

EDUCATIONAL BUILDING FACILITIES FOR CHILDREN WITH AUTISM IN MALAYSIA

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Article history

Received

28 June 2015

Received in revised form

2 September 2015

Accepted

21 December 2015

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Graphical abstract

Respondent	Position	Working Experience
TEACH 1	School Principal	15 years
TEACH 2	Teacher	7 years
TEACH 3	School Manager	5 years
TEACH 4	Program Coordinator	15 years
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TEACH 6	Teacher	8 years

Abstract

Autism Spectrum Disorder (ASD) is a general term used for a group of people who suffer from complex disorders of neural development. Individual with autism face the problem of development disability where it significantly affects their communication, social interaction as well as behaviour. Besides that, autism also associated with learning ability where it depends on their severity. In response to a growing number of children with autism, the action should be taken to address the needs and problems of these individuals. Therefore, it is essential to provide a conducive environment to enhance their performance especially in terms of learning. This paper unveils the theoretical framework of the study which incorporates existing policies and initiatives regarding to building facilities in Malaysia as well as variables in order to enhance learning environment of children with autism within the context of educational facilities. A qualitative research method has been applied to achieve the objectives of this research. Preliminary findings were gathered through semi-structured interviews with teachers that deal with children with autism. The result indicates that building construction and environmental services have a great influence on children with autism especially in learning.

Keywords: Educational building facilities, Children with Autism

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1.0 INTRODUCTION

Malaysia has been actively involved in providing accessibility in term of facilities for disabled since the country endorsed the Convention on the Right of the child (CRC) in 1995. Consequently, of its obligation under the CRC, Malaysia enacted Acts regarding person with disabilities. According to Person with Disabilities Act 2008, person with disabilities encompasses those who have long-term physical, mental, intellectual or sensory impairment that may prevent them from full participation in society. Therefore, autism also can be categorized into the group of person with disabilities where it can be characterized by different degrees of learning disability. Research consistently shows that people with autism are significantly impaired in their adaptive functioning, which is, the ability to have fulfilling

relationships with peers, family members and more widely, to achieve expected levels in schools, gain skills for some degree of independent living and take part in community activities [1]. Therefore, learning environment can become difficult, confusing and sometimes threatening for children with autism [2].

In order to enhance the development of children with autism learning environment has become an important constituent because research has proven that the quality of educational facilities affects learning outcomes and the individuals within the building. Since the rate of children diagnosed with Autism Spectrum Disorder (ASD) is increasing, it becomes crucial for the designers to think about the appropriate approaches to design inclusive educational learning spaces to benefits the users as well as to meet their needs [3]. Building policy and guidelines pertaining to design for special need

children must be referred to have a clear indicator or information on what features is needed for designing a building for children with autism. It is paramount to ensure that the building is effective, convenient and fit for purpose for everyone to use especially for children with autism.

Nevertheless, autism has been ignored by the architectural community, are excluded from building codes and guidelines, even there are few guidelines which developed explicitly for special needs. Users with autism have not been studied and their needs or requirements also are not considered in the design of built environment [4]. In Malaysia, no building or access codes that incorporate specific requirements for dealing with children with autism. Assorted building codes of practice have also been exempted from requirements to specific design for autism. Classrooms which provide a variety of choices in physical environment are preferable and indispensable for meeting the wide range of educational requirements for students with disabilities in order to help them to become successful learners [5]. Normal children probably have more ability to endure with badly designed space compared to children with autism would be, therefore the responsibility to create a good environment is brought seriously [6]. In response to this, the variables regarding to this issue needs to be explored in order to reveal the deriving factors that may enhance learning performance of children with autism in term of educational facilities.

2.0 THEORETICAL FRAMEWORK OF THE STUDY

2.1 Existing Policies and Government Initiative Regarding Building Facilities in Malaysia

There is insufficient of Malaysia government policies been established pertaining to educational building facilities for children with autism in Malaysia. Yet, there are no specific building codes or policies that can be referred in order to fulfill the requirement of educational building facilities for children with autism whether in Malaysia or other developed countries. Most of the building codes and policies are restricted to person with disabilities which mentioned in general and the requirement also does not specific to any disabilities. In Malaysia, the requirements are generally

mentioned in the National legal and policy framework where it shows an improvement in quality of life and also fulfilment of the right of person with disabilities [7]. Specific building standard for autism also fails to be outlined by the United Nations mandate on the Global Program on Disability. Similarly, according to the preliminary investigation to various government agencies such as local authority there is no evidence of explicit framework pertaining to educational building facilities for children with autism. Besides that, Uniform Building by Law 1984 is silent on this matter. UBBL 34A makes it compulsory for building in order to provide access where it allow persons with disabilities to get into, out of and within the buildings. The Act stipulates new buildings to be constructed must be accessible, whereas the existing buildings must comply within three years.

Other than that, Young Elanor, an author of RIBA Journal states that design resources for new construction are also limited when considering the need of children with autism [8]. Research that focuses on building design is needed so that, the designers can become knowledgeable or informed of these implications before designing a building for children with autism. Therefore, it is important to have a policy guideline which catering specifically to the scope of autism needs in order to accommodate them with required educational building design in order to allow them to live independently and participate fully in all aspects of life. Therefore, it is important to ensure that all new infrastructures built to be accessible to persons with disabilities so that, they may have equal access to the physical environment, eliminate obstacles and barriers to internal and external facilities. The development in terms of statutory regulation pertaining to building facilities for the disable has led to the increasing of awareness regarding person with disabilities. However, in Malaysia there is no explicit framework pertaining to autism spectrum disorder but there is a law which concern on the person with intellectual disabilities namely "Persons with Disabilities Act 2008". Unlike the other developed countries, the awareness regarding the autism issue in term of education, health, service, welfare, facilities and so forth was just begun in Malaysia. With regards to this, the prevailing regulations in Malaysia that related to buildings and access are for disabled as in Table 1 below.

Table 1 Regulations in Malaysia

Regulations	Descriptions	Gaps
Persons with Disabilities Act 2008 (Act 685)	On 24 th January 2008, The Persons with Disabilities Act 2008 (Act 685) have received Royal Assent and also published in Gazette. Generally, the establishment of this act is to provide for the registration, protection, rehabilitation, development and wellbeing of persons with disabilities	However, there is still lack of regulations where the policy and guidelines pertaining to children with autism, especially in term of educational building design are still limited in Malaysia. There is no particular policy or guidelines that can be referred to design educational building for children with autism in Malaysia.
Malaysian Standard Code of Practice on Access for Disabled Persons	Unlike the Persons with Disabilities Act 2008 (Act 685), the categories of person with disabilities that being caters by Malaysian Standard are wheelchair users, crutch users which is including in practice arm amputees, blind and also deaf people. Any building plan that will be submitted to the Local Authority must comply with it after the date of gazetting. Besides that, the existing buildings also must do so within three years of that date but the application may exempted from its requirements as the local planning authority thinks fit.	
Uniform Building By Law (UBBL) 34A	Uniform Building By Law was amended on 20 th September 1990 at the 35 th National Council of Local Government (NCLG). UBBL 34A makes it compulsory for building to provide access where it enable the disabled persons to get into, out of and within the buildings.	

However, while many policies related to persons with disabilities have been developed in recent years, policies regarding to building facilities for children with autism are still deficient. Other than that, a new action plan for 10 years is being created with the expiry of the National Plan of Action (2008 – 2012). The government intends to get input from local and foreign experts in order to take into consideration the terms of the Incheon Strategy that has been implemented in Korea. The Incheon Strategy which was developed by the United Nations Economic and Social Commission of Asia and the Pacific (UNESCAP), is the first set of regionally agreed disability-inclusive development goals. It was developed after consultations with governments of state parties in the region and civil society stakeholders. The Incheon Strategy builds on the CRPD, aims to create an inclusive barrier-free as well as rights-based society for persons with disabilities in Asia and Pacific. The Malaysian government, as one of the State parties in the UNESCAP, has agreed to adopt and commit to the implementation of the Incheon Strategy by promoting action to achieve the Incheon Strategy goals by the year of 2020. Malaysia will be acclimating its national policies for persons with disabilities in accordance with its commitments under the Incheon Strategy. It is hoped that the gaps in existing policies, programmes and service delivery that have been identified will assist in the revision and improvement of policies and strategies for children with disabilities. In relation to

this, inclusion of Incheon Strategy into PWD Action Plan has been implemented in Malaysia.

Despite commendable effort, it is apparent that efforts towards achieving design guidelines for educational building for children with autism still have some way to go. Although, the policy in term of disabilities has been established but there are still lack of regulations where the policy and guideline pertaining to children with autism especially in term of building design are still limited in Malaysia. There is no specific policy or guidelines that can be referred in designing educational building for children with autism in Malaysia. The research in the area of building design for autistic children also lacking where most of the research focused on particular disability, education, services and so forth. In a way forward to achieve the goal of Incheon Strategy, government that act as the main pillar should play their roles to put off the serious issue regarding this matters.

2.2 Design Principles of Educational Building for Children with Autism

Since the rate of children diagnosed with Autism Spectrum Disorder (ASD) is increasing, it becomes crucial for the designers to think about the appropriate approaches to design inclusive educational learning spaces to benefits the users [3]. It is important to ensure that the building is effective, convenient and fit for purpose for everyone to use

especially for the children with autism. Therefore, the understanding and knowledge on how children with autism experience and adapt to the environment is essential to be explored first before designing the areas for them. Even though designing physical environment for children with autism needs an understanding of autism and individuals requirements, some principles of design can be applied to improve their responses to learning and therapies [9]. There are various impacts of building design that have been found out by some researcher in term of their behaviours and also learning. Elements present in the learning environment must be designed and chosen by the possibility to bring about positive behaviour on children with autism [10]. This is affirmed by [11] who outlines a design guidelines from a research that has been conducted, the design guidelines as in Table 2 below.

Table 2 Design Guidelines

Design Guidelines	Descriptions
Use of bright colours	to create visual stimulation for hypo-visual
Use of neutral colours	to create serenity for hyper-visual
Use of warm colours	to create psychological warmth for hypo-tactile
Indirect natural lighting	1) reduce glare and distracting views for the hyper-visual 2) less distracting than buzzing artificial light for the hyper-auditory
Direct natural lighting and views	creates visual stimulation for hypo-visual
Noise and echo-proofing	1) creates a conducive environment for hyper-auditory 2) eliminate distracting opportunity of self-stimulation through echoes for hypo-auditory 3) creates a neutral auditory background for interference auditory
Use of smooth textures	1) calms the hypo-tactile 2) produce echo and reverberation stimulation for hypo-auditory
Use of rough textures	stimulates the hypo-tactile
Cross-ventilation	reduce inconvenient smells and odours for the hyper-olfactory
Enclosed ventilation	may help contain scents during aromatherapy for the hypo olfactory

If universal design is to achieve its goal of making settings that can be used by all people it must be

solely or mainly eliminate physical barriers or obstacles for people with sensory and physical disability and it must also address the cognitive barriers that effects the decisions making process of individual with brain impairments [12]. The environment should be structured in order to give consistency and also clarity, so that the child know what is expected of them in specific situation, where things belong and can anticipate what comes next [13]. Therefore, the purpose of this proposal is to describe the overall research to develop an educational building design guidelines for children with autism in Malaysia.

3.0 RESEARCH METHODOLOGY

A systematic and well-coordinated research methodology has been conducted to ensure the objectives of the research can be achieved. The approach and method selected for this research were also replicated from the previous research done in other countries. This research applied a qualitative research; it is research process involving emerging questions and procedures, data is usually collected in the participants, the concentration of buildings from the details to general themes, and researchers who make the interpretation of the meaning of data analysis [14]. In stage 1, an extensive literature review was carried out on the background of the research to understand the topic of this research. The background of the research was included a literature review on the gap of the existing policy pertinent to autistic child with regards to educational building design and learning environment. In addition, an extensive literature review was also be executed to study on the variables to enhance the learning environment of the autistic child within the context of educational building design. This stage enables the researcher to conceptualize the variables of the educational building. In stage 2, in-depth semi-structure interviews were carried out in this research between the researcher and the selected teachers that involved with autistic children in order to obtain the knowledge and information in details regarding the educational facilities for children with autism in Malaysia. This is because, the strength of qualitative research is its potential to produce complex textual descriptions on how people experience a given research issue [15].

4.0 RESULT AND DISCUSSION

4.1 Introduction

Semi-structured interviews were held with teachers who involved with children with autism. Teachers were chosen for this research because they are conversant with autistic children peculiarly in term of

behavior as well as variables that may enhance learning ability of children with autism.

4.2 Research Respondents

Five respondents had participated in the semi-structured interviews where the respondents have at least 5 years of working experience. The respondents consist of teachers and school coordinator of autism school. The description mentioned above can be referred to Table 3.

Table 3 Position held by Respondents

Respondent	Position	Working Experience
TEACH 1	School Principal	15 years
TEACH 2	Teacher	7 years
TEACH 3	School Manager	5 years
TEACH 4	Program Coordinator	15 years
TEACH 5	Program Coordinator	5 years
TEACH 6	Teacher	8 years

Furthermore, this research was focused on autism school within the area of Klang Valley. Out of ten respondents, only six respondents have agreed to participate with the semi-structured interviews.

4.3 Conduciveness of Autism School in Malaysia

Most of the autism school in Malaysia does not really meet the needs and requirements of children with autism. The learning environment was not conducive enough for children with autism to fulfil their learning requirements where the design of the school does not show subtlety to the needs of children with autism. It is unambiguous after the researcher interviewed teachers who work with children with autism. Respondent 1, 3, 4 and 5 added that:

"Autism school in Malaysia is still not conducive for children with autism. We don't really think about the environment as long as is safe, quiet and we have enough space. We don't consider a lot about colour, lighting, and ventilation. So, as long as it comfortable for them to learn because at the moment we don't have ability to think about it".(Respondent 1)

"...No. I don't think so its conducive enough for children with autism. Mostly the design of the school is not so much for the kids. It is about how much can you afford"...(Respondent 3)

"...No. You go to internet and then you google in US, UK and Australia. What is the different between Malaysia. Autism school in Malaysia is not conducive enough. The awareness is there. If you look for Europe country US, UK, Canada,

Australia if a child is diagnosed with autism the government will sponsored all for autism. The autism school is very well design to meet the requirements of children with autism"... (Respondent 4)

"In my opinion, autism school in Malaysia was not conducive enough in term of facilities and the design also was not really meet the requirements and needs of children with autism compare to other countries such as London. This is maybe because there is less awareness about autism in Malaysia". (Respondent 5)

The respondents regarded that the autism schools in Malaysia are still need to be improved to meet the requirement of children with autism in order to develop their learning ability. Yet, guidelines in the Malaysian context are still much broader for specific disabilities notably for autism.

4.4 Variables that may Enhance Learning Ability of Children with Autism

There is a growing awareness that limits the participation of disabled persons in society and the institutions arising from the interaction between the individual's impairment and attitude, as well as the environment. In Malaysia, this trend has fostered a recognition of increased the rights and abilities of persons with disabilities and their potential to contribute to society. In this research, the area that being focus by the researcher are on building construction and environmental services. The data collected from the semi-structured interview with teachers who work with children with autism shows vigorous correlation between educational environment and learning performance of children with autism. Respondent 1 has explained that:

"Yes, learning environment is important for children with autism because it greatly affects their behavior as well as learning. They need a quiet environment, little distraction, little noise from outside or anything that may trigger tantrum".

On the other hand, most of the teachers portray that variables such as material, colour, ventilation, acoustic as well as lighting are important to consider when designing a building for children with autism because it presents a great influence on children with autism especially in term of learning and behavior. It is supported by [16] where it is increasingly clear that due to sensory processing problems experienced by children with autism, physical environment such as materials, texture, furniture choice, colour as well as lighting is an important element to consider when designing educational environment for this group of users. This is because, children learn well in the environment that is design according to the interests of the children [17]. This is affirmed by respondent 1 and 3:

"...the colour, we just try to use a cool colour. Not like red because they are quite bad temper so we don't use those colour. We try to use a cool colour. They usually sensitive to sound. So, if possible, it should be in the area of more quiet. But for us we can't do that because around us a lot of mechanics. Sometimes, it can be quite noisy. And then the children will start to cry when it's too noisy. Don't put anything on the wall because they will distract them or if you post some poster they will tear it up. So it will actually quite distracting. So, we try not to put anything on the wall. We are not really concern about texture but of course they does affect them because some of them are afraid of the feeling of rough surface".(Respondent 1)

"...in terms of acoustic we needs a quiet environment for the children to make them feel comfort. Because most of the children are afraid with noise. So the building must be accommodate with soundproofing. The children also are sensitive to light where they will avoid a flickering light like if we switch on the pendant light it will blinking right. So they cannot see that. Ventilation we just used a normal ventilation only. There is no special ventilation. As you can see here we don't use a hot colour. We just used a cool colour that make them feel so calm. Because the colour may affect their behaviour". (Respondent 3)

From the findings, it can be seen that a building designer should be striving to assure the building criteria are met when designing a building for children with autism and aware the detrimental effects on the learning ability of children with autism. Therefore, framework of educational building facilities establishes the importance to the building designer as a guidance that can be referred before designing a building for children with autism. Educational professionals and architects would both benefit if design guidance were available in a concise and accessible form [6].

5.0 CONCLUSION

In a nutshell, a good learning environment could enhance and also improve learning development of children with autism. Various environment designs may attract and increase their interest during the process of learning. The environment should be structured in order to give consistency and also clarity, so that the child know what is expected of them in specific situation, where things belong and can anticipate what comes next. Therefore architects or designers of the building should consider the physical and sensory aspect when designing living and learning spaces for children with autism.

Acknowledgement

The Authors would like to express their gratitude for the financial support from MOHE (Minister of Higher Education) under the Niche Research Grant Scheme (NRGS),600-RMI/NRGS 5/3 (12/2013) given to this research.

References

- [1] Charman, T., Pellicano, L., Peacey, L. V., Peacey, N., Forward, K., and Dockrell, J. 2011. *What is Good Practice in Autism Education?* London.
- [2] Tuckett, P., Marchant, R., and Jones, M. 2004. Cognitive Impairment, Access And The Built Environment. 1-49.
- [3] Rahaman, F. and Rahim, A. A. 2011. Designing Inclusive Educational Space for Autistic Children: A Review of the Existing Discourse. *International Conference on Universal Design in Built Environment*. 53.
- [4] Khare, R. and Mullick, a. 2013. Research Tools to Learn About the Needs of Children With Autism. *Proc. Hum. Factors Ergon. Soc. Annu. Meet.* 57(1): 506-510.
- [5] Abend, A. C. 2001. Planning and Designing National Clearinghouse for Educational Facilities. 4905(888).
- [6] Scott, I. 2009. Designing Learning Spaces For Children On The Autism Spectrum. *Good Autism Pract.* 10(1): 36-51.
- [7] Final Mapping. 2013. Children with Disabilities in Malaysia.
- [8] Henriksen, K. and Kaup, M. L. 2014. Supportive Learning Environments for Children with Autism Spectrum Disorders. 9: 1-12.
- [9] Khare, R. and Mullick, A. 2008. Educational Spaces For Children With Autism; Design Development Process. *CIB W084 Build. Conf. Liveable Environ. All.* 66-75.
- [10] Sánchez, P. A., Vázquez, F. S. and Serrano, L. A. 2011. *Autism and the Built Environment*. 1st edition. Europe: InTech. 363-380.
- [11] Mostafa, M. 2008. An Architecture for Autism: Concepts of Design Intervention for the Autistic User. 2(1): 189-211.
- [12] Calkins, M., Sanford, J., and Proffitt, M. 2001. Design for Dementia: Challenges and Lessons for Universal Design. *Univers. Des. Handb.* 1-54.
- [13] Department of Education. 2005. *Teaching Student with Autism Spectrum Disorder (Inclusive programming for ASD students in New Brunswick schools)*. New Nouveau. 1-146.
- [14] Creswell, J. 2008. The Selection of Research Design. 3-22.
- [15] Mack, N., Woodsong, C., MacQueen, K. M., Guest, G., and Namey, E. 2011. *Methods, USA: Family Health International*. 36(1): 1-120.
- [16] Brooks, T. 2010. Developing a Learning Environment Which Supports Children With Profound Autistic Spectrum Disorder to Engage as Effective Learners Volume I Developing a Learning Environment Which Supports Children With Profound Autistic Spectrum Disorder to Engage as Eff. Coventry University in collaboration with the University of Worcester.
- [17] Dodge, D. T. 2010. Research Foundation: The Creative Curriculum.