



An Approach to the Design Criteria of Autism Education Centres

Diyarbakır Sample

Mine BARAN¹, Aysel YILMAZ² & Meltem ERBAŞ³

Keywords

Autism, Autism
Education Centres,
Planning.

Abstract

Children with autism, with their increasing proportion in the population, represent a group whose need for education cannot be ignored. There is an increasing interest in places which children with autism need for communication, or for training to fulfil their daily requirements. Especially, in our country it is seen that although there are training centres for children with autism, most of them have shortages in terms of technique or design. Therefore, the target audience is unable to get the full benefit from these centres, and thus there is a need to conduct more research and awareness activities for children with autism and training centres. Diyarbakır can be considered among our cities with insufficient autism education centres. Therefore, the study is based on first the common design criteria that may be required in planning an autism centre, and then evaluating Diyarbakır by domestic and international sampling in line with such criteria, and lastly, preparing a pilot project proposal at Diyarbakır centre. It is considered that the research to be done in line with these evaluations shall contribute to the studies to be conducted in similar areas.

Article History

Received
20 Oct, 2017
Accepted
15 Nov, 2017

1. Introduction

Architecture is a discipline that can generate designs that respond to human-environment interaction. The design process must provide solutions that encompass not only normal individuals, but those who are physically or emotionally handicapped as well. The individuals at issue here are the children with autism (Autism Spectrum Disorder).

Autism is a pervasive developmental disorder which starts early in life and manifested by delays, deficiencies or deviation in social relationships, communication, behaviour or cognition (Doğangün, 2008). According data from Centres for Disease Control and Prevention in 2006, 1 in every 150 children had Autism, in 2012 1 in every 88 children had Autism. According to the last available information, in 2014 1 in every 68 children had Autism (Centres for Disease

¹ Corresponding Author. Associate professor, Department of Architecture, Dicle University, mbaran40@gmail.com

² Lecturer, Department of Architecture, Dicle University

³ Research assistant, Department of Architecture, Dicle University

Control Prevention,2012). The most important treatment for autism today is special education. There is an increasing interest in places where children with autism can fulfil their communication and daily needs, and get education. Early identification of these children and initiating the appropriate education is crucial for the course of the condition and mitigating the problems that might be encountered in the subsequent periods.

It is estimated that there are approximately 450,000 people with autism in our country. But the current number of schools is insufficient to fulfil the needs of such demand from students. Especially, in our country it is seen that although there are training centres for children with autism, most of them have planning and technical shortages. Therefore, the target audience is not able to fully benefit from these centres, and thus there is a need for more research and awareness activities in the field of child autism and education centres. Also, there is a lack of criteria in the design and audit stages in order to establish such centres and the centres are evaluated according to the regulations on Special Education and Rehabilitation Centres of the Ministry of National Education, and there isn't any special, detailed regulation for autism education centres.

1.1. Common Design Criteria at Autism Education Centres; literature review

The current up-to-date literature has been evaluated in order to determine the design criteria for establishing education centres for children with ASD. (Harker & King 2002, Khare & Mullick, 2008, Young, 2004, Humphreys 2005, Whitehurst 2006, Mostafa 2008, Vogel 2008).

While the characteristics and behaviour types of children with ASD can sometimes vary, the centres built for them must have properties that promote education and developing their skills. The design criteria which are being formed have been tackled within the framework of the commonly used criteria which are considered important, and the criteria have been examined in 8 sub-headings as follows:

- Flexibility- adaptability
- Intimate-balanced
- Calm, order and simplicity,
- Predictability- max. visual quality,
- Specialised location or areas
- Appropriate to emotional development
- Safety
- Naturalness

were used to examine the criteria.

2. Materials and Method

In the first phase of the study, a literature review of the common design criteria that may be required in planning the autism education centres is carried out and domestic and foreign models have been evaluated according to these criteria (Table 2). Then, a pilot study specific to Diyarbakır has been carried out in line

with this evaluation. It is stated that there are approximately 600 autistic children throughout the city (according to the 2015 data from the City Health Department, National Health Department). However, despite this population density, Diyarbakır can be considered among our cities with insufficient autism education centres. Children with ASD receive education at an education centre at the city's centre which has been converted from a primary school building, and 26 private education and rehabilitation centres (together with children with different diagnosis) and in integration classrooms at schools.

The school considered for the pilot study is a centre where only the children with ASD get education. In this study, first an analysis of the selected design criteria has been made and a questionnaire has been filled out by the families and the educators who are primarily responsible for the education of these children. The questionnaire work at the centre has been done on different days and times selected randomly. In order for the results to constitute data in this subject in the future, a model project proposal at the central district of Diyarbakır according to the selected guidelines (Table 1). For this purpose, a residential area inside Dicle University away from the crowded structure of the city was chosen, considering the relationship with the university. Importance was attached to have the residential area located at a point which was isolated from the city, but close to the communication network with the city.

Table 1. Design Phase of the Autism Education Centre

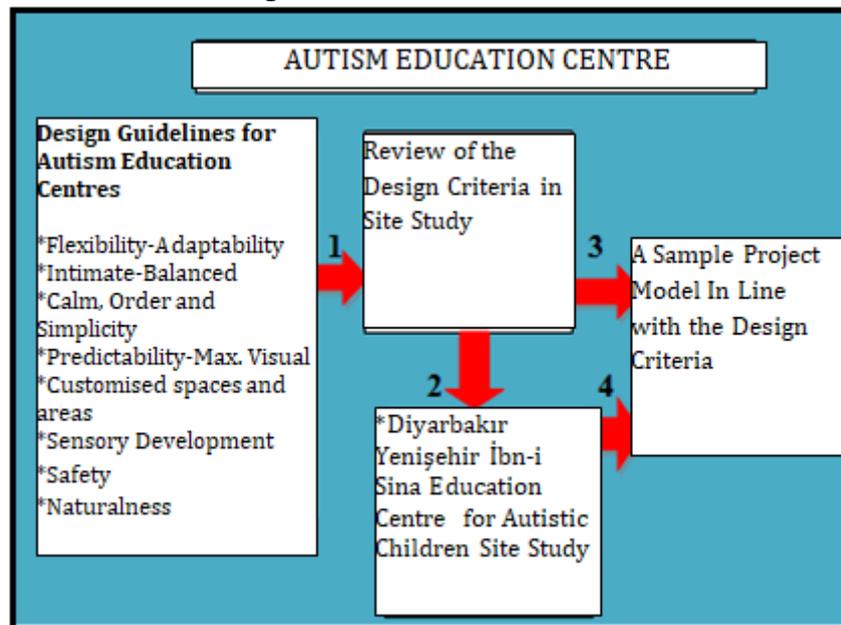


Table 2. Common design criteria, solutions and sampling table for autism education centres

DESIGN CRITERIA FOR AUTISM EDUCATION CENTRES				
	1- FLEXIBILITY - ADAPTABILITY	2- INTIMATE - BALANCED	3-CALM, ORDER AND SIMPLICITY	4-PREDICTABILITY - MAX. VISUAL
CONCEPTUAL FRAMEWORK	Flexibility in design and equipment is likely to help accelerate the developmental and educational capacity of the children with ASD and allow increased personal skills and self-esteem through various activities. (Lynch, 1998)	For an autistic individual to feel comfortable, the environment they are in shouldn't be perceived as an institution. This could only be done by designing the educational centre similar to their homes (Humphreys, 2005).	In order to reduce the hypersensitivity in children with ASD simple spatial arrangements and solutions, which are not distractive will help them feel comfortable both auditory and visually. A clean, plain and peaceful lay out, instead of irrelevant stimuli, will help these children focus their attention. (Scott, 2009; Khare & Mullick, 2008).	Predictability in design is especially important for the autistic children which need visual support. Primarily the orientation problems should also be able to produce solutions for this matter. From an architectural design standpoint, a clear educational centre together with readable, foreseeable, imaginable elements should be provided (Scott, 2009)
SAMPLING	 <p>Sunfield Autism School- England</p>  <p>Özel Tohum Vakfi Special Education School/Turkey</p>	 <p>Southwest Autism and Research Centre- USA</p>  <p>Koç Autism School/Turkey</p>	 <p>İstanbul Özel Tohum Vakfi Special Education School/Turkey</p>  <p>Sunfield Autism School- England</p>	 <p>Özel Tohum Vakfi Special Education School/Turkey</p>  <p>Washington State University Autism Centre / USA</p>
DESIGN SOLUTIONS	Mobile boards or platforms and empty spaces can be created in order allow the children with ASD to make changeable arrangements. The classrooms should be designed at least between 5 - 8 m ² and accommodate 8 students maximum in order to prevent a sense of being stuck in children in small spaces (Scott, 2009)	Furniture with suitable colours should be used in order to help them feel themselves comfortable around the designed education centre. Also, it is more appropriate not to arrange it like an institution.	In design, the classrooms should be away from noisy areas which can distract attention such as sport areas, cafeterias. Acoustics of these locations must be taken into account and especially the distractive lighting must be replaced and natural light should be used as much as possible. Having and labelling adequate storage areas will facilitate the autistic children perception (Humphreys, 2005, Mostafa, 2014)	It is important to design the areas of the centre which are used intensively are easy to find. It is especially important in the design of the centre that the areas which are intensely used are easy to find. Numbers, signs and pathways must be used to help an autistic child in orientation together with shapes and maps, when required (Vogel, 2008).

	5- CUSTOMISED AREAS OR SPACES	6- EMOTIONAL DEVELOPMENT	7- SAFETY	8- NATURALNESS
CONCEPTUAL FRAMEWORK	As the autistic children have certain social problems, personal space may have more priority for them compared to normally developing children. Therefore, autistic individuals have generally stated that a narrow, confined space close to them gives them a sense of control and freedom. (Davis & Dubie, 2004) "At one point, the architects proposed a special or therapy room where a child can calm down" (Scott, 2009)	The children with ASD need sensory information that will increase their focus in educational areas. Therefore, a child must be provided with opportunities to explore in every environment in the school. (Ayes, 2005). Also, areas where these children can play freely will support their development (Mostafa, 2008).	As the autistic children are prone to crisis or behaviour such as hand flapping and tantrums that may hurt themselves and people around them, the designers and the teachers should pay attention both to physical safety (cabling, open staircases, unfiltered windows, loose floors, toxic paints, etc.) and emotional safety (Khare, R. & Mullick, A. 2009).	As feeling at home will allow for relaxation in the children and enable more learning, the centre should be designed not like an institution but suitable colours (warm colours, skin colour tones and pastels) should be used, and since green and blue are said to have a calming effect on autistic individuals, it should be turned into an intimate place with plants and natural objects (Humphreys, 2005).
SAMPLING	 <p>Haus Bucken Autism Educational Centre/ Germany(Vogel, 2008)</p>  <p>İstanbul Dr Senai Demirci Autism Educational Centre /Turkey</p>	 <p>Wisconsin Autism School/USA</p>  <p>İstanbul Özel Tohum Vakfi Special Education School/Turkey</p>	 <p>Maia Autisme Okulu/ French(Vogel, 2008)</p>  <p>İstanbul Özel Tohum Vakfi Special Education School/Turkey</p>	 <p>Haus Bucken Autism Educational Centre/ Germany(Vogel, 2008)</p>  <p>İstanbul Özel Tohum Vakfi Special Education School/Turkey</p>
DESIGN SOLUTIONS	A quiet corner half separate, half interconnected or highly controlled where children who are overwhelmed by other people can stay for some time can be formed. This sometimes can be a space inside the centre or a separate area in the classroom (Scott, 2009).	Activities that include jumping, spinning, skipping, rocking, hanging or pushing, or watching the water, getting rest or touching which will participate in the emotional and motor development of the children with ASD should be created. (Ayes, 2005).	The design of the education centres must be away from sharp corners and uncontrolled areas. The floors must be covered with carpets or vinyl covering to prevent injuries and the shelves must be secured to walls or ground, sliding doors and cabinets must be used and windows can be electronically locked, when required (Khare, R. & Mullick, A. 2009).	Gathering areas which will give the autistic children a sense of a home living room must be designed and a sense of softness must be created with colours, furniture, lighting and materials chosen and learning must be encouraged with lower mirrors, plants, art areas (Humphreys, 2005).

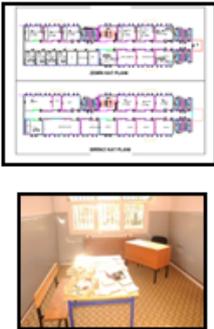
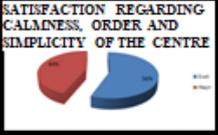
3. A Study For An Autism School in Diyarbakır In Line With the Selected Criteria

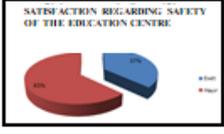
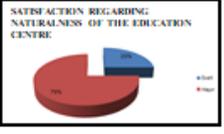
The study covers Diyarbakır İbni Sina OÇEM (Autistic Children Education Centre). İbni Sina Autistic Children Education Centre, which is located at the 3rd kilometre of Diyarbakır-Elazığ highway, is converted from 12 classrooms and attached building of the formerly known Şair Nesimi İlköğretim Okulu. OÇEM is two storeys and comprised of administrative and general service areas inside a courtyard. The centre which started operations in 2012 provides service to 43 students in 9 classrooms. The students aged between 4 and 15 are comprised of 19 boys and 14 girls.

Mine Okur, the Founder President of DOM-DER (Diyarbakır Autism Centre Association) and a mother of a autistic child, Prof. Dr Nahit Motavalli Mukaddes, Specialist in Child and Adolescent Psychiatry, and Prof. Dr Ahmet Yaramış, Child Neurologist, emphasize that the most important treatment for autism is education, but the education provided in the centre is very insufficient. In Europe, while the hours of education is 8-9 hours a day, it is 8 or 9 hours a month (2 days for 45 minutes) at the centre.

An analysis table has been formed with respect to the selected design criteria in this study. In architectural design, satisfaction questionnaires are considered an important source of data so satisfaction related to the design criteria of a group of 43 parents and 8 educators (a total of 51 persons) were examined and the results are expressed in graphics (Table 3).

Table 3. A Study and Satisfaction Analysis of Diyarbakır Autism School According to the Selected Criteria

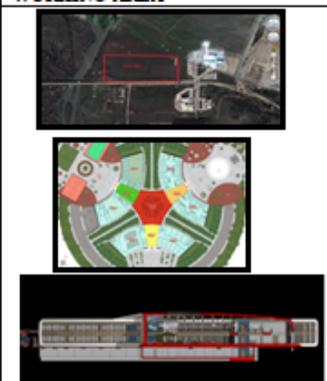
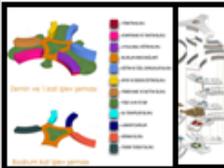
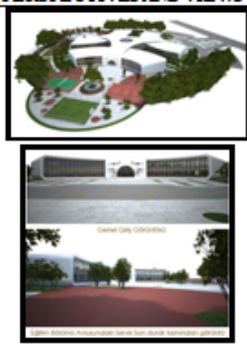
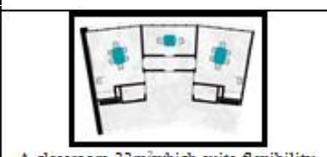
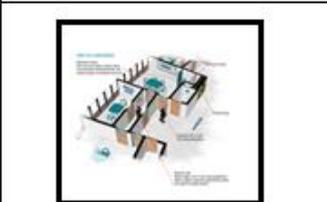
ANALYSIS DIYARBAKIR IBNI SINA EDUCATION CENTRE FOR CHILDREN WITH AUTISM				
DESIGN CRITERIA	1- FLEXIBILITY	2. INTIMATE- BALANCED	3. CALM-ORDER AND SIMPLICITY	4. MAX VISUAL
ANALYSIS	<p>- The classrooms doesn't allow for a flexible environment required for different needs.</p> <p>-Furniture and spatial arrangements are for one way activities - Although there is a partial storage area, different arrangements are sufficient as there aren't mobile platforms.</p>	<p>- The place doesn't establish confidence for face to face communication and interaction.</p> <p>- The colours, furniture and other objects in the education centre are just like an institution so that the autistic individuals do not feel comfortable as if they are in their homes, resulting in them becoming nervous.</p>	<p>The attention of the children can easily be distracted as the wall objects and applications may make the place look disorderly. As a result, they cannot get comfortable audio-visually</p> <p>The classroom relatively provides a hygiene environment by being clean and odourless.</p>	<p>Although predictability (foreseeability) is an important factor for students with ASD are visually inclined, it is used very little in the classrooms of the education centre examined.</p> <p>The corridors and playing areas lack direction signs.</p>
SAMPLING				
SATISFACTION ANALYSIS				
DESIGN SOLUTIONS	<p>As seen from above, the satisfaction related to the education centre design criteria is 11%. Therefore, a design according to the changes in the needs of the children should be done for new arrangements by the children and the place should be divided in sub-units.</p>	<p>As the satisfaction according to intimacy and balance of the centre is 21% negative, the arrangement of the physical location should be pleasant and encouraging and they should feel at home. Having objects such as closets, calendars or family photos that belong to children can help children feel safe.</p>	<p>56% is not satisfied when the education centre is assessed according to calmness, order and simplicity. Therefore, an audio-visual classroom setting free from disorder (built-in closets) should be provided</p> <p>The place should allow for the order that will reduce emotional excess.</p>	<p>The satisfaction related to predictability is 12% when the analysis is evaluated.</p> <p>An environment which minimised orientation disorder and space-time confusion should be provided in the structure.</p>

DESIGN CRITERIA	5- CUSTOMISED SPACES AND AREAS	6- EMOTIONAL DEVELOPMENT AND SUITABILITY TO INTEGRATION	7. SAFETY	8. NATURALNESS
ANALYSIS	<p>The classrooms lack spaces which are formed for a controllable sense of safety.</p> <p>Personal areas or objects (closets, etc.) are not considered.</p> <p>There isn't a withdrawal room or a therapy room where a child can calm down and step back in the education centre.</p>	<p>OÇEM building is organised like a typical primary school buildings without any spaces suitable for sensory and motor developments or allow for exploring the environment by the children.</p> <p>The outdoor location is for playing activities but the indoors lack arrangements which are tactile and arouse interest.</p>	<p>The construction materials used in the classrooms are partly natural, and there are also artificial fixtures and furniture. Floor covering are partly carpet and some classes have tile floorings. This leads to disabilities in children due to falls.</p> <p>The safety of the children is ensured with the use of iron bars at the windows, but this can be at a level that is visually uncomfortable.</p>	<p>The classrooms designed with catalogue furniture are equipped for general primary schools, not for this special group.</p> <p>Arrangements that will help children feel at home are not considered and an institutional ambience is created by the use of cold colours and lighting, such as white and grey.</p>
SAMPLING				
SATISFACTION ANALYSIS	<p>SATISFACTION REGARDING CUSTOMISED SPACES AND AREAS IN THE EDUCATION CENTRE</p> 	<p>SATISFACTION REGARDING COMPLIANCE OF THE EDUCATION CENTRE WITH SENSORY DEVELOPMENT AND INTEGRATION</p> 	<p>SATISFACTION REGARDING SAFETY OF THE EDUCATION CENTRE</p> 	<p>SATISFACTION REGARDING NATURALNESS OF THE EDUCATION CENTRE</p> 
DESIGN SOLUTIONS	<p>At the result of the satisfaction analysis, the customised areas and spaces are found to be 71% deficient.</p> <p>More spatial arrangements which provide different ways for the children to explore the spatial relationship with their own bodies. Quiet corners or withdrawal rooms, half separated, half interconnected or highly controlled where children overwhelmed by other people can stay for some time.</p>	<p>Sensory development and integration suitability was evaluated as 84% insufficient.</p> <p>Therefore, there must be places for activities such as jumping, pulling, rocking, hanging or pushing in the education centre.</p> <p>There can be areas such as ball pools can be created inside the spaces.</p> <p>Also, natural materials and equipment that provide a deep tactile pressure must be preferred in such areas.</p>	<p>Although it is found 63% safe, environment and equipment elements which prevent bodily damage as much as possible, and which are comforting should be used.</p> <ul style="list-style-type: none"> - Carpets and vinyl flooring can be preferred due to high durability and protection. -For walls, non-toxic water based paints and materials can be used. - An electronic locking system can be established for safety at the windows. 	<p>75% didn't perceive the education centre as natural.</p> <p>Therefore, using earthy and pastel colours that create a sense of softness in paints, furniture and lighting in classes and connection areas will have a soothing effect.</p> <ul style="list-style-type: none"> - Planning the classrooms with green or water elements from the nature will provide a warm environment.

4. In Case Study: A Project For Design Criteria

In this section, we provide a project proposal for the selected design criteria and the project is analysed according to the design criteria (Table 4)

Table 4. Diyarbakir Autism Education Centre Sample Project Model and Analysis

PROJECT PROPOSAL FOR AN EDUCATION CENTRE FOR CHILDREN WITH AUTISM			
WORKING AREA	PROJECT DETAILS	DESIGN PHASE	PERSPECTIVES AND VIEWS
	<p>A residential area of 26,000 m² on a land of 50,000 m² has been arranged. The user profile consists of children aged between 5 and 12. The capacity of the education centre is for a total of 140 students, with 16 classrooms for 5 students each.</p> 	<p>The concept of the centre has been developed from a few opinions taking into consideration the special needs of autistic children. The first one took inspiration from dolphins that are vulnerable on land, but can demonstrate its skills in the sea. The second one emphasized on the circle in order to be open to the public. Circle is a naturally closed form. In order to represent opening out, the circle is broken into pieces and the spokes are embracing the outside.</p> 	
SITUATION PLAN	BASEMENT PLAN	GROUND FLOOR PLAN	FIRST FLOOR PLAN
			
PROPOSAL PROJECT ACCORDING TO THE DESIGN CRITERIA			
<p>1- FLEXIBILITY</p> <p>The classrooms are designed in at least 5 m² and for 5 persons. Also, they are designed in a way that the locations might be used for different purposes in the education of autistic individuals.</p>  <p>A classroom 33m² which suits flexibility criteria</p>	<p>2. INTIMATE- BALANCED</p> <p>The design of the education centre gave particular importance to being comfortable like at home. Rooms, closets, objects that belong to the children are established. Also, being institutional is avoided for the children to feel safe just like with their families.</p> 	<p>3. CALM-ORDER- SIMPLICITY</p> <p>The design provides acoustics that separates the noisy, half noisy and calm spaces to provide calmness in a way that will not distract the autistic children. In addition, a complex, confusing structure is avoided in the proposed education centre.</p> 	<p>4. MAX VISUAL</p> <p>The autistic children will find directions easily due to strong functional grouping in the design. Besides, there are zigzag calls to easily find out the classrooms along the education block.</p> 
<p>5- CUSTOMISED</p> <p>Special areas where the autistic children can calm down and be on their own are designed in the proposed project. Also, there are only objects that belong to them in those areas, such as personal object, closets, etc.</p> 	<p>6- SENSORY DEVELOPMENT</p> <p>As the autistic individuals need sensory information which will increase their attention, areas made of natural materials which allow for activities such as jumping, skipping, rocking and hanging, and for exploring inside and outside the education centre.</p> 	<p>7. SAFETY</p> <p>A design free from sharp corners and uncontrolled areas is developed for the education centre. An environment and equipment which protect against bodily injury is used as much as possible. The entire facade surrounds the entire building like a shell and any automated system for safety can be easily established. Automated doors and windows, cameras can all be controlled from a centre.</p> 	<p>8. NATURALNESS</p> <p>The centre is designed in a way that will help calming and learning by making children feel at home and turned into an intimate place with the use of warm colours, skin colours and pastel tones as well as plants and natural objects as green and blue is known to have calming effects on children.</p> 

5. Conclusion

Architecture is the art of creating spaces that respond to all kinds of needs.

In recent years, despite many research made in relation to autism, it is seen that there are deficiencies in built-in environment literature and the structural solutions for autistic individuals.

It is obvious that further analysis and evaluation of the architectural structures which are suitable to the needs of the autistic individuals and which are built and designed for them are required. Therefore, the research on this issue must be fostered.

Taking into account the increasing prevalence of autism and the importance of education in treatment, it is essential to create a high level of awareness of autism. Although autism is a developmental disorder with variable parameters, this study has been done in line with the commonly used criteria in the design of the education centres for autistic children rather than those criteria which have accuracy..

At the result of this study, attention was drawn to;

- Carrying out the planning activities in line with the common design criteria,
- Taking into account the opinions of the families and educators of the children, even the psychologist and the users with ASD at the centre, if possible,
- Emphasizing the importance of the educational environment for autism,
- Making such studies widespread,
- Enactment of more detailed regulations specific to autism education centres.

As a result, it is hoped that the evaluations and the project model created for a centre that may be built in the future for these individuals will contribute to the works to be done on this subject.

Knowledge

This study is being sponsored by Scientific Research Project Division (Project no:13-MİMF-105), Dicle University

References

- Centres for Disease Control Prevention, (2006)
- Davis, K. & Dubie, M. (2004). Sensory integration: Tips to consider, *The Reporter* 9(3): 3–8. Khare, R. & Mullick, A. (2009). Incorporating the behavioural dimension in designing inclusive learning environment for autism, *International Journal of Architectural Research* 3(3): 45–64.
- Doğangün, B., (2008), Özel Eğitim Gerektiren Psikiyatrik Durumlar, İ.Ü. Cerrahpaşa Tıp Fakültesi Sürekli Tıp Eğitimi Etkinlikler, Türkiye’de Sık Karşılaşılan Psikiyatrik Hastalıklar Sempozyum Dizisi No:62 ,S:157-174 (Psychiatric Conditions that Require Special Education, İ.Ü. Faculty of Medicine, Continuous Medical Training Events, Common Psychiatric Diseases in Turkey, Symposium Series No:62, P:157-174)
- Harker, M & King, N. (2002). *Designing for Special Needs*. London: RIBA Press.
- Humphreys, S. (2005, Feb/March). *Autism & Architecture*. *Autism London Bulletin*. 7-8
- Khare, R. & Mullick, A. (2008). Educational spaces for children with autism: design development process, CIB W 084 Proceedings, *Building Comfortable and Liveable Environment for All*, Atlanta, USA, pp. 66–75.
- Lynch, K. (1998). *The image of the city*, Gustavo Gili, Barcelona. Montaner i Martorell, J. (2002). *Modernity surpassed: architecture, art, and thought of the 20th century*, Gustavo Gili, Barcelona.
- Mostafa, M. (2008) *An Architecture for Autism: Concepts of Design Intervention for the Autistic User*. *International Journal of Architectural Research iJAR*. Vol. 2 (1) 189-211.
- Scott, I. (2009). *Designing learning spaces for children on the autism spectrum*, *Good Autism Practice* 10(1): 36–51.
- Vogel, C. (2008) *Classroom Design for Living & Learning with Autism*. *Autism Aspergers Digest*, May-June. Retrieved 01-07-09 from <http://www.designshare.com/index.php/archives/901>
- Whitehurst T. (2006b). *The impact of building design on children with autistic spectrum disorders*. Sunfield School: Sunfield Research Institute.
- Young, E. (2004). *Special Deeds*. *RIBA Journal* July, 58-60

© Copyright of Journal of Current Researches on Social Science is the property of Strategic Research Academy and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.