



IMPROVING INDOOR SURROUNDINGS With APPROPRIATE INTERIOR DESIGN SERVICES

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ABSTRACT

As people become more aware of the necessity of eco-friendly construction methods and environmentally conscious design, more and more customers are looking for ways to integrate sustainability ideas into their interior design projects. Efficient use of energy, decreased pollution, and reduced rubbish are all aspects of eco-friendly interior design, along with the use of environmentally friendly building materials and techniques. Architects and interior designers play a crucial role in sustainable interior design by guiding customers in the selection of eco-friendly materials and providing guidance on how to live in harmony with their surroundings. The study's overarching goal is to learn everything researcher can about sustainability's significance in the field of interior design and the many ways it may be incorporated into space planning. According to the study, interior architecture must use sustainable design to reduce negative impacts on the environment. There has been a sudden and disastrous shift in the global ecology. Human eating habits are mostly to blame for these shifts and the ecological deterioration. While many other sectors contribute to environmental degradation, the construction industry ranks high among them. Interior designers play an important role in promoting sustainable practices, which may improve both man-made and naturally occurring ecosystems. Sustainable design seeks to reduce negative effects on the environment while simultaneously preserving resources for use by current and future generations via the use of materials, methods, and procedures that are cognizant of the Earth's life cycles.

Keywords: *Wellness, Urban atmosphere, Workplace, Interior architecture, Strategy design, Designer*

Introduction

The present environmental disaster has many causes, but two of the most important ones are industrialization and technological advancement. Since the rate of population expansion on Earth has been unsustainable for quite some time, placing researchers' limited resources in an unsustainable situation, it is imperative that they have a deeper comprehension of the need of sustainable activities. Members of the interior design and architecture professions have a moral duty to help keep the world's ecosystems intact (Alfuraty & Basim, 2020). The primary objective of interior designers used to be to enhance the room's look, which was approached in a highly linear fashion. Interior designers have long believed that preventing overcrowding is more important than considering ways to conserve energy and lessen pollution. Additionally, this strategy did not take into account the possible negative impacts of design on consumer health and pollution levels. Contrarily, eco-friendly and health-focused interior design is now trending. That word "sustainability," which means "meeting today's needs without compromising those of the future," has been all over the news as of late. The importance of a sustainable built environment is becoming more apparent to the general public. As more and more people realize the impact they have on the environment, the demand for sustainable home furnishings has surged. This study takes a more ecological stance on sustainability than others that have looked at it from a social or



economic angle. This article has two goals: first, to examine the relevance of sustainability to interior design; and second, to look at the many ways sustainable practices might be included into the designing of interior spaces. The paper's outline is as follows. The study's writers go into more detail on how eco-friendliness impacts the interior design sector there. In this session, interior designers will discuss their role in sustainability initiatives as well as their impact on environmental challenges such as water scarcity, pollution, loss of biodiversity, and climate change. The researchers also provide examples of interior building designs that use this notion. Investigating interior design's potential for greener practises is one such objective. Scientists' goals would include improving indoor air quality, conserving water, and reducing the environmental impact of construction materials.

Background of the study

There is a bigger environmental issue, and consumption concerns are just one facet of it. Using resources and then producing waste are two of the most common outcomes of consumer behaviors. One creature may reap the benefits of another's waste thanks to the natural consumption cycle, which functions as a closed-loop system. The release of chemical, synthetic, and dangerous chemicals into this cycle by industrialized societies has had a profound effect on the ecosystem. When these contaminants get into the system, they disrupt the cycle by causing linear and fragmented consumption. Industrialized countries' citizens have "thrown away" their waste without giving any consideration to how it can harm wildlife or human health. Inquire as to the exact location of the trash before disposing of it (Merabet et al., 2021). Whether they're in a landfill, on the water, or in some other remote location, they'll never really be alone. There will be an accumulation of garbage when Earth is alive. An annual waste of about one million pounds of energy, materials, and other important resources is produced by the average American. Over the course of the new century, indulgence continued. The researcher began the study with the intention of helping the interior design business lessen its environmental effect. By better understanding environmental issues, their causes, and potential remedies, interior design professionals may better serve their customers and the world at large. According to academics, the interior design industry has taken stock of its impact on the environment and recognized the need to change its practices. Sustainability in design is a more modern concept that is propelling this change. According to Stieg, a lot of practitioners are either still in the learning process or have struggled to acquire these other ways. If the interior design industry is serious about making a difference, it's imperative that everyone from students to teachers understand the value of sustainability. These days, many professionals in the industry perceive eco-friendly layouts as the standard, rather than an afterthought. Many groups have given sustainable design education some thought, such as the US Green Building Council (USGBC) and the Interior Design Educators Council (IDEA), among many others. Sustainable education has long been a focus for these organizations (Malagnino et al., 2022). A large portion of the interior design community is continuously searching for fresh research, product details, specifications, and any other vital knowledge that can help them create solutions that last. Because of its successful history, sustainable design education has piqued the interest of scholars. The evolution of interior design owes a great deal to their contributions. Information on sustainable design has to be easily available. Consequently, people's knowledge was better preserved for future generations. Additionally, students gain crucial knowledge about the processes that shape interior design as they go through their education. Perhaps one day the US will teach and use environmentally friendly design ideas, particularly in interior design, in accordance with standards pertaining to life and fire safety, the Americans with Disabilities Act



(ADA), and other laws pertaining to interior building. Concerns and issues about the future of design education in interior design degree programs are widespread among educators. The scope and depth of this investigation are enormous (Li et al., 2022).

Purpose of the research

Analyze the effects on indoor air quality (IAQ), occupant health, and environmental impact of various eco-friendly interior design approaches and materials. Look into the possibility that green construction practices have positive effects on occupant health, such as reducing stress and respiratory issues. Integrating sustainability into interior design may maximize the health benefits for individuals. Provide a comprehensive outline of all the guidelines and suggestions. Present the researchers' recommendations for healthier, more environmentally friendly interiors to legislators, architects, and designers to rally support for their cause. For sustainable interior design to play its part in making homes and offices healthier places to live and work, more people need to know about it, according to the study.

Literature review

A critical component of sustainability is raising awareness about the significance of environmental protection. Sustainable design is one way individuals may demonstrate their concern for the environment. One characteristic of this design method is its emphasis on long-term resource preservation. Sustainable design is prevalent in traditional and vernacular architecture across the globe. Sustainable practices are fundamental to high-quality design. The utilization of locally sourced, natural materials, as well as basic construction methods and the skills of locals, are signs that these structures are climate and environment sensitive. Additionally, passive design principles were used throughout through the building process. Throughout an interior installation's lifespan, a building process called "sustainable interior design" takes environmental impacts into account. Therefore, indoor spaces have little, if any, effect on the natural world (Reyhaneh et al., 2021). When it comes to interior design, sustainability mostly means reducing the use of harmful building materials, avoiding pollution, and finding new uses for existing resources. In the inside, the designer decides on everything from the lighting to the woodwork, plumbing, equipment, and finishing touches. The truth is that a truly sustainable approach aims to enhance the quality and usefulness of a project across its entire existence, which in turn improves the user experience. While it's true that every project has some kind of influence on the environment at some point, it's also true that sustainable design may help reduce such effects. When interior designers use the right approaches, they may revolutionize the way eco-friendly spaces are made. Possible methods of implementing the changes include becoming knowledgeable of the many sustainable design concepts, looking at existing examples, and making use of new technologies. Important questions and guidelines need to be addressed by the interior designer. This is vital in order to create an excellent, eco-friendly design. Here, the researchers take a holistic view of the issue; they monitor the lifespan of a site and identify seven separate challenges. Consideration of long-term viability and ecological impact should guide all project choices. The main actions that the designer must do to make an eco-friendly interior are also laid out in the blueprint. The ability to quickly assess new circumstances and adjust one's approach is essential for architects and designers. There has been a lot of talk about the potential impact of interior designers in creating sustainable and environmentally friendly environments. Making the most of available space, reducing reliance on non-renewable energy sources, and maximizing efficiency are all tenets of environmentally



conscious design. By selecting eco-friendly products, the researchers may reduce their impact on the environment, conserve water, enhance the building's occupants' quality of life, and make the most efficient use of available resources. Operations and maintenance-related tasks. Throughout the design process, sustainable practices are promoted by design philosophies that embrace alternative approaches. Avoid jeopardizing the company's financial line while simultaneously reducing harm to the environment and the health of the local population (Rongbo et al., 2020). This strategy is comprehensive and well-integrated. A method that improves a structure all the way through its lifetime, from design and construction to operation and maintenance. Building and decorating with these materials could speed up resource depletion, pollute the environment during production, put researchers' health at risk, accelerate global warming, affect the accumulation of pollutants, lead to water shortages, and decrease biodiversity. Natural resource depletion stands out among these repercussions, but it's far from the only one. Consumption of a drug indirectly contributes to climate change due to the high energy needed to complete its life cycle. Certainly, the researchers concur. The sum of all the energy needed to bring a material from its inception to its final disposal is known as its embodied energy. This includes all stages of processing, manufacturing, shipping, installation, upkeep, and disposal. The more a substance's embodied energy, the more good it does for the environment. Wood, for instance, has less embodied energy than other materials since it has already undergone a lot of processing and movement in nature. Indeed, aluminum's high energy consumption is a direct outcome of its multi-phase structure. The material or item undergoes several transformations over its lifetime, including mining, manufacturing, refining, and more (Ming, 2021).

Research question

What impact does a stable climate have on sustainable interior design?

Research methodology

Research design:

The analysis of quantitative information was conducted using SPSS version 25. The odds ratio and 95% confidence interval were used to ascertain the magnitude and direction of the statistical link. The researchers set a statistically significant criterion of $p < 0.05$. A descriptive analysis was performed to ascertain the primary characteristics of the data. Quantitative approaches are often used to evaluate data obtained from surveys, polls, and questionnaires, as well as data modified by computational tools for statistical analysis.

Sampling:

Research participants completed questionnaires to provide information for the study. Employing the Rao-soft software, researchers identified a study population of 534 individuals, prompting the distribution of 820 questionnaires. The researchers received 813 responses and removed 39 for incompleteness, resulting in a final sample size of 774.

Data and Measurement:

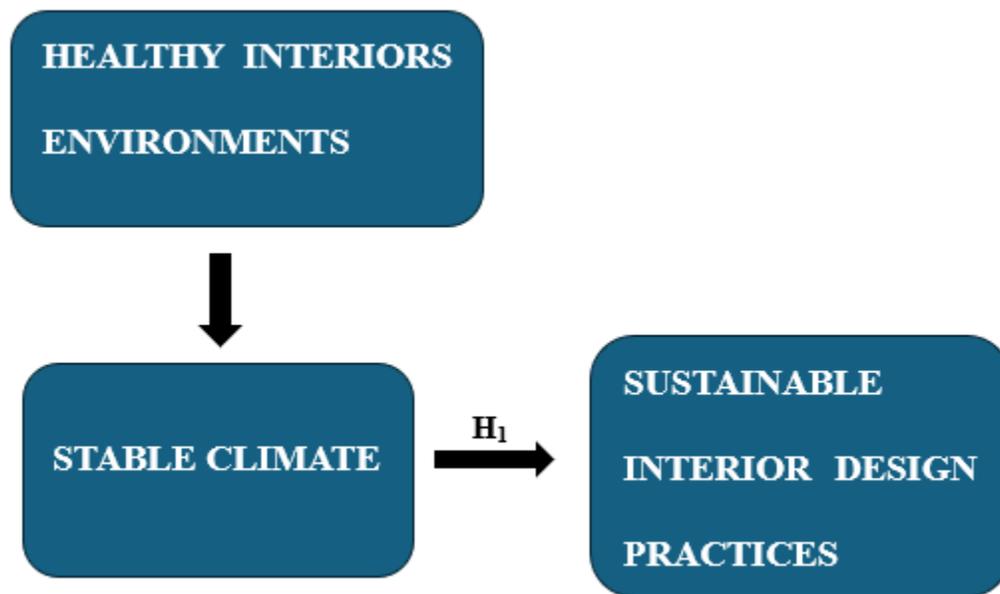


The study's main data was derived from a questionnaire survey, which may have been a one-to-one correspondence survey or a Google Form survey. The survey had two components: (A) a segment soliciting demographic information from all sources (both online and offline), and (B) a segment requesting answers to variables on a 5-point Likert scale. Numerous other sources, mostly available online, supplied the secondary data.

Statistical Software: The statistical analysis was conducted using SPSS 25 and MS-Excel.

Statistical Tools: To grasp the fundamental character of the data, descriptive analysis was used. The researcher is required to analyse the data using ANOVA.

Conceptual framework



Result

- **Factor Analysis**

One typical use of Factor Analysis (FA) is to verify the existence of latent components in observable data. When there are not easily observable visual or diagnostic markers, it is common practice to utilise regression coefficients to produce ratings. In FA, models are essential for success. Finding mistakes, intrusions, and obvious connections are the aims of modelling. One way to assess datasets produced by multiple regression studies is with the use of the Kaiser-Meyer-Olkin (KMO) Test. They verify that the model and sample variables are representative. According to the numbers, there is data duplication. When the proportions are less, the data is easier to understand. For KMO, the output is a number between zero and one. If the KMO value is between 0.8 and 1, then the sample size should be enough. These are the permissible boundaries, according to Kaiser: The following are the acceptance criteria set by Kaiser:

A pitiful 0.050 to 0.059, below average 0.60 to 0.69



Middle grades often fall within the range of 0.70-0.79.

With a quality point score ranging from 0.80 to 0.89.

They marvel at the range of 0.90 to 1.00. Table1: KMO and Bartlett's Test

Testing for KMO and Bartlett's

Sampling Adequacy Measured by Kaiser-Meyer-Olkin .986

The results of Bartlett's test of sphericity are as follows: approx. chi-square

df=190

sig. =.000

This establishes the validity of assertions made only for the purpose of sampling. To ensure the relevance of the correlation matrices, researchers used Bartlett's Test of Sphericity. Kaiser-Meyer-Olkin states that a result of 0.986 indicates that the sample is adequate. The p-value is 0.00, as per Bartlett's sphericity test. A favorable result from Bartlett's sphericity test indicates that the correlation matrix is not an identity matrix.

Table: KMO and Bartlett's

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.986
Bartlett's Test of Sphericity	Approx. Chi-Square	3252.968
	df	190
	Sig.	.000

Bartlett's Test of Sphericity further substantiated the significance of the correlation matrices. The Kaiser-Meyer-Olkin measure of sampling adequacy is 0.986. Researchers determined a p-value of 0.00 via Bartlett's sphericity test. The researcher acknowledges that the correlation matrix is invalid, since Bartlett's sphericity test produced a significant result.

❖ **INDEPENDENT VARIABLE**

• **Healthy Interiors Environments**

The significant impact that interior spaces have on people's health makes it all the more important to understand what makes for a healthy and sustainable environment. While there is a dearth of data on the impact of individual components, there is an abundance of data on the components' interactions with one another and with humans. The researchers embarked on this trip with two



goals: (i) to get a better understanding of the interplay between different components and the risks of missing important details, and (ii) to collect the required tools to examine interior environments. Members of the academic communities focusing on technology, behavior, and medicine worked together interdisciplinarily to produce this study. The results were derived from a combination of workshops, literature reviews, and discussions with invited experts and representatives from different stakeholder groups (Simon Elias & John Krogstie, 2020).

❖ FACTOR

• Stable Climate

We deal with chemicals on a regular basis in the researcher jobs and in the researcher personal lives. Chemicals are fundamental components of all living things. Chemicals are the building blocks of all forms of life. This includes humans, flora, and fauna. Chemical compounds are the building blocks of all food. Numerous compounds are inherently harmful, while others become far more so when subjected to heat, crushed, or combined with other chemicals. It is possible to cause harm only by transferring chemicals from one container to another. Accidents resulting in casualties might happen if there is a lack of proper safety measures or understanding about the potential dangers. Factory, store, laboratory, office, farm, and home and garden are just a few of the many locations and uses for chemicals. Depending on your line of work, the chemicals you employ on the job can be for cleaning, upkeep of machinery, or even your core business itself. When chemicals are used, there are several potential dangers. The dangers change depending on the responses. It would be impossible to enumerate all of the potential dangers that may arise from a combination of chemicals or from chemicals coming into contact with air. In order to keep everyone on the job safe and healthy, this manual will go over some of the most typical dangers that people face on the job and how to avoid them (Balaji et al., 2020).

❖ DEPENDENT VARIABLE

• Sustainable Interior Design Practices

The term "sustainable interior design practices" describes a set of guidelines for creating comfortable and environmentally friendly interiors with little waste of materials and energy. You may include these approaches into your interior design projects to reduce your influence on the environment without sacrificing functionality, aesthetics, or health. Renewable or recyclable materials, energy-efficient lighting, water-saving fixtures, and eco-friendly building supplies are all part of sustainable interior design. Emphasis is on finding items with a small carbon impact, eliminating waste, and recycling what researchers already possess. Reusing wood furniture, using non-toxic paints, and flooring materials that are either recycled or supplied sustainably are some examples of methods. Sustainable interior design also takes into account the whole product lifespan, from manufacturing to disposal, to make sure that decisions are eco-friendly. On top of that, it involves making sure that rooms are designed to make the most of natural light and ventilation, minimize energy use, and improve the quality of indoor air for the people living there. Through the integration of economic, social, and environmental factors, sustainable interior design methods strive to create spaces that are both ecologically sensitive and practical. This method is



both aesthetically pleasing and useful for achieving long-term sustainability objectives (Shanaka Kristombu et al., 2022).

- **Relationship Between Stable Climate and Sustainable Interior Design Practices**

In the end, the weather impacts how a room feels as much as its practicality. Comfort and beauty may coexist in a well-designed home, fostering a sense of oneness with one's surroundings. Everything from materials to color schemes and floor plans may be impacted by climate when it comes to interior design. Uplift and racking may occur in windy regions, while flooding and water damage can occur in rainy regions. Roofing and heating systems are impacted by snowy regions, whereas specific construction materials are needed in hot and sunny climates. Reduced size and brittleness are symptoms of dryness. Buildings and construction account for almost 40% of global carbon emissions, making interior designers a powerful force in the fight against global warming. Key climatic conditions that impact interior design include temperature, precipitation, wind, and sunshine (Ayman Fathy, 2021).

To reduce the impact of human-caused climate change, architects, designers, and city planners are working on solutions. Adaptive design allows for the development of structures and interiors that can endure ever-changing climates for longer periods of time, while a sustainable interior approach creates a safer atmosphere. The atmosphere and user experience of an interior space are impacted by climate in a number of ways, including material choice, spatial layout, and energy use (Al Dakheel et al., 2020).

Subsequent to the aforementioned debate, the researcher developed the following hypothesis to analyze the correlation between Stable Climate and Sustainable Interior Design Practices.

- ***“H₀: There is no significant relationship between Stable Climate and Sustainable Interior Design Practices.”***
- ***“H₁: There is a significant relationship between Stable Climate and Sustainable Interior Design Practices.”***

Table 2: H₁ ANOVA Test

ANOVA					
Sum					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	39588.620	284	5134.514	940.559	.000
Within Groups	492.770	489	5.459		
Total	40081.390	773			

In this investigation, the results will be substantial. The F value is 940.559, attaining significance with a p-value of .000, which is below the .05 alpha threshold. This signifies the ***“H₁: There is a significant relationship Stable Climate and Sustainable Interior Design Practices.”*** is accepted and the null hypothesis is rejected.



Discussion

The study's authors drew the conclusion that air circulation and light-letting windows are crucial for making indoor environments healthy. Sustainable design principles have many advantages, but two of the most important are better air quality and more natural light. The installation of skylights and carefully arranging windows are two examples of such tactics. Mood enhancement, reduced eye strain, and support for the body's natural circadian rhythms are just a few of the many benefits of limiting exposure to artificial light. Implementing efficient ventilation strategies, such as utilizing materials with minimal volatile organic compound (VOC) levels and operating suitable air filtering equipment, may enhance the indoor air quality. When designing a green house, the materials used are of utmost importance. By opting for low-impact and non-toxic solutions, researchers can enhance indoor air quality while reducing the potential health risks linked to off-gassing from traditional chemicals. Studies have shown that interiors made from natural materials are far healthier than those made from synthetic ones. Materials such as bamboo, repurposed wood, and paints with minimal concentrations of volatile organic compounds are examples of such materials. These materials have the potential to reduce their negative effects on the environment while simultaneously offering benefits like increased durability and decreased upkeep requirements.

Conclusion

The role of the architect or designer is crucial in achieving sustainability in interior architecture. All of the materials and finishes used in a project are chosen by the interior designer, who has full creative control over them. Sustainable design practices have many advantages and almost no drawbacks, and they are rapidly gaining popularity among designers. Interior designers may do their part to create green spaces by thinking about how the materials they choose will affect the environment. Additionally, they need to stop using tropical hardwoods, which are becoming extinct, and instead encourage the employment of recycled materials while reducing the consumption of toxic volatile organic compounds (VOCs). You may stay away from the toxins in paints and fabrics by living a healthy lifestyle that incorporates things like plants, sunlight, and natural ventilation. Interior designers have the potential to enhance the water and energy efficiency of existing buildings by using water- and energy-efficient goods. In order to improve people's health and reduce the negative impact on the environment, this study's reasonable results suggest that sustainable practices should be given priority when designing interior architecture.

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