Tools for Community Engagement

Designing Learning Environments for Students with Visual Impairments

NILOU VAKIL
University of Kansas

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This paper describes the process of developing a kit of tools for community engagement. The research team explored strategies for working with an educational facility and their stakeholders in such a way that they could be true participants in the design process. Specifically, the toolkit is to be used in the planning and design of schools that serve students with visual impairments and blindness. The stakeholders' lived experience and knowledge make them vital citizen-experts to this endeavor; however, disparate language, coded drawings, and professional jargon often prevent meaningful participation. The tools presented here draw designers and users into a common language.

INTRODUCTION

Despite best intentions, the participatory process often breaks down when architects engage users in design workshops. Trained as experts, the drawings and language utilized by design professionals can often alienate the user or citizen-expert. Too often the sought-after dialog that is necessary to develop well-designed buildings devolves into a monologue. The user wants to express the types of spaces and relationships that need to be accomplished by the building but doesn't have the professional language or representation skills to convey architectural concepts. Likewise, the architect is not fluent in the technical language of a particular nuanced building typology. This disconnect occurs often in the design of educational spaces.

PROCESS

There exist few tools for community engagement. We've all participated in "sticky-note" sessions that try to draw out the most critical goals and priorities of the design process. The "visual preferences survey" is another exercise which engages stakeholders on what they would like to see in a project. This methodology, in particular, resides solely in the visual realm. It is very difficult to speak one language, visual or otherwise, when the desired outcomes are sensory in nature. That is, they are intended to engage all the senses.

The building type example explored here is educational environments for children with visual impairments and blindness. Several specialized and nuanced spaces have been developed to allow sight-challenged students to thrive in educational environments. Leading an architectural design studio, the author worked with student-researchers to develop graphic post cards that represent these conceptual educational strategies and the best spatial relationships with which to accomplish those strategies.

The process builds on the author's experience as a practitioner and participant in several past community engagement projects.[1] Primary to this work are the following questions. What are the strategies used in design processes that engage users who are underserved? And, specifically, what strategies can be employed to engage the visually impaired and their advocates in determining their learning environment?

In the book, *The Eyes of the Skin* by Juhani Pallasmaa, it is argued that the consideration of vision as our most noble sense has led to the suppression of all other senses. This has resulted in the overall impoverishment of our built environment. It articulates that humans have not always held vision as the dominant sense.[2] In fact, one's sense of hearing was gradually replaced by that of vision. He further argues that in numerous cultures the sense of smell, taste, and touch continue to have a collective importance in communication, behavior, and memory. Ocularcentrism then, the prioritization of the visual over other senses, has long dominated our built environments. This perspective is made obvious in our configuration and design of learning spaces that alienate those with visual impairments and low vision.

LEARNING AND VISUAL IMPAIRMENT

Visual impairment is the partial or total inability to see due to partial or complete loss or absence of vision or to visual dysfunction. Visual impairment encompasses the continuum from blindness to low vision.[3] Approximately 12 million Americans 40 years and over have vision impairment; and, approximately 3% of American children younger than 18 are blind or visually impaired.[4]

Impaired vision from birth or in early childhood can have profound impact on development. It can restrict participation in

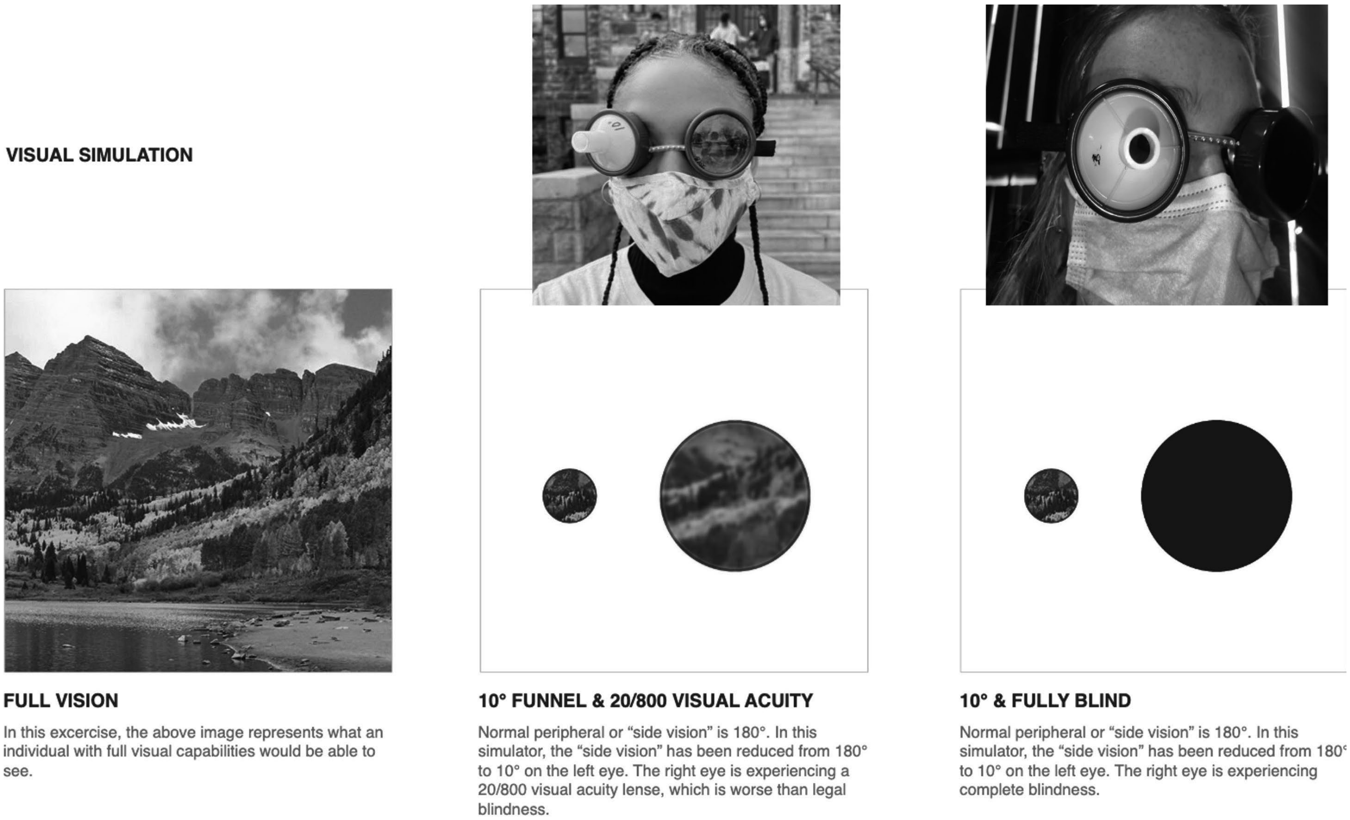

Figure 1. Research students experiment with eye disease simulators .
Image credit: Bridgett Espino - Liz Putnam

social, physical, educational, and later, employment opportunities.[5] It is not hard to imagine children with vision impairments being reluctant to participate in learning activities because of the fear of the unknown. The sight-privileged learning environment can lead to alienation, isolation, anxiety, and depression. We sought to better understand the design strategies that integrate sight-challenged learners into their environments through sensory exposure.

RESEARCH

The research described here had four phases. In Phase One, we conducted literature review to better understand the current best practices in designing facilities for the visually impaired. Phase Two involved the analysis of exemplary case studies. Phase Three identified distinct design strategies in consultation with facility stakeholders and professional experts. Graphic cards that can be used to work with stakeholders and better facilitate the design process were created in Phase Four.

The author has worked with the Kansas State School for the Blind (KSSB) for several years. KSSB is a fully accredited public pre-K -12 school located in Kansas City, KS. It serves students with visual impairments and blindness in grades pre-K through 12th grade. It first opened in 1868, one of the first institutions of its type in the country. Their primary mission is to ensure learners with visual impairments are able to assume responsible roles in society and lead fulfilling lives.

Architectural design studios have been run that focus on visioning sessions and design workshops looking at KSSB’s campus facilities and proposing improvements to the aging structures. Student researchers have worked with KSSB’s students, faculty, staff, administration, and broader community throughout these exercises. Also, State orientation and mobility specialists were invited to workshops to assist in the documentation of facility requirements for students with visual impairments. These professionals worked with the design studios to help the student-researchers better understand how these young learners interact with their environments. In addition to studying the various eye diseases that cause vision loss in children, they were led through simulation experiences. Various eye disease simulator devices that are able to simulate eye diseases were used. The team experienced blurry vision, loss of peripheral perspective, floating bodies, light sensitivity, and other common states of vision loss in children. Blackout simulators and blindfolds were also used to mimic the sensation of blindness.

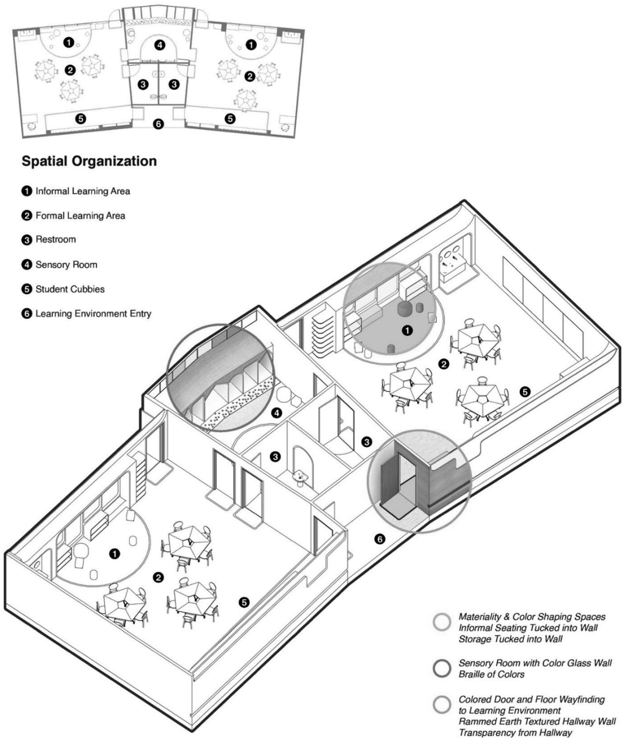

Figure 2. Classroom prototype.
Image credit: Bridgett Espino - Liz Putnam

The team maneuvered familiar and unfamiliar classrooms, hallways, stairwells, as well as several non-compliant environments. They also tried to identify bus stops, ride public transportation, order coffee, and perform other routine tasks of daily living. The orientation specialists also worked with the students in learning how to use assistive devices like white canes and how to navigate spaces with guides. They were also coached on the best way to approach people with vision loss when encountering someone who appears to be disoriented or struggling with issues of navigation. Students documented their experiences and began to realize the extent to which our build environment privileges those with sight.

Two important case studies were explored. The first is The Anchor Center for Blind Children in the Central Park Neighborhood of Denver, CO. Opened in 2006, this 15,600 sf facility was designed by architect Maria Cole in partnership with Davis Partnership Architects. Cole led the team on a tour of the facility. The school has roughly two dozen professionals working with 100 children, infants to 5-year-olds, readying them for entry to mainstream schools.[6] Tactility is emphasized and sensory spaces assist the students in navigating the built environment.

The second case study researched was the Hazelwood School for the Blind in Glasgow, Scotland designed by Alan Dunlop Architects. This 29,000 sf facility completed in 2007 specializes in educating young people aged 2-18 who are both blind and deaf.[7] The team began to find common themes within the two buildings.

Starting with the exterior, sensory gardens designed to be accessible to people with disabilities engage all the senses by providing opportunities to see, smell, touch, and listen to plant life and garden fixtures. These can often be expanded to allow more active interaction encouraging a safe space to develop children's motor and mental development. Wayfinding strategies were particularly refined. Both projects feature a high-ceiling central corridor filled with light. Intersections were minimized contributing to a clarity of circulation.

Contrasting colors and textures allow those with some light sensitivity to orient themselves and navigate to various areas of the school unassisted. The changing textures allow the students to detect an acoustical change when sound bounces off the various materials. There is a cork wall that not only allows for tactile identification but also dampens the sound as you pass by it. These textural changes allow students to identify thresholds to different spaces. Sound traveling differently in various volumes of space give the students cues for orienting themselves and navigating around the facility. The development of navigation skills is critical for the students.

Clerestory lighting along the main spine provides ample light for those with low vision to see bright primary colors. Reducing glare is important as well and diffused lighting was employed. Contrasting materials and surface treatments at risers, treads, nosing, and landing allow students to safely navigate stairways. The designs also promote predictability in the spaces and circulation. Well-designed casework and storage systems allow for toys, supplies, and educational materials to be put away. This reduces visual clutter and the associated distraction and confusion that can result. It also allows for smaller children to put away toys and learning games quickly and efficiently to reduce fall hazards.

Sensory spaces within the school are important opportunities for visually impaired children to explore the world around them in a safe, unencumbered manner. Different material, forms, surface textures, sounds, aromas, and sensations stimulate the young person to explore their immediate surroundings and develop confidence in their spatial analysis skills. This can help young people to better develop skills in navigating the school, its grounds, and the broader outside world.

DESIGNING THE TOOLS

The team identified and documented these design strategies. They then simplified and categorized them into prototypical approaches that could be summarized and represented simply to a user group, client, or community member. These strategies and design components were then translated into universal design "learning cards." These postcard-size placards are able to be held in the hand, categorized into groups on a tabletop, and serve to structure the design workshop discussions. Each

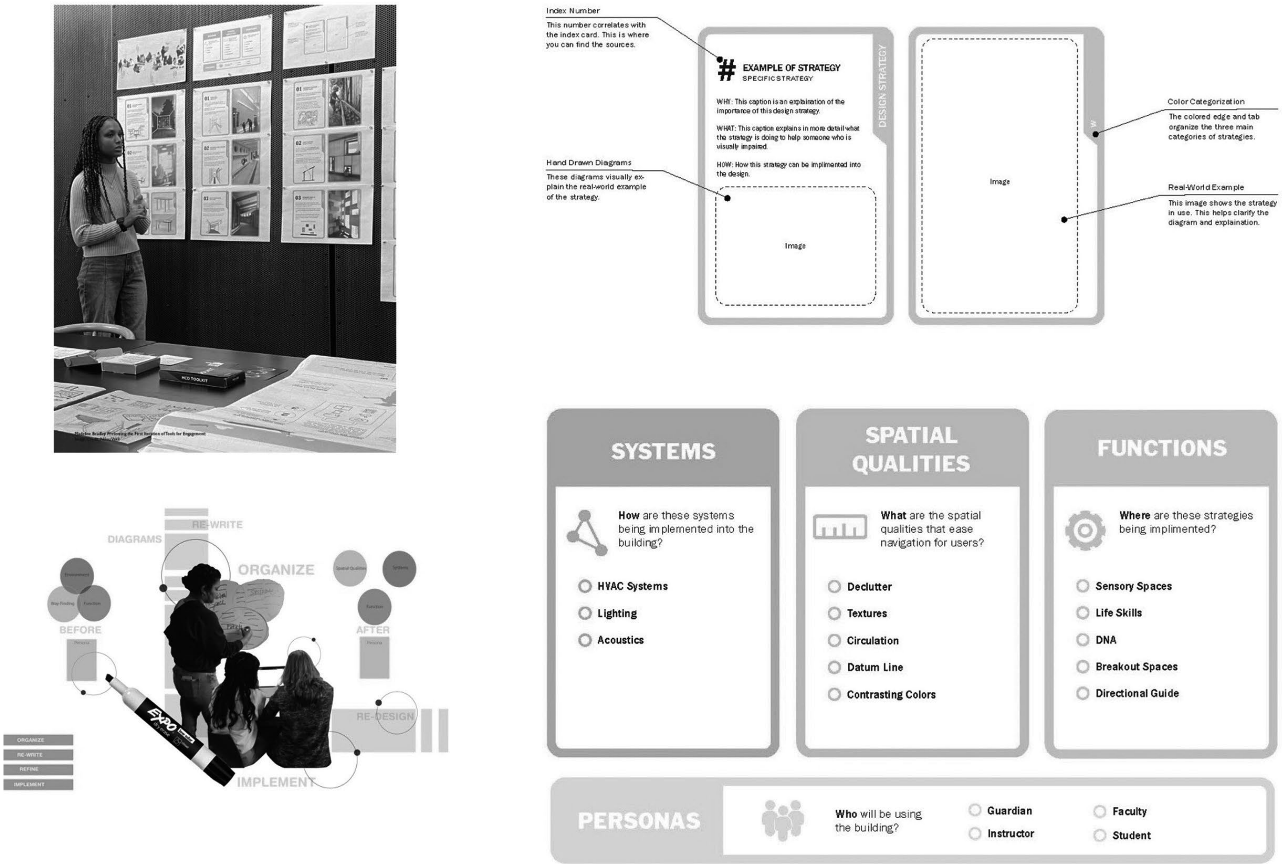

Figure 3. Process of designing the engagement cards
Image credit: Nilou Vakil

card contains a design idea or strategy related to educational environments for the visually impaired. They contain a graphic representation of the educational concept such as a photograph, diagram, or drawing that is relatable and easy to understand. The back of each card contains a description of the concept using decoded and jargon-free language to convey the intent of the design strategy. The group will now be working with the State mobility consultant to add braille to the cards so that the descriptions can be read directly by the students and staff that are visually impaired or blind. The cards allow the school's community to participate in a meaningful design process.

After several iterations, the team selected three categories of cards that provided flexibility in the inclusion of the various topics: Systems, Spatial Qualities, and Functions. In the category of Systems, they included HVAC, lighting, acoustics, technology, and audio/visual systems. Spatial Qualities included such items as decluttering strategies, textures, and the creation of datum lines. For Functions, the team included sensory spaces and how this can be understood throughout the building: in classrooms, corridors, offices, multi-use areas, etc. Finally, to test the learning environment a series of relatable personas were established. For example, what are your expectations for the school if you are a parent dropping off your student? If you are a student, what are your expectations and how will you interact with the school for the duration of a school day? Teachers, administrators, guardians, faculty, mobility specialists and the broader community were all considered as personas to create an inclusive system of engagement.

In addition to the above-mentioned card categories, several blank cards are included in the set and on hand at the workshops. This is to document additional ideas from the participants, allowing new input or ideas that the cards did not address. We invited students, teachers, facilities personnel, and school administrators to participate. Several have visual impairments. They bring lived experience to the process as citizen-experts that lends invaluable insights.

We held a final design workshop with the group in May of 2022 that explored the renovation of several of their KSSB's spaces and also the conversion of a courtyard into a sensory garden. One of the most rewarding components of the process was the collection of several hand-written cards describing new sensory design ideas. The cards facilitated a dialogue between the design team and the user groups that allowed for the generation of new concepts.

Figure 4. Design engagement session with the members of Kansas State School for the Blind. Image credit: Nilou Vakil

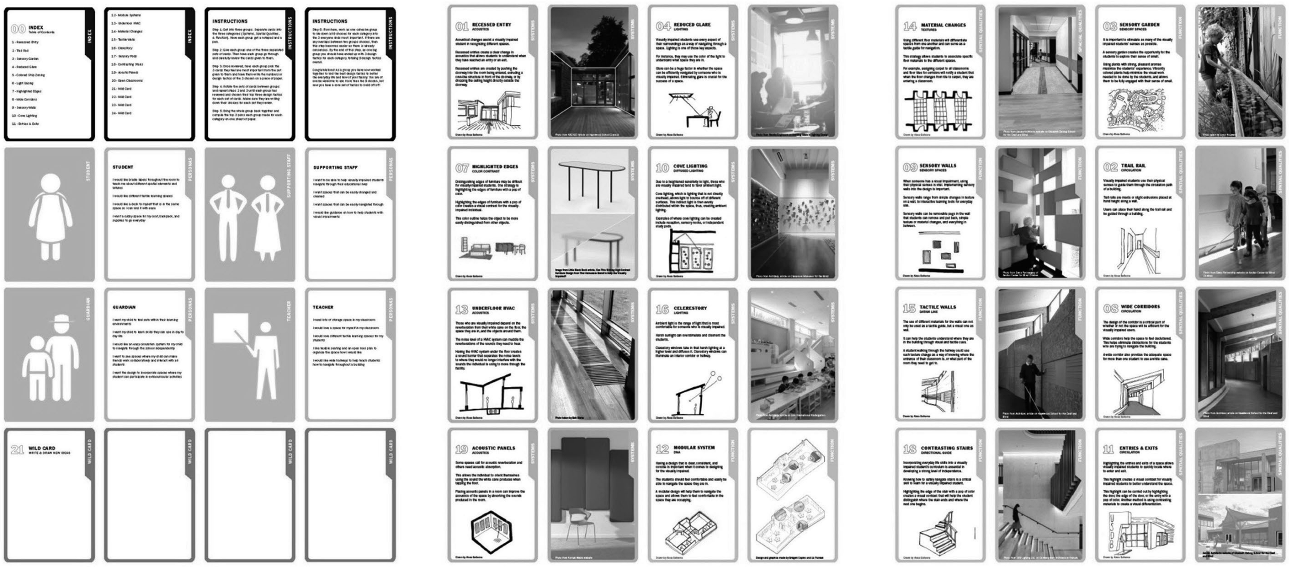

Figure 5. Completed cards. Image credit: Nilou Vakil

CONCLUSION

The teams' immersion into the lived experience of those with visual impairments through the use of simulation devices gave them a better understanding of the problem at hand. The necessity to engage one's non-visual senses in not only navigating spaces, but to better understand the qualities of those spaces forced the realization that architects must have the ability to design for users who are much different than themselves. The team concluded that designing educational spaces where the primary learner need not be dependent exclusively on visual cues may help all learners. Fully engaging one's senses can broaden notions of exploration, journey, and discovery. Spaces that prioritize sensory engagement create better human experiences for everyone.

ENDNOTES

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