Sense and Sensitivity in Architecture – The Use of Five Senses in Space making

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This study intends to look at the importance of the five senses in experiencing a space. The five senses include vision, touch, olfaction, taste and auditory. Architects need to look into how a space interacts with its end user. Architecture is the journey and not just the destination. It’s a whole package of experiencing a space and it’s not just about the architect. In the process of thinking and perception of architecture there is always more importance given to visual senses than the other senses and the problems of contemporary architecture is rooted in visual dominance and may be the result of unbalanced senses system. All our information about our surrounding world is achieved by our senses and this information help us in perception and recognition. A building should bring into perspective all the five senses, thereby giving a three-dimensional angle to the structure. This study also looks at the role of perception of a space for a person who is sensory impaired such as a person with blindness, deafness, dumbness etc. Therefore, we use Phenomenology of Architecture to experience a space through sensory properties

Key words: Architecture, five senses, sensory impaired, phenomenology

INTRODUCTION

“In memorable experiences of architecture, space, matter and time fuse into one singular dimension, into the basic substance of being, that penetrates our consciousness. Architecture is the art of reconciliation between us and the world, and this mediation takes place through the senses”- Finnish architect Juhani Uolevi Pallasmaa (2005).

The sensory modalities that are involved in spatial perception in humans are sight, smell, taste, touch and hearing. Taste, Smell and touch give information about the near space (haptic space) while hearing and vision provide perceptions about events or objects in far space. In perception and thinking there is domination of sense of sight compared to the other senses and most of the problems seen in contemporary architecture may be due to the unbalanced senses system. It is not correct to ignore one or more of the senses in architecture. Only by controlling all the parameters that affect our senses such as sound, light, color, objects, forms, relations etc. can we influence our soul better. “Our bodies and movements are in constant interaction with the environment the world and the self-inform and redefine each other constantly.” (Juhani Pallasmaa 2005)

During the architectural experience when there is interaction between imagination, body and environment, only then will one have memories of every place one has visited. The existential experience will be strengthened when there is multisensory experience of the architecture and all the senses experience equally the quality of the space

“Architecture is essentially an extension of nature into the man-made realm, providing the ground for perception and the horizon to experience and understand the world. It is not an isolated and self-sufficient artifact. It directs our attention and existential experience to wider horizons.” (Juhani Pallasmaa 2005).

Aims and Objectives

Our aim is to understand the role of all the sense organs in architecture and not just the visual aspects.

Our Objectives are to get better understanding about creating spaces which are relatable and perceivable by all despite disabilities such as blindness, hearing and speech
impairment etc and to understand the role of sensation in architecture as a tool in sensitizing people towards people with special abilities and also bring in the emotional aspect of a building so that people can feel a space and not just see it with their eyes.

Phenomenology – The Architecture of Sense

Phenomenology of Architecture is to experience building materials through sensory properties where the building functions in the fourth dimension which is time and not the second or third dimension. Phenomenology proclaims that the design of the building should stimulate the senses and not just the visual stimuli. Architects like Christian Norberg-Schulz (1980), Peter Zumthor (2006), Juhani Pallasmaa (2005) and Steven Holl (2006), are connected with the theory of phenomenology. The Architectural experience is a dialogue between mind, body and the built environment. The entire body’s inclusion allows all the senses to be involved and not just sense of sight. The body can sense the warmth of the environment, its texture, smell and sound. On personally analyzing the experience one will understand one’s perception of that particular experience is initiated by lighting, materials and spatial composition. The raw response data is not universal but is intimately personal.

Dominance of vision

Architecture is considered as a visual phenomenon. Now our reliance on vision is so much that all our other senses are neglected and are being suppressed. Buildings are now designed to please the eye and not the entire body. When architects design visual environments without taking into account their functionality, multi-sensoriality and user friendliness they end up with distorted spaces which lack mental or physical accessibility. Le Corbusier with the statement that “Architecture is the masterly, correct and magnificent” (Le Corbusier 1959) is a good example. His statement clearly leads to architecture for the eye but due to his sense for materiality and his sculpturing talent he avoided his buildings developing into sensory reduction. The famous Japanese architect Tadao Ando (1991) gave extreme importance to the play of light and shadow and its function in the perception of a space. Ando's architectural style is said to create a “haiku” effect, emphasizing empty space and nothingness to create the beauty of simplicity. His finest architectural work in which the play of light and shadow is given a lot of importance is the Church of the Light, Osaka, Japan.

Touch – an Intimate sense

“The architecture of the eye detaches and controls, whereas haptic architecture engages and unites” (Juhani Pallasmaa 2005). The tactile sense plays a vital role in one’s sensory perception of a space. The tactile sense includes affection, intimacy and nearness while the sense organ of distance is the eye. The sense of sight observes and investigates, whereas the tactile sense feels and approaches. The tactile sense gives us information of weight, texture, temperature and density. The complexity and variation of textures are used to create and define space, but the tactile sense is the most important for the blind. “The hands of the sculptor are independent organisms of recognition and thought; the hands are the sculptor’s eyes.” (Juhani Pallasmaa 2005). Touch can reveal the history and origin of the material. “A pebble polished by waves is pleasurable to the hand, not only because of its shape, but because it expresses the slow process of its formation; a perfect pebble on the palm materializes duration, it is time turned into shape.” (Juhani Pallasmaa 2005)

The human skin can detect temperature, and the foot can feel the texture of the ground. “Standing barefoot on a smooth glacial rock by the sea at sunset, sensing the warmth of the sun-heated stone through one’s soles is extraordinarily healing; making one part of the eternal cycle of nature. One can sense the slow breathing of the earth.” (Juhani Pallasmaa 2005). Contrast in spatial volume can be experienced by an individual through a sense of openness or enclosures. The volume change can act as a boundary from one space to another, occurring either as a gradual transition or as broad contrast, breaking up the monotonous volume of space. Hazelwood School was designed for children who are both blind and deaf – therefore their tactile sense was more vital in catering to their independence and helping them in their orientation of the building. In this building Architect Alan Dunlop (2004) conceived a plan to make children follow a straight route through the building, thereby avoiding maze-like conditions. The interior walls of the building are paved with materials which are multiple textured, which students can feel with their hands and make out their whereabouts. They are therefore able to move about the school without any help and this increases the children’s confidence despite their impairment.

Acoustics – A Building Soundtrack

Hearing is Omni-directional and incorporating and provides a three-dimensional atmosphere. “We are not aware of the significance of hearing in spatial experience, although sound often provides the temporal continuum in which visual impressions are embedded.” (Pallasmaa, J. 2005). The sound of a building is the result of combination of the volume and form, the material of the surfaces and their application. A building usually works towards sound absorption, isolating and reducing sound, though spaces which are crafted for acoustics act as an instrument, leading to a multi-sensory experience and help the blind in their understanding and exploration of space. People are able to determine the direction of a sound, from behind or above and this can help the blind to orientate themselves and move around a room. This can be improved when there are differences of volume, form, and materials in a space, providing different pitched sounds, sound
absorption and reverberation times. Sounds in architecture increase the perception intensity.

**Anechoic Chamber:** An anechoic chamber is designed to absorb sound and electromagnetic waves reflections. The chamber is also isolated from surrounding waves. This makes a detector or a person hear only direct sounds and not any reverberant sounds, therefore simulating being in an infinitely large room. The quietest room on Earth is supposed to be Orfield Laboratories, Minnesota (USA). The principle in making a room anechoic is to make sure that there are no rebounding sound waves, by ensuring all sounds get absorbed by the room itself. To create this, these rooms are lined with wedges made of fiber glass such that the entire floor, ceiling and walls are covered with these wedges. This results in uneven wedge network projecting from different directions. This principles is used for improving acoustics in concert halls and large scale auditoriums.

**Olfaction of places**
Odour has the power to preserve and capture memory of every space, and every space can be identified by its own particular smell. “A particular smell makes us unknowingly re-enter a space that has been completely erased from the retinal memory; the nostrils awaken a forgotten image, and we are enticed to enter a vivid daydream. The nose makes the eyes remember.”(Juhani Pallasmaa 2005). A particular smell, its intensity and density can define specific places. The finishing of a material also affects smells which could help the blind to identify what the material is. For example timber has a natural recognizable aroma. This can be either subdued or enhanced depending on the finish chosen; either varnish, wax, polish. By varying these finishes it would be an interesting experience for the blind people as they identify the various smells.

**Taste in Architecture**
The human tongue can distinguish 7-8 different types of taste, but the human nose can differentiate the smell of hundreds of substances, even in minute quantities. The olfactory sense amplifies taste. The same is true regarding taste in architecture. It means that the sight of appealing materials in architecture will make our mouth water.

A building should act like a finely tuned instrument that will interact with the occupant’s senses at the right moments.

**Influence of Architecture on Human Emotions**
Architecture has a huge impact on a person’s mood. This is the fundamentals of architecture: not how a building looks, but how it makes us feel, how it allows us to behave, act, reflect and think. The relationship of architecture with our mood may not be measurable. On the other hand, it may be subjective, complex and happen with use and over time. By reviewing related research on emotion, Measurement of User Emotion and Experience in Interaction with Space” by Myung Eun Cho and Mi Jeong Kim (2017), we can find out what kinds of components in an architectural space arouse people’s emotions .In this research, authors regard the components as environmental stimuli that trigger people’s emotional responses. Emotional stimuli in a space can be divided into two main aspects, emotional expression and emotional exchange, which are produced according to the users' interaction with the space. The former deals with the user emotion by itself in a space, while the latter emphasizes the interaction of the user and a space. When a human being perceives or experiences a space not just by the visual aspect but through all the senses the person will emotionally connect more with that space. The same space can create different emotions in different people depending on how they use their senses and how they feel at that moment. Some spaces leave an everlasting memory in one’s mind.

**Role of Sensorial Architecture in Increasing Human Efficiency**
While designing architects focus on touch and sight and do not take into account that people also experience taste, smell, and sound. Taste will be hard to incorporate into a building’s structure, but architects can design spaces where people can experience taste, like an office pantry room. Most people associate all experiences with how they felt at that moment. They evaluate an experience based on what they see, taste, hear, smell and touch. Based on these criteria they decide whether the experience was enjoyable or not. A company should create a comfortable and enjoyable workspace for its employees to work in and it is the job of the designer to bring it into action. Usually offices contain cubicles which are small confined boxes which have a computer, a chair and a desk. These cubicles create a negative feeling in the employee and will bring down the company’s productivity. It is important to keep the employees happy so that they will be more productive and this will improve the company’s profit. We should create an office environment which will stimulate the workers through the five senses where the worker’s morale improves and his productivity increases.

**Role of Sensorial Architecture in Lives of the Specially Aabled**
During their day to day life visually impaired people enter various spaces that are designed for the sighted. To understand these spaces the visually impaired tend to filter their olfactory, acoustic and tactual abilities to understand these spaces. To understand their surrounding environment, a visually impaired person must use all their remaining senses, using them in cooperation. Blind people require more time to adjust to their environments, they need to explore the building, listen to the spaces and find how their body influence the space. They need to touch and physically explore the building, and then become aware of the surrounding environment.
The visually impaired persons depend more on their hearing and therefore their auditory perceptions increases. But the sense of vision becomes predominant for the deaf or hearing impaired persons. The common sense that they both uses is touch, their balance and their kinaesthetic sense. The necessary design considerations in architecture required for the sensory impaired have to be added in the early stage of design process and cannot be added at a later stage during construction. To a sensory impaired person the concept of sensory accessibility is important. The concept of accessibility provides physical access but sensory accessibility provides everyone with disability to participate and experience the space.

Universal design is a design concept that recognizes human impairment as a universal condition. It takes into account the fact that all human beings will experience disability at some point in their lifetime. It aims to go beyond merely breaking down physical barriers to including a re-definition of disablement as a condition shared by all and not just a minority group (Steinfeld, 2001). Architectural features that are important for sensory impaired people are spatial proportions, acoustics and openings. These should be involved in the initial planning of an architectural project. Only then will the space be sensory accessible to all. When designing for the specially abled it is necessary to make the design accessible to all which means that in addition to removing the physical barriers and making the space functionally and physically accessible we should also ensure that the design should appeal to the user’s mind by making sure that the design involves and engages all the senses so that everyone can perceive the space differently. “Considering multiple sensory modalities during the design process are likely to create richer, more interesting and more engaging user-product interactions, because these products exploit the full potential of people’s sensory connections with the surrounding world”. - Hendrik N.J. Schifferstein and Lisa Wastiels (2014)

CONCLUSION

Architecture needs to fulfill its practical purpose, but along with this, it must enhance the purpose of the built environment and its user experience. It needs to push beyond the boundaries of mere shelter and start to question and explore the potential for environments to achieve more. A building should not only be passive, but should actively and seamlessly support the users of the space. It is very important to understand and acknowledge the emotions stimulated by the built environment. Although this may not happen to all people at all times, it is happening – without the necessary awareness of the term phenomenology. Phenomenology doesn’t make life better or more beautiful but it makes people evaluate their sensory experience and become aware of their world. While undertaking the study of senses within architecture, it became noticeable that there are areas of sensory engagement that are currently underutilised within design. This lack of purposeful design with relationship to intangible senses prohibits a fully multi-sensory engagement. It is inevitable that all senses are present in design - but these are not necessarily consciously designed for. A space primarily designed with a resulting image in mind can still be touched and listened to, but these are consequent upon the visual intentions. Some architects have started to pursue a multi-sensory approach but typically only address individual senses rather than the whole experience. Furthermore, some techniques do not utilise all facets of sensory engagement, such as light which is rarely appreciated for the temperature it can emit, or a space which primarily investigates the physical connections rather than volumetric. It is imperative to realise that architecture is not merely the science of designing buildings but involves using all of the senses in a particular built space and leaves a lasting impression in the user’s mind.

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