The Impact and Challenges of Conventional Design Approach on Creation of Conducive Learning Environment for Autism Persons in Special Education Centre in Offot Uyo

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Abstract

This study was set to investigate the impact and challenges of conventional design approach on creation of conducive learning environment for autism persons in special education centre in Offot Uyo. Two research objectives and one hypothesis were postulated to guide the study. The population comprised all the people, material/items from which the study obtained information. This research focuses on all the students in the 2 (two) centres of autism rehabilitation in Uyo. This study adopted both case study and practice-based studio design approach while Purposive sample technique was used in selecting the respondents. Researcher made instrument tagged, "SPATIAL SEQUENCING QUESTIONNAIRE (SSQ)" and administered them to the respondents. Cronbach Alpha reliability technique was used to establish the reliability coefficient of 0.92. Thorough analysis was done on each case study. Besides, data were analyzed using regression analysis and hypotheses tested at 0.05 significant levels. The results of the data analysis revealed that there is significant influence of conventional design approach on creation of conducive learning environment for persons with autism. Amongst the recommendations made was that parents, caregivers, educators and even autistic persons themselves should be involved to some extents during the design phase and execution of the projects meant for autistic persons.

KEY WORDS: Autism, Conventional Design, Learning Environment,

Introduction

Autism, medically referred to as Autistic Spectrum Disorder, is a developmental psychological disorder that begins in the early stages of infancy and affects a child's ability to develop social skills and engage in social activities. It could be described as a form of sensory malfunction when assimilating stimulatory information from the surrounding physical environment. Mostafa, (2008), statistically, one in one hundred and fifty (1:150) children, regardless of socio-cultural and economic aspects are affected by this disorder. Further revelations show that autism is more prevalent, roughly four times more in males than in females, (Henry, 2011).

Individuals with developmental and psycho-social disorders (autism inclusive) have often been overlooked in design. Building codes and requirements have also excluded specific requirements for designing for autism. From research, general exclusion may be due to non-standardized nature of challenges and needs along the autistic spectrum (Mostafa, 2008). The repercussions of this design negligence are enormous.

Generally, children with autism are famous for having tantrums in public places, often leading to common misconceptions of autistic disorders. These actions are justifiable on the grounds that architects and designers of spaces have usually failed to provide environments that are sensitive to the autistic condition, by their designs. By understanding the mechanisms of this disorder and consequent needs of the autistic user, the physical environment could be designed sensitively to alter the sensory input and perhaps modify the autistic behavior, in the long run, creating an environment conducive for learning (Buxbaum, 2009).

Statement of Problem

The physical environment can have a great impact on the ability to stay focused and can affect behavioural patterns in autistic persons. Research reveals a number of influential architectural factors on autistic behavior which includes: acoustics, spatial sequencing, lighting, colours and patterns, and texture. Comparatively, acoustics and spatial sequencing are the most influential as they have the greatest effects on attention span of autistic persons in learning environments.

In Uyo, the Special Education Centre at Mbiabong-Etoi is designed in a conventional manner without adopting strategies for engaging sensory architecture as an intervention tool for autistic persons in the centre. The implications are visible; attention span of autistic students are affected, behavioural patterns distorted, and it therefore takes a longer time to modify autistic behavior at the centre, to guide the autistic students through their learning experience at the centre.

In summary, an autistic person identifies the architectural environment around him in accordance to sensory zoning rather than functional zoning. As such, designs emphasizing order, sequence and routine are desirable for autistic persons if distractions and diversions are to be eliminated and behavioural patterns improved. In Uyo, Akwa Ibom State, persons with autism are generally classified under the disabled community without a careful attempt at discovering the specific challenges that are peculiar to this group of persons. In the Special Education Centre located at Mbiabong Etoi, Uyo; persons with autism are made to undergo learning under routine general conditions. This creates difficulties for them as the architecture of their learning environment has failed to ameliorate their condition.

Objective of the Study

The objectives of this study are to:

1. Examine the impacts and challenges of conventional design approach in the creation of learning environments for student with Autistic Spectrum Disorder.
2. Adapt the strategies developed in design of the Special Education Centre for Autistic persons as Architectural design Solutions.

Research Questions

The following research questions are presented to guide the study.

1. In what ways can the impact and challenges of conventional design approaches be achieved to create learning environment for students with Autistic Spectrum Disorder (ASD)?
2. How can the design of the special Education center for persons be adapted as architectural design solutions?

Hypotheses

The following hypotheses will be tested:

1. There is no significant influence of conventional design approach on creation of conducive learning environment for persons with autism.

Literature review

Space and Functional Analysis

When designing school areas for children on the autism spectrum, it is important to have knowledge and understanding of how they experience the environment, the people and objects within it as well as the functionality of such environment. Humphrey (2005) and Pauli (2006) described very well the potential sensory differences in perception, processing and responses. It is also important to know that not all children are affected in the same way or to the same extent. Whilst many children are capable of learning within mainstream environments, some children require a more bespoke and tailoured setting (Humphrey, 2005).

Increasing attention is being paid to the design of classrooms, units and schools. Hence, local authorities (LAs) and their appointed architects are being faced with the challenges of designing appropriate learning environments for these children, (London, 2007). According to Kanne, Randolph & Farmer, (2008) the design architect should always verify these basic information and respond to these challenges. Hence, designing for autistic individuals, must sought for published statutory guidance, books, research publications, journal articles, feasibility studies, web-based and anecdotal information. In their write up they also present an analysis of four recently completed buildings for children on the autism spectrum in relation to the body of knowledge examined. Each of these units was visited and interviews were held with the architect and end users. The architects provided drawings, images, briefing notes and design analysis to allow a broad appreciation of the design and its specific response to autism.

The designing analysis for People with Special Educational Needs and Disabilities in Schools, (updated, 2005), published by the Department for Education and Employment contains the following points in relation to designing educational spaces for children with autism:

1) The building should have a simple layout which reflects order, calm, clarity and has good signage and way-finding.
2) Pupils may show different sensitivities to spaces: some will be frightened by large, open spaces and wish to withdraw to smaller spaces, whilst others will not like enclosed spaces.

3) Designing low sensory-stimulus environments reduces sensory overload, stress and anxiety.
4) The provision of pleasant, well-proportioned space, with plain, bare walls decorated in muted soft colours will allow teachers to introduce stimulus, (such as wall displays of work or information), gradually to suit pupils needs.
5) Classrooms can be arranged so that teachers may employ different teaching methods, with spaces for individual work or screened personal workspaces.
6) Use of indirect lighting and the avoidance of noise or other distractions, (blind cords, exposed pipes or dominant views out), need to be considered.
7) Containment in the class base for reasons of supervision, safety or security by the use of two door handles, at high and low-level, must neither compromise escape procedures, nor violate human rights, (in that children must not be locked up unless they are secured or detained legally in secure provision).
8) Robust materials should be used where there are pupils with severe disabilities and safety precautions for doors, windows, glass, plaster and piped or wired services will be required.
9) There is a need to balance security and independence and to find the right mix between tough materials and special equipment in order to avoid an institutional appearance, whilst at the same time eliminating risks.
10) Simple or reduced detailing and changes of plane may reduce the opportunity for obsessiveness.' A further, practice-based source is Simon Humphreys, an architect with a wide range of experience in designing for autism, including designing a home for his brother who has autism. He produced a short paper in 2005 which relays the principles he feels are specific to designing for autism. He seems to accord with all of the points listed above, with one or two significant additions:
    - Good levels of natural light and ventilation.
    - Proxemics: 'Proxemics deals with the amount of space people feel necessary to set between them-selves.
    - Proximity is the condition of being near or close. Proxemics can also be termed as personal space around the body. A person with ASD can be more guarded about this space and any infringement is seen as a personal threat. They need more space.' (Humphreys, 2005).
    - Good Observation: It is useful to be able to observe the movements of people with Autism Spectrum Disorder (ASD), without them feeling constantly under surveillance. Good observations will put the career at rest, which will help their well-being and can only benefit the person with ASD (Humphreys, 2005).

Designing Learning Spaces for Autistic Children

When designing areas for children on the autism spectrum, it is important to have knowledge and understanding of how they experience the environment and the people and objects within it. Amaral, Schumann & Nordahl (2008) describe very well the potential sensory differences in perception, processing and responses. It is also important to know that not all children are affected in the same way or to the same extent. Whilst many children are capable of learning within mainstream environments, some children require a more bespoke and tailored setting.

Methods

Research Design

The research design adopted for the study is both case study and practice-based studio design approach.

Area of the Study

The study area for this research is Uyo, Akwa Ibom State.

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Population of the study

The population of the study includes all the people, material/items from which the study obtained information. This research focuses on all the students in the two(2) centres of autism rehabilitation Centre in Uyo.

Sample and Sample Technique

The sample comprise of 96 students in the 2 (two) centres of Autism in Uyo as well as 204 other respondents made up of psychologists, architects and teachers teaching students with Autism. They were purposively selected as they were considered most suitable by the research for this study, based on researcher's judgment. These gave a sample size of 300 respondents.

Questionnaire

Two instruments were used in the collection of data for this research and they include interviews, questionnaire, schedule and physical inspection. A research questionnaire tagged "**spatial sequencing questionnaire (SSQ)"** The questionnaire is made up of two sections, sections A and B. Section.

Validation of Research Instruments

The interview question schedules and those of the questionnaire were constructed with the assistance of one expert in the department of architecture as well as one test and measurement expert all in Akwa Ibom State Polytechnic. They were engaged to carry out the content and face Validation of Research Instrument. Their inputs were used in preparing the final draft of the interview / question schedule.

Reliability of the instrument

The researcher used Crombach Alpha technique to determine the reliability of the instrument **(SSQ)**, using 30 people who did not form part of the main study. They were randomly selected and the instrument administered on them. Data collected from the respondents were subjected to reliability test and it produced an average reliability coefficient of 0.92.

Method of Data Collection

Data for the study was collected through the interview schedules, questionnaire and case study methods, as well as an intensive investigation of the research aim based on several assumptions. Hence, the main sources of data used for the study was from both the primary and secondary sources.

Method of Data Analysis

Data collected was analyzed through studio practice and designing for people living with autism. Data was also analyzed based on spatial sequencing as a sensory tool in the design for persons

living with autism. The hypothesis was stated in the null form, and tested at .05 level of significance with appropriate statistical tools.

Results and discussions

Hypothesis

The null hypothesis states that there is no significant influence of conventional design approach on creation of conducive learning environment for persons with autism.

In order to test the hypothesis, two variables were identified such as:-

1. Conventional design approach as the independent variable
2. Creation of conducive learning environment for persons with autism as dependent variable

The two variables were subjected to regression analysis in order to generate the predicted (y) value of y (conventional design approach) for x^1 as the value of x (creation of conducive learning environment for persons with autism).

Table 1

Model Summary of the influence of conventional design approach on creation of conducive learning environment for persons with autism.

Model	R	R-Square	Adjusted Square	Std. Error The Estimate
1	0.81[a]	0.66	0.66	0.97

***Significant at 0.05 level; df= 298; N= 300; critical R-value = 0.113**

The above calculated R-value 0.81 was greater than the critical R-value of 0.113 at 0.05 alpha level with 298 degree of freedom. The R-square value of (0.66) predicts (66%) of the level of influence of conventional design approach asserted on the creation of conducive learning environment. The rate of percentage is highly positive and therefore implies that there is significant influence of conventional design approach on creation of conducive learning environment. It was also deemed necessary to find out the extent of the variance of each case of the independent variable as responded by each respondent (see table 2).

Table 2

Analysis of variance of the influence of conventional design approach on creation of conducive learning environment.

Model	**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**
Regression	545.59	1	545.59	578.26	.000[b]
Residual	281.16	298	.943		
Total	826.75	299			

a. Predictors: (constant), CONVENTIONAL DESIGN APPROACH
b. Dependent variable: CREATION OF CONDUCIVE LEARNING ENVIRONMENT.

The above table presents the calculated F-value as (578.26) and the computer critical f-value as (000). Being that the computer critical f-value (000) is below the probability level of 0.05, the result therefore means that there is significant influence of conventional design approach on creation of conducive learning environment.

Discussion of the Findings

The result of the data analysis in table 1 was significant due to the fact that the calculated R-value (0.81) was greater than the critical R-value of (0.113) at 0.05 levels with 298 degree of freedom. The result implies that there is significant influence of conventional design approach on creation of conducive learning environment. The result was in agreement with the findings of expert and other researchers on the subject matter. The significance of the result caused the null hypotheses to be rejected while the alternative one was accepted.

Conclusion

Given that many conventional educational environments are sensorily complicated and unpredictable, designing an environment that helps individuals cope with the perceptual sensory aspect of autism could tremendously improve their quality of life. Through the application of spatial sequencing techniques in design for autistic persons, as well as other sensory design tools, it is believed that a designer would ultimately succeed in getting autistic users who literally live in chaos out of the chaos, so that they find some meaning and or order.

Recommendation

Having been exposed to a number of revelations in the course of this research, the following recommendations may prove useful:

1. Parents, caregivers, educators and even autistic persons themselves should be involved to some extents during the design phase and execution of the projects meant for autistic persons.
2. Challenging behaviours exhibited by many individuals with autism may be an involuntary response to an over stimulating environment. On this note, designers of spaces for autistic persons must endeavour to control sensory stimulation with their designs.

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