



The Effectiveness of Autism Character Stimulation Room at Autism Service Centre Batam Through Behavioral Architecture

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ABSTRACT

Autism or commonly referred to as autism spectrum disorder often occurs in children at an early age. Not only that, the symptoms of autism result in the failure of the brain's nervous system and sensory bodies as well as the intellectual decline in individuals who experience it. Sensory malfunctions in the body eventually form 2 characters with different responses to stimuli in a certain environment, namely, hyposensitivity and hypersensitivity. 1 in 500 children in Indonesia is known to have this disorder, so it becomes an issue that is not only developing in the country but has an effect on the world. With a significant increase in the number of autism cases, the need for space will increase. Architects as a profession involved in design play an important role in creating a conducive space for children with autism. However, the space must be adjusted based on the characteristics of autism, so that it can function well for them. This research was conducted by evaluating spaces that have different levels of stimulation in the Batam City Autism Service Center, then developing them. This study also uses a behavioral architectural approach by reviewing the characteristics of people with autism, so that the room can provide comfort for them. The research method used is a qualitative-descriptive form and analyzes the room based on existing criteria. The results of the study are a multifunctional low-stimulus room and a high-stimulus room that can adapt based on variations in activity.

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1. INTRODUCTION

Indonesia is the country with the largest population increase in the world, with a population that has reached 276.4 million by 2021. Every year, there is an increase in the number of children by 500 people. However, 1 of them was detected as having autism spectrum. Until now there has been no research that can reveal data on children with autism accurately. According to (Larete et al., 2016), with a significant increase in population, the number of children who are indicated to have autism is certainly increasing. Not only in Indonesia but there is also the development of autism cases in the urban sector, one of which is the city of Batam in the Riau Islands. It is estimated that the ratio of autism cases in the city reached 1 in 100 in 2009. This is a growing issue not only domestically, but globally. With the increasing number of autism cases involving individuals in the community, every professional in various fields including architects began to study and understand autism cases to provide a better life for them (Hauptman et al., 2019). However, the space needed must have a great impact not only on the psychology (Bahari, 2020) of autism but also as a mediator in developing their sensory response abilities. Before creating the right space, an architect as a professional involved in the design must examine each autistic behavior from various aspects that can help their development (Hejazi, 2020) (Runa et al., 2019). As is well known, autism has two characteristics, namely hyposensitivity, and hypersensitivity. These two autism characteristics are formed from nervous failure, including the sensory system in the body, resulting in different levels of sensitivity in an environment. Thus, the needs they need certainly cannot be generalized but can be grouped.

This research was conducted by evaluating hypersensitive and hyposensitive rooms based on design standards for autistic characters in the Autism Service Centre in Batam City. The Autism Service Center is an integrated service place for the Batam City Education Office which aims to provide learning, transitional education, and public services through coaching for children with autism. The purpose of this research is to develop a room for hyposensitive and hypersensitive so that it can accommodate the needs of the two characters and develop their sensory abilities.

2. MATERIALS

Autism

Autism usually called Autistic Spectrum Disorder (ASD), is a disorder of the brain's nerves that causes delays in processing information. The disorder also makes it difficult for people with autism to interact and behave normally in social circles. Generally, the symptoms of autism appear in children at an early age. According to IDEA (Individuals with Disabilities Education Act Amendments), autism is one of a collection of classifications of children with special needs in the category of "intellectual disorders" (Desiningrum, 2017) and is genetic with cognitive criteria (Lord et al., 2020). The word "autism" itself comes from the Greek language which is formed separately from the word "autos" which means "self". The word "autism" classification aims to indicate self-centered thoughts. It can be concluded that the condition of autism's focus on one thing causes a tendency to isolate oneself and avoid social circles (Kalalo & Yuniar, 2019). In general, people with autism can be classified based on the type of disorder including motor disorders, sensory disorders, behavioral disorders, emotional disorders involving the mental work system, and sensory perception disorders (Nugraheni, 2012). Thought patterns in humans generally vary but

differ from children with autism. Autism characters have a structured thought pattern that follows directions when doing activities. However, sometimes the response shown by them is inappropriate or abnormal. Not only that, but autism also has a different level of sensitivity from other normal people. This is caused by the failure of the sensory system (sensory) in the body in response to incoming stimuli. If the level of stimulation (stimulation) is not appropriate, it will affect the body in adapting to the environment. This sensory failure causes the formation of 2 characteristics, Hypersensitive and Hyposensitive (Wulandari and Taquiuddin, 2021). When people with autism with hypersensitive and hyposensitive characters share the same stimulation with humans in general, they will show discomfort (for hypersensitivity) or lack of behavior that is highlighted (for hyposensitive).

Table 1 : Autism Characteristic (Hyposensitive and Hypersensitive)

Senses	Hypo-Sensitive	Hyper-sensitive
Auditory (Sound)	1. Doesn't respond when someone calls their name	1. Too sensitive to noise
	2. Not sensitive to noise, or accustomed to enjoying the sound of crowds and certain objects	
	3. Impaired sensitivity to sound causes children with autism with the hyposensitive type to often create excessive loud noises	2. Able to recognize noise before others
Tactile (Touch)	1. Often in direct contact with people or objects	1. Only interested in certain clothes or textures
	2. Can't feel pain after being injured	2. Don't want to come into contact with water, and sensitive when walking barefoot
	3. Have a low level of sensitivity to extreme temperatures	3. Very sensitive to touch or being touched
Visual (Sight)	1. Have an affinity for light with high contrast and bright colors	1. Sensitive to bright light (shows rejection behavior by covering eyes with hands)
		2. Easily distracted by the movement of things
		3. Low level of focus on something and interested in staring at certain people or objects.
Vestibular (Motion)	1. Often make unnecessary movements	1. Difficulty with activities, including moving
	2. Have a high interest in activities that require movement	2. Difficulty controlling movement
Smell / Taste (Olfactory)	1. Have a high resistance to spicy taste.	1. Very sensitive to spicy tastes, or foods with strong odors.
	2. Interested in putting all kinds of objects into the mouth	
	3. To recognize an object, hyposensitive characters are accustomed to using the mouth	2. Some children with hypersensitive criteria only like foods with soft textures

Senses	Hypo-Sensitive	Hyper-sensitive
Proprioception (Sense of body's location)	1. Having trouble getting past the obstruction in a room	1. Difficulty in moving certain objects such as tying shoelaces and buttons on clothes.
	2. Often leans on objects and people	2. Hypersensitive autism character will move the whole body in all positions to see things

Source: Author, 2022

Table 1 classifies hypersensitive and hyposensitive characters according to the behavior caused by sensory malfunction based on 5 sensory aspects which include Auditory (sound or hearing), Tactile (touch), Visual (vision), Vestibular (movement), Smell (smell or taste), Proprioception (body control system). Basically, in the human body, there is a connector between behavioral variations with the brain called sensory integration. Through this connector, a neurological process, directing and translating each sensor input can occur, so the body can respond according to the sensor input. This form of sensory integration refers to the context of processing, integrating, and organizing information from the body and the environment. Thus, it can be concluded that sensory integration plays an important role so that humans can carry out daily activities, such as sitting, walking, running, eating, and so on (Glennon, 2021)(Kencanasari et al., 2020).

Behavioral Architecture

Architecture in general can be defined as the science of shaping a dwelling, building, or space for various activities. By involving user behavior, an architect can adjust the form to provide comfort for the users who are in it. Architecture can also be classified as a field of knowledge in creating physical space or a place for human activities (Permana et al., 2022), thus allowing users to move from one space to another (Cahyadi and Kurniawan, 2019). The bond between humans and the environment is one thing that is difficult to separate because the environment is a factor in shaping human behavior.

In addition, changing patterns of human behavior (Umar et al., 2021) can also be influenced by the environment. And vice versa, the character of an environment can also change according to human behavior. In general, the existence of architecture can develop and play a role in meeting human needs. Human behavior is a requirement in developing architectural forms to create a behavioral architectural approach. Behavioral architecture is a concept, or idea, as well as an approach that focuses on user actions or activities (Permana et al., 2021). Several principles must be considered in behavioral architecture, including (Hidayat et al., 2019):

1. Able to communicate with humans and the environment
2. Can accommodate user activities comfortably and pleasantly
3. Fulfilling aesthetic values, composition, and aesthetics of form

Through behavioral architecture, 5 spatial components play an important role in creating this approach, including (Haryadi and Setiawan, 2014)(Haristianti et al., 2021):

1. Space Color : Color is an important component in providing psychological needs for humans who are in it. Color can also affect a person's behavior.
2. Room Shape and Size : The shape of the room which is limited by walls, floors, and ceilings seems to give the impression of protection for users. However, most people

certainly have different interpretations of the shape of the room. The variation in the size and shape of the space can also affect the psychological aspects of the person who occupies it.

3. Furniture and Room Layout: The use of space and the arrangement of furniture is one of the components of a dwelling which is determined by the activity needs and habits of the users in it. Arranging furniture by classifying types, and dividing space based on activity can provide effective circulation for users.
4. Texture and Material: Textures and materials play an important role in creating a conducive space for users. The selection of appropriate materials and textures can provide an aspect of comfort when moving in the room.
5. Light, Sound, and Temperature: As it is known that lighting is the most important component in forming a space, or dwelling. Through the aspect of lighting, the condition of a person's psychological aspects can change at any time. The choice of light contrast for a particular space is very much needed so that it can maximize the current activity and provide comfort for the user. Not only light, but sound is also one aspect that must be considered. Noise caused by sound can be uncomfortable for users in other rooms. Therefore, a room with a high noise level should be provided with soundproofing material to suppress noise from both inside and outside the room. In addition to sound and light, the temperature is also a component in maximizing user comfort in a space. By paying attention to and reviewing several components of space in the application of behavioral architecture, an architect can create a space that is conducive and comfortable for users.

Space for Autism

Autism is divided into 2 groups, namely hypersensitive and hyposensitive. The stimulation needs needed by the two autistic characters are certainly different, so they need an appropriate room. To form a space to channel stimulation appropriately to the character of autism, there are 8 design criteria needed. According to (Vogel, 2008), design criteria in creating rooms and schools for autism include:

Table 2 : Design Criteria for Autism

Criteria Design	Description	Design Consideration
Flexible and Adaptable Design	Flexibility in the field of architecture can be described as the ability of a dwelling to adapt to the layout, both indoor and outdoor spaces based on user needs.	Does not limit the space for autism to explore. In addition, it can use a movable panel wall based on the urgency of the user. Autism also requires a quiet space with a small size.
Non-Distracting Space	Autistic characters can be easily distracted by certain objects. By reducing objects that block the vision of children with autism, their focus will also increase	Minimizing the use of objects that can give stress to children with autism. Floor material should not use ceramics with a high level of reflection.

Criteria Design	Description	Design Consideration
Controllable Environment	Can be described as a criterion that can create conditions where all users will feel comfortable and able to control themselves when having a transition space between private and public spaces.	Divides space into 2 parts, namely public and private. In addition, the objects in the space are arranged linearly, so that children can be well directed.
Predictable	By remembering every day that is done sequentially, children with autism will not feel anxious.	Using everyday patterns or illustrations for autism, to keep their actions predictable.
Non-Threatening	The non-threatening room has a calm, comfortable atmosphere. So that it gives the impression of being welcoming and open to people with autism.	Don't use wall colors that can harm the psychology of children with autism. Use friendly objects.
Sensory Motor Attuned	Sensory needs for autism are generally flexible and can change at any time. Thus, an environment that has sensory facilities is needed so that children with autism can explore the environment.	Sensory motor needs include facilities that support movement, such as indoor therapy gym, mini budget ball pit, cradle swing (optional).
Non-Institutional	In the process of adjusting to the environment, autism characters need an atmosphere that looks the same as their home.	Creating a calm and comfortable atmosphere like home involves aspects of simple objects and other supporting components in fulfilling these criteria.
Safety	Autism characters have a different level of self-control from other normal children. They cannot feel pain when injured. From this form of behavior, parents often worry about the safety of their children. Therefore, space for autism should be provided with materials with environmentally friendly textures that also cannot hurt children with autism.	In determining the texture and materials that will be used for the room for autism, you should choose soft and comfortable materials.

Source : Author, 2022

Table 2 explains the design criteria and standards in a design for children or people who are indicated to have autism spectrum. Basically, the character of autism can grow and develop physically, so it doesn't have a big difference with other people. It's just that, the character of autism has a deficiency in the mindset. This causes their ability to behave, and socialize, and respond to sensory input appropriately. Therefore, in forming the right space for autism, an architect needs design criteria as guidelines in order to accommodate the needs of users such as autism.

3. METHODOLOGY

The research method used in this study is a form of descriptive research with a qualitative approach. According to (Sugiyono, 2018), descriptive-qualitative is a method that is based on the philosophy of post-positivism and is also used to examine the condition of objects naturally. The purpose of descriptive-qualitative research is to describe, explain, and answer appropriately about the problem to be studied by studying the characteristics

of certain groups or individuals. In this study, people with autism become objects that can strengthen the findings of the effectiveness of the stimulation room on autism characters at the Batam autism service center through a behavioral architecture approach. In addition, the data collected is the result of observations that are reviewed based on 8 design criteria in the room and consist of adaptable, non-distracting, controllable environment, predictable, non-threatening, sensory-motor attuned, non-institutional, and safety. The research place is an autism service center in the city of Batam which was inaugurated on February 18, 2014, and has been established for 8 years until now. The location of this service center is on Jl. Pemuda No. 4, Baloi Permai, Batam City District, Batam, Riau Islands.




Figure 1 : Autism Service Centre
Source : Author, 2022





4. RESULT AND DISCUSSIONS

4.1 Space Analysis Based on Design Parameters

In research that has been conducted at the Autism Service Center, it can be seen that there are 2 rooms with different levels of stimulation and are grouped for hyposensitive and hypersensitive autism characters. Among them are, low-stimulus and high-stimulus therapy rooms.

Table 3 : Low Stimulus Room Analysis

Room Type	Existing Condition	Suitability
<p>Therapy Room (Low Stimulus)</p>	 <p>Adaptable - Flexible : Low stimulus therapy room has a size of 1.5 x 2m and functions as a therapy area for children with autism and teachers (therapists) with a capacity of 2 people. However, in this room, there are no flexible components, so this room cannot be adapted to meet the needs of people with autism.</p>	<p>(x)</p>

Room Type	Existing Condition	Suitability
	 <p>Non-Threatening : Lighting in the stimulation room uses fluorescent lamps that can cause "flick". The "flick" that arises from the light will cause anxiety and increase emotional responses in children with autism.</p>	(x)
	 <p>Non-Distracting : The floor material used in this room is ceramic with a high level of reflection. This can provide a distraction for hypersensitive children, causing a decrease in their level of focus during learning.</p>	(x)
	 <p>Predictable : In a low-stimulus room, there are no patterns or visuals that can help autistic children's daily lives. Such as giving visual images to the book area to mark the area or other visual uses.</p>	(x)
	 <p>Controllable : The low stimulus room does not have enough area to be used as a public and private area because it only measures 1.5 x 2m. Not only that, the use of furniture that is difficult to move, can reduce the accessibility of autism.</p>	(x)










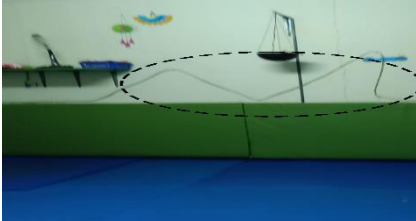

Room Type	Existing Condition	Suitability
	 <p data-bbox="598 546 1190 674">Sensory Motor Attuned : There are no small-scale facilities in a low-stimulus room that can support the sensory-motor needs of hypersensitive autistic children.</p>	(x)
	 <p data-bbox="598 904 1190 1032">Safety : Ceramic material on the floor in a low stimulus room has a hard and slippery surface, so it can increase the risk of injury to autistic children when injured</p>	(x)
	 <p data-bbox="598 1290 1190 1442">Non-Institutional : Low-stimulus rooms have not been able to display the same comfortable room as when children with autism are in their homes. The use of 1 color with low contrast, will only increase the child's focus but will reduce the comfort of the child.</p>	(x)

Table 4 : High Stimulus Room Analysis

Room Type	Existing Condition	Suitability
<p data-bbox="277 1778 517 1839">Therapy Room (High Stimulus)</p>	 <p data-bbox="576 1868 1190 2018">Adaptable - Flexible : This therapy room has formed a size of 4 x 4m as a therapy and isolation room for children with autism who are detected with tantrums. However, the use of this space is increasingly ineffective because there is no activity going on.</p>	(x)

Room Type	Existing Condition	Suitability
	 <p>Non-Threatening : Indoor lighting uses fluorescent lights that can cause "flick" so that it can provide anxiety for children with autism, including hyposensitivity</p>	(x)
	 <p>Non-Distracting : Indoor furniture is in the corners and edges of the room. In order not to cause a risk of injury when a hyposensitive autistic child hits the object.</p>	(v)
	 <p>Predictable : In this room, there is no division of areas with certain patterns or colors and visuals.</p>	(x)
	 <p>Controllable : This room is only used as an isolation room with 1 activity happening, so there are no public areas and private spaces for children with autism.</p>	(x)
	 <p>Sensory Motor Attuned : There are only bubble tubes as a form of relaxation for children with autism, but there are no sensory facilities that can help children's motor development.</p>	(x)

Room Type	Existing Condition	Suitability
	 <p>Safety : The arrangement of cables is not neatly arranged, with the height of the cables installed reaching 1m from the floor. With the average height of a 6-year-old child reaching 1m and being able to touch the cable, it can be a risk to their safety</p>	(x)
	 <p>Non-Institutional : A space that can function properly in accommodating user needs is a room that can provide comfort and a sense of security. However, the high stimulus room at the autism service center has experienced a decline in function due to the absence of activities that occur for a long time.</p>	(x)

Source : Author, 2022

Based on the findings in the low stimulus room, it can be concluded that of the 8 existing design criteria for autism, the room does not meet any criteria. The components in the room are not adjusted to the maximum based on the user's activities, so it will cause discomfort for children with autism, especially hypersensitivity. In addition, based on the analysis of rooms that have high stimulation for hyposensitivity, it can be concluded that the room only meets 1 of 8 design criteria, namely non-distracting. The layout of furniture is located on the edge of the room to facilitate the movement of children with autism and also so that children do not hit objects. With the criteria are not met, it can give an uncomfortable impression to people with autism. Therefore, it is necessary to adjust and develop the design of the stimulation room so that it can function again. With a space that can function properly for autism, a conducive learning environment will be created so that parents and teachers can feel satisfied (Ghazali et al., 2018).

4.2 Design Recommendation

Low Stimulus Room

A low stimulus room is a space where users can feel comfortable and relaxed when they feel stressed or when they receive excessive stimulation. This room is also designed for hypersensitive autistic characters and serves as a place to provide sufficient stimulation capacity.

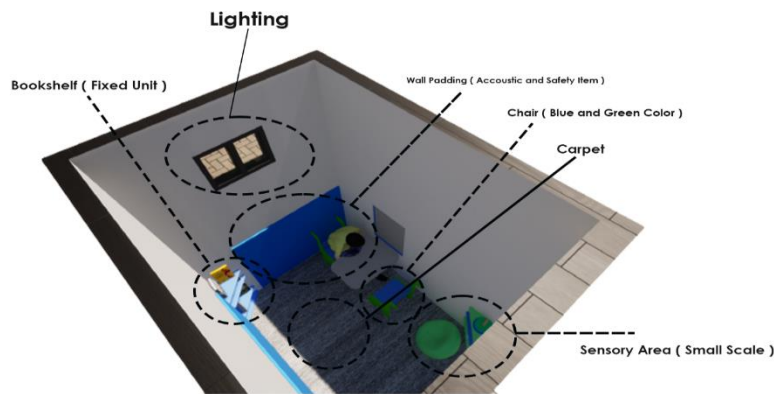




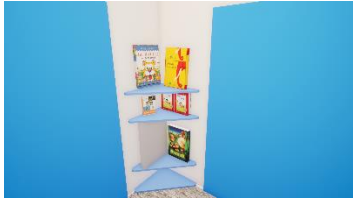


Figure 2 : Layout Details (Low Stimulus Room)


Source : Author, 2022

Figure 2: The low stimulus room in the autism service center has a size of 1.5 x 2m and the ceiling height from the floor reaches 3m. The layout division in the low stimulus room is adjusted to the hypersensitive character who tends to be easily distracted and difficult to block objects. Thus, objects and furniture are arranged to the edge of the walls and corners of the room so that children can explore other areas easily. Not only that, the provision of facilities for hypersensitive autism must be minimal and not much so that they can focus during the learning period or when they want to calm down. There are 6 elements that make up a low stimulus space, including a bookshelf, lighting, wall padding, chairs and tables, carpet, and sensory areas.

Table 5 : Design Recommendation

Room Type	Design Recommendation	3D Visualization
<p>Low Stimulus Room</p>	<p>Wall Padding: This component functions as a material that can withstand the impact of autistic children when they are in uncontrolled behavior. Not only that, wall padding can reduce noise coming from outside the room. According to (SNI, 1993), the standard decibel level for the rehabilitation or therapy room is 35dB. The use of wall padding can reduce the risk of injury in hypersensitive autistic children</p>	
	<p>Carpet : The carpet can be used as a floor covering material because it can cover reflections, so the focus of hypersensitive autistic children on learning is not reduced. In addition, the use of carpets with a smooth texture can provide comfort for hypersensitive autism. Hypersensitive characters tend to be sensitive to strong odors, thus the material on the carpet uses natural materials and can reduce existing odors. Carpets can also be used to reduce noise when changing the furniture in the room (Celia & Santosa, 2014).</p>	

Room Type	Design Recommendation	3D Visualization
	<p>Bookshelf : The bookshelf in a low stimulus room is fixed component and is in the corner of the room. The position is adjusted based on the perspective of the autistic child. That way, children can easily put or pick up books and other objects. The size of the bookshelf is adjusted to the standard bookcase for children aged 6 years, which is 60cm. Not only that, the corners on the bookshelf are not sharp and still use a round (dynamic) pattern so as not to pose a risk of injury. The triangular-shaped bookshelf also aims to save space in the room. (Beatrice & Susanto, 2021)</p>	
	<p>Chair (Blue and Green Color) and Table : In color psychology, humans need space or objects with appropriate colors to carry out activities comfortably, including people with the autism spectrum. Autism characters such as hypersensitivity need colors that can provide calm, and cold for them such as blue and green. According to (Sutanto, 2017), cold colors can be used to be considered emotions and anger or excessive stress. (Non-Institutional Criteria). Not only that, the height of the chair in the room is formed based on the standard size for children aged 6 years, which is 30cm. In addition, there is also a distance between the chair and the table, which is 10 cm. In addition, the desk in the study area is flexible and can be folded so that it blends with the wall. With a flexible component, of course, it will provide more area for children with autism when they are undergoing other activities. The table in the low stimulus room is adjusted to the standard of furniture for autism with a height of up to 50cm, width of 60cm, and length of 80cm and has a semi-circle in the middle with a size of 40cm (Sari, 2012).</p>	
	<p>Sensory Area : The sensory area has a small scale and is designed to meet the sensory needs of hypersensitive autistic children after receiving learning from the teacher. Facilities in the area include bean bags or sofas with soft textures so that children with autism can still feel comfortable. Not only that, there are also sensory equipment in the form of flip-flop toys with the aim of training the autistic child's motor skills. The sensory area can also function as a relaxing area for children with autism.</p>	

Room Type	Design Recommendation	3D Visualization
	<p>Lighting: Hypersensitive autism character has a high sensitivity to light. Thus, the opening position is designed with a height that reaches 175cm. The position of the high opening also causes light to diffuse, so it doesn't directly hit the eyes of the autistic child who is in the room. The window in the room also has a size of 40 x 50 cm. The use of clerestory windows as a source of natural lighting serves to avoid the effects of noise and disturbances around the room (Torky, 2013). In addition, there are also LEDs that are designed as artificial lighting and are 1 in number and have low contrast, so they don't hurt the eyes of children with autism.</p>	

Source : Author, 2022

High Stimulus Room

The high stimulus room at the autism service center measures 4 x 4m, with a ceiling height of 3m from the floor. A room with a ceiling that is not too high or low can provide comfort for children with autism, and does not create the impression of isolation (Safrilia, 2018). In addition, the floor tiles in this room measure 60 x 60cm. This high stimulus room serves to increase stimulation and train sensitivity for hyposensitivities.

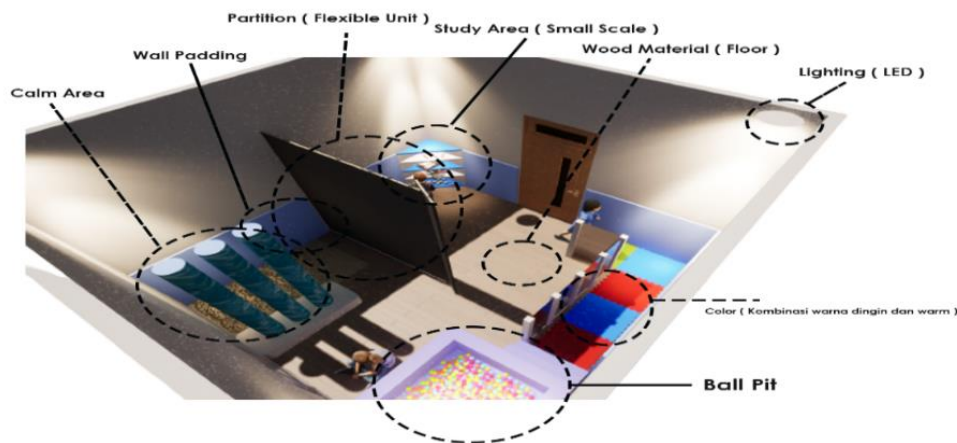





Figure 3 : Layout Details (High Stimulus Room)

Source : Author, 2022

Hyposensitive characters tend to find it difficult to pass excessive objects, often bump into objects, are easily distracted, and are unpredictable. Therefore, the furniture is placed on the edge so that children can reach certain objects easily. Not only that, some partitions are flexible and can be folded to expand the view of hyposensitive children. The components in this space consist of a quiet area (relaxation), wall padding, partitions, study areas, room elements such as color, lighting, floor coverings, sensory areas, and a ball pit.

Table 6 : Design Recommendation

Room Type	Design Recommendation	3D Visualization
<p>High Stimulus Room</p>	<p>Study Area (Small Scale) : The furniture in this area includes bookshelves with a height of 1m and a shelf width of up to 60cm. This size is adjusted to the standard height of furniture for children aged 6 years, so they can put certain items or objects without difficulty. This shelf is designed in a triangular shape so hyposensitive autistic children can understand basic shapes.</p>	
	<p>Color : This sensory area is designed in the form of a road with color patterns on different floors. Not only that, each color has a different texture. It aims to strengthen the motor of hyposensitive autism. The circulation width in this area reaches 1m. This area can also train hyposensitive autism sensitivity to different textures. The handrail located in sensory area 1 can help children with autism when they have difficulty walking and the height of the railing has been adjusted to the average height of 6-year-old children in general, which is 1 meter. If the autistic child feels restless and anxious while walking in the area, causing uncontrollable behavior, the wall padding on the side of the wall will withstand the impact of the autistic child. The color in the room also uses a combination of red, purple, green and dominated by blue. The color red can serve as an attractive color for hyposensitivity and channel stimulation into the mind. (Cherry & Underwood, 2012)</p>	
	<p>Ball Pit : There is a ball pit area with a size of 1.25 x 1.25 m., and a ball pit height that reaches 1 m and is also designed as an area to provide stimulation for hyposensitive autistic children. This area is also a play area in the room.</p>	

Room Type	Design Recommendation	3D Visualization
	<p>Mirroring Area : This area is a sensory area that can help gross motor skills in hyposensitive autistic children by involving a mirror as a medium. Children with autism generally find it difficult to focus on something not only hypersensitive, but also with a hyposensitive character. Mirroring movement is basically an activity or therapy in imitating movement. Besides being able to improve body coordination, children with autism can also train self-confidence slowly. The mirror in this area is flexible with a height of up to 1m and a width of 60cm. This type of mirror is a sliding type, so it can be shifted into the wall with a depth of 5cm (Tri Yuniwati Lestari, 2021).</p>	
	<p>Calm Area : This area is designed to be 2m long and 1m wide. The relaxation area for hyposensitive autism uses a carpet with a furry texture to provide stimulation for hyposensitive autistic children. Not only that, the position of the relaxation area is next to the bubble tubes. Bubble tubes can relieve stress and anxiety experienced by children when they are indoors.</p>	
	<p>Partition : High-stimulus indoor partitions are flexible and can be used according to space requirements and user activities. If the child is in the study area, to increase their focus, the partition can reduce noise in other sensory areas.</p>	
	<p>Material : The floor in the high stimulus room uses material as a forming element because wood can inhibit friction so children with autism don't slip easily when exploring the room.</p>	
	<p>Lighting : The lighting in the room uses 4 LEDs and is located in each corner of the room with a contrast that is not too high so that it can illuminate the whole room.</p>	

Source: Author, 2022

5. CONCLUSION

In general, every human being needs space to support large or small-scale activities. An effective space is not only reviewed based on the constituent components but the elements in the space must be adjusted to the characteristics and behavior of users so that they can move comfortably. If there is a decrease in function, then the needs of each individual who is in it cannot be met either from the psychological aspect or self-

development. This does not only apply to most people, but also the character of autism. People with autism tend to have high sensitivity (hypersensitivity), or lack of sensitivity when in an environment (hyposensitive). Thus, people with autism need a space that can be adapted to their needs. The Batam City Autism Service Center has become a place for people with autism to regain learning and help them get used to responding to sensory stimulation. However, based on the evaluation that has been carried out on the stimulation room in that place, it can be concluded that most of the rooms in the service center do not meet the criteria specified for autism. Thus, the researchers decided to study, analyze the room, and develop the room so that the findings obtained were in the form of a multifunctional low-stimulus room, and able to be adapted to different variations of activity and a high-stimulus room that could channel stimulation for hyposensitivity. Not only that, by studying user behavior and reviewing it based on a behavioral architecture approach, researchers can create a conducive environment for the two different autism characters.

6. REFERENCES

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