

Retrospect and Prospect to Green Approach in Interior Materials

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ABSTRACT

The growing concern of global warming and the subsequent impact on our planet has made the individuals to focus on their own practices at home and their workplace and how they contribute to the Earth's health. As a result, environment friendly interior design is a growing trend wherein the implementation of sustainable practices can impact your carbon footprint and keep excess pollution out of air, water and landfills. Thus, switching towards "green" design can improve the overall health and well-being of the planet. This paper shall focus on the various aspects of the interior design elements that can impact the environment and the subsequent factors that should be kept in mind while designing any space to minimize the adverse impact on the living environment.

Index Terms: Sustainability, Green, Sustainable interiors, Environmentally sustainable interior design (ESID).

1. Introduction

Traditionally, the interior design profession focused only on the aesthetic enhancement of an interior space for a client, an approach that is relatively backward and conservative. It ignored the importance of energy savings and carbon emission and its reduction as well as the harmful effects on the mental and physical health of the consumers and environmental pollution.

However, in recent years the interior design practice has seen a dramatic shift to design strategies that focus on providing healthy and sustainable environment for the inhabitants to live and work. The people have begun to understand their role towards the environmental health and they now seek interiors that are environmentally responsible. This interest in environmental responsibility has resulted in the need for the Environmentally Sustainable Interior Design (ESID). Although ESID has become a major issue in interior design practice, the frequency with which interior designers make sustainable choices in real practice is still limited. This 'sustainability gap' is the disparity that exists between the principles of ESID and the reality of practice. It is characterized by a lack of connection made by designers between their practice and the resulting environmental impacts of that practice.

Now, the interior design profession serves for the human habitation in the environment. The need of a sustainable environment is an obligation rather than a will, in order to survive. This study aims to discuss the various interior design elements in the dimension of sustainability and the interconnectedness of the buildings, people and community in the creation of an environmentally responsible built environment.

Materials and methods: To document and analyse the well-being in terms of Interior sustainability, a study of literature was conducted. Identity, collect, categorize, and analyse are the four stages of the technique. The keywords were discovered during the research. This study aimed to investigate and analyse the numerous features of interior design elements that have an environmental influence, as well as the subsequent variables that should be

considered when creating any space to reduce the negative impact on the living environment. Google scholar and science direct are used to conduct literature searches. Following the analysis, more discussions were held on three factors: Interior Lighting, Materials, and Furnishings

2. Sustainability and Green Design Considerations

The terms “green” and “sustainable” are often used interchangeably in design. However there is a subtle difference between the two. “Green” design focuses on the issues of the people- their health, safety and welfare, thus implying a micro perspective, whereas, “Sustainable” design has a more global approach, that is, the health, safety and welfare of the planet, such that it is possible for this generation to meet their needs without jeopardizing the ability of the future generations to meet their own needs, thus implying a macro perspective.

The primary focus on eco-friendly “green” design at home strives to improve indoor air quality and reduce the impact that major purchase can have on the environment. Thus, starting at home at micro level, the environment-friendly interior design can have a major effect on the overall environment of the world, at macro level. The following considerations should be made while redesigning any interior space to improve the air quality:

- Right Lighting
- Water-based Paint
- Right Wood
- Avoid Chemicals and Right Fabric
- Incorporate Green Plants

2.1. Right Lighting

The use of natural light should be maximized. Energy efficient windows and doors can enhance the indoor air quality by less dependency on artificial lighting and subsequent energy saving. At night, incandescent bulbs should be avoided as they can drain energy quickly. Instead, a low voltage system and fluorescent or halogen bulbs should be used as they efficiently convert most of the energy produced into light.

2.2. Water-based Paint

Wall paints are a major carrier of Volatile Organic Compounds (VOCs). When paint is applied on the walls, what you smell is the off-gassing of the paint’s chemicals. But even when the fresh paint smell disappears, off-gassing may still be occurring. To minimize the impact of VOCs on the indoor air quality, water-based paints should be used which will eliminate the chemicals that affect the environment. Also, while purchasing paint for the walls and furniture, the one with “Low Odour” or “Low VOC” should be selected.

2.3. Right Wood

The selection of wood for the use in furniture is very important because its impact on the indoor air quality is long-lasting. The solid wood like walnut, oak, teak or maple are more durable and will last longer thus, making it sustainable. Moreover, sustainable hardwoods should be selected that rely on traditional building and joinery

methods, like tongue and groove joints, rather than glues. The chemicals used in fixing furniture can off-gas VOCs into the air, thus polluting the environment. The use of antiques should be promoted since they are the most “green” products, created from old growth forests without the use of any artificial or harmful glues and chemicals for staining and polishing.

2.4. Avoid Chemicals and Right Fabric

Similar to the modern adhesives and stains, fabrics can also off-gas quite harmful irritants into the air. To avoid such harmful effects, organic materials should be considered when selecting upholstery and curtains. Organic cotton, wools and silks should be selected that are labeled “organic” to stay away from the chemicals and side effects of the off-gassing of fabrics. The flame retardants in many upholstery fabrics include polyurethane, formaldehyde, doxin and brominated flame retardants, which can be sensitive to eyes and lungs. Most of the rugs used in furnishing are “synthetic” in nature, which are nothing but some form of plastic like nylon or polyester. Such materials are non-biodegradable and pollute the environment.

2.5. Incorporate Green Plants

Bringing the outdoors in is always a great idea, and houseplants can filter the air, thus keeping the environment cleaner and healthier to live in. They also have a mood-lifting power that while not necessarily quantifiable, is of great daily benefit. Plants are the easiest thing to incorporate into a luxury design- it can be an addition of a collection of green herbs in the kitchen, large potted plants in the living room, or a range of sizes in the bedroom, they can enhance the indoor air quality of any home. An even bigger green element is a green wall in your home. These are sometimes called vertical gardens or living walls and consist of an entire wall of houseplants. A big dose of nature, these have some considerations with regard to watering systems and weight of the installation, however the benefits outweigh the initial investment. These can transform a room, along with entire space, into a pleasing area. Aside from the aesthetic benefits, the air filtering properties of a green wall are greater in magnitude than just a few potted palms. A green roof, another important element, involves planting vegetation on the roof of your house. The plantings can be herbs, drought-tolerant plants or other vegetation.

Typically, they are installed in a growing medium that has a waterproof membrane underneath. The concept, which comes from Germany, has a host of benefits for your home, including reduced heating and cooling costs, flood risk reduction, etc.

Table 1. Analysis and Summary of the papers studied related to ESID

S.No.	Title	Author	Description	Methodology	Input Parameters	Results	Limitations
1.	An inclusive vision towards a sustainable interior design for human	Dr.Aya Lotfy Zakarya Habbak	Multiple terminologies relating to sustainable Interior Design are	Descriptive and analytical approach.	Place: Identified as part of a study on environmentally friendly interiors. Time period: from the	The research comes to a conclusion. 1. Interaction with environment is an important aspect of	The research question is restricted to the following: 1. What are the

	well-being and health		defined in this study. As a result, the goal of the study is to distinguish between these various words, describe their tactics, and exhibit their interiors in order to determine their benefits.		mid-twentieth century until the present.	human nature. 2. The structure's design should not end at the point when it does not hurt the environment. 3. The development of interior spaces and sustainable structures is not limited to aesthetics and visual responses.	long-term environmental goals? 2. What are some examples of locally and globally interiors that include sustainability principles? 3. How might sustainable environmental processes be used to enhance the area of interior design, both worldwide and locally?
2.	Environmentally Friendly Material Characteristics Applied to Interior and Furniture	Yunida Sofiana and Ade A S Fajarwati	The goal of this study is to choose a variety of natural materials that symbolize green and recyclable resources. The study methodology included gathering data from secondary sources, assessing the data, and sorting it into green and recycling categories.	This study's methodologies are based on an observation in Indonesia and a review of the literature.	Some natural materials have properties that make them ecologically friendly and can be used in interior design and furnishings.	Present usage of materials in interior design, furniture, and furnishings is still severely limited, the possibility to create with any sort of material is still very extensive and viable.	This research is only a minor component of the overall material use process in a sustainable environment.
3.	The State of Environmentally Sustainable Interior Design	Mihyun Kang and Denise A. Guerin	This research looked at the state of environmentally friendly interior	An online survey of interior design professional	Use of environment friendly Interior design practices.	Indoor environmental quality was recognized as a less often implemented	There was limitation in location of the survey.

	Practice		design practice to offer a foundation for developing instructional methods for sustainable interior design.	s was undertaken across the US.		component of environmentally sustainable interior design than the use of sustainable interior materials.	
4.	Sustainable Interior Design for Homes	M. M. Reham and Mohie Eldin	The research examines interior design in terms of sustainability, particularly in the context of housing, while also highlighting the factors that drive it and making suggestions.	The study used the analytical approach.	Key factors to successful interior design.	The research focuses on The interior designer, the clients, and the grading systems are three aspects that can influence sustainable interior design.	Good education in universities and experience for interior designers.
5.	Sustainable Environment in Interior Design: Design by Choosing Sustainable Materials	Ali Basim Alfuraty	The purpose of this study is to investigate the role of interior designers and users in promoting sustainability principles in interior spaces through the right use of materials and design solutions.	A two-stage strategy will be implemented, with the first phase consisting of a literature review. An analysis and evaluation of regional and local instances is included in the second step.	The first, second, and fifth models were all freshly constructed structures, while the third model was a refurbished historic building, and the fourth model was a restored and rehabilitated building.	Existing buildings' interior spaces may be converted into sustainable internal environments by redesigning those using sustainable materials rather than ones that harm the environment and create financial damage.	—

3. Results and Discussions

Sustainable interior design practice can be categorized in three dimensions as: global sustainable interior design, indoor environmental quality, and interior materials. The indoor environmental quality, that is also an assessment category in the LEED, is the most important implication in considering the sustainability of interior environments. Improving indoor air quality which is mainly the activity of reducing indoor pollutants, improves the thermal

comfort and quality of interior lighting. Moreover, using materials those can have the possibility of recycling is another criteria in obtaining sustainability. In considering these aspects, most essential interior design elements are

- Materials
- Furnishing
- Lighting

3.1. Materials

In material selection, the most important criteria is to select the material according to the features of function. As an example, materials used in the hospital interior and the shopping mall should be different due to the sterilization aspect. Especially, the selection should aim to long term use. It is very important to use a material in its maximum potential in order to reduce waste of resources.

The energy that is used in the process of producing materials is known as the embodied energy. Each material has different amount of embodied energy. For example, concrete, steel and the plastics are higher in embodied energy amount in the construction materials. Especially, natural materials such as stone and timber comparatively have less embodied energy.

Another important criterion in material selection is the recycling potential of the materials. Moreover, the level of emission of toxic gases both used in production process and during the period of the materials is an essential criterion in achieving sustainability. Especially, most traditional techniques in construction and materials are widely sustainable. As an example, traditional materials like mud brick and adobe are highly sustainable in the means of level of toxic gases emission. They are natural materials. All these criteria are important in maintaining indoor air quality. Finally, materials, as interior design elements, should meet the requirement of sustainability in the potential of long term use, recycling, and less emission of toxic gases.

3.2. Furnishing

Furniture is the major element in interior design. They have a wide range of materials and color. In the context of sustainability, materials used in the production process and the long term use of the furniture are the major criterions.

Wood products are widely used materials in the furniture production. They can be recycled actually. However, some synthetic materials used in the wood production process cannot be recycled. Moreover, the wastes occurred in the production process damages the nature. These waste products contain same toxic polymer based synthetic materials. The rate of the waste to the product is about 30% of the total amount of the product.

Rather than the production process, the old furniture also cannot be recycled. These wastes have a big role in increasing the amount of global waste. Achieving sustainable furniture, recycling is one of the important criterions. Recently, some of the furniture companies started producing furniture totally from waste. Furniture produced from waste sometimes faces the problem of aesthetics. If the aesthetic quality of the furniture is considered, then, it will both serve for the purpose of sustainability and widely used.

3.3. Lighting

Lighting considerations in interior design is mostly considerate on the reduction of using electric energy. Energy used in interior environment of the building approximately captures the 40-50% of the total energy used in buildings. It occupies a large amount of energy consumption. Therefore, designers should use the maximum possible natural light in interior environments. Environmental lighting is also one of the physical parameters affecting the indoor environmental quality.

Day light can be explained as “the practice of bringing light into a building interior and distributing it in a way that provides more desirable and better quality illumination than artificial light sources”. In this context, the building should be located according to gain maximum day light. Also, the size and the depth of the room should be appropriate to use maximum day light. The recent development of new technological tools to carry day light to the deep interior space of the building even to the basements has enabled to collect the sun light and reflect the light through the reflective tubes. Laser cut panels, light piping systems, horizontal and vertical light pipes are examples of these systems.

Moreover, there are many research studies carried out about the benefits of day light in life quality in interior environments. Especially, these studies demonstrate that day light affect the productivity level in office environments.

The lighting is a major interior design element. It is obvious that it has an essential role in developing sustainable interior environments. It is both important in energy reduction and for the sake of human health.

4. Conclusion

“We don’t inherit the earth from our ancestors; we borrow it from our children”.

This axiom serves as the philosophical basis for the need and importance of green and sustainable approach towards designing. The aim of the environmentally responsible design is to convert the building industry in such a way that the design and the construction practices of the built environment enhance the health and welfare of the living generation without compromising the resources and living standards of the future generations.

Interior environments are the places that meet the human needs. They are the most intimate environments to its users. The need of willing to create sustainable environments should be first met in the interiors. People should live in sustainable environments with the help of professionals interior designers. Interior designers have an essential tool in their hands to lead sustainable environments and create consciousness in sustainability.

Declarations

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Competing Interests Statement

The authors declare no competing financial, professional and personal interests.

Consent for publication

Authors declare that they consented for the publication of this research work.

References

- [1] Ness, N. (2001). Urban Planning and Sustainable Development European Planning Studies. 9(4), pp.503-524.
- [2] Article, An Environmentally Friendly Approach to Interior Design, <http://bhgreollection.com/blog/environmentally-friendly>.
- [3] Environmentally sustainable interior design: A snapshot of current supply of and demand for green, sustainable or Fair Trade products for interior design practice, <https://doi.org/10.1016/j.ijsbe.2015.03.006>.
- [4] Nur Ayalp, Environmental Sustainability in Interior Design Elements.
- [5] <https://www.homedit.com/luxury-interior-design-eco-friendly>.
- [6] Susan M. Winchip, Sustainable Design for Interior Environments, Second Edition, pp.20-34.
- [7] Dr. Louise Jones, Environmentally Responsible Design: Green and Sustainable Design for Interior Designers, pp. 1-14.
- [8] Dr. Aya Lotfy Zakarya Habbak, An inclusive vision towards a sustainable interior design for human well-being and health, Aya Habbak, pp. 353-370.
- [9] Yunida Sofiana, Environmentally Friendly Material Characteristics Applied to Interior and Furniture, Advances in Social Science, Education and Humanities Research, pp.235-237.
- [10] Mihyun Kang, The State of Environmentally Sustainable Interior Design Practice, American Journal of Environmental Sciences, pp.179-186.
- [11] M. M. Reham, Sustainable Interior Design for Homes, Indian Journal of Science and Technology, pp.1-9.
- [12] Ali Basim Alfuraty, (2020). Sustainable Environment in Interior Design: Design by Choosing Sustainable Materials, 3rd International Conference on Sustainable Engineering Techniques (ICSET 2020), pp.1-18.