infrastructure for waste disposal
Health	Smoking Ban
Threats	Cars Animals Lack of secure infrastructure
Vandalism	Damage to public infrastructure
Social Issues	Distribution of wealth and private property Increase of infrastructure for children Design of public space for children Increase of leisure-time infrastructure for children
Institutional settings	Approval of infrastructure Spaces of relative freedom
Aesthetics	Graffiti Commercial Space
	Flora and Fauna
	Environmental Pollution
Positive Connotations <span style="color: green;">■</span> Negative Connotations <span style="color: red;">■</span> Demands <span style="color: blue;">■</span>	

Table 1 presents an overview of the spatial aspects that the participants discovered during mapping. The following sub-sections illustrate the different subcategories with specific examples, discussion and reflection.

#### 4.1 Environment/environmental protection: increase of infrastructure for waste disposal

The participants evaluated the state of the environment (or environmental protection) in their school's proximity critically, especially in terms of the waste of resources and fossil-fuelled individual transport. In this context, they formulated demands for an increase of both e-mobility and infrastructure for waste disposal. Figure 2 is one of a series of map entries that depict waste bins that are locked behind a metal fence. They belong to a local supermarket and have probably been fenced to prevent illegal waste disposal by third parties, as this seems to be a problem in the neighbourhood (WAZ, 2020). However, these inaccessible waste bins seem to issue a challenge, or cognitive conflict, to the participants: in their everyday lives, be it at school or in their private lives, they are probably confronted with questions of sustainability and environmental protection. For example, the disposal of waste and its significance in relation to sustainability is part of the Primary Social and Science curriculum (GDSU, 2013: 76). Pursuing this line of enquiry could provide a good opportunity to question the scope of individual action in relation to environmental protection, and to question spheres of environmental protection that students cannot influence immediately in that particular neighbourhood.

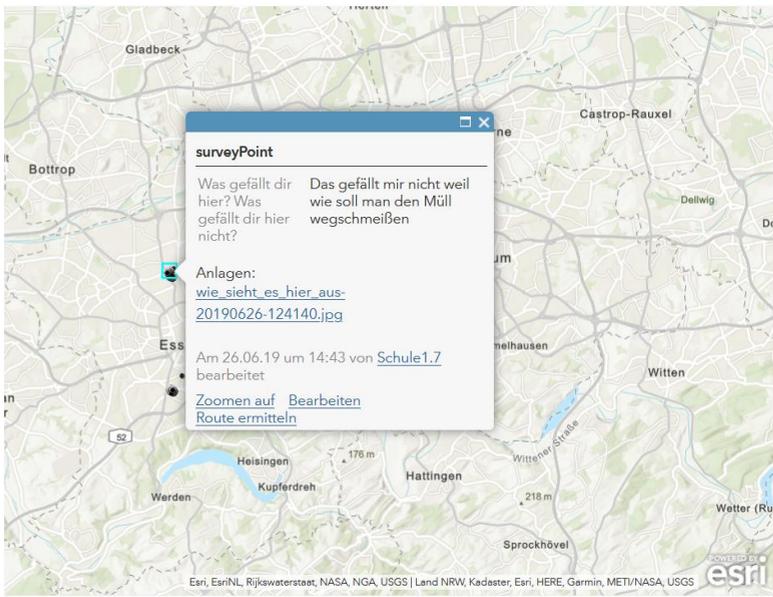
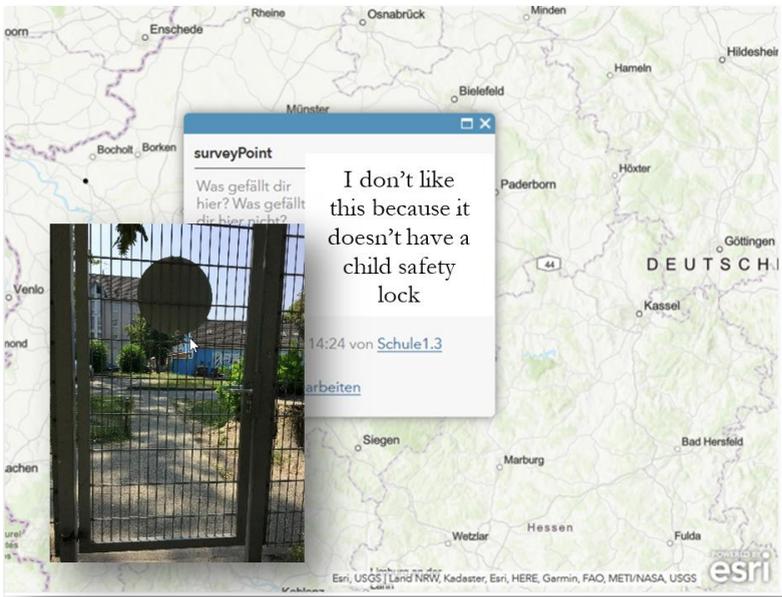


Figure 2: Extract from collaborative map in ArcGIS-Online (© Esri)<sup>5</sup>

<sup>5</sup> Data sources for this and the following ArcGIS maps: Esri Community Maps Contributors, Land NRW, Kadaster, Esri, HERE, Garmin, INCREMENT P, METI/NASA, USGS | Esri Community Maps Contributors, Land NRW, Kadaster, Esri, HERE, Garmin, INCREMENT P, METI/NASA, USGS. In cases where a large-scale map would have revealed the school's location, a smaller scale was used to ensure anonymity. The map's entries were translated from German into English by the authors.

## 4.2 Threats: lack of secure infrastructure

The category ‘Threats’ consists of objects in public spaces that the participants have evaluated as being dangerous. These range from relatively vague ascriptions (‘bumblebees are dangerous animals’) to criticism of specific elements of infrastructure that pose a possible threat, especially to children. Such criticisms draw attention to generational differences between children and adults, and seemingly re-affirm public spaces as potentially dangerous for children (Evans, 2008; Holloway, 2014). Figure 3 shows an example of a perceived threat in relation to a lack of safe infrastructure for children. The fact that the school playground’s side entrance gate does not feature a child safety lock is perceived negatively, although it remains unclear whether such a lock would be intended to prevent children from leaving the school grounds or intruders from entering. In mapping the lack of a lock, the participant communicates a need for protection. The expression of that need could derive from prior negative experiences or the internalization of patronizing perceptions (Pokraka & Gryl, 2018) of the possible threats that public spaces hold, especially for children.



**Figure 3:** Extract from collaborative map in ArcGIS-Online (© Esri).

## 4.3 Social issues: distribution of wealth and property

In the category ‘Social Issues’, the participants’ perceptions of social inequalities, which manifest themselves spatially, become evident, especially through questions around the design of public spaces in relation to children’s needs (e.g. the provision of free leisure facilities, usability of public spaces for children, and the increase of infrastructure that caters specifically for children’s needs). Furthermore, the participants expressed strong criticism of the distribution of wealth and private property, an issue that was present in the group discussions

that took place before the mapping excursions (Pokraka & Gryl, under review). The criticism of the distribution of wealth ranged from specific disapproval of the cost of Pokémon trading cards, which are very popular among several of the participating children, to very general demands for income equality at the level of individuals (see Figure 4) or for a reduction in living costs. Interestingly, these demands can be traced in the maps made by groups from both the wealthier southern neighbourhood of Rüttenscheid and the lower-income Altenessen, although no data was gathered on the socio-economic backgrounds of the individual mappers.



Figure 4: Extract from collaborative map in ArcGIS-Online (© Esri).

#### 4.4 Institutional settings: spaces of relative freedom

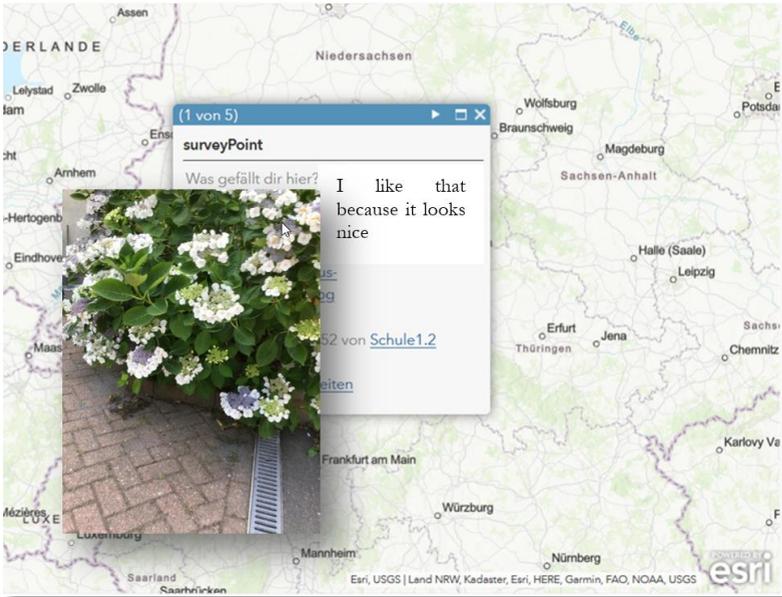
In terms of institutional settings, many participants mapped objects and places within their school grounds. This is not surprising, as all of the excursions started in the schools' day-care facilities. However, it is interesting to examine what specific elements of their school environment the students mapped: Tonucci & Rissotto (2001) have summarized the increasing importance of institutional settings within children's life-worlds and their exposure to adults' control as the shift from playground to 'sandbox city'. However, the collaborative maps show that the participants create and value their own free spaces within supervised institutional settings. Figure 5 shows a geo-referenced picture of the school's toilets, which were mapped by several participants. The toilets potentially provide a space within the school environment where pupils are not subject to supervision and regulation. Going to the toilet unsupervised provides opportunities to increase their sphere of action and autonomous spatial appropriation.



**Figure 5:** Extract from collaborative map in ArcGIS-Online (© Esri).

#### 4.5 Aesthetics: flora and fauna

'Aesthetics' is probably the most ambiguous category to have emerged from the data: many places and objects were mapped and annotated with either positive or negative associations according to whether the individual participant considered them 'pretty' or 'ugly'. The sub-categories 'graffiti' and 'commercial space' are connoted both positively and negatively in Table 1. However, almost every point that was mapped in the sub-category 'Flora and Fauna' was evaluated positively in terms of aesthetics. Participants emphasized the importance and their appreciation of urban green spaces, as well as of domestic animals (dogs, cats, animals at an urban petting zoo) and of wild animals (insects) which they encountered. Herlyn et al. (2003) have already noted the demand for urban green spaces in the context of children's participation in urban planning processes.



**Figure 6:** Extract from collaborative map in ArcGIS-Online (© Esri).

## 4.6 Discussion

The data analysis has shown that incorporating digital geomedia into a primary school-based learning environment can be beneficial for exploring their spatial appropriation processes with children. Using digital geomedia in the ways outlined is part of an education for Spatial Citizenship based on subjective neogeography. Through the creation of collaborative, mash-up maps that incorporate geo-referenced pictures along with text annotations, which could be added either by typing or by using voice recognition, participants were able to record and communicate a collective perspective on their life-worlds.

The critical examination and formulation of specific demands for spatial and social change which are evident especially in the categories of environment/environmental protection and social issues can provide a starting point for socio-spatial participation. Such demands are also vivid examples of the students' spatial appropriation processes: they identify life-world challenges but at the same time acknowledge their own relation to these life-worlds and the opportunity for change (Rhode-Jüchtern, 2004; Daum, 2010; Jaeggi, 2016). The results also make clear that paradigms of the institutionalization of childhood (see Tonucci & Rissotto, 2001) are ambivalent: children's life-worlds are subjected to processes of institutionalization; at the same time, children undermine these processes through the creation and validation of free spaces within institutionalized restrictions, as became evident in the school toilets examples. At the same time, guarded and secure spaces for children are sometimes perceived very positively due to imagined, or experienced, threats in public space (see the child safety lock example above). In the analysis of the workshop discussions (Pokraka, 2021), we identified the importance of private gardens as places for free exploration and as extended

spheres of action in lieu of public spaces, which were perceived as potentially dangerous. Acknowledging and supporting the search for these free spaces within the power-related restrictions of a neoliberal school system (Gryl & Naumann, 2016) can encourage the mature appropriation of space (Dorsch & Kanwischer, 2019) within an education for Spatial Citizenship. However, exposing children's 'hidden' spaces of autonomy always runs the risk of these spaces being eliminated. This makes weighing the interests of the children, their right to privacy, and the search for fields of autonomy in education (and research) a crucial point for consideration.

At the same time, the suggested mapping process provides opportunities to incorporate these challenges in the Primary Social and Science Education classroom: using the point-maps to identify spatial clusters and thematic points of interest offers a student-centred approach for learning. For example, the Primary Social and Science curriculum focuses on questions of economic action in relation to the distribution of material resources (GDSU, 2013: 32), which can be linked with issues of social inequality through the question of the distribution of wealth. Furthermore, the demand for an increase of e-mobility can be linked with the perspective-connecting topic of sustainable development (GDSU, 2013: 75–76). Here, one could also focus on the climate-related importance of urban green spaces beyond their mere aesthetic or recreational functions. However, one must note that learning environments tend to promote solely the impact of the individual's actions on climate change and sustainability, which Kehren (2016: 151) calls the 'privatization of sustainability': the implication is that as soon as students separate their waste, avoid fossil-fuelled individual transport and remember to turn off the lights when leaving the room, climate change is solved. There are several recent approaches that could be useful for tackling these issues, which stem from a de-politicized examination of highly political, global issues: transformation in geography education (Rohmann, 2021) proposes a systemic perspective on an education for sustainable development that reflects on both the scope of individual action and political dimensions. Furthermore, an approach of immanent critique in social geography didactics (Lehner et al., in preparation) can support the process of uncovering immanent contradictions in global environmental issues – e.g. the promotion of e-mobility which still relies on the production of electricity using fossil fuels.

## 5 Conclusion

We have presented the conceptualization of a learning environment based on an education for Spatial Citizenship: the incorporation of geomedial education in primary school teaching and learning. The analysis of the learning environment has shown that using simple web mapping applications can support student-based enquiry into spatial challenges in the children's own life-worlds, as well as the exploration of global challenges that manifest themselves spatially on a local level. We would like to encourage the use of digital mapping, especially for initiating and supporting processes of spatial appropriation and of exploring the world, within Primary Social and Science Education.

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