HEALTHY INTERIORS ENVIRONMENTS WITH THE IMPLEMENTATION OF SUSTAINABLE INTERIOR DESIGN PRACTICES.

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ABSTRACT

Customers are looking to integrate sustainability ideas into their interior design projects, driven by the growing awareness of the need for ecologically responsible construction and interior design in society. Reducing energy usage, pollution, and waste, as well as using building materials and practices with a minimal environmental effect, are all part of environmentally friendly interior design. Because they choose the materials and products to be used and how people may engage with their surroundings in an environmentally conscious manner, architects and interior designers play a crucial part in attaining sustainability in interior design. The study's overarching goal is to learn everything they can about the significance of sustainability in interior design and then investigate the several ways that sustainability may be incorporated into interior space planning. To reduce negative impacts on the environment, the study indicates that sustainable design is an essential component of interior architecture. At an alarming pace, the globe is experiencing detrimental changes to its ecosystem. The consuming habits of humans have contributed to environmental deterioration and, in turn, these changes. The construction sector is a major producer of waste and pollution, however, there are many other causes as well. Interior designers are part of an industry that has the potential to improve both the built and natural ecosystems by using sustainable practices. The goal of sustainable design is to reduce negative effects on the environment while simultaneously preserving resources for use by present and future generations via the use of materials, techniques, and procedures that are considerate of the Earth's life cycles.

Keywords: Environment, interior design, healthy interior, sustainability.

INTRODUCTION

The current global environmental catastrophe has its roots in the rise of industries and technology, both of which have had enduring detrimental consequences on the environment. A greater understanding of the significance of sustainable practices is required since the world's population has been steadily increasing over many centuries, putting our finite resources in an unsustainable state. Professionals in the fields of interior design and architecture have an ethical obligation to aid in the preservation,

restoration, and protection of the world's ecosystems. In the past, interior designers mostly cared about making a room seem better, which was a quite one-dimensional process. The conventional wisdom in interior design has long ignored the need to reduce emissions and energy consumption in favor of a focus on fashion and luxury in cramped spaces (Rady, 2023).

Additionally, this method disregarded the negative impacts of design on customer health and pollution levels. However, there has been a sea change in interior design in the last few years, with an emphasis on creating sustainable and healthfully constructed spaces. Sustainability, defined as "meeting today's needs without compromising those of the future," is a term that has gained plenty of attention recently. More and more, people are starting to see the value of a sustainable built environment. Sustainable interiors are in high demand from clients who have recently become aware of their part in and effect on the environment. While there are many ways to look at sustainability from a social, economic, and environmental perspective—the environmental perspective is the one that this study employs. This paper's goals are twofold: first, to get a thorough comprehension of the significance of sustainability in interior design; and second, to investigate the several ways in which environmental sustainability may be attained via the design of interior spaces. The outline of the paper is as follows. There the researchers go over why sustainability is so important for interior designers. They would talk about some of the environmental problems that designers cause, such as global warming, resource depletion, biodiversity loss, trash, and water shortage, and will go into sustainability and how interior designers fit into it. Also covered in this part is the topic of incorporating this idea into the interior design of a structure. Environmental sustainability in interior design is a goal that would explore. The researchers would take a close look at energy efficiency, water conservation, how to make interior spaces healthier, and how to lessen the environmental effects of building materials (Othman, 2021).

BACKGROUND OF THE STUDY

Concerns about consumption are just one aspect of a larger environmental problem. Most consumer activities include the use of resources followed by the production of trash. As a closed-loop system, the natural consumption cycle allows one organism to use another's waste products. The chemical, synthetic, and toxic compounds that have been released into this cycle by industrialiser civilizations have had a profound impact on the environment. These pollutants disrupt the cycle and cause linear and fragmented consumption once they enter it. The developed world has 'thrown away' its garbage without thinking about how it would affect the environment or its citizens. Whenever garbage is discarded, one must enquire as to the precise location of the disposal. No matter how far away they are from the surface of the earth in landfills, seas, rivers, or

anywhere else they are never alone. During Earth's life cycles, the trash accumulates. Every year, the typical American squanders around a million pounds of resources including energy, raw materials, and more. Even in the new millennium, this pattern of excess persisted (Oke, 2023).

Concerned about the interior design industry's efforts to reduce its environmental impact, the researcher approached the study with that goal in mind. Those working in interior design have a responsibility to learn about environmental problems, their origins, and ways to mitigate, cure, or repair the harm that humans inflict on the planet. The researchers state that the interior design industry has critically examined its environmental effect and acknowledged the need to alter its methods. Sustainable design approaches, a recent development, are responsible for this shift. Stieg claims that many practitioners are still learning or have had a hard time acquiring these alternative approaches. Interior designers, teachers, and students must be conscious of sustainability if they want to be agents of change in the field. Incorporating sustainable design into the design process, rather than an afterthought offered to customers, is now widely considered the norm by many experts. Numerous groups have considered sustainable design education, such as the US Green Building Council (USGBC) the IDEA is the Interior Design Educators Council. Teaching about sustainability has been a priority for these groups. Many of the interior design faculty, students, and professionals in the field are always on the lookout for new studies, product details, and specs, as well as other crucial information needed to develop long-term solutions. Based on what they have been Sustainable design education has been highlighted by researchers. They played an essential role in the field of interior design. Sustainable design information must be readily accessible. They trained individuals, who then impart their expertise to younger generations. Along with long-term as part of interior design processes, which subsequently enhance and provide their pupils with important information. Maybe they're approaching that moment when environmentally friendly design principles are taught and used in the United States with a focus on interior design, as well as on fire and life safety regulations, Americans with Disabilities Act (ADA) and other interior construction requirements. Having said that, teachers have a plethora of challenges and concerns with the long-term curriculum of degree programs in interior design including design. This study covers several topics and questions (Kineber, 2023).

PURPOSE OF THE RESEARCH

Find out how different eco-friendly interior design methods and materials affect IAQ, occupant health, and the environment. Find out if there's a link between eco-friendly measures and better health for building residents, including less stress and fewer respiratory problems. Offer a thorough collection of rules and recommendations for maximising the health advantages of inhabitants via the integration of sustainability

into interior design. Provide designers, architects, and lawmakers with your thoughts and suggestions on how to improve indoor environments and public health by using sustainable methods in interior design. Stakeholders should be made more aware of the importance of sustainable interior design in creating healthier environments for living and working.

LITERATURE REVIEW

People's knowledge of the need to protect the environment is paramount to the concept of sustainability. A design that demonstrates human regard for our world is an example of sustainable design. This kind of design is characterised by the preservation of resources for both the current generation and the generations to come. Several instances of sustainable design can be found in traditional and vernacular structures from all over the globe. Sustainable design is an intrinsic constituent of excellent design. These structures were aware of their surroundings and climate, and they made use of local, natural materials, straightforward construction techniques, and the expertise of locals. Additionally, they made use of passive design principles via their construction. The term "sustainable interior design" refers to a methodology that acknowledges the environmental implications that occur during the whole life cycle of an interior installation. As a result, the adverse impacts that interiors have on the surrounding environment are considerably mitigated or eliminated. In the context of interior design, the most essential elements of sustainability are those that pertain to the reduction of the use of dangerous construction materials, the avoidance of pollution, and the recycling of resources (Al-Bukhari, 2021). The designer is accountable for making decisions on the finishing, lighting, woodwork, equipment, plumbing, and other interior features that are necessary. The reality of the matter is that a genuinely sustainable strategy involves considering the whole of a project's life cycle, optimising its functionality and quality, and therefore the experience that its users have with it. It is essential to have an understanding that every project influences the environment at every step of its life cycle and that these effects may be avoided via the implementation of sustainable design; this is extremely important. By using the necessary techniques, interior designers can bring about significant changes and improvements in the process of designing ecologically friendly interiors. An awareness of the many principles of sustainable design, an examination of the examples that are already in existence, and the use of new technology are all ways in which the changes may be accomplished. The interior designer is required to adhere to principles and provide answers to essential issues. This is necessary to achieve a design that is both high-quality and favorable to the environment. This is a universal scheme of the problem-solving process in which seven concerns have been singled out that follow the life cycle of a place. Each step of the project must be addressed with a focus on

sustainability and eco-friendliness because each stage of the project must be approached appropriately. The plan also illustrates the most significant actions that a designer must follow to create an environmentally responsible interior design. Throughout the whole of the design process, the designer or architect must be willing to make concessions and consider the repercussions of each step that is taken. As was noted earlier, interior designers can bring about substantial changes and provide the circumstances necessary for the effective implementation of the concept of sustainability and environmental conservation via the work that they do. Among the concepts of sustainable design are the capabilities of maximizing site potential, minimizing the use of non-renewable energy, and improving energy efficiency. Use items that are better for the environment, preserve and save water, improve the quality of the environment within the building, and maximise efficiency. Activities related to operations and maintenance. Employing a sustainable method at each stage of the design process, choices are encouraged by design philosophy. Develop procedures that were lessen the severity of adverse effects on the environment as well as the health of the people living there, without risking the bottom line of the business. It is a comprehensive and integrated approach. A method that has a favorable influence on all stages of the lifetime of a building, including the design, construction, operation, and rehabilitation phases of commissioning. It is possible for the materials that they use to construct and decorate the interior to make the depletion of resources worse; affect the climate waste, climate change, a scarcity of potable water, and the loss of biodiversity buildup; contribute to pollutants throughout the manufacturing process or the manufacturing process puts our health at jeopardy. The depletion of resources is which of the effects of employing certain materials is the most noticeable. Substance usage of anything has an indirect effect on the warming of the planet, particularly considering the amount of energy that is used during their life cycle. This is the case. This is known as embodied energy, which refers to the energy that is required for acquisition, processing, production, transportation, installation, and upkeep for the destruction and disposal of a substance. In the event of a material's higher amount of energy that is embodied, the more advantageous it is towards the surrounding environment. When it comes to the material, for instance, wood has a low energy that has been embodied since it has already been handled in nature and simply needs refining and shipment to be completed. On the contrary, because of its many phases, Aluminum requires a significant amount of energy. Mining, manufacturing, refining, and other activities are an integral part of its life cycle transferring the material or goods (Österbring, 2019).

RESEARCH QUESTION

What kinds of instructional strategies and activities are being used by professors who are educating students about sustainability in the field of interior design?

RESEARCH METHODOLOGY

China's many different organisations were responsible for carrying out the research. A quantitative technique was chosen by the researcher because of the restricted resources and the short amount of time available. Using a random sampling process, each respondent was contacted for the survey. Following this, a sample size was determined using Rao Soft, and the total number of samples was 534. Individuals confined to wheelchairs or who are unable to read and write would have the survey questions read aloud by a researcher, who would then record their answers word for word on the survey form. While participants waited to complete their surveys, the researcher would inform them about the project and field any questions they may have. On occasion, it is asked that people finish and send back questionnaires simultaneously.

SAMPLING

Research participants filled out questionnaires to provide information for the research. Using the Rao-soft programme, researchers determined that there were 534 people in the research population, so researchers sent out 820 questionnaires. The researchers got 813 back, and they excluded 39 due to incompleteness, so the researchers ended up with a sample size of 774.

DATA & MEASUREMENT

A questionnaire survey was used as the main source of information for the study (one-to-correspondence or Google-form survey). Two distinct sections of the questionnaire were administered: Both online and offline channels' (A) demographic information, and (B) replies to the factors on a 5-point Likert scale. Secondary data was gathered from a variety of sites, the majority of which were found online.

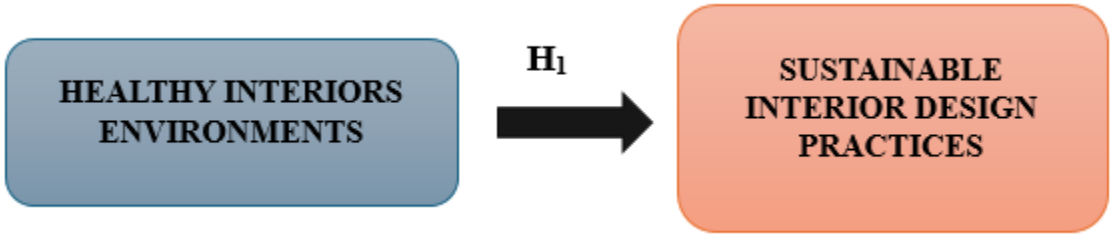
STATISTICAL SOFTWARE

SPSS 25 was used for statistical analysis.

STATISTICAL TOOLS

To get a feel for the data's foundational structure, a descriptive analysis was performed. A descriptive analysis was conducted to comprehend the fundamental characteristics of the data. Validity was tested through factor analysis and ANOVA.

CONCEPTUAL FRAMEWORK



RESULTS

Factor Analysis: The process of verifying the underlying component structure of a set of measurement items is a widely used application of Factor Analysis (FA). The observed variables' scores are believed to be influenced by hidden factors that are not directly visible. The accuracy analysis (FA) technique is a model-based approach. The primary emphasis of this study is on the construction of causal pathways that connect observable occurrences, latent causes, and measurement inaccuracies.

The appropriateness of the data for factor analysis may be assessed by using the Kaiser-Meyer-Olkin (KMO) Method. The adequacy of the sampling for each model variable as well as the overall model is assessed. The statistics quantify the extent of possible common variation across many variables. Typically, data with lower percentages tends to be more suited for factor analysis.

KMO returns integers between zero and one. Sampling is deemed adequate if the KMO value falls within the range of 0.8 to 1.

It is necessary to take remedial action if the KMO is less than 0.6, which indicates that the sampling is inadequate. Use the best discretion; some authors use 0.5 as this, therefore the range is 0.5 to 0.6.

• If the KMO is close to 0, it means that the partial correlations are large compared to the overall correlations. Component analysis is severely hindered by large correlations, to restate.

Kaiser's cutoffs for acceptability are as follows:

A dismal 0.050 to 0.059.

• 0.60 - 0.69 below-average

Typical range for a middle grade: 0.70–0.79.

Having a quality point value between 0.80 and 0.89.

The range from 0.90 to 1.00 is stunning.

Table 1: KMO and Bartlett's.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.941
Bartlett's Test of Sphericity	Approx. Chi-Square	3252.968
	df	190
	Sig.	.000

The overall significance of the correlation matrices was further confirmed by using Bartlett's Test of Sphericity. A value of 0.941 is the Kaiser-Meyer-Olkin sampling adequacy. By using Bartlett's sphericity test, researchers found a p-value of 0.00. A significant test result from Bartlett's sphericity test demonstrated that the correlation matrix is not a correlation matrix.

TEST FOR HYPOTHESIS

DEPENDENT VARIABLE

Sustainable interior design practices: Environmental responsibility, resource efficiency, and occupant well-being are the guiding concepts of sustainable interior design techniques, which include principles, strategies, and methodologies for creating and decorating interior spaces. All while creating spaces that are healthy, beautiful, and practical, these methods try to lessen the toll that interior design has on the environment. Green building practices include using renewable or recyclable resources, energy-efficient lighting, water-saving fixtures, and other environmentally friendly products. The focus is on finding goods with minimal carbon footprints, reusing existing resources, and minimising waste. Some examples of practices include using non-toxic paints, recovered wood furniture, and sustainable or recycled flooring materials. To further ensure that decisions are in line with sustainability principles, sustainable interior design takes the whole product lifespan into account, beginning with manufacture and ending with disposal. Better indoor air quality, less energy use, and making the most of natural light and ventilation are all part of sustainable design. Interiors that are both aesthetically pleasing and practically sound may be made eco-friendlier and more conducive to achieving sustainability objectives in the long run by using sustainable design principles that take economic, social, and environmental factors into account. To educate and widen an individual's horizons to preserve their

lofty goal, it is necessary to understand the function that sustainable interior design plays. This was made the desire to live a more elevated style of life realistic. Even though the world is filled with melancholy, there is still a place for optimism, and the potential for a single act of kindness may result in enormous benefits.

INDEPENDENT VARIABLE

Healthy interiors environments: Considering indoor settings have a significant influence on health and well-being, it is essential to understand the factors that contribute to their health and sustainability. The amount of information that exists about individual components and the impacts they have is enormous; nevertheless, there is a dearth of understanding regarding how they interact with one another and the role that inhabitants play in these interactions (both as a cause and a recipient). The researchers' goals were to (i) investigate how elements interact with one another and the possible dangers that may arise if they are not considered from a holistic point of view, and (ii) determine the components that are necessary to develop research on indoor settings. This work is the result of a collaborative effort amongst academics from a variety of fields, including those investigating technological, behavioural, and medical viewpoints. The outcomes were determined by doing literature studies, holding workshops, and having conversations with invited experts and representatives from a variety of stakeholder groups.

Relationship between sustainable interior design practices and healthy interior environments: The sustainable interior design system emphasises the utilisation of materials that are non-toxic and low in volatile organic compounds (VOC), which may drastically cut down on the amount of dangerous chemicals that are discharged into the air. Additionally, the utilisation of natural materials such as wood and stone can further contribute to the improvement of the quality of the air inside the building. Sustainable interior design emphasises the utilisation of materials that are non-toxic and low in VOC, which can significantly reduce the amount of harmful chemicals that are released into the air. In addition, the use of natural materials like stone and wood may further help the maintenance of comfortable and healthy interior air quality. It is possible for sustainable design to enhance the health of occupants by maximising the amount of natural light and views, offering access to natural environments, and designing rooms that encourage both physical activity and mental harmony (Zayed, 2020).

Based on the above discussion, the researcher formulated the following hypothesis, which was to analyse the relationship between Sustainable interior design practices and Healthy interior environments.

Since the above discussion, the researcher formulated the following hypothesis, which was analyse the relationship between knowledge management with efficient management of tacit knowledge.

H_{01}: There is no significant relationship between Sustainable interior design practices and Healthy interiors environments.

H_1: There is a significant relationship between Sustainable interior design practices and Healthy interiors environments.

Table 2: H_1 ANOVA Test.

ANOVA					
Sum					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	38514.620	432	5655.517	1047.462	.000
Within Groups	495.370	341	5.356		
Total	39009.99	773			

In this study, the result is significant. The value of F is 1047.462, which reaches significance with a p-value of .000 (which is less than the .05 alpha level). This means **"H_1: There is a significant relationship between Sustainable interior design practices and Healthy interiors environments"** is accepted and the null hypothesis is rejected.

DISCUSSION

The research underscores the significance of windows that let in natural light and ventilation systems in the process of developing healthy interior spaces. Natural illumination and better air quality are both considerably enhanced using sustainable design principles. Some examples of these practices are the strategic positioning of windows and the utilisation of skylights. Not only does this strategy lessen the need for artificial illumination, but it also improves mood, lessens the strain on the eyes, and reinforces circadian cycles. A better indoor air environment may also be achieved by the implementation of efficient ventilation techniques, such as the utilisation of materials with low VOC and the operation of appropriate air filtering systems. In environmentally responsible interior design, the selection of materials is of the utmost importance. Material that is low-impact and non-toxic improves the quality of the air within a building and lowers the danger of health problems that are associated with off-gassing from traditional substances. According to the findings of the research, the utilisation of natural materials like bamboo, recycled wood, and low-volatile organic compound paints is a significant contributor to the creation of a healthier interior

environment. Not only do these materials have less impact on the environment, but they also provide advantages such as being more durable and easier to maintain (Palm, 2020).

CONCLUSION

When it comes to interior architecture, the architect or designer is an essential component in the process of attaining sustainability. It is entirely up to the discretion of a designer to choose the appropriate materials and finishes for every component of an interior design. Designers who embrace sustainable design have nothing to lose and a great deal to gain from doing so. To develop an ecologically sustainable interior, designers need to take into consideration the influence that the materials they want to use in the interior had on the environment. They should also promote the use of materials that have recycled content, steer clear of tropical hardwoods that are endangered, and restrict VOCs that are harmful to human health. A healthy lifestyle may be achieved by avoiding chemicals, such as those found in paints and textiles, and by incorporating elements like plants, sunshine, and natural ventilation. By choosing goods that are low in energy consumption and water consumption, interior designers can impact the energy efficiency and water consumption of buildings that are currently in use. Taking into consideration the findings of this study, it is possible to conclude that the incorporation of sustainability into the design of interior architecture is of the utmost importance to foster better health for people and reduce the negative impact on the environment.

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