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SAFE SCHOOL ZONES: URBAN RESEARCH FOR THE DEVELOPMENT OF CHILDREN'S VISIBILITY USING CO-DESIGN AND PLACEMAKING METHODS.

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ABSTRACT | Although children are a large user group of the city and its public transportation, their challenges are not equally handled in the Hungarian context when speaking about urban planning. While there are countless examples in the Western literature of children's involvement in urban planning processes (Derr et al. 2013, Krishnamurthy 2019, Lovrić 2023), in Hungary we are only at the beginning of the discourse. The paper is going to introduce an ongoing research and development project started 1,5 years ago including both research and implementation phases and its results as a case study aiming to adapt the already existing Western know-how into the Hungarian context.

The work-in-progress research aims to explore how social design might facilitate children's physical and mental safety regarding the inclusivity of public places and mobility formats through placemaking. It has been conducted in collaboration with the Innovation Center of a Hungary-based design university, the Budapest Public Transport Center, the ELTE Institute of People–Environment Transaction and the Municipality of the 7th district of Budapest, aiming to tackle the needs of children (age group 10-13) in lights of public transportation, micro and active mobility intensively focusing on the usage and opportunities of public places around their school. To unfold the needs of the target group the research used process-based co-creational data collection, methodological tools of social design, action research, observatory research, and interviews, resulting in the creation of a design prototype focusing on the specific challenges raised by the target group. The research led to finalising a ready-made product with scalable and transferable potential and providing a set of options (installative and regulative) to Municipalities for alternative ways of traffic calming through placemaking in school areas. This prototype is not a result, but rather a research tool to observe and analyse the children's behaviour and discover the adaptation potential. Besides being a research tool, the intervention aims to cause traffic calming and to affect drivers' behaviour through visual stimulation.

The paper introduces the results of the research by illustrating what are the main challenges and obstacles children face when using public spaces in a big city (especially in school zones) and what type of interventions can help to ensure their physical and mental safety while using these spaces. Assessing the usability and impact of the tangible prototype is not the last methodological part of the research project: currently, the research is focusing on a new school environment integrating the findings of the first stage of the project as well as new stakeholders. Concluding the findings of our case study about urban child protection, public place awareness, and liminal spaces, it opens the argument of transferability and paradigm changes in the context of Budapest and has potential relevance in other big cities as well as in the CEE region.

1. Introduction

Children's urban environments play a crucial role in shaping their physical health, social connections, and identity development, especially after their kindergarten years. While much attention has been given to physical health aspects, like air quality and safety standards (Tamburlini et al., 2002), there is a growing recognition of the importance of considering children's emotional connections to their surroundings (Dúll, 2009). Understanding the diverse needs of children in urban environments requires consideration of various factors, including their need for security, exploration, socialisation, and privacy which vary according to their age (Day, 2007; Altman et al., 1978). Balancing these needs can be challenging, particularly as children transition between home, school, and public spaces in their primary school years (Freeman & Tranter, 2011). Given the complexity of children's needs, involving them in the design process is essential for creating inclusive communities (Davis & Jones, 1996). Placemaking, a participatory approach to urban design, offers a valuable opportunity to engage children in shaping their surroundings (Marshall & Bishop, 2015). By actively involving children in community workshops and design charrettes, urban planners can create vibrant and child-friendly spaces that foster a sense of ownership and belonging from a young age (Ellery & Ellery, 2019). Placemaking in urban planning involves a multitude of factors, including the level of involvement of end users, the methods employed, the scale of interventions, and the diverse stakeholders engaged in the process. This paper delves into the intricate interplay of these factors by examining existing examples from around the world.

Building upon these insights, an intersectional collaborative research project was initiated in Budapest's 7th district, involving multiple stakeholders such as the Budapest Public Transport Center, the ELTE Institute of People–Environment Transaction, a Hungary-based design university and the 7th-grade (12-13 years old) children community of a primary school, based in the 7th district of Budapest. The project aimed to address the needs of children regarding public transportation, micro and active mobility, and the usage of public spaces around their schools. Through a comprehensive research and co-creation-based design process, the project sought to enhance children's visibility and safety in urban environments.

2. Children's Urban Environments: Understanding Needs and Promoting Inclusive Design

When speaking about the connection between children and their physical environment, sources highlight mainly the role of places in the context of physical health (Tamburlini et al., 2002; Day, 2007) instead of healthy social connections and the development of their identity. The negative impact of harmful environments on children's physical health cannot be questioned when speaking about poor indoor air quality, hazardous building materials and unsafe building standards, chemical or biological contamination of furniture, arts-and-crafts material and playgrounds, radiation and noise (Tamburlini et al., 2002). But to understand the complex role of children's environment, we also need to understand the importance of place attachment and place identity. Results of environmental psychology show that people form emotional bonds with the environment they live in and use (place attachment). These meaningful places over time become part of the person's self-definition (place identity) (Dúll, 2009). It has different dimensions since an emotional relationship can develop to a corner of a room, to a house, to the neighbourhood, to the city, or even to imagined or mythical places (Mazumdar - Mazumdar, 1993 cited by Dúll, 2009). With Dúll's literature summary, we learn that attachment to a place develops because the control of the place enables "the manifestation of action and competence" (Dúll 2009, 133). Attachment to a meaningful place has countless advantages, such as the sense of security, belonging, control and ownership as well as experiencing social connections.

Several studies (Altman et al., 1978; Day, 2007; Freeman & Tranter, 2011) examined the connection between the needs of children and the opportunities offered by their physical scenes as well as the significant role of place attachment in the ongoing development of children's identity (Day, 2007; Gordon, 2010). According to

different ages, children need a place to feel security, integrity, magic, sensory exploration, creative intervention and inspiration (Day, 2007), they need to learn, play, socialise and explore but on the other hand they need to experience privacy (Altman et al., 1978) and quiet reflection (Woolley & Spencer, 2000) as well. According to these conflicting needs and tension between the known and the unknown, Day (2007) also articulated that the environment should serve the children's journey of development by offering enough flexibility and opportunity for adaptation. To serve these diverse needs children need scenes such as their home and their school, cultural spaces, outdoor environments like playgrounds and nature as well as their whole neighbourhood (Christensen & O'Brien, 2003; Freeman & Tranter, 2011; Campos & Luceño, 2020). While the most important of all seems to be the children's home (Altman et al., 1978; Dúll, 2009, Freeman & Tranter, 2011) still it needs to be clarified that different environments can support different needs. 'For children "indoors" is a private domain, the source of physical shelter, social security, and psychic support - and also the locus of adult dominance and the limiting effects of "family" and "school." "Outdoors" is a necessary counterbalance, an explorable public domain providing engagement with living systems and the prevailing culture locus of volitional learning' (Altman et al., 1978, 88). It also seems that after the kindergarten years, during their primary school years, children need to explore more and learn responsibilities and by that, outdoor environments get a bigger role in their development and school environments can play a leading role in being available for these needs (Day, 2007).

The school is a psychologically significant environment, which has a wide range of socio-physical effects on the users of its environment, which is not only educationally important, but the school is also a key socialisation medium (Altman et al., 1978; Day, 2007; Dúll, 2007), a safe environment for unstructured play (Freeman & Tranter, 2011) and an opportunity for informal learning (Day, 2007; Freeman & Tranter, 2011; Alegre, 2023). When talking about school environments, research is mainly focused on the indoor school environment (Altman et al., 1978; Day, 2007), much less on school yards (Day, 2007; Kyriakou, 2014; Green, 2021) and even less on the public areas of school fronts (Krajnović, M. et al., 2023). In this sense, it is also worth examining literature about smaller-scale urban contexts such as liminal spaces in the context of childhood (Christensen & O'Brien, 2003). School fronts, just like liminal spaces, are "at the boundary of two dominant spaces, which is not fully part of either" (Dale and Burrell, 2008: 238), their function is not easily defined just like its ownership by a specific group and these are the spaces where anything can happen (Turner, 1974 cited by Shortt, 2015). Following Day's (2007) explanation about linking spaces, school fronts are territories of arrivals and departures, of welcoming and saying goodbye: this environment should give space for children to reset their mind from outside to inside, from unknown to safety, from liberty to expectations and vice versa. These scenes should offer space for children, to release their tension after a long day at school and to manage their conflicts in a wide-open space which is still close to the safety of the well-known school.

Based on the complexity of children's needs in their urban environment, involving them in the design process of urban planning is essential for creating cities and communities that are truly inclusive, dynamic, and responsive to the needs of all residents (Altman et al., 1978; Davis & Jones, 1996; Bakar, 2002; Day, 2007; Simonsen & Robertson, 2013) and placemaking seems to be a valuable method of involvement. Children bring a unique perspective, often noticing details and aspects of their environment that adults may overlook. By actively engaging children in the planning process of public spaces, decision-makers can gain valuable insights into what makes an area appealing, safe, and functional for younger members of the community (Freeman & Tranter, 2011). Moreover, including children in the process empowers them to have a voice in shaping the places where they live, play, and learn, fostering a sense of ownership and belonging from a young age. Placemaking serves as an excellent tool for involving children in the urban design process due to its focus on community engagement and participatory approaches (Ellery & Ellery, 2019). Placemaking encourages residents, including children, to actively contribute their ideas, creativity, and insights to the development of public spaces. By organising activities such as community workshops, art installations, and design charrettes specifically tailored to children, urban planners and designers can harness their imagination and enthusiasm to co-create vibrant and child-friendly environments. This collaborative approach not only ensures that children's needs and preferences are taken into account but also cultivates important life skills such as teamwork, problem-solving, and civic engagement as well as the development of place attachment (Marshall & Bishop, 2015).

3. Exploring Factors in Urban Placemaking: Tools, Scales, and Stakeholders

When talking about placemaking and the involvement of end users in the urban planning process, many variable factors have to be considered: the level of involvement of the children, the methods used, the type and the scale of the planned intervention as well as the participating stakeholders. In the following section, the paper is going to investigate these factors through already existing examples from around the world.

3.1 Tools of Involvement

As we discussed above, the involvement of children in urban interventions and decision-making is undoubtedly essential in today's urban design process: still involvement has different tools for different aims, which can lead us to reach different depths of participation. When speaking about tools, we can apply introductory but also informal meetings, observations, questionnaires, interviews and participative workshops - also we group these tools depending if there is a direct connection to the target group or not, or depending on what kind of activities they are including. We cannot state that these tools are used in general in most of the examined cases, but indeed these tools can give a real depth when speaking about involvement and by that, they are very commonly used.

Even if we collect examples of participation and collaboration, there are still tools which are not meant to bring new people together but they are still serving placemaking from behind: these are the research methods of observations and questionnaires. Placemaking projects often involve observation as a tool, to collect data about the target group. It can happen in an indirect way when the participants are observed in their natural habitat, where they are not directly involved, as it happened in the project of the Jai Vakeel School (JVS) in Mumbai, where the design team visited the school and studied the children's behaviour during the school hours (NIUA, 2019). Besides observations, questionnaires are classical tools to gather information from a larger group. It can be used in different project phases: getting to know the target group's behaviour before the deeper involvement and used to starting a discussion, and also assessing the results and rapidly evaluating (Danenberget al., 2018). In the case of children, these questionnaires can also get a more playful form such as the form of a booklet, to get to know the children's point of view about their dislikes, street activities and outdoor playing habits in a playful way (Slingerland et al., 2020).

Verbal tools such as interviews, group discussions and other formal and informal meetings play a significant role in placemaking projects by providing invaluable insights into community needs, aspirations and preferences, thus informing the design process and ensuring the creation of spaces that truly resonate with and serve their intended users. Introductory meetings have to happen to define the roles and expectations of each participant, which are key elements in the process (Sutton, 2002), just like in the case of the research project led by TU Delft in the Tarwewijk neighbourhood in Rotterdam (Slingerland et al., 2020). Besides meetings, interviews are also key elements of placemaking research projects, which can be conducted by the target group itself. In the project of "The Walking Neighbourhood" in Chiang Mai (Thailand), the children conducted interviews with local people (such as shopkeepers, local 'icons' and habitants), who oversee the everyday happenings as constant observers (NIUA, 2019). Another informal verbal tool might be community walks, just like in the project of the Bernard van Leer Foundation in Bogota, where community walks were organised to involve the neighbourhood and to identify possible danger spots (NIAU, 2019).

Participatory workshops represent a cornerstone in placemaking projects, serving as platforms for engaging children, and stakeholders and fostering collaborative decision-making processes aimed at enhancing the quality of public spaces. These workshops encompass a variety of formats and methodologies tailored to specific project objectives and community dynamics. Common workshop types include community visioning sessions and collaborative brainstorming exercises, each offering distinct advantages in eliciting diverse perspectives and co-creating inclusive environments. These participatory

approaches have the potential to facilitate meaningful dialogue, foster social cohesion, and engender sustainable urban development. In urban placemaking research projects different types of workshops appear: Ana Vargas, a Venezuelan architect in her project called 'Tracing Public Space' conducts photographic mapping excursions with the children to understand their needs and discover potential opportunities for transformation (Danenberg et al., 2018). Community-engaged co-creational workshops develop a sense of belonging to a community and create stronger connections amongst the locals as seen in the project called 'Hack Our Play', which was implemented in the St. James' Church Kindergarten in Singapore (Danenberg et al., 2018).

3.2 Scales

Urban placemaking projects can be also categorised by the different scales of the interventions such as micro-level scale, public space scale, neighbourhood scale and city scale (Danenberg et al., 2018). Even if it is important to add, that in many cases scales are not necessarily final and they often grow into adaptable solutions (NIUA, 2019), still the paper is going to introduce examples according to these four categories including different types of interventions such as pieces of street furniture, climbable objects, sidewalk games, playful pedestrian street crossings, opened schoolyards and child routes (Krishnamurthy, 2019) as well as built constructions, permanent installations, and also simple visual gestures, occasional solutions, which are more like an event or an activity.

The micro-level scale is the most supervisable setup since it can offer the opportunity to be completely overseen by its users, which results on the one hand parents and guardians immediately acting on unexpected events and on the other hand children reading the environment. The space has well-defined functions and borders and the most common solutions of micro-level scale are street furniture installations. Since the same street furniture can target different user groups, it can play an important role in building a connection between children and other local people sharing the same neighbourhood, just like in the case of the Darling Quarter Playscape in Sydney, Australia (NIUA, 2019). Street furniture can also function as a transitional environment between the children's home and school, functioning as a liminal space which helps them mentally both to prepare for challenges and to calm down after them (Krishnamurthy et al., 2018). The FURNISH-KIDS research project was realised in Barcelona and is a good example of how street furniture can respond to different challenges while transforming urban space (Furnish Tech, 2020).

In the public space scale, the opportunity to explore appears in different forms of playing and learning, which can happen in the forms of playgrounds, sidewalks, and schoolyards. It happens in the presence of a parent or caretaker but at a broader distance from them. These are often part of parks, shopping centres and other built environments. The Hammarby Sjöstad neighbourhood in Stockholm became a famous model ('Hammarby Model') since many sustainable design elements are involved, like the example of the overhanging balconies around a public space, offering parents the opportunity to look after their children without bothering their free play (NIUA, 2019). The public parks of Amsterdam designed by Aldo van Eyck (NIUA, 2019) were created with the idea that children prefer places for playing, which are not perfectly organised, but rather places to discover (Han et al., 2018). The main concept was to create a minimalistic place from only a few variables, and climbable elements and let the children explore the space while encouraging them to use their creativity. Climbing helps children improve their decision-making skills, gives them courage and makes them feel and become more independent (Malone K. et al., 2014). The outside world might seem intimidating for a child, but making these functional places more playful might help children feel more connection and security using their urban environment. As an example, creating sidewalk games can create the expression of an extended playground (Muasaroh et al., 2020), just like the playful solution of the Sidewalk trampolines in Copenhagen (ArchDaily, 2022). The closeness of the roadway might be a threat to the children in the case of these sidewalk games, which means that safety measures also need to be implemented, just like in the case of the School Zone Improvement Project in Seoul, where they developed clear separation with the help of small fences (NIUA, 2019). Besides children, playful street crossings can also affect the driver's behaviour and by that, it can be a tool to increase the

visibility of vulnerable road users and support road safety. After getting the legal permission, an intervention like this can be implemented by the community, involving local schools or artists, either way, it can create a special place for the locals from the neighbourhood. While public playgrounds and sidewalks are available constantly, some places in a city are open only in a certain timeframe for the public, such as schoolyards. Extending the opening hours of these yards can give another venue for local children to play as well as for the local community to organise events and social gatherings (Kyriakou, 2014). The St. Lawrence Neighbourhood in Toronto illustrates the same example: the playground next to the school belongs to the school itself and during school hours it is used exclusively by the students, but after those hours it is opened for the local community (NIUA, 2019).

The neighbourhood scale encourages the children to move forward in independent and playful exploration such as different routes, networks and the riverbank. The Cantinho do Céu Complex in Sao Paulo illustrates how a riverbank can be turned into an inclusive, green urban environment beneficial for all the locals of a neighbourhood: it brings closer the waterfront to the children through accessible pathways, designed for exploration with many playable objects and spaces alongside (NIUA, 2019). Another neighbourhood-scale placemaking intervention can be a network, connecting different sites of the city, such as the 'Playing out' project (NIUA, 2019), showing how a micro-scale bottom-up project can grow into a neighbourhood-scale solution. Its core idea first came from two local parents aiming to create a small outdoor space for children, but through community engagement today the project involves 150 streets in the city. (NIUA, 2019). When discussing a network of child-specific places, we also need to consider their connecting routes to become child-friendly: they can create awareness to help children feel safe and support their independent urban mobility (Corsi, 2002). In Maggie Daley Park in Chicago, the routes are enriched by interactive and climbable objects on their sides (NIUA, 2019). A project realised in Bogota, created routes to develop a sense of safety in children. The project aimed to assess the danger spots by mapping them with the children and the local community and then creating smaller tactical interventions to target the problems (NIUA, 2019).

3.3 Dividing Roles

Urban placemaking projects can be realised with the involvement of different stakeholders, such as educational and research institutions, designers, the state or a local municipality, NGOs or civic organisations, and organisations of the private sector. Each potential stakeholder has a different role and can contribute to a project in different ways by bringing their own experiences, knowledge and power to the table, which means that responsibility can be shared but also that the different expectations of the stakeholders need to be articulated to avoid disappointments and conflicts. Schools might have a significant role in creating a bridge between the design team, the children and other stakeholders too. The school community can realise and articulate a problem and ask for support to solve it just like it happened in Mumbai, where the Jai Vakeel School and the Victoria Memorial School for the Blind have invited a team of designers to transform the campus' outdoor space into a play area, which would fit the needs of the disabled children (NIUA, 2019). The school realised that it is unused and could be turned into an intermingling space, for children from different local schools to meet and play together. Municipalities can support a placemaking project with local funding, they also have the authority to give permissions for occupying public spaces and realise constructions last but not least, municipalities can be the target group of policy recommendations, since they can influence local regulations. The power of civic organisations comes from knowing the local communities directly through public actions which is clearly illustrated by the Smart Park Redevelopment Project in Bhubaneswar, India, where the local NGO had a significant role in the realisation process (NIUA, 2019).

In conclusion, the involvement of end users, particularly children, in the urban planning process through placemaking initiatives necessitates consideration of various factors such as the level and methods of involvement, the scale of interventions, and the roles of participating stakeholders. The depth of participation can vary based on the tools utilised, ranging from introductory meetings and observations to participatory workshops and informal verbal tools like interviews and group discussions. These tools provide invaluable insights into community needs and preferences, informing the design process and fostering collaborative decision-making. Moreover, placemaking projects encompass different scales of

interventions, from micro-level installations like street furniture to neighbourhood-scale initiatives such as creating networks of child-friendly places and routes. Different stakeholders, including educational institutions, designers, municipalities, NGOs, and civic organisations, play crucial roles in these projects, contributing their expertise and resources to create inclusive and vibrant urban spaces that cater to the needs of children and the broader community. Through a comprehensive examination of these factors and examples, an urban placemaking project was realised in Budapest, as presented by this paper.

4. A Collaborative Research Project in Budapest's 7th District

Built upon the introduced learnings, a research project was developed by the Innovation Center of a Hungarian-based design university, the Budapest Public Transport Center, the Institute for Human–Environment Transaction of Eötvös Loránd University and the Municipality of the 7th district of Budapest, aiming to tackle the needs of children (age group 8-13) in lights of public transportation, micro and active mobility, focusing on the usage and opportunities of public places around their school. The main research question was how design might facilitate children's physical and mental visibility and safety regarding the inclusivity of public places and mobility formats using placemaking to mitigate traffic through innovative research and a co-creation-based design development process.

The first chapter of the research project ended in December of 2022 and it had five different stages: (1) observations by the researchers focusing on the current situation of the street of the school, (2) questionnaires for the students focusing on their mobility and socialising habits, (3) problem mapping workshops involving four classes (with 30 students each) of four different schools of the 7th district, (4) participatory design workshops, involving 30 students from one of the previous schools and (5) testing the usage of the already installed prototype through observations and questionnaires among student and teachers.

By the observations and the questionnaires, we could understand the general conditions of the school front environment as well as the general usage of it. During the observations field notes were taken focusing on the behaviour of arriving and leaving students and teachers, accompanying parents, drivers, and pedestrians as well as physical circumstances and social interactions between the different groups. We have learnt that students use micro-mobility vehicles and the matter of their storage is unsolved. Neither students nor parents socialise in front of the school. Pavements are narrow and parking cars are filled up on both sides of the street. Many students are dropped off by car in the morning but in the afternoon students leave in groups by walking. Most of the students leave closer than 10 minutes of travel but some students have to travel more than 30 minutes to get to school.

The problem mapping workshops included four workshops (45 minutes each) for 4x30 students of four different elementary schools, situated in the 7th district of Budapest. The four occasions had four different focuses. During the first workshop, the students created a common cognitive map (Altman et al. 1978) about the urban environment of their school. They had to involve not only its physical conditions (with parking spots, green areas, traffic lights and so on) but also they had to place their emotions (fear, happiness, loneliness, togetherness etc.) on this commonly created map to help the researchers to understand the advantages and limitations of the place in its fullness. In the second workshop, students got involved in small, facilitated group discussions about their mobility habits and most commonly used routes. During the discussions, we used different visual aids to help the conversation. With the third workshop, we created “parent personas” with the students to understand their families' habits and preconceptions about mobility, public space and the built environment. The persona creation was supported first with more general (such as: What does this person look like? What does this person wear? How does this person travel in the city? What is the daily routine of this person) and after with more specific questions (such as: What does this person think of the safety of the street? How does this person feel about the efficiency of public transportation? What does this person suggest us in an urban environment?). During the last (fourth) workshop, students created their common collage based on their needs, including given and desired activities related to public space in the school environment, which helped us to understand both the current and the wished use of the space.

The structure of the following participatory design workshops was developed based on the results of the problem mapping workshops: it included a group brainstorming and modelling session, engaging one class of students, organised into small groups. These sessions aimed to ideate with the students, addressing the challenges identified during the prior examinations (observations, questionnaires and problem-mapping workshops). The brainstorming phase focused on four topics: greening and sustainability, mobility, safety and the usage of the current school front area. To warm up the groups we used different rapid creative games like story cubes, activity and visual prompts. The main activities of the brainstorming phase were situational exercises, where the groups of students got different rapid situations to solve. The situations included examples like: “You are waiting for a public transport service to get home and you need to fill in the time left at the stop. What does an ideal bus stop look like?” and “We need to designate and build a safe way home for our 4-year-old little brother.” In each situation, the students got different tools to work with. We aimed to use child-friendly and playful tools, such as cardboards, blind maps, speech bubbles, printed street view screenshots, colourful tapes and sticky papers, pictures, maps drawn on the floor and life-sized projected photos. After the situational exercises, each group had 45 minutes to model their ideas as detailed as possible, including all the solutions and functions they collected during the brainstorming.

Based on the collected data, a prototype was designed to tackle the challenges raised by the target group. The results of the participatory design workshops gave a significant imprint on the development of the final implementation: aiming to develop an inclusive, child-friendly, sustainable and adaptable urban intervention which supports children’s visibility and traffic calming as well. Assessing the usability and impact of the tangible prototype was the last methodological part of the research. This involved different observation methods such as narrative impact assessment among the target group and quantitative tools like speed measurements using a speedometer. Speedometers were executed twice, approximately one month apart by the Budapest Közút Zrt. The first happened before the installation and the second was one week after it. Both happened on the same four days of the week, from Monday to Thursday measuring the traffic of the entire day. The created and installed prototype at a pilot location is a research tool which combines modular, alone-standing steel structures, asphalt painting and plantain. This research tool provides real-life opportunities to collect and analyse data and start a conversation with different stakeholders (children, parents, teachers, neighbours) in a co-creational manner. The prototype is an experimental small-scale installative intervention that aims to react upon the insights coming from the children such as dedicated space to gather and wait, being visible, having a chance to experience place attachment and having a more recognisable school area. Besides these aspects, the prototype also tests the utilisation of scooter storage to respond to the emerging usage of different micro-mobility tools among children. Another goal of this placemaking tool is to make the school more visible and affect the traffic surrounding it. The intervention aims to cause traffic calming and to affect drivers’ behaviour through visual stimulation.

After collecting and analysing the results of the first project, the collaboration started a second chapter last November, involving a new school from the same neighbourhood aiming to move forward with the learnings of the already closed project. The methodology is built upon the previous one including some changes based on the feedback and takeaways.

5. Results

During the whole research project, we collected (1) qualitative data through observations, questionnaires as well as problem mapping and co-creational workshops and (2) quantitative data by speed measurement tools.

Both the prior examinations (observations, questionnaires and problem mapping workshops) and the co-creational workshops resulted in a deeper understanding of the challenges children face in the specific urban environment of school front areas. Regarding the built environment we have learnt that the involved students face a high level of placelessness: there is no dedicated place for them to gather and socialise after school or to wait for each other. And even more, they feel unwanted in this environment resulting in

them being unable to develop an attachment to this place which should have a major role in their development. They also articulated the need for greening, alternatives for playgrounds, colours, bright bus stops, seating areas, storage spaces for rollers and bikes, litter bins, and larger visible spaces but also smaller spaces for more privacy. They also have different levels of knowledge about the school environment, they could not (or hardly) point out favourite places, although they mentioned parks, squares and places for sport and sitting close by. Students' physical and mental safety also turned out to be a main concern: they feel that they are not visible and their sense of security is disturbed by traffic and strangers. Regarding the children's physical safety, speed measurements proved that drivers not only avoid slowing down in the close environment of the school, but we recorded a significant amount of speeding as well. The speed limit was 50 km/h, and the maximum velocity was over 90 km/h.

Besides learning about the needs of the involved children, we also gained a deeper understanding of the perspectives of their teachers, parents and locals through observations, interviews and questionnaires. Parents are a large group, who frequently spend some time in front of the school waiting for their children, mostly during mornings and afternoons also. They were often leaning against the safety barrier while talking to each other. Also, there were occasions, when they met with a teacher for a brief discussion or just handed over a paper. The school front area turned out to be a meeting point for the school's whole community as well as for some locals, even if it was not established in its planned form.

Based on the prior examinations and the co-creational workshops, a prototype was created and installed in the form of an experimental small-scale and modular intervention, to react upon the insights listed above coming from the children and their teachers as well as to use it as a research tool for more data collection. After the installation of the prototype we applied different observation methods such as narrative impact assessment among the target group, questionnaires as well as speed measurement tools. The most beneficial functions offered by the prototype seemed to be the leaning components placed on the safety barrier, the bag holder surfaces, the bench and also the place itself created by the installation. According to our new observations (one year after the installation), we can see that the placed modular system is widely used by the school's community for a shorter period during the mornings and for a longer time during the afternoons according to the observatory research. The prototype tested the utilisation of scooter storage to respond to the emerging usage of different micro-mobility tools among children, but it does not offer a permanent solution, however, it draws attention to this question. According to the suggestions of teachers and students, the installation should involve even more sitting surfaces and more opportunities to store bicycles, also teachers had suggestions to strengthen the structure of the installation to make it more resistant and thus safe. Besides these suggestions, only one main criticism was formulated by the school community about the painting of the asphalt around the installation, which means it needs more structured preparation and more involvement of the target groups in its design process. The goal of targeting traffic calming is partially reached, since the average velocity compared to the starting setup decreased by 3 km/h, after the installation.

Receiving feedback from the children and teachers through questionnaires (repeated one year after the installation) and group discussions, we learned that many children enjoy the colourful and playful solutions as well as the plants and seatings, we could also learn that in the case of both students and teachers, the installation is popular and it became the centre of social interactions in the school front area for both teachers and students as well as their parents. Since the children also articulated their new ideas according to the size and setup of the installation, it means that the participatory process was successful in involving the students in the design process: they started to feel engagement, ownership and control. Although on their first visit after the implementation, students hardly stepped into the new installation to explore it, a few months later during observations we learnt that it has become an often-used space, not only by the children, but the whole school community as well.

6. Conclusions

The involvement of students in co-creational workshops presented both challenges and opportunities in the design process. Despite initial difficulties in expressing their opinions, a few participatory workshops effectively engaged the students, emphasising the importance of their inclusion in urban interventions. This research highlighted systemic issues such as the general placelessness of the target group and their invisibility. Moreover, the findings regarding public place awareness, liminal spaces, and traffic calming suggest potential paradigm changes in Budapest and other cities in the CEE region. The research methodology provided valuable real-life opportunities to collect and analyse data and initiate meaningful conversations with various stakeholders, including children, parents, teachers, and neighbours. Moving forward, the research aims to integrate the findings into a new school environment, involving additional stakeholders more directly and focusing on more diverse groups of users besides children. While the traffic calming installation showed some improvement in traffic speed, there is still room for bolder solutions, and concerns about children's safety near intense car traffic persist among teachers. Observations revealed consistent use of the installation during after-school hours, indicating its potential impact despite cold weather conditions. The next steps involve extending the scope of traffic calming through placemaking by further developing tested prototypes and creating new, ambitious small-scale interventions in collaboration with intersectoral actors to provide scalable and transferable solutions for Municipalities in school areas.

6.1 Images



Figure 1. Co-creational workshop of the case study with the involved students. Photo by Máté Lakos. 2022. 06. 08.



Figure 2. Neighbourhood mapping workshop of the case study with the involved students. Photo taken by: Máté Lakos. 2022. 06. 08.



Figure 3. The installation of the case study in front of the school. Photo taken by: Balázs Turós. 2023. 06. 03.



Figure 4. Prototype evaluating workshop of the case study with the involved students. Photo taken by: Balázs Turós. 2023. 03. 28.

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