Sensory Garden: A Systematic Design of the Playground for Texas Tech University-Child Development Research Center with Considerations for Children with Autism Spectrum Disorder

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# **OBJECTIVE**

The aim of this project is to design an outdoor learning environment, a sensory garden, that enhances sensory integration for preschool children with specific consideration for children with autism. Children with autism understand their surrounding environment and sensory data differently from neurotypical children. Their sensory processing of the surrounding sensory integrations is presented through hypersensitivity and hyposensitivity vestibular, proprioception, tactile, auditory, visual, and olfactory sense reactions. This project focuses on designing a sensory garden that considers and welcomes children with Autism Spectrum Disorder (ASD) in an outdoor learning environment for preschool children.

## **METHOD**

A literature review on designing outdoor learning environment for preschool children and designing a sensory garden for children with ASD.

#### Site analyses

Develop design solution implementing the guideline for better preschool outdoor learning environment and divide the garden for hypo and hyper sensory in the Texas Tech University-Child

# LOCATION



Weeks Hall, Lubbock, TX 79415





- The site located in Lubbock, Texas in the southwestern United State (zone 7).
- The site is a part of a child development research center, which would be in this study.

## **DESIGN CONSIDERATIONS**



Development Research Center.

# **RESEARCH FOCUS**

## SENSORY CONSIDERATIONS

Sensory integration theory is used to describe the complex experience that children with ASD could have with their senses (Barakat, Bakr, & El-Sayad, 2019)

. These senses can be classified into hypo- or hypersensitivity that affects their relationship between their body and the surrounding environment. This research considers four senses: smell, vision, hearing, and touch; in addition, this research considers movement, which is considered a hidden sense (Barakat et al., 2019).



The design of the sensory garden will follow the best practice indicator guidelines as it fit in the three zones areas: quiet zone, transaction zone, stimulation zone.

#### Note:

- Safety and safety materials should exceed all the guidelines in the outside learning environment. Children with ASD who have low sensory reception may be in danger; for example, some children may want to climb as high as they can and then jump; this extreme fall may enable them to feel the impact (Davies, 2011).
- Play equipment should be located far apart to allow children with ASD to play without touching or being touch by others (Davies, 2011).

# SOLUTIONS

The design solution for this sensory garden is divided into three main zones: quiet zone, transaction zone, and stimulation zone to ensure balance spaces for all children with ASD with different preferent and comfort levels.









Play in natural elements often calms children with ASD and can lead to hours of quiet and introspective play (goric.com, 2015).

# **RESEARCH CONSIDERATIONS**

Children with ASD are neurotypical; the way they receive the surrounding environment and levels of comfort vary from one individual to another. This outdoor Learning Garden need to be varied and cater to both hypersensitive and hyposensitive children.

## DIAGRAMS



## Deciduous



Chinese-Quince Bu (Large Shrub) (Me

Butterfly BushEdward Goucher'<br/>Glossy Abelia<br/>(Medium Shrub)(Medium Shrub)

Shrub



Green Ash

Small Tree

Shade

Sugarberry Thornless Honey Large Tree Locust Medium Tree

Shade



Red Oak Large Tree



zone.



**Boxelder** 

Medium Tree

**Loose Parts** 

White Fir

Medium Tree

Evergreen Semi-Evergreen



Provence Lavender M Small Shrub

Mexican Feather Grass Grasses

Shade



Italian Stone Pine Large Tree



Lady Banks Rose Vine





## Keys:

## Stimuli Zone

1- Sensory Play Area 2- Sensory Path 3- Wall Music

### Escape

4- Escape House 5- Hidden Tunnel

## **Transaction Zone**

6- Sand Play Area 7- Balance Log 8- Art Play Area 9- Play Equipment 10- Multipurpose Lawn 11- Mud Kitchen 12- Fruit And Vegetable



#### Garden

## **Quite Zone**

13- Water Play Area 14- Multipurpose Lawn 15 - Shrub Maze 16- Earth Play/Lose Part Play 17- Gross Motor Activities

#### Entrance

Primary Pathway (6' wide) Secondary Pathway (4' wide) **Shade Structures** Playground Equipment Use Zone

## **Paths**

The path is designed to easily navigate different zones. Also, evidence suggests encouraging children with ASD to walk on these paths around the garden areas will help them a have better overall feeling of how the garden zones work together and how it could be used (goric.com 2015). Affordance: runnable, walkable, walkable.

**Incorporates Full-Body Movement** Many children with ASD benefit from random and motivated movement. Thus, it is good to design a playground that incorporate both passive (such as being pushed on a swing) and interactive (full-body movements on the playground equipment).

Playing in a natural setting such

as sand helps children with ASD

(goric.com, 2015). Affordance:

calm down and lead them to

long hours of quiet play

playable, comfortable

**13- Water Play Area** 

Water area has also been

identified from research that

children with ASD enjoying

Affordance: splash-able

playing with water for a long

time quietly (goric.com, 2015).

**5- Sand Play Area** 

## **Shade Structures**



#### **Sensory Area**

Children, particularly children with ASD, enjoy sensory areas. Evidence reported how sensory areas help children when they feel deep pressure and soothe them (Barakat et al., 2019)

1- Sensory Play Affordance: enjoyable, explorable, soothe-able, experienceable, challenge Area

able

2- Sensory Path Affordance: walkable, playable, explorable

3- Wall Music. Affordance: playable, sound-able



8- Art Play Area

Art area gives children





10/14- Multipurpose Lawn (wide open space) It is better to have wide open space such as lawn area for children with ASD to fall back to (Barakat et al., 2019). Affordance: runnable, engageable **11- Mud Kitchen Affordance:** creatable, shapeable

**12- Fruit And Vegetable** Garden This garden could be used for education purposes as well as used

for growing food for the

Center such as carrots,

Affordance: plant-able,

dig-able, bendable, pull-

corn, beans, broccoli,

and cucumbers.



#### Children with ASD need to know that there is a place for them to hide if they feel uncomfortable. They should know the location

**Escape Spaces** 

of these places so they can run to them to feel safe.

**4- Escape House** 

Affordance: escapable, protectable, hid-able, relax-able, multi-usable

5- Hidden Tunnel

Affordance: escapable, protectable, hidable, relax-able, multi-usable







## 7- Balance Log Affordance: Jumpable, balanceable



Affordance: drawable, colorable, writable, creatable

opportunities to draw, write,

and design their own play.



equipment especially slides and swings (goric.com, 2015).

children with ASD reported that

their children love to play with

Affordance: climbable, slidable, runnable, jumpable, swingable



**16- Earth Play/Lose Part Play** 15- Shrub Maze Affordance: discoverable



# CONCLUSION

Considering dividing the playground into sensory zones and quiet zones may help children with ASD experience better playing and learning environment. An improved environment could help them interact with other children, and, in turn, make them more comfortable.

safe way.

This area encourages hand-on activities, a favorite part of the playground for many children as well as children with ASD, where they can create their own structure and shapes. Loose parts are a good way for all children as well as children with ASD to express creativity in a

Affordance: playable, dig-able, creatable, certifiable

# **FUTURE STEPS**

Many children with ASD could be more successful in school with other children if the surrounding environment design considers their behavior as well as hyper- and hypo-sensitivities. Thus, in a future step, I would examine the use of the sensory zones and quite zones in designing outdoor learning environments for children with ASD with other children.

**17- Gross Motor Activities** Affordance: changeable, experienceable, multi-usable, jumpable







# REFERENCES

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