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Review Article

School Architecture for Autism Children**Sepideh Sharif Khajepasha**^{*1}, Ebrahim Samin Sharifi M², Hadi Arezoumand³ and Kamal Saeidi M⁴¹PH.D Student in Architecture, Department of Art and Architecture, Shabestar Branch, Islamic Azad University, Shabestar, Iran²PH.D Student in Architecture, Department of Art and Architecture, Naghadeh Branch, Islamic Azad University, Naghadeh, Iran³Student of Architecture, Ayine Kamal University, Orumiyeh, Iran⁴Master of Architecture, Ayine Kamal University, Orumiyeh, Iran

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Shabestar Branch, Islamic Azad University, Shabestar, Iran***Article History:****Received:** 22/01/2017**Revised:** 06/02/2017**Accepted:** 06/02/2017**DOI:** <https://dx.doi.org/10.7439/ijbar.v8i3.3891>**Abstract**

Lately many researchers have done in relation to the link between architecture and autism or the autism likely environments which show that architecture could be effective in the states of the children suffering from autism disorders. The education center for the autism children need special spaces for education and treatment. Surveys in many Asian countries show that most of the care centers of the children suffering from autism are created by the changing the use of the spaces like houses or are created by adding some temporary walls to the spaces in spite of that the surveys show that environment affect treatment of these children. So, it is tried in this study to concentrate accurately on the autism child and also study the designing process of the elite educational spaces in the world. Then we will try to reach a suitable algorithm special for these children. The data gathering tools for this study are questionnaire, interview and close and direct contact with the autism children and interviewing their parents and related responsible people in different environments like rehabilitation centers for the autism children dependent to the Welfare Organization. In addition using questionnaire was for recording the behavior, movements and child relations with the people around. And when the identification stage of the research audience (the Autism child) ends it is tried finally to present suitable spatial and physical ideas for designing the educational spaces and to achieve health specially creativeness.

Keywords: Architecture, Autism child, Designing pattern, Educational space.**1. Introduction**

No remedy is found yet to prevent children suffering from autism. But if the treatment is done at the right time the illness is improved and the social and verbal skills of the child are progressed [1].

If a child suffers from autism it is possible to go to the consultants and the specialists to get familiar with the different ways of treatment and the right time for it and make the world easier for him/her and prevent increasing the autism illness. Autism is seen all around the world and is seen more in boys than girls. In other words race, living place, education level, financial status, religious beliefs and living method do not play any role in autism. Parents should

know that what is more important than the title of the illness is to cure it. It must be taken into consideration that these children can learn, behave correctly and live like normal people in future if they get the right and on time treatment. But achieving these goals need the right and on time treatment, tolerating the problems and the troubles of the treatment period. Although the reasons of autism are unknown it is possible to use architecture to treat these children and the supporting organizations must create such centers to help families succoring these innocent children [2].

2. Research Method

This research is an interdisciplinary one which means architecture and psychology that uses the survey method- observing, close and direct relation with the autism children and interviewing their parents and responsible people in relation with these children in rehabilitation centers like Welfare Organization and in addition using the questionnaire to record the behavior, movements and the communicating method of the child with others. And when the identification stage of the research audience (the Autism child) ends it is tried finally to present suitable spatial and physical ideas for designing the educational spaces and to achieve health specially creativeness.

3. What is Autism?

The children suffering from autism refuse to get in relation with the peers. They cannot share their thoughts, emotions or their tendencies with others. Their world is identified by their isolation preferences in which they are not aware of others even their siblings or parents. The autism child even lacks the ability to play with peers. The people [2] suffering this disorder which starts before three years old, suffer from the abnormal or delayed operations in social interactions, spoken language or playing [3].

4. Autism Features

- 1) Delay in learning to talk or even not speaking at all
- 2) The child may be seem deaf but the audiometric tests show everything is normal
- 3) Different behaviors, interests and the repeated games. For example continuous swinging, abnormal interest in some objects or getting annoyed if the routine living program is changed.
- 4) Inability in saying the name, making eye contact, avoiding being pampered, hugged or avoiding getting help.
- 5) Inability in starting conversation or talking with others or inability in maintaining talking.
- 6) Being sensitive to light, voice or being touched and also being unconscious toward ache.
- 7) Amazing food habits like eating some limited types of food or eating non-eatable things like chalk or soil.
- 8) Self-mutilation behaviors like beating the head to earth or walls or by the hands [4].

5. Taking a look at the architecture theories

Hinder says it is very important to have enough information of the experience of the autistic children about environment, people or the things around them while designing spaces for them. Jim Taylor says: Architectures were trying to design a room in which children or the

student could refer when they are stressed or when they need loneliness. These rooms are called “snoozelin”. We disagreed this theory because we wanted students to be in their social situation even when they give up and don’t feel single lonely. So these rooms are very suitable places for this goal. Plimley pretends that the students select the paintings in which electrical and computer accessories are used to provide the virtual world. It seems that computers are highly favored even among the autistic children. The employees believe that the vast and big windows lead more light and then distractions among students. So, the employees use the matt plates to prevent this. The architectures try to use the controllable curtains by the employees to prevent this. The researches show that green color holds relaxing effect on autistic children and adults. [2] Jin says in addition to paying attention to the mental specifications, it is important to create an immune situation in such an environment to meet the needs of the children in the designed spaces. On the other hand such environments must be designed which can challenge the mind of the autistic child and be effective in the child’s treatment and also education. It is possible to improve eyesight using different colors and forms, and also use the different textures on the walls or the floor to improve the sense of touch in the child. It must be mentioned that to improve hearing sense using the hard surfaces or create dispersion in audio echo which improves the curiosity sense of the child. It is also true about the olfactory that keeping children in situations in which the smells are identified and the things are diagnosed from each other. It must be pointed that to provide physical health the furniture of the space must be in conformity to the body size of the children [2].

6. General needs of the autism child in designing the educational spaces

- 1) Need for regular and simple environments which hold suitable empty spaces
- 2) Need for combination of the small and large spaces
- 3) Need for environmental situations which are highly controllable by the employees
- 4) Need for different educational methods for autism
- 5) Need for balancing the situation between security and independency
- 6) Suitable use of technology to help progress of learning in autistic children [2]

7. The general bases of designing the building to prevent bewilderment and stress

- 1) The building must be designed in a simple form in which it would be possible to find regularity, relaxation and the paths and points easily

- 2) Designing the simple environments which hold less stimulating sense to reduce stress and worries of children
- 3) Using the simple walls and floors with soft colors and no decoration
- 4) Simple integration and reduction of the details in designing which can prevent aggression in children [2]
- 5) It is better to place the paintings of children along the corridors which give personal sense of the environment to the children and not the organizational space [2]
- 6) Autistic children are classified into two groups, some of them fear the big and open spaces and wish for smaller rooms and some others are dissatisfied by the closed rooms, so the two types of the spaces must be considered [2]
- 7) The direct light and the noises and other factors leading annoying must be prevented seriously (like the deadlock corridors, superficies and easily seen piping and etc.)
- 8) Creating a balanced and controllable acoustic environment because the voice of children holds high frequency
- 9) Installing monitors in classes which play natural views with sound lively
- 10) It is better to use the circulating spaces as the halls instead of using corridors for relating the spaces.

8. The bases of designing the classrooms

- 1) For extended use of the visual icons the classes must hold cork board. Because the autistic children need special forms of teaching in comparison to the other children; especially the iconic teaching is very important [2].
- 2) The classrooms must be settled in a way that the teachers to be able to teach in groups or privately.
- 3) It is better for the classrooms be smaller than the common ones and place maximum 6 students in it. Also the classes must have fewer places for one to one teaching and smaller groups. It is better that these classes be separated by the glass panels (or plastic) and then by this method the child will not feel loneliness or being away from the environment.
- 4) All classes must be acoustic and standard isolated (150 mm dense concrete wall and 19 mm dense plaster at both sides) [2]
- 5) The individual desks must be placed in classes which are separated by the walls and make any student work independently
- 6) The direct light and the noises and other factors leading annoying must be prevented seriously (like the deadlock corridors, superficies and easily seen piping and etc.)

- 7) The windows in classes must be designed from floor to the ceiling and the natural light and view of the private yard must be seen. The skylights must be used as the lighting and ventilation systems [2]
- 8) It is prohibited to design the tight, dark or poky spaces because they can increase the stress level, decrease the operation, increase the aggressive behaviors and deteriorate the inter personal relationships.
- 9) The floors of the classrooms must be paved with carpet and this will reduce the voice echo.

9. Elements of Treatment- Educational spaces

- 1) Designing the computer site room for better use of technology to help learning in autistic children
- 2) Designing a little cinema to watch cartoons [5]
- 3) Paying attention to the educational classes including treating mind, rehabilitation, speech therapy, music therapy, games therapy, theatre therapy
- 4) Designing a space including ball pool in which children would be able to physically practice exercises in any weather

10. How to apply colors?

- 1) It is better that the selected color for the walls and the floors of the classrooms to be completely neutral and the only exception place is the entrance of the unit in which the green color to create a favorite and relaxing space.
- 2) Using the light colors in some places to simulate the sense of sight for treatment of sight problems [6]
- 3) Using the pink and violet tonalities which hold the most positive effect for the autistic children

11. The security points in designing

- 1) Using the double knob doors one established high and the other at lower place (children could not be prisoner in classes except in security matters) [7]
- 2) The doors, windows, glasses, pipes and the cables must hold the upmost security [8]
- 3) The material used on the surfaces must be tough
- 4) All the used colors and the adhesives must be non-poisonous and be based on water [9]
- 5) The yard and the corridors must be controlled by the closed circuit cameras and the telecommunication devices
- 6) It is better for the place to be designed in one single floor
- 7) The high and sharp cornered podiums must not be used
- 8) The open spaces for the children must not be opened to the street

12. The bases of designing the green spaces

- 1) The trees must be planted which do not odor
- 2) The barbed plants must not be planted as they may lead to injuries in children
- 3) The poisonous plants must be avoided as the children sometimes explore the world by tasting

13. Conclusion

Although the reasons of autism are unknown it is possible to use architecture to treat these children and the supporting organizations must create such centers to help families succoring these innocent children. In fact the aim of this study is to introduce a group of the society which less attention is paid to it and the second aim is to achieve the standards and the regulations of designing a space which meets the needs of these children. In this paper some designing points for increasing the learning capacity of autistic children are presented and it is clear that it is very important to be aware of the subject for suitable designs. The architectures try to build and create the environments in which the children would be able to explore the environment and achieve the global experiences by special methods through different ways. On the other hand they must design the spaces in which the mind of the user (autistic child) is challenged and is effective in education and treatment of the child. Finally it is about designing a space for education and treatment of all children who are not able to use the normal education plans because of mental, physical and emotional considerations.

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