

# Biophilic Design(School) For Physically Challenged People

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## Abstract

This research paper is based on Planning and Designing of a School for physically challenged people using Biophilic design. A School is place where we all have spent our teen period, from where one masters the universal concepts of morality, diciplines and expession that have significant influence in their life. Many people with physical disability never get an opportunity to attend or enroll themselves in a school and only handful complete their primary education. They are also part of our society and they should equally treat and respect. The school period is the crucial phase of life and education is vital for all to improve their skills and physical development. In this paper an attempt has been taken to plan and design a healthy and safe educational environment for children with physical difficulties, such as visial deficiancyand Disability. where Biophilic design concept is used to connect them with nature which helps to enhance the ability to concentrate and boost their academic performance. It is also beneficial for their emotional and mental stability. The goal of using Biophilic design is to minimize environmental concerns such as air pollution and noise pollution, leading to many health problems. The Design also encourages sustainability and has energy-efficient interiors and exteriors, as more sky lights and ventilation are provided to carry the natural source of light to the interior space, as students spend several hours in the interior space. The school structure planned in a single story to eliminate stairs and steps, to create a barrier- free environment, and to recharge the surrounding area with greenery and water bodies. Usage of natural materials and textures, forms in interiors as well as exteriors to navigate blind students to their orientation. The main motive for designing of such a building is to address both social and environmental issues at the same time. The world needs more biophilic design structures to bring in the connection with nature that humans losing in their everyday lives.

## Key words:

Biophilic Design, School, Interior – Exterior, Barrier-free Design, Sustainable, Energy efficient, physically challenged people.

## 1. INTRODUCTION

The physical Disability is part of Human life that everyone experience at a some point. And certain people have been disabled since they were born. Although they should not be neglected as they are part of our society. Physical deficiency is part of a human life that anyone faces at some point in time. And certain people have been disabled since they were born. Although they should not be neglected since they are part of our society. They have a complicated or not easy life as a regular human, they have been oppressed by people and the negative attitude of people towards disability, specially in schools. As a result, many pupils with disabilities do not attend school or drop-out of school. They deserve special treatment and a safe educational environment for improved academic experiences that can support them with their everyday lives. A barrier-free design principle must also be used in every building. Physically disabled is not the only thing, there's another important issue that we're faced in this century, losing the nature of our surrounding spaces that brings more health issues like anxiety, tension, depression. And Biophilic is a modern concept in architecture and design in which nature is directly or indirectly reconnect with human. Research has found that we spent 90% of our time indoors and many people going towards the urbanization, changing of our lifestyle that have detrimental impacts on the natural world as well as on our health problems. Educational building needs to be focused on biophilic design, both inside and outside, for a healthy learning environment, particularly for physically challenged people. It will strengthen them emotionally and mentally. Therefore, needs to be design a special school for people with

impaired vision and physically disabled by incorporating Biophilic design in their interiors and exteriors, using 14 patterns of biophilic design principles, which includes Nature in the space patterns, Nature Analogous patterns, Nature of the space patterns. Working with various forms, textures, materials and shapes enables to create a inner space more intriguing and enjoyable to learn.<sup>[5]</sup> It would be a fresh design process in which two different problems are merged to create a better safe learning environment in which they learn without any restrictions or limitations.

## 2. METHODS

1. BARRIER-FREE DESIGN : The school building has planned and designed as a single story structure to avoid the steps or staircases as they offering nursery to secondary education who are visually impaired and physically disabled or handicapped. Therefore, the structure is split into two parts to separate the education system of two different disabilities.

The entire structure offered universal design concept which is accessible to all.

- 1.1 Providing signages in interior as well as exterior of the structure which helps them to navigate throughout the school. e.g, Braille and tactile signs, Directional sign or audible sign.
  - 1.2 Wide corridors, lobbies and paths to pass freely and safely.
  - 1.3 Proper Circulation space in classroom and other areas.
  - 1.4 Use of sliding doors in classrooms for clear opening to facilitate passage of wheelchair & others.
  - 1.5 Providing Handrails running throughout the walls of school for support.
  - 1.6 Guiding block flooring for blind students.
  - 1.7 In classroom, electrical switches and blackboard provided at lower level or 32"-42" above the floor level.
  - 1.8 The toilet floor should have a non-slip surface. Washbasin and W.C. shall be at the lower level with a supporting handrail.<sup>[2]</sup>
2. MATERIAL CONNECTION : The natural materials like timber and cork were used in wall cladding which offers sensory stimulation- touch , smell and warm feeling, help the visionary impaired student to assist them in orientation throughout the school building.<sup>[4]</sup>

For furniture ,Plywood and Teakwood material is used for classroom table-chair design with a smooth texture, small curvy edges with lower height. Lockers and cabinets of plywood material with laminate finish. Usage of wooden handrail with braille signs .

Flooring – grey chequered cement tiles and guiding block tiles providing for exterior flooring and for interior solid hardwood flooring or vinyl plank flooring is best accessible flooring for physically disabled people.

Colors – use of Zero-VOCs paints which is environmental friendly, prevent from different health problem. Cheerful colors used in interior space.

Wall treatment – stone, timber and cork cladding were useful for students with disabilities. In classroom, organic & non- toxic chalkboard paint is used on a wall for blackboard apart from digital board. Living plant wall at indoor spaces.

Door and Window – Glass + Aluminium Sliding door and window.

3. BIOPHILIC DESIGN : The connection with nature, in some way directly or indirectly decreased the level of stress. For a student, specially who suffer from physical disability, it is really crucial

that their learning environment is calmer and more relaxed. By incorporating the Biophilic principle in buildings, we can create a sustainable and secure educational environment. There are 14 patterns in biophilic design that enable us to link our built environment with nature directly and indirectly.

Connection to the Natural system – To reduce the noise pollution and improve the air quality better, can use air purifying plants, e.g, spider plants, bamboo palm, lilyturf, etc in interior landscaping, needs very less water and comes with many health benefits.[1] Usage of water bodies in the school's central courtyard and a small garden to help students to alleviate stress and keep them emotionally stable. The entire school building is covered by large plants and trees that tend to absorb noise from the surrounding environment.

Energy efficient – Usage of large no.of skylights and ventilation in corridors and classroom to carry out the most natural light to the indoor areas and supply the classroom with large window too. This helps to minimize the energy charge. Installation of solar panels to offset external electricity. For indoor landscaping, use of plants that require less sediment and water. This methods can make structure more energy efficient.

### 3. RESULT

The School design focus on two crucial problems that are functional to everyday life, the loss of a human-nature connection Physical disabilities. As a designer, it is our duty to address the issue of design in our surrounding environment in order to make our lives healthy and secure. While planning and designing the whole structure, the Barrier-free design and the Biophilic design philosophy were used to create a major impact on students' learning and productivity through out the school environment without any boundary and limitations. The use of certain biophilic patterns that provide access to visual and non-visual interactions with nature in the interior and exterior spaces of the structure ensures a comfortable and safe learning atmosphere. Different forms, texture and natural material were applying in design to offers sensory stimulation, such as touch and smell. The school structure also promotes the energy efficient design as vast number of skylights and ventilation system used in classroom and corridors, as well as solar panels used that minimize the charges from outsource. The green environment in their surrounding may not cure them with physical health but it definatly helps in emotional and mental stability, bring confidence in their life who are physicalled disabled.

### 4. DISCUSSION

This research shows the importance of Biophilic architecture and design that is essential for all type of building construction, especially in educational buildings. There is no such educational building in our country that promotes biophilic design as well as universal design together. Physically challenged people needs special treatment from their surrounding environment and Nature has the power to heal them from Anxiety and depression. A school that promotes healthy learning environment and also focus on their comfort which enables to concentrate in their academic performance with accessible design concept for Disability.

## 5. CONCLUSION

Nature plays a vital role in growing imagination and innovation, as well as encouraging people to enhance their overall well-being. Children particularly those with physically Disabilities, need a safe and healthy learning environment. Incorporating Biophilic Design in education building allows students to connect with nature, helps them to alleviate stress and enhance academic performance. It has a great scope to design a biophilic design school for physically challenged people, as the confidence they lose due to the challenges they face physically could be regained by just giving them a better learning environment.

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