Sensory Spaces: Inclusive Design for All

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Abstract

Surrounding yourself with nature activates the parasympathetic nervous system and the sympathetic nervous system, which promotes mental health as described in the "Green Mind Theory". Green Mind Theory connects the body with natural and social elements [1]. Surrounding one's environment with natural elements is proven to be beneficial to the brain and body as a whole. The brain is split up into two main categories when examining its interaction with nature, the top and bottom brain, and is a product of the activated parasympathetic nervous system (top brain) along with the sympathetic nervous system (bottom brain). The benefits vary in quantity depending on the user's focus, attention, awareness, and immersion. Benefits can also include longer-lasting memories, which occur when neurons are created by the hippocampus as a reaction to an enriched environment. [1] While natural spaces are beneficial to everyone, they can be designed in a way that is especially beneficial to those with sensory disabilities. This article and project proposal investigates sensory gardens design in Auburn, Alabama and explores land design as a way to provide a wide range of sensory experiences to children with unique sensory capabilities. The design includes different features, surfaces, objects, and plants to stimulate the multitude of senses. Results show how design can respond to the needs of people groups who process the world around them in different ways.

Introduction

While typical gardens utilize senses in everyone, specific types of sensory spaces can be designed to meet the needs of children who struggle with different types of sensory processing disorders. Research shows that sensory spaces are most successful when structured with "stations" allowing children to be more social and interactive. [2] Sensory spaces are more beneficial than spaces designed for a single sense or without consideration of atypical sensory needs. [3]

Children with unique sensory needs often experience the world differently. Some may find certain sounds, textures, or movements overwhelming, while others might seek additional sensory input. A child with hypersensitivity to noise might cover their ears in loud environments, while a child with hyposensitivity might seek intense sensory stimuli by spinning or jumping. Sensory-friendly designed environments can provide new types of spaces and experiences for an underserved population grappling with managing sensory challenges.

Sensory Garden Case Study

This project generated a design based on existing research for children who hear, see, smell, and feel in unique ways. By acknowledging and accommodating through design diverse sensory needs, children can be empowered to navigate the landscape comfortably. When researching sensory gardens, Hazreena Hussein, examines how these spaces are beneficial to children with mental disabilities [2]. Hussein's article "*The Influence of Sensory Gardens on the Behavior of Children with Special Educational Needs.*" provides data that backs up the importance of sensory gardens. As a start to Hussein's article, she introduces the idea of sensory gardens and their history. Hussein interviewed and collected data from landscape architects, teachers, therapists, and students. She also looked at the behavioral traits of the Lyndale Special School and how groups of students interact in sensory gardens, analyzing how the park was split into four zones with twenty-seven individual behavioral settings.

Autism Spectrum Disorder

The rate of autism spectrum disorder is increasing across the world. According to the CDC, one out of every thirty-six children have autism [4]. This rate has

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increased from one out of every one hundred and ten in 2006. One main reason this number has increased significantly over the twenty-first century is due to evaluation availability. [4] With no formal "autism test," clinicians have gotten better at spotting what is present and diagnosing Autism. This led to an eye-opening rate of increase since 2006. Since more children are being diagnosed, the problem is still growing. Having an increased rate of diagnoses will correlate to cause of concern for these parents. The brain is wired differently for children with autism. Research shows that the somatosensory cortex of children with autism is more sensitive to touch sensory such as a brush on the palm or feeling different textures. [5] The brain works like this for each of the senses, providing sensory sensitivity.

Park Design + Methods

When selecting a project site in Auburn, Alabama, location, accessibility, and practicality were a priority. A site was chosen next to East Samford Middle School, which currently is the Kiwanis Fitness Trail. After several site investigations, current conditions were documented, and an iterative design process began. This process includes sketching, prototyping through plan iterations, and investigations through the act of creating sections and perspectives. This type of process, termed research through design, is exploratory and cyclical. Inclusive design was the focus to support those with sensory challenges. The new design is made to function as a park for everyone, but certain areas are tailored to benefit those with Autism. The five main human senses each have their own set "area" along with other features that are more associated with traditional part design (Figure 2).

Park Elements

Implementing an herb bed section engages with the smell sensory. Adding Rosemary (Salva Rosmarinus), Gardenia (Gardenia jasminoide), Honeysuckle (Lonicera periclymenum), and Lavender (Lavandula spp.) evoke strong, sweet smells and are found throughout sensory spaces. Children are allowed to freely pick, smell, and taste the plants. For sight, raised beds (Figure 1) are added throughout the park for visual sensory. These beds have 2-foot levels, so visual sensory is engaged vertically. Seasons were also thought about in this design with evergreen plants, along with other plants that show vibrant colors outside of summer.

Figure 1. Raised Beds Section Cut

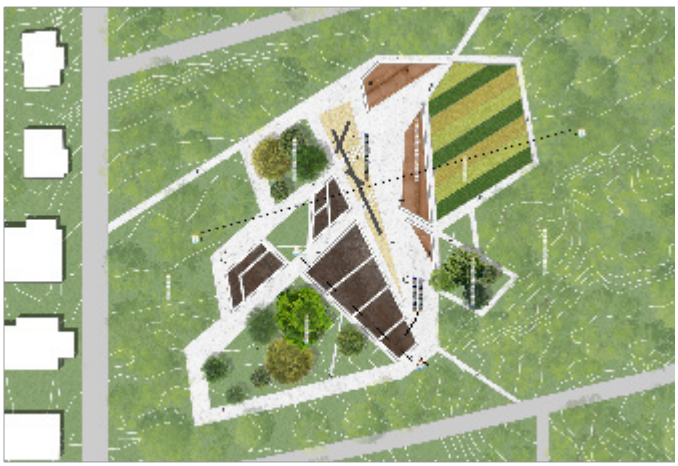

Figure 2. Park Plan View

Colorful chimes move with the wind and children are in control while they push and pull tubes, imagining their own musical symphonies in the Sound Sensory Grove. These chimes engage sound sensory with natural wind, but also with human manipulation. Texture is something that is cohesively used throughout the park. Textured walls are installed throughout the sensory park including rough, uneven surfaces that induce tactile sensations. Sand is also used in the center section to provide touch sensory.

Sensory design is heavily emphasized in the plans, but there are several areas that target the needs of autism that don't pertain to one specific sensory. Raised arches are designed to accommodate children with unique auditory processing capabilities. The sound of the water falling, and the act of splashing generates sound experiences and unique forms of play. The Archway playground (Figure 3) curves through the land interwoven with cascading sheets of water. Children splash, jump, kick; interacting with the water in various ways. This allows many different senses to simultaneously interact with the brain. The swing grove also adds to the play experience. Circular seats suspended and tethered by

ropes are designed to engage in the act of pushing and pulling, moving in circles, and the feeling of air moving quickly.

Figure 3. Archway Perspective Rendering

Conclusion

Sensory Spaces shows that it can be beneficial for certain people groups to use design to facilitate sensory disorders and the researcher believes more outdoor spaces should be designed with multiple sets of values. Whether it is designed for Autism, ADA Accessibility, or other disabilities, spaces have a more complex level of impact on society. Sensory gardens are becoming more common across the world, but still need to grow. This project brings awareness and a sensory garden to Auburn, Alabama.

Statement of Research Advisor

"Through his research fellowship, Will Bozeman investigated ways designed landscapes can facilitate the health and well-being of underserved populations. This type of design, termed inclusive design, can enhance the lives of people living with unique sensory challenges. Bozeman's proposal shows a great sensitivity to ways of designing structural elements, engaging with seasonal change, and creating safe and enticing spatial conditions that allow for a multitude of sensory explorations."

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Authors Biography

William Bozeman is a Senior in Environmental Design. He plans on getting his master's in landscape architecture post-graduation.

Mentor Kelly Homan is an assistant professor in Auburn University's College of Architecture, Design, and Construction's Environmental Design program. Kelly's research includes documenting Alabama grassland communities, ecologically focused urbanism, and landscape-scale conservation design.