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Activating the role of architecture in Repurposed autism centers

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Abstract

Since the earliest attempts by humans to create shelters and environments that protect them from external dangers, architecture has been able to respond to the diverse and evolving needs of its users throughout history. However, there is currently a group, for whom architecture has not yet fully responded to their needs. The increasing prevalence of autism worldwide is one of the biggest challenges of our time. Unfortunately, individuals with autism suffer from the lack of autism-friendly buildings, which further widens the gap between them and society. This research examines the phenomenon of repurposed buildings, currently being used as autism centers, and explores the potential of architecture and interior design in enhancing the repurposed environment. The study aims to contribute to creating spaces where individuals with autism can thrive. The analysis of the internal environment components of a repurposed autism center was conducted, identifying the architectural weaknesses. Some suggestions were then presented to address these issues, based on the (ASPECTSS) design index. The research method can be adopted to utilize design indicators to improve the reality of repurposed autism centers.

Keywords: Autism, Design for autism, Autism-friendly buildings, Repurposed autism centers, (ASPECTSS).

*** Theoretical study**

In order to understand the research problems and what autistic people suffers from, its essential to present some of the most previous and related studies. As follows:

* INTRODUCTION

Autism has passed through a long series of studies and researches since the first diagnosis in (1946) till present in order to identify the core of this phenomenon. This wide range of autism definitions from different points of view indicates the lack of specific scientific basis for its meaning. In addition to the wide spectrum of symptoms which made it difficult to diagnose autism. The most recent and adequate definition is presented by the World Health Organization (WHO), as a diverse group of conditions related to the development of the brain. Usually, it is diagnosed in early stage of childhood by the most common characteristics which are difficulty with social interaction and communication in addition to the repetitive behaviors (World Health Organization, 2023). These conditions resulted the children to isolate from family and community, which makes education and training process very difficult dew to the previously referred isolation and the lack of attention span which in best conditions may extend to few seconds (Ridderinkhof, Bruin, Driesschen, & Bögels, 2018). Without the adequate attention spans, its very difficult to the care-givers in autism centers to communicate and train the autistic people.

The prevalence of autism has changed significantly since the first diagnosis, experiencing an alarming increase over time worldwide. The most recent prevalence rates are estimated by a ratio of (1:100) children worldwide (Zeidan, et al., 2022). While in Iraq the rates are determined by (1:80) children which highlights the urgent need to establish autism specialized centers to provide the essential care for autistic children. unfortunately, the reality is different, as Iraq lacks government-run autism centers, the available options are limited to private centers which are not architecturally designed to meet the needs of those children (Samadi, 2022). This previously mentioned rates are considered as a call for help to focus on designing and paying more attention to the existed centers.

Specialists have provided various definitions of architecture, focusing on its core feature which is transforming a space into an environment that offers the user an existential experience, enabling them to form a stable image of their surroundings and giving them the opportunity to be part of a community and culture, thereby turning a building into true architecture. It is well-known that people, with their

diverse cultures, nationalities, and geographical conditions, perceive the environment in different ways, especially individuals with disabilities or neurodiversity, including those with autism (Sánchez, Vázquez, & Serrano, 2011).

*** Design for autism**

It is essential when designing spaces for individuals with autism to understand how they perceive and interact with their environment. Studies have pointed out sensory differences and social communication challenges that accompany the symptoms of autism. While typical children can learn in conventional environments, children with autism may require more specialized and detailed spaces to support their learning and development (Scott, 2009).

Given that architecture is the primary refuge for humans, providing a safe haven from external conditions, it is necessary for spaces designed for children with autism to offer support and facilities based on an understanding of the users' needs and preferences, which differs from autistic level to another. This can be achieved by creating environments that are comfortable, accessible and inclusive (Almaz & Raafat, 2024), to provide the optimum opportunities for learning and living. Studies have found that the rehabilitation and training of children with autism should take place in a comfortable and flexible environment free from stress-inducing stimuli. The spaces should include areas for play, relaxation, and training, designed with simple and basic shapes rather than complex ones. Additionally, it is important to use directional signs (to ensure a sense of belonging and increase confidence) and eliminate sharp edges and corners (Jalalian, 2021).

The Autism (ASPECTSS) Design Index is the first set of evidence-based design guidelines worldwide to address built environments for individuals with Autism. It was developed over a decade of research and is comprised of seven criteria that work with other design elements, as shown in figure (1), proposed to be facilitative for autism design. It is used as both an assessment and design development tool (Mostafa, ASPECTSS TM The Autism Design Index, 2015). Those criteria are: -

1- Acoustics: This criterion proposes that the acoustical environment be controlled to minimize background noise, echo and reverberation. The level of acoustic control should vary according to the level of focus

required from users within the space, as well as the user's autism level.

2- Spatial Sequencing: This criterion is based on the concept of utilizing the tendency of individuals with autism towards routine and their preference for predictability. It works in conjunction with the criterion of sensory zoning. The organization of spaces requires that they be arranged in a logical order based on the schedule for using those spaces. Movement should flow as smoothly as possible from one activity to another through unidirectional traffic with minimal disruption and distraction, using transitional areas.

3- Escape Space: The goal of these spaces is to provide a refuge for the user, protecting them from the excessive sensory stimulation in their environment. Offering a neutral sensory environment with minimal sensory stimulation. They should be intimate in scale and can range from the completely physically and visually enclosed to the subtly defined.

4- Compartmentalization: This criterion aims to define the sensory boundaries of each activity by dividing the classroom or even the entire building into sections. Each section should have a single, clearly defined function, with sensory characteristics that align with it. The separation between these sections does not need to be strict, it can be achieved through furniture arrangement, changes in flooring or variations in lighting.

5- Transition Spaces: This criterion works with Spatial Sequencing and Sensory Zoning criteria. These are areas that help users recalibrate their senses as they transition from one level of stimulation to another. They may take the form of passageways, nodes that connects spaces or expand to become a complete sensory room that balances the users' senses.

6- Sensory Zoning: This criterion suggests that when designing for autism, spaces should be organized according to their sensory quality rather than their traditional functional divisions.

7- Safety: considerations must be taken with all building systems, material choices, surfaces, protective barriers, furniture, fixtures etc. It is best that all spaces also be visually accessible to allow safe monitoring of children at all times (Mostafa, Architecture for autism: Built environment performance in accordance to the autism ASPECTSS™ design index, 2015).

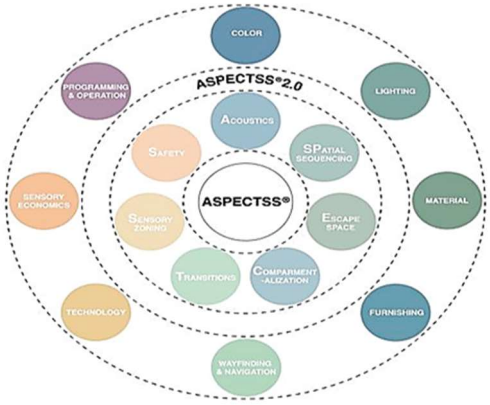

FIGURE 1. The seven aspects and complementary design element.

In summary this design index proposed that to create a built environment for autism one must calm it down, break it down into manageable experiences in discrete spaces, organize those spaces in a sensory and temporally logical flow and accommodate for sensory overload escape.

*** Research problem**

The lake of government-run autism centers although the high raised rates of autism worldwide and locally indicate a serious need to design and provide a special adapted autism-friendly buildings.

*** Research Objective**

This research aims to analyze the already existing autism centers and determinate a guiding tool or indicator to improve the built environment where the autism training takes place.

*** Research Objective**

There are no architectural approaches followed in the process of repurposing a building to be used as an autism center, its possible to improve those centers by following pre-certificated approach (ASPECTSS) to make the built environment more flexible, comfortable and specialized for autistic people needs.

*** Repurposed buildings for autism**

Many buildings with diverse uses undergo changes in function for several reasons, including economic factors, adapting to user's needs, or abandonment of their original function and failure to be utilized effectively. A building may lose its original designated function due to its incompatibility with the evolving context surrounding it, or because its space and dimensions become unsuitable for accommodating an increasing number of users over time (Lepel, 2006). Some of those changes are: -

1- Adaptation: This includes any major work to modify, repurpose, or upgrade a building to suit new conditions or requirements.

2- Decoration: This involves making something appear more attractive by placing items on or around it, such as covering walls or other surfaces in rooms or buildings with paint or wallpaper.

3- Improvement: This includes all actions aimed at enhancing the

performance, maintenance, or safety of a building element without changing its original function.

4- Maintenance: This includes all procedures taken throughout the life cycle of an element, aimed at keeping it in a condition that allows it to perform the required function, or restoring it to that condition.

5- Modification: This refers to all administrative and technical actions aimed at changing the function of a building element. (British Standards Institution, 2010)

The rapid increase in the prevalence of autism worldwide, and specifically in Iraq, has led to the adoption of a policy of repurposing buildings. As a result, centers have been established in converted homes to meet the needs of children by providing spaces for training and rehabilitation. The problem is that these centers are not architecturally designed to meet the needs of children with autism. The changes made to these buildings do not align with the design standards for autism-friendly environments. According to what trainers at one of the autism centers have agreed upon, in an interview by the researchers, this poorly designed environment distracts the children's focus and makes the rehabilitation process more difficult.

*** Research Methodology**

The study adopts a comparative analytical methodology aimed at analyzing and comparing the architectural designs of centers dedicated to children with autism, with those repurposed from homes, focusing on evaluating the extent to which these designs align with the cognitive and sensory needs of the children based on the (ASPECTSS) design criteria.

One example of repurposed autism centers is the Imam Hussein Autism Center, which is considered one of the oldest autism centers in Babylon Governorate and is part of a series of centers affiliated with the Imam Hussain Holy Shrine. The center operates with both morning and evening shifts to accommodate a large number of children suffering from speech problems, learning difficulties, and autism from the middle Euphrates region. It occupies an old house building with an area of (500) square meters, rooms are divided using partitions to create individual and group classrooms. The staff at the center, including training specialists and teachers, have noticed that the colors and details in the spaces do not meet the comfort needs of children with autism. There are also many visual stimuli that cause distractions for the children during

training and rehabilitation sessions, making the process consume more time and energy. One of the trainers stated in an interview that she removes all toys and distractions from the space before each training session, yet the children still get distracted due to the patterns on the floor coverings or walls, Fig.2.

FIGURE 2. Exterior and interior environment of the center.

The other example is Najaf Autism Center which was established in (2014) to accommodate autism and other disorders that accompany it. Originally, it is a house that had been modified into classes, as shown in Fig.3.

FIGURE 3. Interior and Exterior view of Al-Najaf Autism Center.

When examining the previous images and comparing them with the (ASPECTSS) principles for autism design, a significant difference becomes apparent between what has been implemented in the centers and what the principles advocate. Design modifications could be made based on these principles in the case of the repurposed center, as shown in Fig. 4,5.

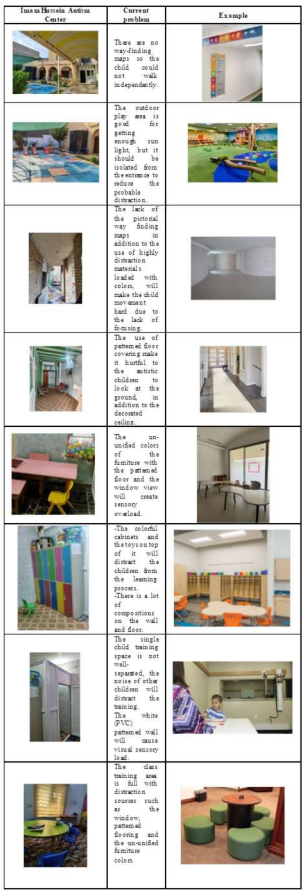

FIGURE 4. design problems within Babylon autism center.

An interview was conducted with the teachers who provide care and training for children with autism in the previously mentioned centers. The questions were directed regarding the most significant elements in the built environment that negatively affect the child's attention and act as distractions. Most of the responses were related to the colors used, the arrangement of classroom spaces, and the child's movement sequence. Most children prefer

continuous movement with clear visual and kinetic axes, without obstacles. Children also prefer the presence of quiet spaces where they can retreat when feeling overwhelmed by sensory stimuli. Additionally, the lack of designated cabinets for educational aids and visual materials was highlighted, and the issue of sound, as well as the absence of sound insulation, was noted as a major problem concerning increased attention span.

*** Recommendations for mentioned centers**

A standard classroom model for the Autism Center has been proposed as shown in Figure 5. The classroom consists of three main spaces, with the first space serving as the entry area. This space contains cabinets of a single color to minimize sensory stimuli and visual distractions for the children. Additionally, the first space offers the opportunity to preview the classroom's components before entering, which helps build self-confidence and reduces surprises that could lead to disruptions in the child.

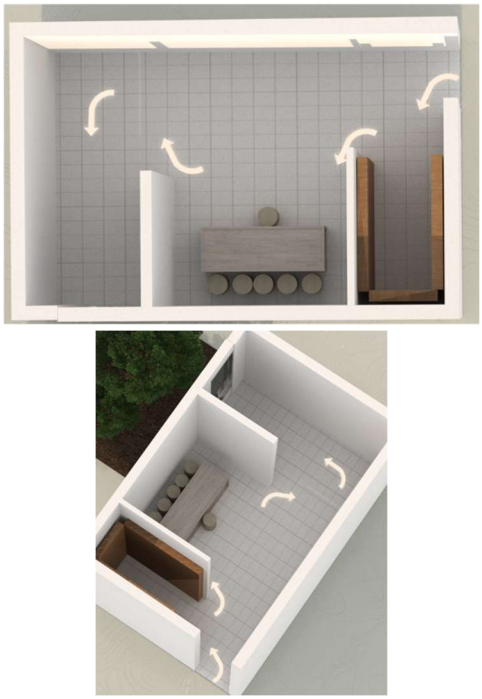

FIGURE 5. Proposed autism class model.

The second section forms the main space where group training takes place. It is noticeable that there are no windows in this section to avoid external distractions and noise. It is preferred to use as little furniture and color as possible in this area, so that color can be introduced through educational tools. The final area represents the motor skills training or play zone. A therapy swing can be placed near the window to serve as a safe space where children can retreat when seeking to regulate their senses, Fig.6.

It is preferred to use a calm, muted color palette that is neither saturated nor contrasting, as shown in the figure. The flooring can be reinforced with shock-absorbing

materials in soft colors, avoiding patterns.

FIGURE 6. Proposed autism class model.

* Conclusion

It is crucial to provide specially designed buildings, both externally and internally, to serve individuals with autism. This includes studying the selection of the optimal location, the impact of neighboring areas, and sources of environmental and noise pollution on the center. Additionally, the interior design should be carefully considered, following the previously mentioned standards. Economic conditions, the significant increase in the number of users or other reasons may lead to the adoption of repurposed autism centers from houses, commercial buildings or other structures. Although the process of changing the buildings use may not fully align with all design standards for autism, the principles can still be applied to improve the built environment. This can be done by making it the foundation for the rehabilitation process, paying attention to the proposed colors and finishing materials, focusing on cost-effective solutions for acoustic isolation, and providing safe spaces for children to balance their senses. These changes do not require structural alterations, such as providing swings, balance bridges, or small tents that offer partial privacy for the child.

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