Immersive Environment: Discussing Child Friendly Urban Spaces with Teenagers

Ruben Joye[1], Hari Sacré[1], Sven De Visscher[1]

[1]University College Ghent/Belgium · ruben.joye@hogent.be

Abstract: Three years ago, the newly elected city council of Ghent (Belgium) committed itself to become the most child and youth friendly city of its region. For this purpose, the city council is planning a range of projects, including the design of a child and youth friendly neighbourhood on the location of a former soccer stadium. Adding the spatial dimension to political choices like this, spatial designers used to apply lists of universal child friendly design criteria, prescribing what all children and teenagers need. Child and youth studies, however, have been questioning this way of reasoning as there is no such thing like universal criteria covering the needs of all children and teenagers. Instead of planning cities for children and teenagers, they promote participation opportunities for children and teenagers in city planning. To the background of this discussion our multidisciplinary research team, consisting of researchers in social work and landscape architecture, developed a participation tool using 3D technology to involve teenagers in the planning process of a youth friendly neighbourhood in Ghent (Flanders, Belgium). Using research by design as a key concept, teenagers were not primarily asked to choose the final design but were invited to revise spatial solutions for urban challenges like housing, mobility, urban life, and public space. In this contribution we will report on the 3D participation tool and results from the workshops with teenagers.

Keywords: Youth friendly, immersive environments, research by design

1 Introduction and Context

This contribution will report on the 3D participation tool developed in the multidisciplinary research project KIDS (children in urban spaces) at the University College Ghent. This research project combines knowledge from social work and landscape architecture, and looks into the various aspects of the child and youth friendly city (CYFC) on the level of policy making, participation of children and teenagers as well as planning and design strategies. In doing so, four pilot cases in two cities explore different aspects of the CYFC. In each pilot case the research team links up with the existing planning process and explores methodologies to involve the participation of children and teenagers. In each case we involve different groups of children or teenagers. In this paper we will report on a series of workshops that focused on the meaning of a youth friendly neighbourhood, using 3D technology. We will first introduce the context of this workshop, sketching the concept and interpretations of the YFC and the specific research site in Ghent. Secondly, research by design using 3D technology, will be situated as a way to involve teenagers in thinking about the youth friendly city. Thirdly, we will report on the 3D participation tool, and discuss some findings from the workshops with teenagers. Finally, we will draw a few conclusions and thoughts to be considered for future research.

Journal of Digital Landscape Architecture, 1-2016, pp. 109-117. © Wichmann Verlag, VDE VERLAG GMBH · Berlin · Offenbach. ISBN 978-3-87907-612-3, ISSN 2367-4253, e-ISSN 2511-624X, doi:10.14627/537612013.

1.1 The Youth Friendly City

A growing number of European municipalities are committed to become a Child Friendly City (CFC). The European Network of Child Friendly Cities was founded in 2000 and is currently active in 15 different countries. In Belgium the concept of a CFC has evolved into a CFC label, as an instrument to attract young and wealthy families into the cities. In its latest signed governance agreement (2013-2018) the city council of Ghent announced the ambition to become the most child and youth friendly city (CYFC) of its region Flanders in Belgium (STAD GENT 2012, WATTEEUW 2013). To achieve this political ambition urban planning is in charge for translating this idea into interventions in the spatial layer of the city (WOLFRUM 2013). Previous attempts to plan and design CYFC often resulted in universalistic sets of design and planning criteria (SACRÉ et al. 2015). Because every city, neighbourhood, square or street has different spatial, social and cultural qualities, urban planning often alludes to a specific rather than an universalistic answer (GEHL & SVARRE 2013). In order to plan and design child friendly urban spaces, it is necessary to take a step back, and discuss the goal of child friendly planning. The goal of most CYFC planning is defined as attracting and re-claiming young wealthy, middle class, families, which is odd for several reasons. Firstly, it is the question whether this could be considered as child and youth friendly, because it relates to the needs of families and is less concerned with the position of children and teenagers (SACRÉ et al. 2015). Secondly, child and youth friendliness is often associated with the urban provisions of children and young people, such as kindergartens, schools and (skate) parks. Even though the convention on the rights of the child defines a child as any human being under the age of eighteen, teenagers (12-18 years) are often disregarded in child and youth friendly planning processes (HEINRICH, J. & UTTKE 2013). Thirdly, the focus on child and youth friendly criteria results too easily in child and youth friendly provisions, and foregoes the necessary debate on the developmental opportunities children and young people should experience in the CYFC. If it is really concerned about the position of children and young people, it should not only focus on more child and youth friendly functions but question what difference these provisions will cause in the lifeworld of its youngest residents.

Based on these critical remarks, we propose an alternative definition of the CYFC. A city could be considered child and youth friendly when it is concerned and willing to support the position of children and young people. Children are not only taken into account as an age group whose precarious position should be planned, but are also fellow citizens who are able to participate in urban planning. Therefore the CYFC is not only a city *for* children, but first and foremost a city that discusses it's ideas *with* children (HEINRICH & MILLON 2014, SACRÉ & DE VISSCHER 2014). In other words urban planning is not so much in charge of planning the most child friendly places *for* children, but instead has an important role to play in involving and discussing urban challenges *with* children and young people in urban planning.

1.2 Redeveloping a Soccer Stadium in the Suburbs of Ghent

In 2013, the official football team of Ghent was relocated to another part of the city. As a result the site of the stadium became available for many plans on the political agenda. The city council decided to redevelop the area into a youth friendly urban neighbourhood and apply the highest standards of sustainability, an exemplary neighbourhood that represents the vision of the 21st century. With this ambitious youth friendly urban neighbourhood, the city council has two goals. First it would like to attract young wealthy families with children from the broader region. Second it would like to implement urban facilities and services in a mainly residential and (almost) suburban area. This double nature implies an undeniable complexity that is challenging to discuss with children. Furthermore, the project area is currently abandoned and has no recognisable structures or landmarks, making it hard to envision the planned future in relation to what is already existing. This research case involved teenagers between 12 and 18 years old, which implies we did focus on the perspective of teenagers and therefore narrowed the concept down to the 'youth friendly city (YFC).

2 Research by Design with Teenagers, Using 3D Technology

Discussing the concept of the youth friendly city with teenagers we focused on the idea of research by design. In research by design, the goal is not to select the perfect plan, but to explore the qualities and challenges of different models. The field of research by design creates opportunities for designers to create a forum where collective learning moments can take place, and in which the design process is seen as a way of investigating and producing knowledge that is exploratory rather than solution-driven (DE VISSCHER & SACRÉ 2015). During this exploratory process, the political dissensus and negotiations among the participants about (un)desired ways of living together in the city are more important than the final plan, turning the process into a form of community development. This dialogue enables teenagers and urban designers to read the same urban design in multiple ways (RANCIÈRE 2003). According to Jacques Derrida, this process of *deconstructing* urban design includes an emancipatory force and educational quality as it reveals new possibilities that couldn't be seen before (WOLFREYS 1998). In our opinion, 3D technology offers a new dimension to research by design, it allows to break free from the plan itself and for instance put spatial perception and spatial appreciation to the discussion.

According to MILLON & HEINRICH (2014), influential youth participation is related to three conditions. Firstly, actions should aim to intervene in existing conditions. Secondly, involvement needs to be part of the public dialog and decision making. Thirdly, engagement should be influential. Besides these guidelines, youth participation in urban planning occurs to be challenging because teenagers are experienced as a critical age group. Building on these conditions, we choose to develop an instinctive participation tool that relates to the lifeworld of teenagers. We believe research should not only be interesting for the researcher but equally for the participants. Therefore, we developed a 3D-workshop that invites teenagers to digitally engage and discuss opportunities for development, using a Cave Automatic Virtual Environment (CAVE).

In order to match the conditions of influential youth participation in the case of the youth friendly neighbourhood on the former site of the soccer stadium, it is important that teenagers

are able to see different alternatives for one and the same neighbourhood. Having more than one design available for the participants to choose from was important to make clear there is no such thing as *one final design or plan* that cannot be questioned. Exploring the ways to integrate urban functions in this rather suburban area, we offered the teenagers different models varying from 'urban' to 'suburban' spheres. It is not the intention to undermine a certain design, nor was it the purpose to find consensus and agreement on one of the three specific designs. Instead, we aim to reveal qualities the participants seem to appreciate or value, and determine deficits they experience. We attribute more importance to the dialogue it provokes and the new knowledge this can generate. It is meant for future plans to build further upon: *research by design*. Using a CAVE as a medium to discuss different planning options could respond to those needs.

2.1 Three Models of the Youth Friendly Neighbourhood

Between November and December 2014 about 60 2nd year landscape architecture students of our institution made designs for the public space of this new 'child and youth friendly neighbourhood'. An existing rough masterplan outlined different building blocks that delineates different areas, including a central one hectare park. We made a selection of 12 designs that represented the most important differences in designs using criteria as program, ordering, car handling and connectivity with the surrounding neighbourhood. Subsequently the designers of the 12 chosen plans each had 2-3 extra students to help turn their design into a detailed 3D-model. As a final step we selected three designs, varying from urban to more suburban spheres (for instance wide range of activities and squares versus more greenery), as this is a hot topic among policy makers as well.

2.2 Technology Used

Inspired by LINQUIST'S (2010) *Simple Immersive Visualization Environment* (SIVE-Lab), we chose to invest in an updated and slightly more sophisticated variant. The big differences are the use of dedicated projection screens in combo with rear projection, a high end gaming computer capable of native triple-monitor support using *NVIDIA Surround* and the use of game engine software.

Since the 'GeForce GTX 690' graphical card has 2x DVI-I dual link and 1x DVI-D dual (plus additional mini-DisplayPort) it was easy to span the computer screen across the three screen using NVIDIA surround without the need for additional hardware. We briefly considered implementing a similar CryVE-setup as described by JAREZ (2010). While this would have resulted in less visible distortion to the side screens, it would also have meant a more complicated setup since this required two additional computers and additional programming.

The city of Ghent is a pioneer in Belgium in the use of GIS, CAD and 3D (C3A 2013), Ghent in 3D managed to get EU-grants in 2009 as part of the European Regional Development Fund (ERDF). Their team was kind enough to provide us with the existing surrounding buildings in LOD2 (special thanks to Mario Matthys). They intend to have made this LOD2 dataset publicly available as open data for the entire city by the month of January 2016 (MATTHYS 2015).

Table 1: Overview of hardware used

Quantity	Item	Detail
1 x	**Alienware Aurora Desktop**	• Intel Core i7-4930K Proc (6-cores, 12 MB Cache, Overclocked up to 4.0 GHz w/ Turbo Boost) • Memory: 16384 MB (4 × 4 GB) 1600 MHz DDR3 Quad Channel • Hard Drive: 256 GB 6 Gb/s Solid State Drive • Graphics: 4 GB GDDR5 NVIDIA GeForce GTX 690 • Windows 8.1 (64 Bit)
3 x	**NEC NP4100 projector**	• 6200 Lumen • XGA | 1024 × 768 • Native 4:3 aspect ratio
3 x	**projection screen ProScreen**	• 225 cm × 300 cm (4:3 aspect ratio) • Frame: Aluminium Box Section + connecting corner pieces • Projection screen (Velcro mounted)
1 x	**Logitech Wireless Gamepad F710**	• 2.4 GHz wireless connectivity
	Miscellaneous cables and adapters	

Trimble SketchUp was used to make the models for the different urban designs, carefully following a set of guidelines set out by the user bac9-flcl on the CryEngine 3 forum (BAC9-FLCL 2011). The free PlayUp Tool for SketchUp was then used to transfer and convert these models to CryEngine. This plugin allows for easy creation and export of content to most of the common 3D game engines including Unreal Engine 4, CryEngine 3 and Unity 3D (PLAYUP 2015). While the plugin certainly has its limitations, it is powerful at the same time in the sense that it even allows to update changes made in SketchUp to CryEngine rather easily.

Our choice for CryEngine 3 at the time was mainly based on the impressive high-quality simulations with regards to vegetation, as well as confirmed support for NVIDIA Surround.

3 Workshop in Three Steps

Seven groups (4-7 teenagers each, aged 12-18) participated in the workshops. The participating teenagers had various backgrounds and lived in diverse residential areas (urban core, urban fringe, rural village, etc.). These workshops took place in the first part of January 2016, took 60 minutes and consisted of three parts:

1) Digital group survey on a tablet about what they define that teenagers should be able to do in a youth friendly neighbourhood.

2) Selecting one of the three designs/models presented by three one minute videos.

3) Discussing affordances in the virtual model of the youth friendly neighbourhood. Exploring and discussing the selected design through little games and drawing exercises using the key activities chosen in the first step.

The digital survey supported teenagers in identifying the key activities for teenagers in a YFC. An extended list (+ possibility to add new ones) was made readily available to them in this survey, with activities clustered in six themes. This extended list was based on earlier workshops done with children and teenagers specifically on topics and activities in the CYFC (PIESSENS et al. 2014). To make this first part of the workshop manageable, the survey was programmed to randomly select two of the six themes to be discussed. Different steps in this survey finally leads to the group deciding on the two most crucial activities for teenagers according to them, and which they'd like to have present in their child and youth friendly urban neighbourhood.

In a second step we introduced the three different designs, with the help of one minutes videos. This gave them a general overview of the differences in design of the public spaces. They were then asked to pick the design that finds the most connections with their two key activities from the survey. The 3D-model of the chosen design is then loaded to the computer and projected on all three sides of the CAVE.

To further familiarize the teenagers with the design, small introductory assignments are given to each of them to explore the design. These questions include walking to a building in which they'd like to live, showing us where they'd meet up with friends, finding areas of possible conflict and indicating where it would be likely to find their parents. In the final part of the workshop, we remind them of their initial selection of the two most key activities for teenagers. They are asked to relate these to the design and envision possible improvements to make these activities possible, or strengthen them. Using whiteboard markers they could draw directly on the projection screen to visualise their ideas and discuss this with the group.

Fig. 1: One of the planning options used in the workshop (design shown: Robbe Devisscher)

4 Results

From the different workshops, a few recurring urban topics from the perspective of teenagers could be identified. It was surprising first of all to find all groups (but one) choose for the design communicating the most 'urban' sphere (Figure 1). This particular design is strongly organised, accommodates many different activities and featured a well-designed main entrance to the neighbourhood. While one of the designs was never chosen, it had a strong appeal to most of the groups as they found it 'relaxing' and 'very beautiful'.

The first topic we distinguished was the contrast between *private versus public*. Most teenagers seemed to prefer a house with a garden, although some prefer other typologies: *"This one, the one here. This is where I want to live, in the block of apartments. I would prefer to live high above, if there is an elevator."*

Control versus autonomy was a second important topic. Being able to independently play and meet with peers, without the supervision of parents, was a key feature in the youth friendly neighbourhood. Elaborating on this topic, these teenagers talked about partying, shopping, hanging around, picnicking, chatting, playing soccer, buying food and drinks and so on. A well designed neighbourhood could support their autonomy, and therefore many criteria for safety were formulated, some teenagers even valued security cameras in public space to monitor the activities in the park. *"I'd like to be able to just stand in the middle of the street during the night, without the fear of something bad happening!" "The main entrance of the neighbourhood and the areas where there is a lot of play need to be safe. We should add a zebra crossing and street lights in order to be able to pass safely at night."*

Another seemingly contradictory topic is having a tranquil versus a vivid neighbourhood. According to some groups tranquillity is not opposite to vivacity, but are features that could both be integrated in a single design. Activities and having things to do or see is very important, which is the major reason why almost every group chooses for the most 'urban sphere'. Drawing attention to the topic of housing most tend to look for a house at the outer edge of the neighbourhood where it's quiet, away from the activities of the central park. This attitude is reinforced when asked to designate buildings for activities they have chosen like a party hall or fast-food restaurants. They either concentrate these in one street (generally on the opposite side of the neighbourhood) or in one of the freestanding centrally located multi-story buildings.

A fourth and last topic was *segregated versus open spaces.* In each group the key activities in the youth friendly neighbourhood featured youth specific activities and general activities for all residents. However, in discussing affordances the debate balanced between segregated spaces and open spaces. Earning money was for instance a popular activity among the teenagers, but this was translated into a public service that would support teenagers in finding a job. Some teenagers clearly mentioned it was not for adults, but only for teenagers. Elderly care was surprisingly enough an activity that one group valued highly in a youth friendly neighbourhood, as the elderly would probably benefit from the vivacity of the neighbourhood, sequentially feeling less lonely. Designing the space for elderly care in one of the multi-story buildings, they drew fences to protect and segregate elderly people from the more crowded park in the middle of the neighbourhood. *"Some of the elderly would not be allowed to leave, isn't it? I mean for their own security. Then it's better to fence it off, right?"*

While it's interesting they consider different age groups within the neighbourhood, their design solutions are often segregational. In contrast there was also a tendency among the teenagers to design certain spots in the neighbourhood 'all age friendly', paying attention to the (special) needs of all residents. "*It needs to be wheelchair accessible, something for the disabled.*"

5 Conclusions

Supporting the position of teenagers in the youth friendly city, the city should not only plan youth friendly urban provisions but also reflect on the developmental needs of young people. Picturing the idea of research by design, to generate knowledge on youth friendliness without the necessity to achieve a consensus on what should and shouldn't change, the research team decided not to ask young people which 'provisions' they want, but instead discuss 'what they like to do in the city'. We discussed key activities in a youth friendly neighbourhood to the background of a virtual model, and further challenged the teenagers to rethink spatial solutions to integrate their key activities. Most teenagers were not addressing structural changes in the design, but valued their agency in defining specific details that would support the position of young people and sometimes other residents.

Using 3D technology in research by design workshops was very productive, as it enabled the social worker and planner to grasp the attention of the teenagers throughout the whole workshop. The participants clearly mentioned that more planners should involve teenagers in urban development processes using 3D technology. According to our experiences this should not always result in clear answers or changes, but focus on the mutual discussion between teenagers, social workers and planners. In the CAVE non spatial thinkers, are able to grasp the scale, experience the qualities, and also formulate the pitfalls of the neighbourhood. Meanwhile the presence of the spatial planner in this workshop is very important, as spatial solutions could be explicated and discussed with future residents. We believe the moment of the dialogue as such is the most important feature of this workshop, as it enables immersive learning experiences for all parties that will probably affect the essential understanding of the youth friendly city.

The focus of this workshop was to discuss with teenagers (on a more general level) which developmental needs and key activities a youth friendly neighbourhood should support, and see how this 3D participation tool could facilitate the discussion. We therefor deliberately chose teenagers who had very little to no connection with the district. This didn't pose any problems as the teenagers were able to grasp the scale of the neighbourhood quit well, and understood how it connected to the downtown area. For future research it would be interesting to spatially embed the workshop stronger and engage local teenagers in a similar trajectory, fully utilising their knowledge and perception of the neighbourhood as local experts. This would enable to perform more in-depth discussions, for instance what does the wider district mean for the planned neighbourhood and conversely how will the planned neighbourhood impact or benefit the district?

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