IMPACT OF DESIGN SERIES, VOL. 9

Sensory Well-being Hub

AMERICAN SOCIETY OF INTERIOR DESIGNERS
RESEARCH

PROJECT TYPE:
Education

LOCATION:
Lane Tech College Prep High School, Chicago, IL

SIZE:
456 SF

WINNING PROJECT:
ASID 2020 Outcome of Design Awards (Category: Social Impact)

CASE BRIEF BY

HKS CITIZEN HKS

CLIENT OVERVIEW

Lane Technical College Preparatory High School is a 4-year selective Chicago Public School on the north side of Chicago. Among the 4,000 students are 216 14-22-year-olds within a diverse learner program. Sixty of these diverse learners have moderate to severe disabilities and learn within five dedicated classrooms.

DESIGN CHALLENGE

Create a space for adolescents with developmental disabilities to recuperate and find equilibrium from an environment with uncontrollable sensory inputs. Provide data-driven insights on designing spaces for people with sensory sensitivities, with a goal to help designers improve environments in other places, too.

DESIGN SOLUTION

- **Sensory zones** with an active zone including musical instruments, rolling pins and a peg wall; a respite zone with nature scenes, beanbag, weighted blanket, a Lite-Brite and fidget wall and a sensory "cocoon" providing a user-selected experience.
- **A free-standing sensory cocoon** serves as a mobile micro-environment dampening sound and light. Users have control of a digital media wall that has interactive sensors for gestures and touch, color-changing lights to match the screen and a sound system.
- **Variety of sensory affordances of design elements** considering tactile, visual, kinetic, and acoustic were included to allow choices for students with hypo- or hyper-sensitivity.
- **Fidget wall** including various sensory interventions were included in the design based on investigative research that found fine motor skill actions could be soothing for students on the autism spectrum.
- **Modular structure solution** with items that are non-proprietary for easy replication or replacement makes the hub construction inexpensive, quick and easy to modify over time or replicate for various scales and budgets.

IMPACT OF DESIGN

- Students with autism spectrum disorder (ASD) reported higher emotional well-being in the second semester than the first semester (statistically significant at p= 0.079).
- Students were observed to be significantly happier during the hub visit (M=3.42) than before (M=2.96). This effect carried over after returning to class.
- Additional observed focus was found to be significantly improved during the hub visit (M=4.12) versus before (M=3.52).
- The cocoon reduced light from the classroom and windows significantly, and median sound-intensity levels inside the cocoon were lower than other areas by 3 dB(A).
- The modular solution significantly reduced costs from $250,000 to $60,000, including sensors for research which would be unnecessary in replicated projects.

PROCESS

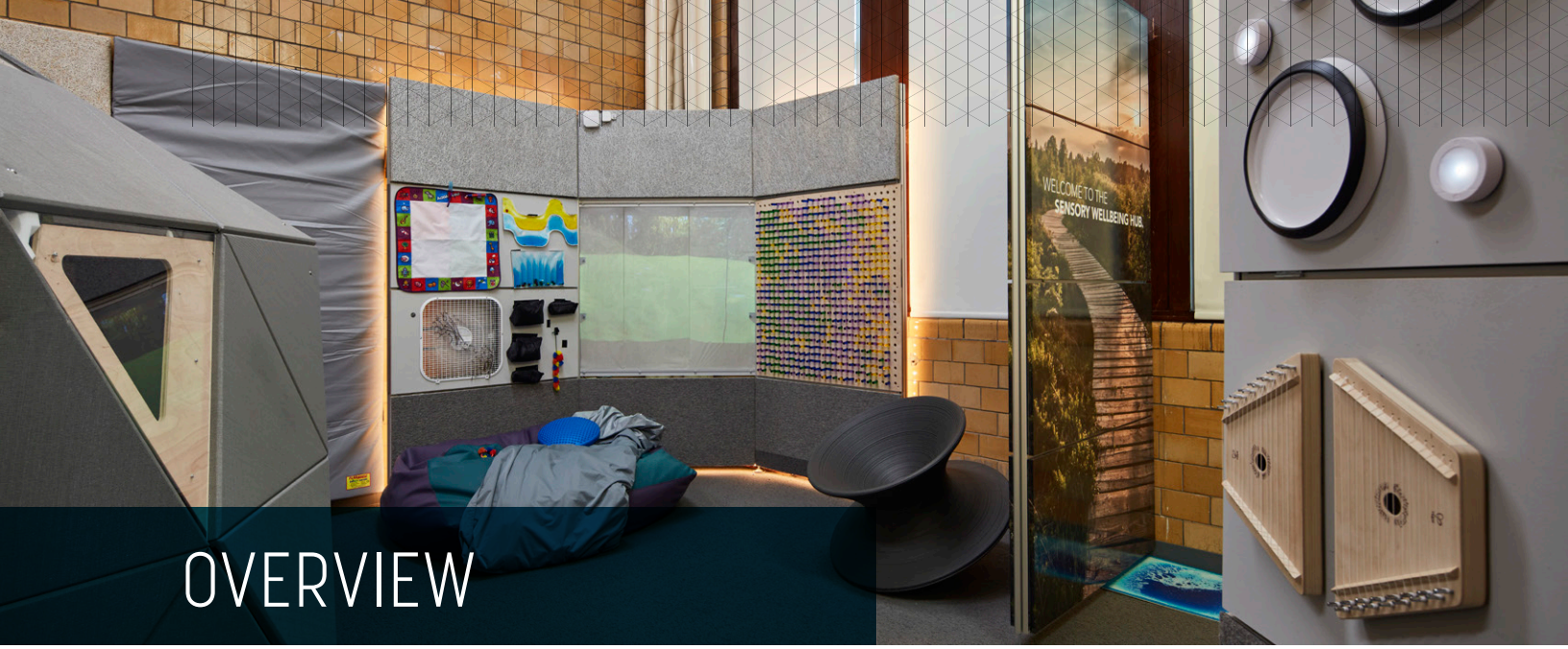
TIMELINE

- Design: May 2016 – June 2017
- Approval: April 2017
- Construction: May – September 2017

PROJECT TEAM

- Design: HKS, Inc., Citizen HKS
- Research*: HKS, Inc.
- Cocoon interior fabric lining design: University of Michigan

This research was supported by the American Society of Interior Designers Foundation Transform Grant.



OVERVIEW

According to the CDC, autism affects 1 in 59 individuals, yet few projects consider designing to include neuro-diverse populations in day-to-day settings like public high schools. The quality of life of students on the spectrum, and others with cognitive development disorders, is greatly impacted by our designs.

Lane Technical College Preparatory High School (known as Lane Tech) is part of the Chicago Public Schools system. It is a four-year selective magnet high school located on the north side of Chicago. The school has a total population of over 4,000 students, with around 60 adolescent-diverse learners (14-22-year-olds) with developmental disabilities in their special education program.

To address the needs of students with developmental disabilities while balancing a public school's need to minimize construction disruption and budgets, Citizen HKS designed a demountable framing structure resembling a high-tech playset. The hub does not require hard-walled construction or renovation; instead, it pops into place in an existing classroom. Citizen HKS installed the sensory well-being hub in one of the five special education classrooms that are clustered together. The hub's modular design system and the mobility of the sensory cocoon allow teachers and staff members to adapt and evolve the space as needed in the future. The non-proprietary sensory interventions are also easily replaced if they're underutilized or need replacement due to extensive use.

This is the first approach of its kind in an American public high school, and to Citizen HKS' knowledge, this project was the first to study how design interventions with different sensory affordances play a role in improving the lives of neuro-diverse adolescents (including those on the autistic spectrum), and develop (and test) a scalable kit-of-parts solution that is open-source and available to all.

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BACKGROUND

The Sensory Well-being Hub project was chaired by Mollie Hart, who has been an assistant principal at the school since 2013 and a part of the faculty since 2004. Ms. Hart began her career at Lane Tech as a special education teacher. During her three years of teaching at Lane Tech, Ms. Hart worked with students in Inclusion Biology and Inclusion Physics and taught self-contained science courses and the Wilson Reading Method for students with reading difficulties.

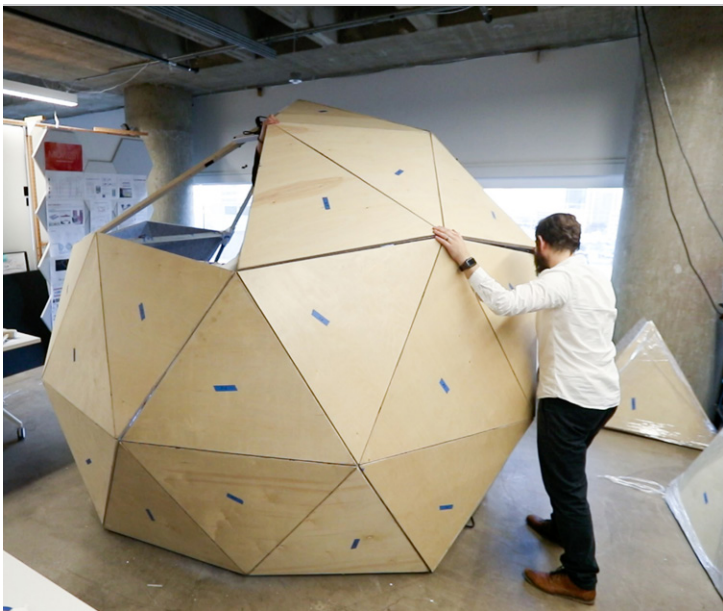
Through our research, we learned that diverse learners each have unique preferences of what they need and desire from a respite environment. For example, some need to make noise and move, while others seek quiet and solitude. The hub enables each student to create an experience that works for them in order to find balance. Audio, visual, kinesthetic and tactile features in the hub help students “reset” from a state of hyper- or hypo-stimulation, and return to the classroom, ready to learn.

Sensory well-being is important for everyone, whether individuals have typical or atypical sensory processing. Childhood experience, including school exposure, can generate long-term effects; yet, diverse learners with developmental disabilities face greater challenges in school where levels of sensory stimulation are higher than in home environments. A key outcome of this project is creating a design solution that addresses the sensory onslaught in an inclusive (no separate room) and equitable (economically affordable) way.

PROCESS

The greatest roadblock to building a sensory respite space is often lack of space and cost. The project team identified these constraints early and included them as a priority in the design solution. The project sought a solution that could be replicated and rescaled as needed to meet whatever footprint was available. A modular solution eliminated complicated and expensive building contractors and permits. This project is the first that creates an open-source, affordable, scalable, modifiable and sensory-diverse solution that can fit various needs, and be installed anywhere, with accompanying research on the comparative effectiveness of different elements, to allow informed decision making. Citizen HKS is currently working with schools in Texas and Michigan, and other schools have already reached out with the hope they may be able to follow the project's blueprints, which are offered as an open-source design resource.

The solution is evidence based and adaptable. Design decisions were based on the best information offered by industry and academic experts. Citizen HKS tested their prototype through surveys, observations and atmospheric sensors over the course of several months to be able to prove which of their hypotheses were correct and which design ideas were underutilized, with the intent to provide an environment that could always be improved to suit the new best findings. Research was integrated in this process via literature reviews, surveys, focus groups, observations, behavior mapping and sensor data. Qualitative insights showed satisfaction from both paraprofessionals caring for the students and the students themselves.



DESIGN SOLUTION AND IMPACT

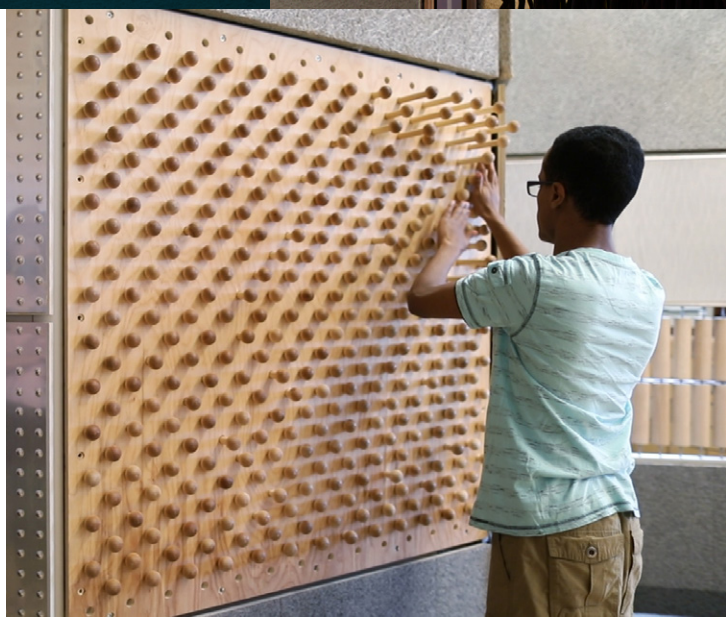
STUDENT WELL-BEING

This project aimed to support marginalized populations, specifically adolescents with developmental disabilities, and their experience in school. This project conducted a well-being survey in the two semesters following installation, and Citizen HKS hopes to track this data over multiple years to show sustained improvement. A validated observation method looking at systematic behavior was used as a majority of the students with cognitive disorders were non-verbal or minimally verbal.

> *Students with autism spectrum disorder (ASD) reported higher emotional well-being in the second semester than the first semester (statistically significant at p=0.079).*

> *Students were observed to be significantly happier during the hub visit (M=3.42) than before (M=2.96). This effect carried over after returning to class.*

> *Additional observed focus was found to be significantly improved during the hub visit (M=4.12) versus before (M=3.52).*



MATERIALS FOR SENSITIVITY

Specifications prioritized low Red-List chemicals, included no added urea-formaldehyde plywood and vinyl free artifacts (for a small premium), and prioritized low VOC materials for the sensitive population using the space.

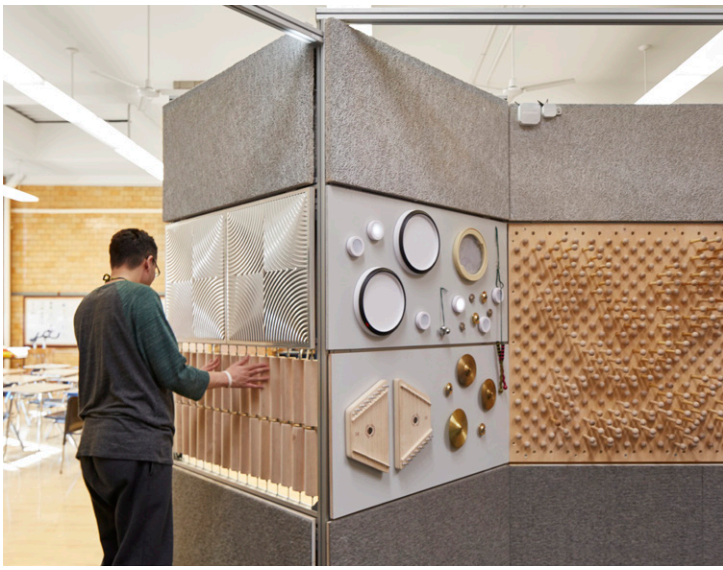
SENSORY DETAILS

The design team paid particular attention to acoustics, lighting and thermal comfort due to the sensory thresholds of the students.

> *Median sound-intensity levels inside the cocoon were lower than other areas by 3 dB(A).*

> *The cocoon reduced light from the classroom and windows significantly.*

> *The temperature was stable (low 70s°F) across sensor locations. Median relative humidity values were within a recommended range of 30–60% (Washington State Department of Health, 2003).*

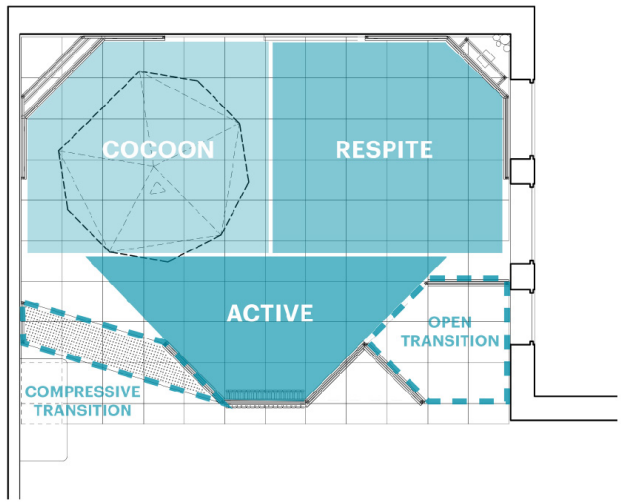


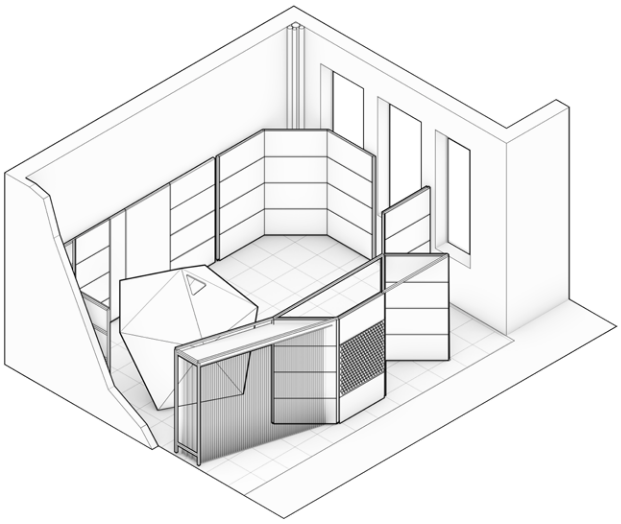
ACCESSIBLE & AFFORDABLE

A preliminary design concept included a drywalled room with proprietary products and priced at more than $250,000. Citizen HKS immediately reprioritized, finding a more accessible and affordable solution, not just for our project but for replicability for others who might follow. The reduced cost balanced with improved student outcomes make a compelling business case.

> *The modular solution significantly reduced costs to $60,000, including sensors for research which would be unnecessary in replicated projects.*

> *An industry grant and donated funds provided the required capital.*

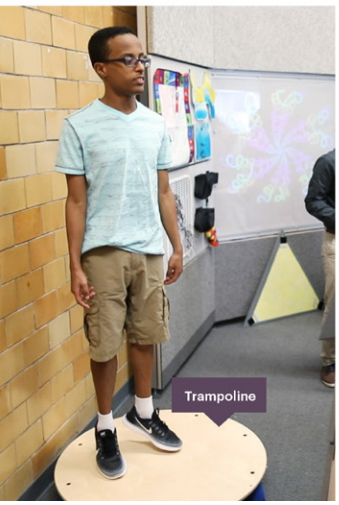


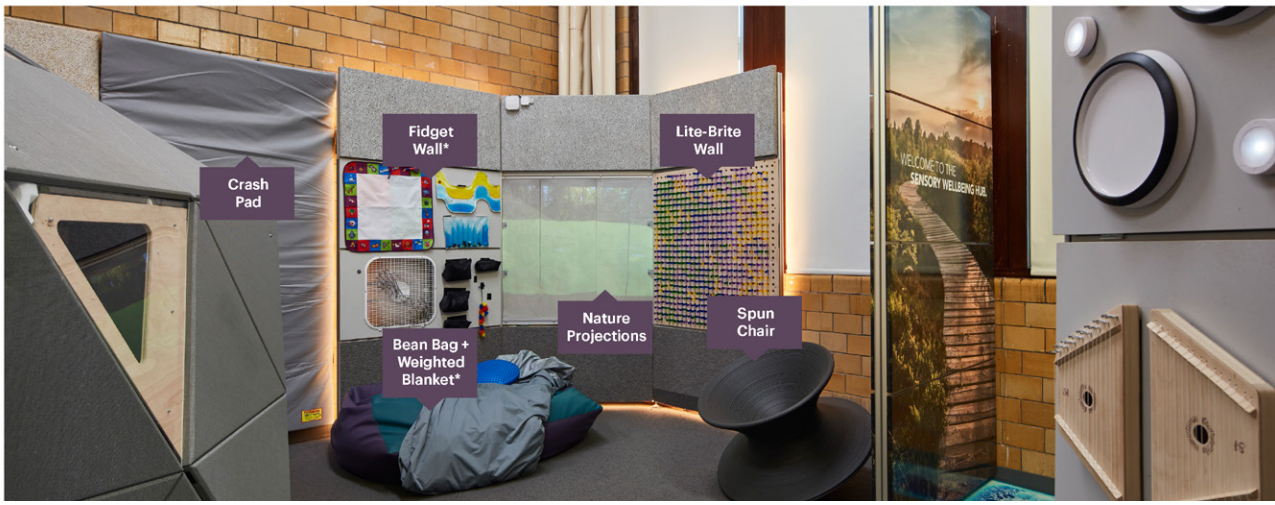


MODULAR & REPLICABLE

The modular system of the hub and the cocoon also enable other schools or organizations to adapt the design for replication at their own sites.

> *Citizen HKS is currently working with schools in Texas and Michigan, and other schools have already contacted our team with the hope they may be able to follow our blueprints, which we offer as an open-source design resource.*





ABOUT HKS AND CITIZEN HKS

HKS is a global firm of architects, designers, advisors and makers driven by curiosity and devoted to creating places that combine beauty with performance. Our 1,350 people in 23 locations are united by our shared culture and sense of purpose. We value honesty, diversity and inclusion and we celebrate creative thinking across our firm. In partnership with each other, our clients and our partners, we craft powerful ideas and solutions. Together we create places that stand apart.

Citizen HKS is HKS' public interest design and global social impact initiative, which aims to improve lives by leveraging design, community service and philanthropy to drive change for underserved communities around the world.

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Photo credit: Hannah Jaggers

2020 OUTCOME (OF) DESIGN AWARDS

AMERICAN SOCIETY OF INTERIOR DESIGNERS

IN PARTNERSHIP WITH

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ABOUT THE 2020 OUTCOME OF DESIGN AWARDS

The ASID Outcome of Design Awards celebrate the proof in the power of design. By highlighting new tools and processes in design, strategy, technology and research, the awards seek to recognize projects that successfully illustrate that “Design Impacts Lives.”

The Outcome of Design Awards seek to shed light on innovative designers and businesses that focus on the quantifiable effect of projects on people in spaces. Projects that measure the outcome of design on the human experience through sustainable, humancentric and socially responsible design solutions are the future, and the Outcome of Design Awards recognize the innovators who are leading the charge.

The 2020 Outcome of Design Awards is presented in partnership with Herman Miller and Mohawk Group.

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