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The Innovation Breakthrough in Digital and Disruptive Era

Design of Education and Rehabilitation Center for Autism Children in Ternate City

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Abstract. Ternate City is one of the cities from North Maluku Province whose population density is so high, so it has the highest number of children with autism. The design location is in Ngade Village, South Ternate City. The design method is carried out in 3 stages. The first stage is a data collection technique in the form of literature studies and field observations. The second stage is the Analysis of Environmental, Human, and Building Aspects. The third stage is in the form of design concept results and building design products in the form of working drawings. The building of the Autism child education and rehabilitation center is a forum for the fulfillment of facilities and infrastructure for people with autism in Ternate City as facilities for handling services for children with autism, developing the talents of children with autism, as well as other functions as a medium for information and introduction about Autism disorders to the wider community. The Center for Education and Rehabilitation of Children with Autism answers the need for proper schools for children with autism in Ternate City. The space needs of building users follow the standards of facilities and infrastructure that are suitable for children with special needs (Autism). The concept of behavioral architecture implements the behavior of children with autism by prioritizing physical and psychic comfort factors to the creation of building conditions and environments whose atmosphere is healing, safe, calm and comfortable

1 Introduction

North Maluku in 2022 has a population of 601,868 people aged 0-24 years and among them there are 63 children with Autism. In North Maluku there are 19 special education centers (PLB) in various districts/cities in North Maluku [10]. Although there are special schools for children with special needs in North Maluku, there are no special schools for children with Autism itself, and the distribution of special schools is still uneven and limited educational facilities and services [1].

Ternate City is one of the cities of North Maluku Province which has a high population density in North Maluku, so it has the highest number of Autistic children in North Maluku. Ternate city already has several special schools (SLB) that are prepared to educate students who suffer from physical and mental disabilities. However, to achieve the expected goals of education and rehabilitation, the right strategy is needed so that the achievement is more focused and effective. The strategy used cannot only be to improve cognitive aspects alone, but must be all dimensions such as spiritual, emotional, social, creativity, and motor must also be developed in a focused and structured manner.

For this reason, there is a need for special medical, psychological and educational treatment for children with Autism. The design of education and rehabilitation center for Autistic children should consider the condition of Autistic children. The

application of the concept of behavior architecture in the design of the education and rehabilitation center for children with Autism is a concept that is expected to be able to consider the behavior of people with Autism which is very necessary in the design. Directing Autistic children to interact well and comfortably with their environment also presents an interactive space atmosphere that can encourage Autistic people to learn actively and can form social interactions with their environment. The purpose of this research is to design an Education and Rehabilitation Center for Autistic children as a place to educate, therapy and get information about Autism itself by applying behavioral architecture.

2 Literature Review

Autism is a condition where a person has impairments in communication, interaction and behavior. Autism is a complex development, usually seen before the child is 3 years old. Children with Autism will experience developmental disorders in various fields, namely disorders in communicating both verbal and non-verbal. For this reason, rehabilitation needs to be given to build a better condition for children with Autism. Rehabilitation must also be routinely carried out so that what the child lacks can be fulfilled gradually. Rehabilitation needs to be given as early as possible before the child is 5 years old. This is because the rapid development of a child's brain generally occurs before the age of 5 years, peaking at the age of 2-3 years.

Some therapies that can be done for children with Autism are speech therapy, occupational therapy, play therapy, behavioral therapy, biomedical therapy, medical therapy and sensory integration therapy [2].

In general, education is very important for every individual wherever they are, all are entitled to education as well as children who have disorders such as Autism. Because it does not rule out the possibility that there are actually hidden skills in him, has talent and creativity in him. For this reason, the role of parents, education and rehabilitation is needed to support each stage in helping, honing the development of children with Autism. It should be understood that Autistic children can achieve optimal growth if supported by good handling [3]. Autism is a disease that is relatively common among the Indonesian population. Although there has never been a truly official survey from the country itself, the Director of Mental Health Development at the Ministry of Health has estimated that around 112,000 children aged 5-19 years were affected by this disease in 2013. Based on data from the Indonesian Central Bureau of Statistics in 2010, Indonesia has 66,000,000 people under the age of 20, so when compared, 1 in 590 children in Indonesia suffer from Autism, which is increasing every year [4].

Education for Autism Sufferers As a result of behavioral disorders (behavioral disorders) and cognitive disorders (cognitive disorders) in individuals with Autism, a forum for education and training is created according to the needs of persons with Autism. Education experiences adjustments to the child (child character), especially in the layout of the classroom and the surrounding environment. Good and regular spatial planning is expected to be able to help the success of healing because in general children with autism really like order and are very foreign to change. A change will make an Autism child confused and then throw a tantrum.

- a. The care for this study center is carried out with a parenting style that is in accordance with the symptoms of Autism they suffer from. At the basic level of parenting, 1 teacher handles 1 child, so that the child receive careful care and continue to follow developments in detail. At an advanced level, the parenting pattern is more towards the independence of the child but is still under the supervision of the teacher.
- b. Education, in principle, the purpose of education for children with autism is to teach various skills that will help children catch up in their development, achieve independence and live the best possible quality of life.
- c. The average talent development for Autism special school teachers and psychologists say that not all autistic children can transition into regular schools. These children find it difficult to concentrate with the distractions around them. Some children show excellent potential in certain fields eg sports, music, painting/drawing, computers. These children must receive education that can channel their interests and talents.

3 Method

The research location is in Ngade Village, South Ternate City. This location has a land area of 20,000 m² or about 2 ha precisely located in BWK III, because BWK III includes parts: Education, Settlement, Services, Trade, Tourism, Port, Fisheries, Agriculture, Military, Sports, Small and Light Industry, and Animal Husbandry.

Data collection techniques are carried out by means of:

1. Literature study is secondary data obtained from books, magazines, which are related to the title as a basis for design reference.
2. Field observation, direct review of the research location to obtain data related to site conditions. The site data that can be collected include contour data, climatology, vegetation, circulation, achievement and utilities.

The research methods used are as follows:

1. Environmental Aspect Analysis is an analysis of data including existing site, site potential, achievement, circulation and parking, site zoning, climatology, regional utilities, vegetation, topography, sea tides, mass layout patterns, and outdoor layout.
2. Human Aspect Analysis is an analysis of activity actors, activity groups, space requirements and space size.
3. Building Aspect Analysis is an analysis of the structure, building materials and appearance of the building.

4 Result and Discussion

Education for Autistic People Due to the existence of behavioral disorder and cognitive disorder in Autistic individuals, an education, training platform is created according to the needs of Autistic people.

Education experiences adjustments to the child (the child's character), especially in the layout of the classroom and the surrounding environment. A good and organized layout is expected to be able to help the success of healing because in general, children with Autism are very fond of order and are very unfamiliar with a change. A change will make an Autistic child confused and then throw a tantrum.

- a. The center's care is tailored to the child's Autism symptoms. At the basic level, 1 teacher handles 1 child, so that the child gets careful care and continues to be followed in detail. At the advanced level, the parenting pattern is more towards the independence of the child but still under the supervision of the teacher.
- b. In principle, the goal of education for children with Autism is to teach various skills that will help the child catch up in development, achieve independence and live the best quality of life possible.
- c. The average aptitude coaching Autism special school teachers and psychologists say that not all

Autistic children can transition into regular schooling. These children find it difficult to concentrate in the presence of distractions around them. Some children show excellent potential in certain areas such as sports, music, painting/drawing, computers. These children should receive an education that can channel their interests and talents.

4.1 Activity Performer Analysis

- Visitor groups: Children with Autism, Parents of children with Autism, Performers of other activities related to information seeking activities.
- Education personnel group: Teachers and Therapists.
- Medical personnel group: Doctors, Nurses, Psychologists,
- Management Group: Principal, Receptionist, Finance staff, Personnel staff, Administration staff, Library staff, Consumption staff in charge of providing food and beverages for the school community, Security guards in charge of providing comfort and security services in the school, Cleaning service, Technicians.

The types of activities at the Autism Education and Rehabilitation Center are divided into several groups, namely:

Table 1. Activity Groups

No	Activity Groups	Activities
1	Primary	<ul style="list-style-type: none"> Teaching Therapy Socialize Playing Health and Psychology Consultation
2	Second	<ul style="list-style-type: none"> Management Activities (Administration, Finance, Documentation, Archives) Public Service
3	Support	<ul style="list-style-type: none"> Prayer Conference Library Cafe
4	Service	<ul style="list-style-type: none"> Security Cleaning Technician

4.2 Building Form Concept

The most suitable form for children in general is a simple and clear form, so that it can be in accordance with the child's psyche, such as geometric formations of cubes, blocks, balls, and others. This simple formation will help the teaching and learning process through the introduction of real shapes, because of the inability of autistic children to be able to imagine something abstract. Geometric shapes are easily recognized by children because children with autism are visual learners. The shapes taken are square and

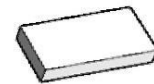
Kepingan puzzle diketahui pertama dikaitkan dengan autisme pada tahun 1963. Gerald Gasson, orang tua dan anggota dewan untuk National Autistic Society di London, Inggris, menciptakan logo untuk organisasi yang terdiri dari sekeping puzzle. Gasson memilih potongan puzzle sebagai alat bantu visual untuk mengilustrasikan sifat dan kondisi membingungkan terkait autisme.



Puzzle dianggap mencerminkan kompleksitas spektrum autisme. Sementara berbagai warna dan bentuk mewakili keragaman orang dan keluarga yang hidup dengan kondisi tersebut.



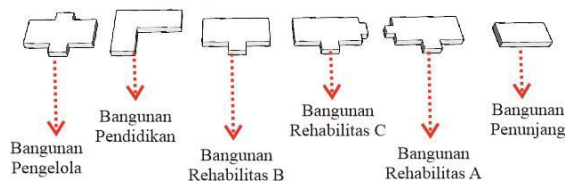
Konsep Puzzle di terapkan pada secondary skin bangunan dan juga perletakan maupun bentuk bangunan.



Bentuk dasar persegi di ubah menjadi beberapa bentuk yang menyerupai kepingan puzzle

circle, from the two shapes will be processed into other shapes by reducing and adding to the two shapes.

Bentuk bangunan berupa kepingan Puzzle yang akan di tata di atas site



Konsep Pita ini digunakan pada Gerbang Site (Gate)
 Pita Puzzle merupakan Lampang kepedulian terhadap penyandang Autisme



Fig. 1. Shape Concept

4.3 Colour Concept

In terms of psychology, color has a strong influence on mood and human emotions, making the atmosphere hot or cold, provocative or sympathetic, exciting or calming. In terms of its effect on the psyche and its distinctive properties, colors are sorted into 2 categories, namely the hot color group and the cold color group. According to research by F.S. Breeds and SE, Kats, there are three color combinations that tend to be preferred, namely contrasting colors, analogous colors and monochrome colors. However, based on children's behavior, colors that children can easily understand are analogous colors. Where there are three kinds of analog colors, namely: Blue color means peaceful, loyal, soft, conservative, Green color means young, warmth, friendship, courageous and Yellow color means bright, bright, happy, warm [8].

The colors used should be pastel colors that tend to be monochromatic for the therapy room. Monochromatic is using colors with the same color, only playing the gradation. The application of color in the interior of the classroom, the interior of the therapy

room uses blue to give the impression of calm and peace for children with autism, especially hyperactive children.

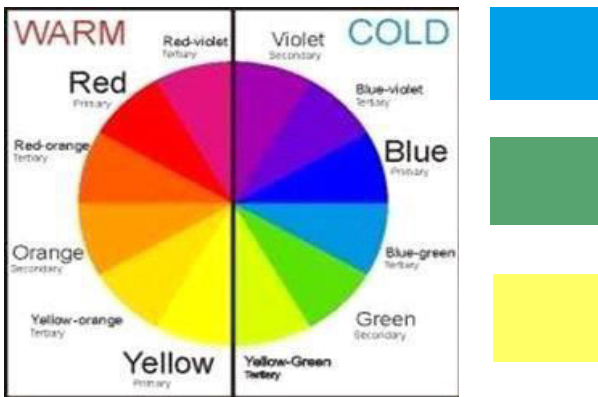


Fig. 2. Colour Concept



Fig. 3. Classroom Interior

The application of exterior colors in educational buildings uses a yellow color that gives the impression of enthusiasm and cheerfulness to the activities in it (Figure 4). The application of exterior colors in the rehabilitation and management building uses blue, and the application in the prayer room building to the service uses white so as not to be conspicuous.



Fig. 4. Exterior Concept



Fig. 5. Exterior of Education Building

4.4 Concept of Landscape

The purpose of rehabilitation itself is to restore the condition as before and also to train humans to perform an action normally with physical conditions that are no longer normal. While therapy functions as an action to help a person be able to carry out activities as before after experiencing a disturbance or injury. The arrangement of outdoor space also functions as a medium for physical therapy for children with autism, which presents natural elements that can be used as healing therapy.



Fig. 6. Concept of Landscape

5 Conclusion

The design of education and rehabilitation center for children with autism can be a place for children with autism in Ternate City so that children with autism can get proper education, therapy and treatment facilities. This design tries to answer the need for a proper school for children with autism in Ternate City. This design is an Education and Rehabilitation Center that facilitates all the space needs of building users, especially children with autism by following the standards of facilities and infrastructure that are in accordance with children with special needs (Autism). This design using Behavioral Architecture Approach implements the behavior of Autistic Children themselves by prioritizing the physical and psychological comfort factors of Autistic children to create building and environmental conditions that can support the activities in it by designing an atmosphere that is healing, safe, calm and comfortable for children with autism so that

they can develop and live independently in the community and have a positive influence on the formation of autistic children's behavior and how architecture can influence the behavior of children with autism.

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