Designing from disability experience: Space for multi-sensoriality

Peter-Willem Vermeersch
KU Leuven, Department of Architecture
(Full) Scale Architecten
Belgium
peterwillem.vermeersch@kuleuven.be

Jeandonne Schijlen
KU Leuven, Department of Architecture
Belgium

Ann Heylighen
KU Leuven, Department of Architecture
Belgium
ann.heylighen@kuleuven.be

ABSTRACT

This paper describes a participatory workshop as part of a larger process to design an inclusive museum space. The workshop covers a number of sessions that go from mutual introductions, over idea generation, to synthesis of an architectural concept. We discuss the participants' experience of the process that is set up to allow for a balanced exchange between architects and user/experts living with an impairment. We also discuss the outcome of the process in terms of its expression of inclusive museum architecture.

CCS CONCEPTS

Social and professional topics → **User characteristics** → People with disabilities

KEYWORDS

Architecture, disability, inclusive design, museum design

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1 INTRODUCTION

In 2017 a participatory design project was set up to redesign a museum space for the Van Abbe Museum in Eindhoven. A follow-up to implement the design is foreseen in 2018.

The project started from ongoing research into user/expertise [1] of people living with an impairment, and how to introduce this expertise in architects' design process [2]. This was motivated by the observation that architecture and architects' design process is characterized by a visual bias [3]. This bias could be overcome by attention to experience. E.g., people with a vision impairment develop a broader attention to other kinds of sensory experiences and therefore a more nuanced knowledge or connoisseurship [4] of multi-sensory spatial qualities [5]. At least in some cases, combining this knowledge with knowledge of architecture has resulted in an enriched understanding of architectural space [6] and the use of representational artefacts in architectural design processes [7]. On the other hand, the participating museum as public institution investigates ways of being more inclusive: in its exhibitions, and with this project also in its exhibition spaces.

The project's ambitions fit in the societal transition from care to inclusion. Care starts from a medical model of disability where an impairment is subjected to cure or prosthetics. Inclusion takes into account also a social or even cultural model of disability. Social or interactional models locate the disability not only in the impaired body, but as much in the interactions with the persons environment (social and built). The cultural model attributes a critiquing power to its understanding by confronting differing experiences [8]. For instance, vision impaired people's non-visual experiences question the emphasis of mainly visual solutions and expression in architecture [9].

The insights from disability studies, hardly find their way to mainstream architecture and construction. A market study reveals interest in the idea of involving user/experts, but a lack of understanding of its added value [10]. The reasons given are that such involvement does not fit common processes or practice, and the lack of financial incentive as people with an impairment are considered a minority. The study further reveals how realizing concrete projects by involving user/experts could help demonstrate how this knowledge not only benefits minorities, but can enrich the understanding and application of inclusion [2].

We argue that (at least some of) the reasons for the lack of adoption of diverse experiences in the design of our built environment can be traced back historically to modernist objectifying abstraction processes. The modernist tendency towards abstraction led in architecture to a preference for visual qualities as visual perception was considered the most distancing kind, and thus closest to the abstract objective world [11]. This tendency also impacted on architects' design tools and processes, which rely heavily on abstractions (plans, sections, numeric values) or visual (3D renders) tools, and processes [12]. Abstraction also contributed to normalizing and standardizing the (objectified) human body to its mean functional ergonomic sizes and relations [13]. One of the few ways architects deviate from this practice is by referring to their own body [14].

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As to impairment and disability in architecture, standardization has led to accessibility norms which focus mostly on wheelchair access. Architectural qualities are transformed to technical dimensions based on an inanimate object: the wheelchair [11].
The participatory project presented in this paper aimed to create a more inclusive museum space that takes more diverse experiences into account (more diverse than the mean visual experience, or designers' personal experience). At the same time we argue that this might help counter a visual bias in architecture and museology, and lead to a richer environment for many. To this end, user/experts are involved from early in the process.
After describing the project setup, the paper presents a design description and brief preliminary thematic analysis of user experiences and design outcome and intentions. This analysis is based on the following data: design notes and drawings made by the architects during the sessions; observational notes made by a museum staff member during the sessions; notes, sketches and models made by the user/experts; photos taken by a photographer during the sessions; and video interviews with the architects and representatives of the user/experts, made by the staff member.

2 PROJECT SETUP

2.1 Timeline of the project

The project was initiated by two architects (authors 1 and 2) (both with a background in research on disability and architecture) and two museum staff members (one of which is responsible for the inclusive museum program). These persons were involved in writing the project proposal. After the proposal one architect was replaced with another architect (without research background, but with experience in exhibition design). The project as it was designed started with a participatory design phase (the focus of this paper), resulting in a public exhibition of the developed concept. Still to be done is developing the proposed concept into construction documents and building the museum space. Once built, the space will be evaluated through interviews with visitors about their experience of the space and the relation with the experience of the exhibited art work.
The participatory design process was developed and guided by one of the architects (author 1), and observed by someone from the museum. The museum further provided the concrete location for the design, and recruited the participating user/experts from their network of visitors and collaborators. In the public presentation both architects were involved (through a haptic model and full scale tactile representation on the floor) as well as one of the staff members (by video interviewing some of the participating user/experts and the architects about the process).
The workshops were held over multiple half days with multiple groups (see Table 1) which were decided on based on the following presumptions. Group H consisted of four hearing impaired people, who relied on hearing aids, lip reading, and some on sign language. Their spatial experience is shaped in part by acoustic nuances and visual communication modes. Group V consisted of three vision impaired people, who used a cane and/or a guide dog. They pay attention to acoustic, haptic, and olfactory spatial qualities in their spatial experience. Group M consisted of five mobility impaired people, who used manual or electric wheelchairs. They move through space in a different way and experience this motion also from a different view point. From each group, one person was asked to act as a representative to take part in a final workshop (see further); we will call this group R. The members of each group decided amongst them who would be representative, based on interest and availability. We decided up front for representatives to limit the time investment and to be able to manage convergence of the design (see further).

Table 1: Workshop sessions schematically represented

H-S1	V-S1	M-S1
H-S2	V-S2	M-S2
H-S3	V-S3	M-S3
	R-S4	

2.2 The participatory design workshops

The workshops were organized for all involved to gradually build up an understanding of each other's experiences and go through specific aspects of a design process. The ambition for the workshops was to obtain a balanced process in which the architects' knowledge is valued more or less equally as the user/experts', with a focus on knowledge on spatial experience. We started with parallel individual workshops where each group (H, V and M) went through three half-day sessions (S1, S2, S3) spread over three weeks (making nine sessions in total). Group R went through one final session S4.
Session 1 focused on getting to know each other's backgrounds, experiences and expectations, and allowing critique on the process. Sanders and Stappers [16] state that all people are creative but on varying levels and must be given tools to express themselves, while designers become facilitators. This session aimed to give confidence about experiential knowledge versus professional knowledge. Pedersen [17] argues that participants' interest is not a given and needs to be maintained. The session also gave a thorough background on multi-sensory architecture and explained the value of their knowledge therein, as well as a forum for critique. First, participants were asked to describe their experience with the built environment, architecture and disability. Secondly, the architect presented how he saw the process, and the ambitions to make a multi-sensory museum space through an inclusive design process in balanced dialogue. Thirdly, participants were asked feedback on these ambitions and the proposed process. Fourthly, the architect presented what he had learned from research about multi-sensory space, disability models, the hypothesis on the value of user/expertise for architects, and a few cases for illustration. Fifthly, architects and user/experts jointly visited the space to be re-designed while coming back to previously discussed experiences, multi-sensory spatial qualities and obstacles. And sixthly, the architect gave a presentation on the relation between multi-sensory architecture and multi-sensory design representations. That was also when he introduced the participants to the tools and materials they could use in the next sessions (colored and textured paper, modelling clay,

fabric, rope, glue, colored pens, printed plans of the existing situation, basic 3D models of the existing situation (see Fig. 1)). These materials were chosen from model making materials common in architectural practice, with attention for both haptic and visual qualities. Sketching and model-making are well suited for spatial expression (2D and 3D) and design thinking (large degree of malleability), but require some skill. Participants could also bring their own tools for the following sessions. One person from group V brought a sketchpad to make tactile drawings.

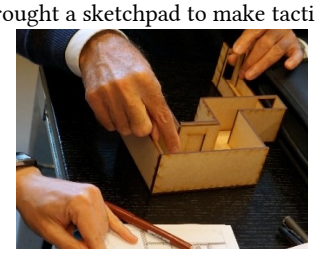

Figure 1: Basic 3D model of the existing space provided for the workshops (Foto © Niek Tijsse Klasen)

In session 2 participants brainstormed about possible interventions, improvements, alterations to the given space. They were free to use whatever means of expression possible with the given materials. The architect did however emphasize his ambition to achieve a spatial concept, and thus steered towards spatial modes of representation (2D or 3D); e.g., pointing out that specific perceptions or intentions should be located/placed within the space. The user/experts worked individually, and the architect went from person to person to have them explain what they were doing and discuss ways of expressing their propositions or developing further propositions.. During this session, a photographer from the museum documented sketches and models made (see Fig. 2).

Figure 2: Examples of how participants spatially presented analysis (left) or design propositions (right) (Foto © Niek Tijsse Klasen)

Session 3 aimed at synthesizing the plethora of ideas from session 2 into one spatial concept for the group. While session 2 gave the pen to the participants, in session 3 the architect held it again. With this, we mean that the architect led the whole discussion, taking final decisions when necessary - either to bring internal discussions to a conclusion, or to focus attention on an architectural intervention. This also allowed to put more nuance in the representations which requires the mentioned skills. The session started with the architect presenting the pictures and models of session 2 to the group, while giving his own interpretations and appreciations. This led to discussions amongst the participants which the architect translated to design moves. Each move was shown to the group, inviting for yet more discussion. This iterative process could be led towards some kind of convergence on which the user/experts as a group could agree. The convergence thus was steered by the architect, but with continuous feedback and suggestions by the user/experts.

The materials for and activities of model-making and sketching took up the roles [18] of toolkits (session 2) and prototypes (session 3), while the architect acted as [19] stimulator (session 2) and co-designer/facilitator (session 3). 'Holding the pen' asserts even authority, but in an explicit way open to critique.

By session 4, each group thus had a concept for the space. From each group, a representative presented this concept to the rest. They explained the design proposal by its forms and expressions, but also the reasons behind the design decisions. Sometimes the architects added small points of attention from their own. As in session 1, this gave the opportunity to share experiences, but now based on a concrete design proposal. After this presentation, the group went through a similar process of discussion towards some converging concept, again steered by the architects.

The quick and dirty sketches and notes made during session 4 were afterwards developed into a 3D presentation model and tactile representation using different floor materials within the space itself (See Fig. 3). The model was positioned within the space so that all participants could reach and touch it as well as look at it.

2.3 The proposed spatial concept

With this design, the user/experts and architects want to propose a museum space with a distinct identity and impact on art experience (see Fig. 3, right). The existing space is a corridor on the top floor that connects the elevator and a bridge through the atrium towards one of the main exhibition spaces. One side of the corridor is a dead end that looks out over the same atrium.

Figure 3: Final result of the participatory design process: tactile floor (left) and visuo-haptic presentation model (right) (© Tomas Dirrix & Peter-Willem Vermeersch)

The proposal divides the corridor into two distinct zones: one is intended as a resting point (the salon) within the museum route, and the other explicitly intends motion (the route).

The salon is an acoustically soft space, unlike the otherwise reverberating museum space. A sculptural acoustic damper is

mounted on the window onto the atrium. Sound penetration is reduced and a sign is given to the rest of the museum that something special is going on up there. The art should be experienced from a seated position. The walls guide visitors towards seating alcoves which are positioned to turn people slightly towards each other, and around the artwork in a circle which people in a wheelchair could complete from their position coming from the corridor.

The route guides visitors into a specific path. The artwork is presented on tables that protrude at a level comparable to eye-height from a seated position, or similarly at hand level while walking. This space does not allow two people to pass each other comfortably, thus hinting at keeping in motion.

On the bridge a second railing will be mounted on top of the existing (closed) railing. At the underside a mirror will be mounted, so that people in a seated position, or smaller persons can view the atrium through the mirror, over the railing. From the topside the mirror is concealed from view.

3 FINDINGS AND DISCUSSION

3.1 Critiquing the process

Most participants appreciated the thorough way in which they were presented with architectural knowledge as much as the fact that they contributed their own knowledge to the design. The participants appreciated the time spent with them, and the effort put in the presentations and materials (such as the basic models) they were given. They felt their input was taken seriously, something we think also has to do with their presence during and control over the first design moves. In this sense, some remarked that the sessions' setup taught them more about architecture and the design process beyond their practical concerns in the built environment. They experienced this as an enrichment for themselves.

Some participants, however, questioned the time intensive investment. Those with a background in design were concerned with their time not being honored financially (something we investigated [10]),[2] or explicitly asked for at least shared intellectual property of the design. (All of them part of group V.) They also had trouble with how the process was conceived, organizing idea generation and synthesis in separate sessions with the architects' guidance. As experienced designers they were able to implicitly but iteratively go through such process. However, after raising their concern, they agreed to continue with the project. They completed sessions 2 and 3 quicker than other groups. After session 4, the representative of group V remarked that for him this was the most interesting session because he could exchange experiences with the other representatives; but also that after having spoken to the other representatives (who were not professional designers) he understood why so much time was spent on sessions 2 and 3.

[2] All user/experts' expenses were reimbursed. Remuneration for the user/experts was discussed during the proposal writing but the funding did not allow such expenses.

3.2 Deconstructing the notion of inclusivity

If one looks back reflexively at the project, the process and resulting concept expresses several dimensions of the notion of inclusion through multi-sensory interventions. The result is an architectural translation of a quest for an inclusive art experience.

Inclusion as accessibility. For the user/experts, first an inclusive museum space must be reachable and comfortable. Tactile guidance makes the space easier to navigate for group V. Less acoustic reverberation and seating gives group H some rest by reducing surrounding noise. The space also allows large enough turning circles for group M at certain points.

Inclusion as equality. One concern was to offer a more equal experience. Where the corridor was too narrow to turn with a wheelchair, group R came up with the guiding tables along the route part, not allowing anyone to pass each other or turn around. The seated position to experience the artwork in the salon gives all visitors a similar lower viewpoint.

Inclusion as exclusivity. Group H played with the idea of providing exclusive information over radio waves (which hearing aids can pick up). The window under the railing is exclusively experienced by people with a low vantage point.

Inclusion as identity. Exclusive solutions give identity to the groups, but so do specific solutions which can be experienced by many but are closer to the experience of some. Group V proposed for instance to demarcate each place by air curtains that would create a clear tactile border.

Inclusion as dialogue. Most user/experts also felt the need for the museum space to invite conversation. The identity expressing design elements should form a basis for discussion. In group H this led to the seating alcoves being arranged so that persons slightly look at each other while experiencing the artwork, allowing for the much needed visual aspect of communication.

Inclusion as empathy. It was the user/experts' and the architects' common hope that communication would eventually lead to a better mutual understanding.

The different themes nuance the notion of inclusion and this deconstruction strengthens the claim of a cultural model of disability [8]. The developed themes particular for this project could provide insights in how to imbed inclusion in other societal domains on different scales.

4 CONCLUSIONS

We described a participatory design process that aimed at getting user/experts with an impairment as far as making their own design moves. To this end a series of workshop sessions were developed at the very beginning of the design process (before any design moves have been made). The sessions provided both time to the architects to explain their knowledge and ambitions, and time to the user/experts to describe their experiences and design propositions. The architects facilitated their expressions to make them comfortable enough to do so, while steering towards some kind of architectural synthesis. The resulting spatial concept expresses what an inclusive museum space could be along different dimensions of inclusiveness.

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