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INTEGRATING FENG SHUI AND SUSTAINABLE INTERIOR DESIGN TO ENHANCE CLASSROOM WELL-BEING: A FRAMEWORK FOR LEARNING PERFORMANCE

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Abstract

This thesis explores the integration of Feng Shui spatial-planning concepts and sustainable interior design principles to enhance the design of classroom and studio environments in higher education. The study focuses on the application of circulation flow (interpreted from Chi) and the Bagua Map zoning method as organizational tools to improve circulation, spatial clarity, comfort, and environmental balance within learning spaces.

A survey-based methodology was employed to gather students' perceptions of classroom layout, lighting, seating, and environmental comfort, as well as their preferences for materials, furniture, and natural elements. Sustainable design applications will include the use of lighting systems which are energy efficient, incorporate natural daylight, and select low-VOC, ecofriendly materials in order to enhance indoor air quality. The research analyzes these findings to develop evidence-based design guidelines that merge Feng Shui concepts with sustainable interior design strategies, promoting both psychological well-being and functional efficiency.

The results demonstrate that applying Feng Shui principles alongside eco-friendly and ergonomic design interventions creates classrooms that enhance student focus, creativity, and overall academic performance. The study provides a practical framework for interior designers and academic institutions seeking to design classroom learning environments that are balanced, sustainable, and conducive to optimal educational outcomes.

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CHAPTER ONE: INTRODUCTION

Background of the Study

The interior design of classroom learning environments significantly impacts students' creativity, concentration, and academic success. As educational methods continue to change, classroom spaces, especially design studios and lecture halls, must adapt to meet the cognitive and emotional needs of students. Research indicates that environmental factors, such as spatial layout, lighting, sound, and overall comfort, significantly affect student engagement, psychological well-being, and academic performance. Well-designed environments can improve focus, encourage creative thought, and help with cognitive processes. In contrast, environments that are poorly designed can lead to distraction, increased stress, and a decrease in productivity (Barrett et al., 2015). Given these challenges, it's crucial to investigate design methods that improve environmental performance while also enhancing the user experience in educational settings.

Problem Statement

Despite the increasing prominence of sustainable interior design in contemporary discourse, prevailing classroom design paradigms frequently neglect the integration of environmental performance with spatial arrangement and user-centric requirements. The majority of existing approaches emphasize energy efficiency and functional specifications, often at the expense of the psychological and experiential dimensions inherent in learning environments.

In addition, Feng Shui—despite its focus on spatial harmony, balance, and circulation—is rarely applied within academic interior design, particularly in higher education settings. This

results in classroom environments that lack a holistic approach to supporting student well-being, creativity, and performance.

Consequently, an integrated design methodology is warranted, one that merges sustainable strategies with spatial planning tenets, to improve environmental quality and the user experience within classroom learning environments.

Purpose of the Study

This study aims to examine how Feng Shui spatial principles can be integrated with sustainable interior design strategies in university classroom environments. The study proposes a conceptual classroom design model for a School of Design building at the University of Central Oklahoma (UCO).

The study is based on student feedback collected through a quantitative survey conducted among interior design students. The survey was used to identify user preferences related to classroom layout, environmental comfort, lighting, furniture, and spatial organization.

The findings of the study are used to develop design strategies that aim to improve student focus, support creativity, and enhance the overall learning environment.

The main objectives of this study are:

1. To identify the environmental and spatial factors that influence student performance in classroom environments.
2. To evaluate student preferences related to sustainable design strategies and spatial organization.
3. To develop an integrated design framework that combines Feng Shui spatial principles and sustainable design strategies.

4. To apply this framework in the design of classrooms within a proposed School of Design building.

Research Questions

1. What is the impact of Feng Shui-inspired spatial strategies on classroom arrangement and student welfare?
2. How do sustainable interior design components influence environmental quality within educational settings?
3. How can the principles of Feng Shui be combined with sustainable design strategies to enhance classroom learning environments?

Research Gap

Although previous studies have looked at sustainable design and Feng Shui separately, there's still a lack of research on how to combine them in educational settings. Most research focuses on early educational settings, with little attention given to higher education, especially design studios, which require flexibility, teamwork, and creativity. Moreover, previous studies have rarely applied these principles to buildings, and they haven't used data about how people use spaces to guide design choices. The viewpoints of university students—the primary users of these spaces—are frequently underrepresented. This research seeks to rectify these shortcomings by synthesizing Feng Shui principles with sustainable design methodologies within a unified framework, subsequently applying this framework to a hypothetical university building and validating design decisions through empirical student feedback.

Significance of the Study

This investigation advances the interior design discipline by advocating for an integrated methodology that merges Feng Shui spatial considerations with sustainable design practices

within the context of higher education. The study emphasizes how the physical environment and its quality affect students' well-being, their ability to be creative, and their academic success. Furthermore, the study furnishes practical, evidence-supported design recommendations, derived from student perspectives, thereby facilitating the creation of more flexible and user-focused learning environments.

This proposed framework also provides a foundation for future research in classroom design, thus contributing to the development of design education in academic institutions.

Scope and Limitation

Scope of the Study

This study aims to develop a comprehensive design framework for university classroom learning environments. It will incorporate Feng Shui principles, which are traditionally used to improve spatial organization and movement, along with sustainable design methods.

The framework's application was illustrated through a conceptual School of Design building, conceived solely for this investigation. The building's location on the UCO campus was carefully selected. It was positioned to align with the main paths people use, the entrances, and the best natural light.

This study will include the design of a conceptual School of Design building. This building will be used to test the integrated framework. This study examines how environmental and organizational strategies affect classroom learning environments, focusing on circulation patterns, solar orientation, and functional zoning.

Classification of classroom learning environments into four with computer lab primary categories within the conceptual building:

1. Design studios for junior and senior students, representing advanced academic levels that emphasize self-directed learning, independence, and individual initiative.
2. Design studios for freshman and sophomore students, which prioritize collaboration, peer interaction, and knowledge exchange, reflecting the early stages of academic development.
3. The study examined three types of lecture rooms: Type 1, Type 2, and Type 3. Each type represented a different teaching method: traditional, discussion-based, and interactive learning.
4. A single computer lab, designed to accommodate specialized applications, complete with the necessary technology and ergonomic considerations.

To ensure the framework accurately reflects the needs and preferences of a wide range of real users in university classroom learning environments, quantitative data was collected from design students at the University of Central Oklahoma (UCO). This data represented various disciplines within the School of Design.

The goal is to create a flexible classroom model that can be adapted and used in different educational settings. This model aims to help create classroom learning environments in universities that are adaptable, sustainable, and beneficial for mental health.

Limitations of the Study

The study is limited to design students at UCO, which may restrict the generalizability of the findings to other academic disciplines or institutions with different characteristics. The data comes from survey responses that people provided themselves. Responses could be influenced by personal biases or different levels of understanding of Feng Shui and sustainable design principles. The framework is demonstrated using a conceptual model, not a physical structure.

Therefore, this assessment is based on theoretical ideas, rather than on how the building performs after it is occupied. This study focuses on specific classroom learning environments: studios, lecture halls, and a computer lab. These were chosen to allow for a thorough investigation within the time available. This study uses Feng Shui principles, particularly those that align with environmental psychology and biophilic design. This approach ensures it meets academic standards in the United States while also being culturally relevant in Saudi Arabia. This study did not consider economic or cost-related factors, focusing instead on the functional, environmental, and psychological aspects of classroom design.

This study encompasses the conceptual design of a School of Design building situated on the University of Central Oklahoma campus. The researcher designed the building and used it as a framework to test how well Feng Shui spatial planning and sustainable interior design strategies work together. The conceptual building has design studios, lecture halls, and a computer lab. It is also a case study for testing and using the proposed integrated design framework.

Definition of Terms

Bagua Map

A spatial zoning diagram used in Feng Shui to analyze and organize interior environments. In this research, the Bagua Map functions as a conceptual planning tool to evaluate spatial hierarchy, circulation patterns, and functional distribution within classroom learning environments.

Feng Shui

A traditional Chinese practice, is a spatial philosophy that focuses on how people interact with their surroundings. It emphasizes arranging spaces, balancing natural elements, and

controlling the flow of movement within space.The main goal is to improve well-being, comfort, and productivity in built environments (Bruun, 2008).

Modern design studies show that many Feng Shui principles align with sustainable design methods, especially in how they use natural light, ventilation, spatial balance, and natural materials. Both approaches aim to create environments that support human well-being while also protecting the environment.

Sustainable Design

An approach to interior and architectural design that prioritizes environmental responsibility, resource efficiency, and human well-being. This approach includes using natural materials, energy-efficient methods, improving indoor environmental quality, and ensuring long-lasting durability.

Learning Environment

A learning environment is any physical space in education designed to support teaching, learning, collaboration, and student involvement. This study focuses on design studios, lecture rooms, and computer labs as examples of classroom learning environments.

Design Studio

A project-based learning space commonly used in design education. In junior and senior studio courses, students are encouraged to work independently and take charge of their own learning. In contrast, freshman and sophomore studios emphasize collaboration, peer interaction, and the development of basic skills.

Lecture Room

These classrooms are designed to accommodate different approaches to teaching.

1. This is the classic lecture format.
2. Discussion-oriented learning.
3. Interactive and flexible learning activities.

Computer Lab

A computer lab is essentially a specialized environment. It's built for learning, stocked with digital tools and all the tech you need. It's designed to support software-driven design, digital modeling, and other computer-dependent activities.

The Conceptual Building

A hypothetical architectural design, was created for this study. Its purpose was to serve as a controlled environment for applying and evaluating the combined Feng Shui and sustainable design framework.

Integrated Design Framework

This framework aims to combine design concepts, specifically integrating Feng Shui's spatial ideas with sustainable design practices. The goal is to improve the functionality of university classrooms, including circulation, comfort, environmental efficiency, and the overall learning experience.

Circulation

This study examines how people move within a space. Specifically, it looks at how students and instructors use classrooms, studios, and shared areas, and how the design of these spaces affects how easily they can move around and how clearly the space is organized.

Environmental Comfort

Is a measure of how well a space supports both physical and psychological well-being. This includes factors like lighting, sound, air quality, temperature, and ergonomic design.

Design Students

Students enrolled in various design disciplines within the School of Design at the University of Central Oklahoma. This includes interior design, graphic design, product design, and related fields.

Clarification of Use in This Thesis

In this thesis, Feng Shui concepts are applied strictly as organizational and spatial-planning tools, not as spiritual or metaphysical practices. Chi is used to analyze circulation flow and movement patterns, while the Bagua Map is implemented as a zoning framework to guide functional distribution and improve classroom layout, visibility, and environmental comfort.

CHAPTER TWO: LITERATURE REVIEW

Introduction

This chapter reviews the literature related to Feng Shui principles, sustainable interior design, and learning environments in higher education. The chapter also examines previous

studies that explore the relationship between spatial design and student wellbeing and learning performance.

The success of the educational process depends mainly on three elements: the teacher, the school building, and the curriculum. From this standpoint, the organizers of the educational process are keen to spend many of effort and money in order to raise the planning and development level of two of those elements: the teacher and the curriculum, while the effort exerted to develop the school building is less – in most cases – it does not keep pace with the development of other elements that complement the success of the educational process, (Abdullah, S. A., & Hamid, S. H., 2018).

The building is the primary expression tool for the components, objectives and symbolism of its design philosophy. Consequently, the architectural designs of schools must reflect the educational philosophy and the scientific and educational objectives that society aspires to achieve. The interior design must be conducive to the educational process and facilitate the organization of pupils inside classrooms. Most public and private schools lack this architectural element publicly in terms of the building's design, look, color, texture, and architectural features, as well as inside regarding the arrangement of internal spaces, furniture, courtyards, playgrounds, gardens, and amenities. Numerous scholars and educational planners underscore the significance of enhancing the quality of school infrastructure and optimizing internal spaces due to their direct influence on student education, particularly at the basic level, and on fostering community-serving skills. (Rahbarianyazd, R., 2017).

Studies related to educational administration have confirmed that the quality of the school building design has a great influence on the implementation of the learning process, as the lack

of adequate conditions for the school building undoubtedly affects negatively the performance of teachers and managers and the students' physical and psychological health and their academic achievement (Barr et al., 2011).

Recently, demands have emerged that "ready-made" school designs are being implemented all over the place that do not take into account the natural environment where the school is located nor the socio-economic stations of the people who will be using it. Schools must be attractive to students while achieving the highest levels of comfort (Abdullah et al., 2018). The interior design must be appropriate for the targeted age groups in order to provide a sense of belonging.

The ideal school situation should provide a sense of home while students endeavor in educational and recreational activities. Therefore, school buildings should be designed with model specifications that help in stimulating the capacities of contemplation, creativity, innovation, critical thinking and analysis among learners and members of the school community. The importance of designing school buildings and structures together with developing school curricula utilizing, modern technology, preparing flexible models and ensuring proper consideration to different academic levels can make a considerable gain (Abdullah et al., 2018). Site requirements, regional climate and physical terrain are to be considered as well.

In recent years, interest in the concept of interior design for schools and classrooms has increased, and there are also vigorous attempts to apply the concept of sustainability in design in a way that positively affects students and the surrounding environment (Abdullah and Hamid, 2018).

Among the notable developments in this aspect is the benefit of some specialists and academic institutions taking advantage of "Feng Shui", a Chinese philosophy that originated about 4000 years ago. The philosophy focuses on the art of harmony with the surrounding space and circulation flow through the environment.

The success of the educational process is influenced by several key elements, including the teacher, the learning environment, and the spatial organization of the classroom. The physical environment of educational spaces can significantly affect students' concentration, interaction, and overall learning experience. Therefore, the design of learning environments has become an important focus in interior design research.

Concept of Interior Design

Interior design is defined as the art of planning, designing and beautifying man-made spaces, and this field is closely related to architecture, although there has been a clear interest in the aesthetics and design of places throughout the ages; the field of interior design is still relatively young. It is worth noting that the name of interior decoration was given to it in the past, which was loose and lacked specificity and this led specialists to use a more accurate term called interior design that is known in some European countries as interior architecture. According to the American Society of Interior Designers, interior design is the sum of the planning and design of interior spaces, which aim to harness the physical, spiritual and social needs of people, which in turn ensures the safety of the building.

The interior design consists of technical and planning aspects. Interiors may be coordinated by specialized engineers and interior designers, as well as the possibility for decorators to design the aesthetic and technical aspects of the place. (Huber and Waxman, 2019).

The interior designer creates designs for buildings, schools, hospitals, hotels, and restaurants, with the scope of work established in collaboration with the customer. The designer considers various factors, including the client's preferences and budget, before producing tailored blueprints. The designer submits these ideas accompanied by vibrant sketches, material samples, and furniture specs, along with the overall project cost.

While numerous individuals may assume the task of embellishing their residences and workplaces, they may encounter difficulties. In such circumstances, the function of interior designers becomes relevant. In this context, an interior designer enhances the functionality, aesthetics, and safety of indoor environments by evaluating various textures, colors, furnishings, spatial arrangements, and lighting to fulfill specific criteria (Gibbs, 2005). The role of an interior designer is exceedingly difficult. Aiming to engage both intellect and vision to cultivate extraordinary new concepts.

It is essential for interior design to provide accurate responses and to utilize various materials that define the project's identity (Stibbe, 2009). An interior designer must possess robust technical skills. They must possess the skills to assess and design a place, as well as deliver a presentation in a clear and compelling manner. They can convey information via sketches, three-dimensional renderings, photos, and diverse forms of working drawings that illustrate spatial arrangements and furniture layouts. Interior designers must exhibit artistic skills to create sketches that aid in determining the placement and appearance of elements within a space.(Gibbs, 2005).

Moreover, interior designers must comprehend the operational prerequisites of their strategies, building codes, health and safety matters, and many other practical facets. Communication is an imperative aspect that interior designers must consider. This is because

interior designers should communicate their ideas to engineers and architects. In this regard, interior designers must be flexible to meet and deal with anyone.

Edwards (2011) asserts that an interior designer is tasked with sourcing and procuring the most exceptional and cost-effective subcontractors, materials, and furniture. Broker and Stone (2010) assert that the interior designer must conduct multiple meetings with the client while progressing with the project. This aims to provide the owner with updates on the project's progress, address inquiries regarding decorations and design, and accommodate any other issues that may emerge from the interior design assignment.

Creativity is essential for an interior designer. Creativity is a crucial element that distinguishes interior designers in their profession. Nonetheless, while interior designers are obligated to adhere to customer specifications, it is equally crucial to exhibit creativity in generating innovative concepts. Interior designers must translate a concept or image into the interior design of a space or structure (Broker and Stone, 2010).

Significance of Interior Design at Schools

The school is the basis on which the student obtains all kinds of knowledge and information. The school building is also considered one of the basic pillars on which the educational process depends, and it is also of great importance in the implementation and success of educational plans. Thus, the school building is component of the infrastructure on which comprehensive development plans are based, provided that the building is designed in accordance with educational specifications and includes the facilities, equipment and tools necessary for the implementation and success of education.

The school building contributes to activating the role of education and educational activities that can only be applied and implemented in the building, and this strengthens the

school building (Stosich, Bocala and Forman, 2018). Designing the building with typical specifications provides students with an atmosphere of reassurance and psychological comfort, and helps in their development in an integrated manner in terms of psychological, physical, behavioral and social aspects. A school building must motivate students and promote the educational system in order to attract future students. Through changing times, a school building preserves the nation's cultural heritage and transmits it from one generation to another (Weng, 2017).

Educational Trends and Their Impact on School Design

The educational building constitutes an educational tool that reflects the philosophy, spirit and goals of education for the society (de Mello Forato et al., 2012). Hence, this section addresses the trends and principles of education as they form the starting point in designing the educational environment.

Educational trends plays an important role in shaping school design since learning environments must align with the changing teaching philosophies and societal needs. Currently, there has been an emphasis on student-centered learning, inclusivity, cooperation, and the integration of technology. Due to this, school buildings are now taken as flexible environments that supports varying learning activities and styles. Having open-plan classrooms, adaptive furniture, and multi-purpose spaces supports creativity, interaction, and critical thinking. There has also been a growing focus on digital literacy, resulting in the incorporation of smart technologies and infrastructure that supports electronic learning. Additionally, sustainability has been one of the core factors considered, which has made the learning institutions to use materials which are eco-friendly and energy-efficient systems.

The Traditional Educational Design Model

Traditional educational trends are influenced by the architecture and design of school buildings. Historically, the educational process was confined to direct instruction from the educator to the learners. The emergence of individualism among students and educators has directly influenced the educational process and the structure of conventional classes. Inadequate and flawed design may compromise educational principles and result in insufficient attention to student needs.

Good educational trends give attention to developing sensory abilities and manual skills, taking into account individual differences between students, and the ability to understand, research, study, and to discover one's own environment instead of being limited to direct instruction through lectures. The period of the 19th century considered a turning point in the design of educational buildings, where the aim of the design was to meet the needs of the student (material and non-material), and the architects, in cooperation with the educators. Design began to lay down the foundations and educational architectural concepts that take into account the human dimension of the user and his functional and psychological needs (Burke and Könings, 2016).

This humanitarian approach requires the designer to commence their work with a concept that fully acknowledges the significance of recognizing the practical and psychological demands of a pupil. It should enable the student to play a significant role in the design of learning environments, facilitating necessary equipment and optimizing the learning process and student performance with desired efficacy. The school building serves not merely as a structural enclosure for various spaces and equipment, but also as an extension of the home environment, where students spend over half of their daily time, necessitating a conducive atmosphere for

optimal development (Reye and Gálvez, 2011). The design of the school building necessitates that the designer prioritize the educational process and the surroundings (Stukalina, 2010):

a) Educational process: The design must achieve the appropriate environment and the building must be capable of achieving the goals of education, curricula and study plans by translating needs. The spaces must also provide appropriate equipment that reflects the goals and requirements of education. This requires focusing on the disparity of capabilities among the students.

b) Classroom environment: In developing the setting or surrounding conditions for pupils, the designer must address their inherent and psychological needs. The environment is categorized into:

c) Physical environment: It pertains to physical requirements that may be quantified and assessed, including ventilation quality, natural lighting efficacy, and acoustic performance.

d) Non-material environment: It is important to point out that the physical and psychological needs overlap, resulting in a suitable environment for the upbringing of the adolescent in a sound manner, on the educational level and on the psychological level.

e) Montage of gaps: This is a design whereby adequate spaces are made between the classes to ensure that the ambiance is accommodative and conducive to learning. Based on the above-mentioned, it is concluded that global trends need to make the school a focal point for community service and providing services to the surrounding environment. This idea contradicts with the above useless theories and fits perfectly with the needs of students because the integration of the school environment into the community increases the individual's belonging to a community.

f) Social aspect: The design should develop a sense of belonging to the community, which is one of the most important goals. In addition to making students feel safe, educators need to positively influence their pupils to be productive members of society. They need to have classroom environments that are conducive to creative exploration and social connection (Chasey & Agrawal, 2013).

g) Economic aspect: Greater use of land and the establishment of the school for more than one role, and the maintenance of the school and the surrounding environment will be healthier for students as well as the educators. The exploitation of youth energies and guidance, which is the most important economic resource, and the development of various community services that can be provided from the current school site (cultural services, health services, educational services) should be considered while designing the internal parts of the school (Kang & Guerin, 2009). The design will ensure that there is effective utilization of land which is a scarce resource in the community.

Sustainable Interior Design

Sustainability plays a critical role in contemporary interior design, especially as consumption levels in large developing countries continue to rise rapidly. For this reason, interior designers must be conscious and responsible in applying their skills to develop sustainable design solutions that support a better lifestyle (Brooker & Stone, 2010). Excessive and unnecessary consumption contributes directly to environmental problems that threaten the Earth's long-term capacity to support human life. In this context, interior designers are uniquely positioned to contribute positively by creating eco-friendly environments and selecting materials that do not harm the ecosystem.

A 2009 article in School Planning and Management highlights that schools are of particular concern due to their unique characteristics, which often make them more vulnerable than other building types. For instance, a typical school may house up to four times as many occupants as an office building of the same size, resulting in significantly higher occupant density. Additional concerns arise when new classrooms are constructed or older ones subdivided without properly adjusting the existing ventilation systems (Bloech, 2009). Schools also host activities—such as science experiments, art projects, and vocational training in areas like auto mechanics, photography, and woodwork—that can release pollutants into indoor air (Bloech, 2009).

Indoor air quality is closely connected to climate control. Both temperature and humidity influence air quality by either promoting or inhibiting the growth of mold and bacteria, which can affect students' health at various levels. Mold spores and allergens may trigger respiratory illnesses, allergies, and asthma attacks (Bloech, 2009). Mark Schneider of the National Clearinghouse for Educational Facilities notes that researchers have been investigating the temperature ranges conducive to effective learning for decades. As early as 1974, David P. Harner reported that classroom temperatures above 74°F had a negative impact on reading and mathematics performance, and identified the optimal learning temperature range as 68°F to 73°F (Earthman, 2002). Similarly, a 1996 study of Florida classrooms found that relative humidity levels above 72% contributed to visible mold growth and symptoms associated with sick building syndrome (Schneider, 2002). Collectively, these findings demonstrate that climate control is essential in learning environments.

Learning is also affected by environmental conditions beyond air quality. Research consistently shows a strong relationship between acoustics and student performance. Good

acoustics are foundational to effective learning. In 1981, the California Department of Health conducted a major study comparing students in grades three through six from schools located near highways with those from quieter neighborhoods. The results revealed that students in quieter schools scored significantly higher in reading, with a similar but smaller difference in mathematics scores (Earthman, 2002). A 1999 study cited by Schneider (2002) examined students in two New York schools, one situated in an airport flight path. Students exposed to chronic aircraft noise scored up to 20% lower on reading tests than students in the quieter school. Additional research by the U.S. Architectural and Transportation Barriers Compliance Board found that excessive background noise interfered with speech comprehension even in newer classrooms (Schneider, 2002).

Lighting represents another essential factor influencing student learning. A 1999 review of seventeen studies conducted between the 1930s and 1997 concluded that appropriate lighting improves test performance, reduces off-task behavior, and enhances overall student achievement (Schneider, 2002). Historically, natural light was the primary lighting source in schools until the 1950s, when decreasing electricity costs led to a decline in daylighting (Schneider, 2002). With today's emphasis on environmentally responsible design, daylighting is regaining popularity.

A major study conducted by the Heschong Group across three school districts—San Juan Capistrano (California), Seattle (Washington), and Fort Collins (Colorado)—found that daylighting significantly improved student performance. Students in classrooms with the highest levels of daylight progressed 20% faster in math and reading than those with limited daylight. Larger window areas were associated with 15% faster progress in math and 23% faster progress in reading. Skylights yielded similar results (Rivero, 2011). Thomas Beck of Beck Architects

adds that daylight is essential for regulating circadian rhythms, supporting concentration, alertness, digestion, and sleep (Rivero, 2011).

Recent studies also address the impact of school and classroom size. Large classrooms emerged in the 1950s as a response to the baby boom and Cold War educational pressures (Duke, DeRoberto, & Trautvetter, 2009). Today, many states—such as Florida—are moving toward smaller, community-centered schools (Stevenson, 2002). In New York City between 1990 and 1996, severe overcrowding led teachers to report negative effects on instructional methods, while nearly 40% of students struggled to concentrate in crowded environments (Earthman, 2002). Research suggests that smaller schools support higher graduation rates, better achievement among at-risk students, increased extracurricular involvement, and reduced behavioral issues (Stevenson, 2002).

Testimonials further reinforce these findings. For example, Granby High School in Norfolk, Virginia, reorganized into four smaller academies in 1999, resulting in reduced disciplinary referrals, improved student engagement, and even attracting back students who had previously transferred to private schools (Duke, DeRoberto, & Trautvetter, 2009).
Across all studies, a consistent theme emerges: environmentally responsible design directly impacts student achievement. As Dr. William S. DeJong of DeJONG educational planning firm notes, sustainability and green design are now among the top priorities in educational facility planning. He also points out that many school buildings constructed during the 1950s and 1960s are aging and were not built to high standards, further stressing the need for sustainable renovations (DeJong, 2007).

Multiple environmental factors—from building structure and internal air quality to acoustics, lighting, and classroom density—play essential roles in supporting student

performance. With continued advancements in sustainable design, the schools of the future will provide healthier indoor environments, improved learning conditions, and enhanced student performance well into the twenty-first century and beyond.

Sustainable design will ensure that limited and scarce resources utilized in constructing the classrooms are acknowledged and managed appropriately. It will guarantee their optimal utilization for the advantage of the pupils, the community, and the government overall.

The Evolution of Sustainable Design

Dean Hawks, Emeritus Fellow of Darwin College, University of Cambridge, and Emeritus Professor of Architectural Design, University of Cardiff, asserts that the notion of "sustainable architecture" would have been unimaginable approximately fifty years ago (Architecture.com, n.d.). At that time, the most resource-intensive constructions in the history of the built environment were set to be created (Architecture.com., n.d.).

In the mid-20th century, natural ventilation and daylight were supplanted with permanent artificial lighting and air conditioning, hence providing illumination for pupils. However, it was during that period when history witnessed the humble inception of counter-perspectives in architectural design and construction. The emphasis was on illustrating a more calibrated relationship between structures and the surrounding environment (Architecture.com, n.d.). Alison Knight (2009) elucidates that from the mid-seventies, the evolution of sustainable design transpired in three phases – Energy Efficiency Phase, Environmental Impact Phase, and Holistic Sustainability Phase. McLennan, however, posits that the origins of sustainable design extend well beyond the contemporary period. He delineates four unique evolutionary phases of sustainable design throughout human history (McLennan, 2004): the indigenous; the industrial, and the modern designs

"The history of sustainable architecture is, in reality, a history of architecture since its modern origins are two millennia ago," Dean Hawk said, echoing McLennan's perception. (Buildings.com, no date provided)". Dean Hawks, Alison Knight, and Jason McLennan, the three writers already mentioned, all believe that sustainable design in the current age began to evolve in the late 1960s and early 1970s. The public's increasing awareness of environmental issues marks the beginning of this transition, which began in the late 1960s and early 1970s. The use of waste and alternative energy sources in construction became an area of experimentation for architects. Wind turbines and solar panels were introduced.

According to Knight (2009) and McLennan (2004), the second wave of this evolution happened in the 1980s and 1990s. The green building movement had its start during this period. There were more failures than successes during this stage. Some notable achievements include the establishment of the Passive Solar Industries Council and the American Solar Energy Society (ASES). But as energy prices dropped again, many lost interest in cutting back. Green design ideals were uncool at the time, and the architectural style was postmodernism (McLennan, 2004). In terms of environmental impact, very little has been accomplished during this time.

The concept of "sustainable development" was first referenced in 1987 in the Brundtland Report of the World Commission on Environment and Development. From a global viewpoint, the word introduced the idea of resource and energy use (Knight, 2009). Global awareness of environmental issues peaked in 1992, the year of the Rio Earth Summit (McLennan, 2004, p. 30). The approach of the 1990s movement differed from that of earlier decades. Instead of focusing only on environmental impacts, as was common in green design and eco-design, sustainable design shifted attention toward how design affects people as well as the social and ethical responsibilities involved (Knight, 2009). The movement had originally started with an emphasis

on conserving energy, but it later expanded to include material choices and resource preservation. Designers were required to consider both local and global impacts of their design decisions.

In 1993, the U.S. Green Building Council (USGBC) was founded, and a few years later it launched a rating system called Leadership in Energy and Environmental Design (LEED). The purpose of LEED was to guide designers through a set of assigned points that covered categories such as energy, water, materials, indoor environmental quality, and site design. Buildings could earn one of four certification levels (McLennan, 2004) depending on the total points achieved: certified, silver, gold, and platinum levels. The system eventually gained broad recognition and is now used by the U.S. General Services Administration (GSA) as an evaluation tool for sustainable design performance. In 2002, the USGBC organized its first Green Building Summit in Austin, Texas. By 2003, nearly four percent of all building construction in the United States had earned LEED certification (McLennan, 2004, pp. 33–34).

LEED Practices

Optimizing the Use of the Sun. Rather than depending on different fossil fuels, Green House encourages using both active and passive methods to connect the home to the sun. Active methods include solar photovoltaic systems that convert sunlight into usable energy. These strategies can be applied through several design choices, such as reducing summer heat gain, increasing winter heat gain, and orienting the home to benefit from natural breezes during spring, summer, and fall (NBM, n.d.).

Improving Indoor Air Quality. This method relies on effective ventilation systems to eliminate dust, pollutants, excess moisture, humidity, and carbon monoxide from the indoor environment (NBM, n.d.).

Using Land Responsibly. This approach suggests utilizing land in a way that preserves the natural landscape and encourages choosing plants that require minimal irrigation (NBM, n.d.).

Creating High-Performance and Moisture-Resistant Houses. Various structural elements such as roofs, walls, doors, and windows protect occupants from weather conditions, noise, and debris. These elements also help control sunlight and heat to maintain comfortable indoor temperatures. Collectively, these components form the building envelope. Choosing the right materials for the envelope is essential for reducing drafts, stabilizing indoor temperature, and managing moisture (NBM, n.d.).

Wisely Using the Earth's Natural Resources. When choosing construction materials, designers should select those that are renewable, reusable, long-lasting, and low in energy consumption, while also minimizing negative effects on both indoor and outdoor environments (NBM, n.d.).

Optimize Site Size. This principle emphasizes that the location, orientation, and landscaping of a building impact local ecosystems and energy efficiency. It encourages reusing and rehabilitating existing structures while applying smart growth concepts. It also highlights that sustainable buildings should reduce and manage stormwater runoff.

Optimize Energy Use. The objective is to lower the consumption of energy produced from fossil fuels by maximizing the use of renewable energy sources, both on-site and off-site. The ultimate vision is to create and operate net-zero energy buildings—structures that generate as much energy as they consume in a year (WBDG, 2013). Although only a small number of buildings meet this standard today, advancements in construction technology and academic research continue to make this goal more attainable.

Protect and Conserve Water. As fresh water sources continue to decline, the demand for efficient water use grows stronger. Measures should be taken whenever possible to reuse and recycle water for on-site applications.

Optimize Building Space and Material Use. Materials selected for sustainable construction should help minimize environmental impacts across their life cycle, including resource depletion, human toxicity, and contributions to global warming.

Enhance Indoor Environmental Quality (IEQ). IEQ plays a significant role in the comfort, well-being, and productivity of occupants. Design strategies should increase access to natural daylight, provide proper ventilation and moisture control, and avoid materials that release high levels of VOCs (WBDG, 2013).

Optimize Operational and Maintenance Practices. To improve working conditions, boost productivity, and lower energy and resource consumption, it is highly recommended to address operation and maintenance considerations early in the design stage. Designers are encouraged to select materials and systems that need minimal water, energy, and harmful chemicals for cleaning and upkeep, making the building more cost-efficient throughout its entire life cycle (WBDG, 2014).

The Concept of Sustainable Design

Sustainable design is a design philosophy aimed at enhancing the quality of the built environment while reducing or eliminating negative impacts on the natural environment (Juarez, 2019). Around the world, architects, engineers, developers, and builders continue to grapple with understanding this emerging approach and determining how best to promote it. For many professionals, the idea is often mistakenly reduced to using recycled materials and installing efficient windows, which alone does not constitute true sustainable design. Over the years, the

concept has been referred to by several names—including ecological design, green design, eco-effective design, green architecture, holistic design, and environmentally friendly design. In this thesis, the terms sustainable design and green architecture will be used.

Sustainable design represents a contemporary approach that integrates the design, construction, and operation of buildings in a way that is more environmentally responsible and better aligned with human needs (Celadyn, 2018). The concept reflects the 1987 World Commission on Environment and Development's well-known definition of sustainability: "meeting the needs of the present without compromising the ability of future generations to meet their own needs" (Your County Green Business Conference, n.d.). According to the United States General Services Administration (GSA), the key goals of sustainable design are to minimize waste, reduce reliance on non-renewable resources, and create healthy, productive environments.

Sustainable design remains a topic of ongoing discussion. In this context, McLennan (2004) suggests understanding sustainable design through the lens of "respect" as articulated in ethical principles, while viewing "unsustainable" practices as expressions of disregard toward that respect. He argues that many current design methods, manufacturing processes, and construction practices demonstrate contempt for natural systems. However, by adopting an attitude of respect toward the environment, society can shift toward protecting and preserving these systems (McLennan, 2004). This forms the core philosophy behind sustainable design.

Ventilation in Interior Design

Natural ventilation is defined as the process of replacing indoor air with fresh outdoor air through natural means. Providing the minimum required rate of natural ventilation inside buildings is essential for human comfort and health. It helps remove carbon dioxide and other

harmful airborne impurities. Natural ventilation also contributes to lowering the temperature of walls, ceilings, and floors through heat transfer caused by convection currents, thereby reducing heat stress on occupants.

Maintaining low levels of indoor air pollution is one of the most important goals of sustainability. The growing use of building materials, synthetic finishes, and various chemical products has increased the concentration of pollutants in indoor environments, creating unhealthy living and working conditions (McLennan, 2004). Additionally, many modern buildings are tightly sealed to prevent air leakage, which improves heating and cooling efficiency but reduces air exchange rates. As a result, these buildings often suffer from poor ventilation, leading to a buildup of indoor pollutants.

To address this issue, designers must carefully analyze the proportions, orientation, placement, and relationship of openings in buildings to the movement of air (Barr, et al., 2011). Properly planned openings help maximize airflow, enhance natural ventilation, and achieve higher air-change rates, ultimately supporting a healthier and more sustainable indoor environment.

Ventilation Types

Natural Ventilation. This type of ventilation relies entirely on natural environmental changes surrounding the building, such as wind movement, shading, and temperature variations. It works by refreshing the indoor air through the natural behavior of airflow, including convection currents and wind forces.

Artificial Ventilation. This type of ventilation depends on drawing external air into the building through central ventilation and air-conditioning systems. It also uses exhaust fans and

sensors that measure pollution levels and air quantity, allowing the required amount of outside air to be regulated and controlled.

Considerations for Ventilation Plans

Some criteria and factors to achieve sustainability through the ventilation component of interior design:

1. Studying Window Orientation: Analyze the direction of the building's windows relative to the prevailing winds in the region to determine how the building is affected. Proper orientation helps achieve thermal comfort and supports the psychological and physical well-being of occupants.
2. Analyzing Interior Wall Design: Examine how the interior walls affect wind trajectory and speed. Interior spaces can either obstruct airflow or create channels and pathways that enhance ventilation, such as air terminals and internal courtyards.
3. Designing Openings and Windows: Ensure that architectural openings and windows facilitate air circulation and allow heat and air transfer. Consider the size, height, location, and number of openings, and use additional openings such as ceiling vents, floor grilles, and cornices when needed.
4. Shading with Natural Elements: Use shading devices and plants, such as trees, to block direct sunlight from parts of the building, reducing indoor temperatures and improving comfort.
5. Installing Thermal Comfort Sensors: Provide sensors to monitor indoor air levels in different spaces to maintain thermal comfort for occupants.
6. Carbon Dioxide Monitoring: Install sensors to measure CO_2 levels and ensure adequate ventilation and fresh air supply, as high CO_2 concentrations can negatively impact health.

7. Selecting Safe Materials: Choose finishing and furniture materials free of volatile organic compounds (VOCs) to reduce long-term pollution. Prefer natural-source or water-based paints without ammonia or acetone, and wooden products that are free from urea-formaldehyde.
8. Smoking Restrictions: Prohibit smoking inside the building and provide designated outdoor or indoor smoking areas that meet specific standards.
9. Controlling Entrance Systems: Prevent the entry of external pollutants by installing floor filter systems to capture dirt and particles, and use high-quality filters in all ventilation, heating, and air-conditioning systems.

Lighting in Interior Design

Light plays a crucial role in human life, beyond being essential for the continuation of life on Earth. It enables us to see and differentiate objects, reducing the confusion between form and empty space, and it also influences our sense of comfort by creating a feeling of warmth in a room. Proper lighting allows us to appreciate colors, shapes, and spatial dimensions. Lighting within buildings relies on two main sources: natural lighting, which comes from the sun and spreads as electromagnetic waves, and artificial lighting, provided by man-made fixtures.

The sun is the primary source of natural light on Earth, and natural lighting is considered the most physiologically suitable for humans. However, it varies according to time of day, season, geographic location, distance from the equator, and weather conditions. Natural lighting has several advantages: it consumes no energy, is virtually cost-free, requires no maintenance, has no harmful side effects, and is both continuous and sustainable.

To achieve sustainability through lighting in interior design, several criteria and factors should be considered:

1. Strategically Placing Openings: Position windows and apertures to maximize light distribution, whether direct, indirect, or diffused.
2. Utilizing Exposed Spaces: Incorporate gardens and horizontal open areas to harness ultraviolet rays and redistribute light to adjacent interior spaces.
3. Site Planning Considerations: Analyze the site layout and the spatial relationships between building blocks throughout the year to ensure that one building does not obstruct natural light from another nearby structure.
4. Using Modern Light Directing Techniques: Apply optical lenses and light guides to bring natural lighting into all areas of the building, especially interior spaces such as basements or areas far from windows.
5. Shading and Diffusion Systems: Install shading panels, solar breakers, and diffused light-directing systems to allow the optimal amount of light into interior spaces.
6. Glass and Heat Gain Considerations: Consider the type of glass used in openings and its effect on heat gain; use heat-absorbing or heat-reflecting glass as appropriate.
7. LED Lighting: Employ LED lights, which are 75% more energy-efficient, last 25 times longer, and operate using a single-way conductor, making them one of the most energy-saving lighting options available today.
8. Compact Fluorescent Lamps (CFLs): Use CFLs, which save 70% of energy and last 8–15 times longer than traditional lamps. These lamps consist of glass tubes coated with phosphor and filled with inert gas.
9. Smart Lighting Systems: Implement intelligent lighting systems to reduce energy consumption and improve lighting quality. Examples include sensors that adjust artificial

light according to natural light levels or occupancy sensors that control lighting based on the number of people present.

Finishing Materials and Furniture

The materials and raw resources used in interior design are diverse and serve as complementary elements for different types of buildings. These materials are applied to finish interior and exterior floors, walls, ceilings, and various mechanical components. They can be classified based on their suitability and function within interior spaces into two main categories: local materials and modern materials, depending on whether they are natural or manufactured. The interior designer selects the most appropriate material for each part of the building, taking into account multiple objectives, including technical performance, expressive qualities, as well as visual and tactile characteristics.

Sustainable Materials

These materials are designed and selected to meet three key characteristics: environmental, social, and economic. Ideally, they are local and natural, and their use does not have harmful effects on health. They are non-toxic, renewable, durable, recyclable, and energy-efficient. Additionally, they are cost-effective, socially acceptable, and sustainable in use. All these materials are intended to achieve the following four main objectives:

1. Effective use of resources and resources.
2. Ensure a healthy environment.
3. Rationalization in the use of resources.
4. Efficient use of energy.

Some considerations for achieving sustainability through the material component of interior design:

Most children spend approximately seven hours a day, for eight months, inside school spaces. Therefore, the interior environment and its cleanliness from pollutants are critical, especially when hundreds of children share the same space, which increases the risk of disease and pollution transmission. To create a healthy and environmentally compatible interior space, the following materials should be adopted:

1. Flooring Selection Considerations:
    a. Using natural, moisture-resistant materials made from plant-based raw materials, such as insulation with linen or natural cotton fibers.
    b. Installing natural wood floors, such as oak, beech, or bamboo, and polishing them with natural wax.
    c. Using natural linoleum, which can be converted into organic fertilizer after disposal, made from materials like linseed and pine resin.
    d. Employing non-toxic, natural adhesives for flooring.
    e. Using natural stone and marble.
    f. Choosing carpets made from natural materials, such as wool.
    g. Using carpets made from recycled materials that are fully recyclable.
2. Paints: Considerations include:
    a. Using water-based paints made from natural materials, free from VOCs, acetone, ammonia, and formaldehyde, which are major contributors to indoor air pollution.
    b. Avoiding varnishes or primers based on synthetic adhesives.
    c. Using natural wallpapers made from plant fibers such as sisal, which are easy to clean.
3. Furniture and Upholstery Considerations:

a. Manufacturing furniture from natural woods such as bamboo, oak, or beech, and using formaldehyde-free wood.
b. Applying harmless lacquers for wood finishing.
c. Selecting furniture with low volatile organic compounds (VOCs).
d. Using stainless steel when appropriate.
e. Producing furniture and fabric for curtains from natural fibers such as wool, cotton, and linen, ensuring the fabrics are untreated with chemicals.

Acoustic Comfort

Acoustic comfort is achieved by maintaining calm and quiet within the space, isolating both external and internal noise, and ensuring that desired sound waves reach their recipients clearly and without distortion. Noise pollution should be minimized as much as possible, as it can have various physiological effects that differ from person to person (Barr, et al., 2011). Exposure to noise levels starting at 65 decibels can particularly affect children, leading to increased blood pressure and difficulties in memory and learning performance.

Goals of Acoustic Comfort. To achieve acoustic comfort, it is essential to:

1. Ensure sound absorption within the space.
2. Isolate both internal and external noise sources.
3. Minimize vibrations and structural noise from the building.
4. Deliver desired sound waves clearly from their sources to the intended recipients, which requires careful engineering design considering furnishings, appropriate finishes, and necessary sound treatments.
5. Maintain appropriate sound levels for different activities (typically between 25 and 40 decibels).

6. Incorporate plants around the school or building to help reduce noise.
7. Use sound-insulating materials for windows and doors, and apply sound-absorbing finishes on walls, ceilings, and floors to reduce reflections.
8. Disperse sound by creating deflections in walls and ceilings.
9. Design the shape, size, and surfaces of interior voids carefully to ensure effective sound distribution and avoid acoustic defects.
10. Group classrooms together and locate them away from noisy areas, using barriers where necessary to reduce noise transmission.

Examples of a Sustainable School

The discussions presented in the previous sections emphasize the critical importance of sustainable design in building construction. Numerous organizations have evaluated buildings designed and constructed according to sustainable principles to compare their performance in energy efficiency, water use, indoor environmental quality, and other sustainability parameters. Post-occupancy evaluations conducted by the U.S. General Services Administration (GSA) on 12 sustainably designed buildings revealed that these buildings outperform national averages in several key areas, including energy operating costs, water consumption, occupant satisfaction, and carbon emissions. Specifically, the GSA study found that sustainably designed buildings consume 26% less energy (65 kBtu/sf/year compared to 88 kBtu/sf/year), have 13% lower maintenance costs ($2.88/sf versus $3.30/sf), produce 33% fewer CO_2 emissions (19 lbs/sf/year versus 29 lbs/sf/year), and achieve 27% higher occupant satisfaction (Kang, et al., 2009).

Case Study: Kiowa County School, Greensburg, Kansas, USA. The project will be a 2-story K–12 educational building situated in Greensburg, Kansas, in a mixed-dry climate area,

covering an area of 12,300 m² (132,000 ft²), and has attained a US Green Building Council Platinum rating as well as an Energy Star score of 94.

In 2007, an EF-5 tornado, 1.7 miles wide, devastated Greensburg, Kansas, destroying 95% of the city's homes and businesses. Although 50% of residents never returned, those who remained sought to redefine their future. The reconstruction of the 123,000 square-foot Kiowa County School reflects the community's determination to provide a place where children could return to learn and thrive. The Unified School District 422 made a strategic decision to construct a single K-12 facility, combining elementary, middle, and high school, to achieve greater operational efficiency.

Sustainable Site Design. The school's geometric orientation aligns with the town's sustainable master plan, placing the facility at the heart of Greensburg along Main Street. The U-shaped building houses the high school and gymnasium in the north wing, and the lower and middle schools in the south wing. Its east-west orientation maximizes daylight exposure and natural ventilation.

Sustainable Material Selection. Interior materials are locally sourced, recycled, and non-toxic. Exterior materials include Kansas limestone, zinc, and reclaimed cypress. Recycled materials were prioritized; interior finish woods came from salvaged cypress trees submerged during Hurricane Katrina. High-traffic areas feature polished concrete floors and concrete blocks, while tactile areas utilize reclaimed wood. Structural insulated panels reduce thermal loading, and limestone shingle rain-screen cladding resists moisture infiltration. Paints and finishes are VOC-free, and carpets are not used. The LEED rating awarded 18 out of 20 points for material selection (Canada Green Building Council, 2007).

Water Efficiency. Given Greensburg's low annual rainfall, the school employs multiple strategies to conserve and reuse water. These include low-flow plumbing fixtures, dual-flush valves, waterless urinals, sensor-controlled lavatories, and rainwater collection in six cisterns. Condensation from HVAC systems is reused for cooling towers. Overall, the school consumes 800,000 gallons of water compared to the estimated 1.4 million gallons, earning 6 out of 7 LEED points for Water Efficiency.

Energy Efficiency. Thermal loading is minimized using structural insulated panels and reflective roof finishes. The school meets its electricity needs through a 50-kilowatt on-site wind turbine and supplemental wind power from a nearby wind farm. HVAC requirements are reduced through building orientation, envelope design, lighting, and sun control systems. A closed-loop geothermal heating and cooling system with 97 wells provides clean, filtered air. The school demonstrates high-performance, sustainable design with enhanced indoor environmental quality (IEQ), achieving 16 out of 17 LEED points for Energy and Atmosphere.

***Indoor Environmental Quality*.** Academic performance, health, and occupant comfort were central considerations. Proper ventilation, optimized daylight, and quality indoor air reduce dependence on mechanical systems. Laboratory classrooms, corridors, gathering areas, the gymnasium, and library all maximize daylight through innovative design strategies. Operable windows allow natural ventilation, while exterior sun shading devices reduce glare and heat. Large windows and high ceilings increase daylight penetration, improving occupant comfort. Overall, these sustainable design approaches contribute to improving the quality of interior learning environments. These sustainable design strategies highlight the importance of environmental comfort, natural lighting, material selection, and spatial organization in learning

environments. These principles provide an important foundation for designing healthier and more effective classroom spaces.

Feng Shui Principles in Interior Design

Feng Shui has often been misunderstood as a spiritual practice; however, in the context of interior design, it can be interpreted as a spatial planning approach.

In this study, Feng Shui is applied strictly as a spatial planning and organizational tool rather than a spiritual or metaphysical practice. The concept of Chi is interpreted as circulation flow and movement within space, while the Bagua Map is used as a zoning strategy to improve spatial organization, visibility, and user comfort.

In this study, Feng Shui is applied as a spatial planning approach rather than a metaphysical practice. The concept of Chi is interpreted as circulation flow within space, while spatial organization is used to enhance user comfort and functionality.

Definition of Core Feng Shui Terminology

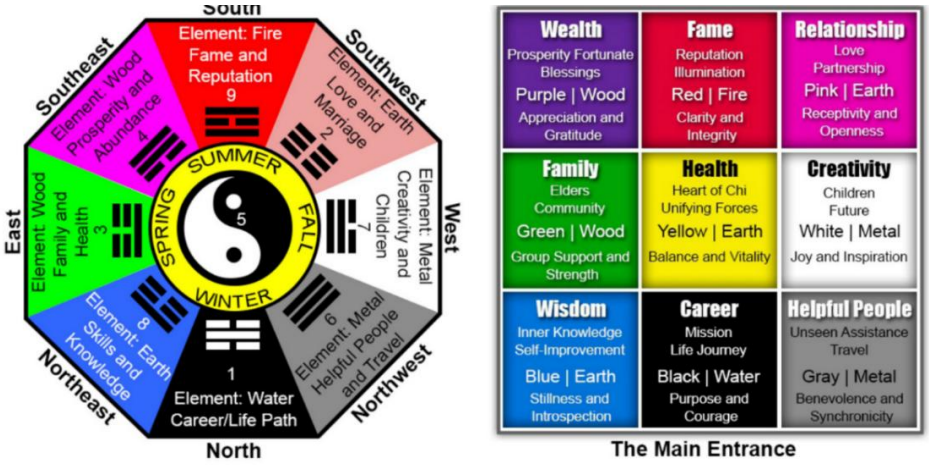
Chi (Qi). Chi refers to the natural movement of spatial flow within an environment. In design studies, Chi is used to describe how people circulate, interact with space, and perceive comfort or tension within a room. It functions as a conceptual tool for analyzing movement patterns, visual openness, and the organization of interior spaces. In this research, Chi is interpreted purely as a design-related circulation and spatial-flow concept, not a metaphysical element.

Bagua Map. The Bagua Map is a spatial zoning framework traditionally used to organize environments into nine functional sectors. In contemporary interior design applications, it is treated as a planning and organizational diagram that helps identify zones for activity, visibility, entry points, and spatial hierarchy. Within this study, the Bagua Map is applied as a design

methodology for zoning classrooms, improving circulation, defining functional areas, and supporting behavioral comfort.

Figure 2.1

Bagua Map



Note: A traditional Chinese Bagua Map used for spatial organization

Clarification of Use in This Thesis

In this thesis, Feng Shui concepts are applied strictly as organizational and spatial-planning tools, not as metaphysical or spiritual elements. The concept of Chi is used to analyze circulation flow, movement patterns, and spatial clarity within classroom layouts. The Bagua Map is implemented as a zoning framework to support functional distribution, visibility, spatial balance, and overall environmental comfort in interior design learning spaces.

According to Kiehl (2005), Feng Shui is an ancient Chinese science dating back over five thousand years. It focuses on the planning and design of houses, as well as the arrangement of furniture, to optimize the flow of energy within a space. Feng Shui originates from Chinese philosophy and emphasizes the importance of aligning individuals with their environment to live

harmoniously and avoid tension, problems, and negative influences. The practice is fundamentally concerned with energy—its movement and its impact on people. Interior decoration is an integral part of Feng Shui, as it directly affects energy distribution and, consequently, influences an individual's life, health, mood, and interpersonal relationships. According to Sang (2013), everything in the environment involves energy emission and absorption, which can shape human experiences. Feng Shui also aims to create balance across eight key areas of life: consistency, family, finances, understanding, spiritual development, personal growth, pleasure, and contentment (Iuliano, 2020). The principles of Feng Shui emphasize spatial harmony, orientation, and balance within interior environments. These concepts provide an additional framework that can be applied to the spatial organization of classroom environments.

Feng Shui as an Institution

According to Ahmadnia et al. (2017), Feng Shui is at least 5,000 years old. In Ancient China, Feng Shui practitioners were responsible for identifying sites for palaces, farms, and villages to ensure that people would not only survive but also thrive. They were also tasked with selecting burial sites that would preserve ancestral memory for future generations. At a time when weather forecasting did not exist and historical records were limited, Feng Shui specialists relied on their keen observation of the natural environment. They considered factors such as:

1. The abundance and availability of drinking water
2. Soil quality and fertility
3. The conditions of mountains, hills, rivers, lakes, and valleys
4. The health of vegetation and animals
5. The availability of fish and game

6. The direction and strength of winds
7. Sun exposure

The Schools of Feng Shui

According to Kiehl (2005), Feng Shui schools are generally classified into three types: pyramid, form, and compass schools. The primary objective of all these schools is to achieve a balance among the five elements of Feng Shui—fire, earth, water, wood, and metal—though each school employs a different approach to accomplish this goal.

Form School. The Form School emphasizes human visual perception, as the eyes are the primary organ through which people interpret their surroundings. This school relies on the ability to observe shapes, colors, and spatial arrangements to understand their impact on human life and behavior. For example, the shape of a mountain may be interpreted as either a potential threat or a protective feature, depending on visual perception. In Chinese culture, a mountain resembling a dragon is considered auspicious, encouraging proximity (Kiehl, 2005). This approach also integrates considerations of human existence and the contemporary Western perspective, recognizing that personality traits are influenced by genetic predisposition, biological factors, cultural background, and religion, all of which must be considered in the planning of spaces.

Compass School. The Compass School relies on precise measurements using a magnetic needle that rotates around the compass center. Unlike traditional methods, this school uses 36 fixed circuits to generate detailed guidance for selecting ideal locations. However, modern use of the compass can be affected by surrounding metal structures, which may interfere with accuracy. Additionally, the use of a compass is less common today (Kiehl, 2005).

Pyramid School. This school focuses on the symbolic and energetic importance of pyramid shapes and not just directional measurements. Unlike the Compass School that relies on precise compass readings and magnetic orientation, this school focuses on the flow and concentration of energy via the geometric forms.

The Components of Feng Shui

According to Pendey (2021), Feng Shui is an ancient Chinese architectural philosophy that emphasizes the flow of life force. Its main components include Yin Yang, Chi, the Octagon, Tao Dao and the five basic elements. The development of Feng Shui is closely tied to the Chinese mainland, and its constituent elements are derived from the basic principles of ancient Chinese philosophy. These principles continue to influence contemporary culture, guiding concepts such as happiness, freedom, and well-being (Morris, 2015).

Tao / Dao. Tao, or Dao, is considered the source of all creation and represents the subtle, immutable forces of nature. Practitioners believe that Taoism and nature are central to spiritual well-being, viewing the natural world as a stable, harmonious system that fosters orderly life. In both urban and rural settings, Feng Shui principles aim to establish a harmonious relationship between human settlements and their surrounding environment (Sang, 2013).

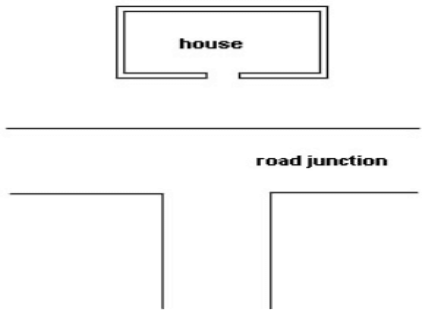
Yin and Yang. Yin and Yang represent two opposing but complementary forces, such as hot and cold, old and young, high and low. Yin corresponds to structural or passive elements, often associated with femininity, while Yang represents functional or active elements, associated with masculinity (Cho, 2021). A balance between Yin and Yang is essential for maintaining physical and mental health. An excess of Yin may result in introspection and observation, while an excess of Yang can lead to social and active behaviors. Figure 1 illustrates the traditional Yin Yang symbol and its associated qualities (Brown, 2009).

Sheng Chi. Which means moving upward. This energy is present in the refreshing, bright, high places. It can be found in wood, on the beach, in parks, in gardens, and beautiful natural areas. This energy makes the people who touch them feel happy and hopeful (Wu, 2019).

Sha Chi. Sha Chi is a negative or harmful energy that can arise in environments where danger or anger is present. It may originate from above or below ground and can adversely affect health, energy, and well-being (Wu, 2019). In a study by Rovika (2009), where she studied the effectiveness of Feng Shui she found that Sha Chi occurs in houses built in low-lying and very humid places, otherwise; it is possible in areas commonly found where useful Chi energy is available. This force moves smoothly as the road turns while the Sha Chi force flows in straight lines making it touch houses in different places like houses at intersections. Moreover, several Feng Shui specialists stated that Sha Chi can have a negative impact on the house if the house is located on a T-junction area on the road, as shown in Figure 2.2, or if the road or river runs straight through one of the doors or windows, as shown in Figure 2.3. Similarly, a house surrounded by other buildings (bridges, roads) will receive dangerous energy as well, as buildings are a box (Rovika, 2009).

Figure 2.2

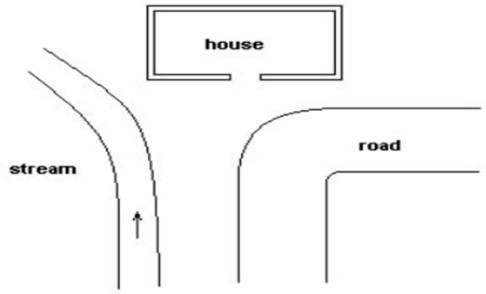
House Impacted by Road Alignment



Note: Illustrates the Impact of Sha Chi Caused by Road Alignment Directed Toward a Building Entrance, which negatively Affects circulation flow and Spatial Balance (Feng Shui Focus (n.d.).

Figure 2.3

House Impacted by Water Flow Directed Towards it



Note: Illustrates how water flow directed toward a building can create Sha Chi, negatively impacting the energy balance of the space (Feng Shui Prophet (n.d.).

When water flow is directed straight toward a building, it can create spatial discomfort known as Sha Chi in Feng Shui. This type of energy is fast and forceful, rather than calm and balanced. In simple terms, when something moves directly and quickly toward a space, it creates

a feeling of pressure instead of comfort. As a result, it may negatively affect the atmosphere of the building and the well-being of the people inside.

Five Basic Elements of Feng Shui

The ancient Chinese believed that the universe, including heaven, earth, and humans, is interconnected through five basic elements. These five elements—Earth, Fire, Water, Metal, and Wood—form the foundation of Feng Shui Figure 2.4. Each element must maintain a certain degree of balance to produce positive effects; otherwise, imbalance can lead to negative consequences. Each element reflects both natural characteristics and aspects of human personality (Sang, 2013). The elements are described as follows:

Earth (Soil / Tu). Earth is known as "The Diplomat" and represents stability, balance, and grounding. It affects physical strength and the sense of order. Excessive Earth energy can lead to sensitivity, boredom, laziness, and seriousness, while insufficient Earth energy may result in feelings of chaos, insecurity, and discomfort. Earth corresponds to flat terrains and elevated areas, with colors such as brown, yellow, and orange representing its influence. Unlike other elements, Earth is not tied to a specific season (Wu, 2019; Farran, 2018).

Fire (Huo / Magic). Fire represents energy, passion, and leadership. It is hot and dry, promoting enthusiasm, courage, and inspiration. Excessive Fire can cause anger, irritability, and impulsive behavior, while too little Fire may result in emotional depletion, lack of vision, or low self-confidence. Rectangular slopes and hilltops correspond to Fire, and its associated colors are red and purple, often linked to the summer season (Wu, 2019; Farran, 2018).

Water (Shui / Philosopher). Water is considered the source of life and embodies spirituality and emotion. Balanced Water energy encourages wisdom, understanding, and inspiration. Excessive Water may lead to feelings of being overwhelmed or emotionally sinking,

while insufficient Water can cause loneliness, depression, and frustration. Water is represented in nature by rivers and oceans, with folding curves and waves symbolizing its flow. Its associated colors are dark brown, blue, and indigo, corresponding to winter (Wu, 2019; Farran, 2018).

Metal (Chin). Metal symbolizes clarity, organization, and analytical thinking. It enhances mental focus, integrity, and personal discipline. Too much Metal may result in critical, talkative, or overly rigid behavior, while too little can lead to instability and quietness. Metal is commonly used in daily life for jewelry, tools, and industrial applications. Its forms are circular, domed, or reflective of the earth, and associated colors include white, gray, and metallic tones, corresponding to the fall season (Wu, 2019; Farran, 2018).

Wood (Mu / Tree). Wood represents growth, creativity, flexibility, and strength. It encourages expansion, learning, and understanding. Excessive Wood energy can cause frustration, stiffness, and stubbornness, while insufficient Wood may lead to stagnation or lack of wisdom. Wood is associated with square structures, deep-rooted growth in search of nutrients, and colors such as green and blue, reflecting spring and renewal (Wu, 2019; Farran, 2018).

Figure 2.4

Positive and Destructive Cycles of the Five Elements in Feng Shui.

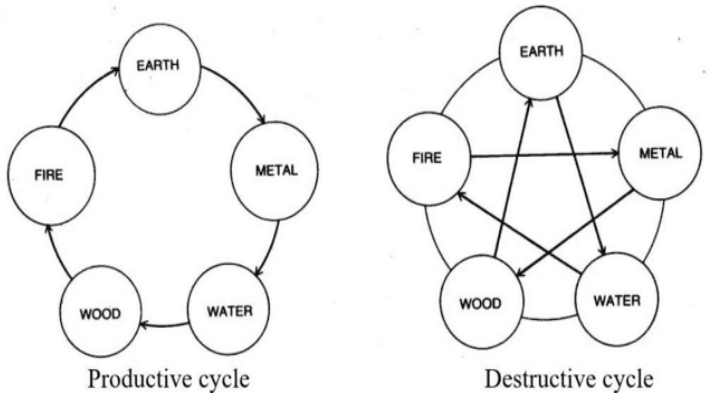


Figure 2.4 illustrates the productive and destructive cycles of the Five Elements in Feng (Kiehl, 2005). Shui, which are Wood, Fire, Earth, Metal, and Water. In the productive cycle, each element supports and strengthens the next, creating spatial balance and balance—for example, Wood feeds Fire, Fire creates Earth (ash), Earth produces Metal, Metal carries Water, and Water nourishes Wood. In contrast, the destructive cycle shows how elements control or weaken each other, such as Water extinguishing Fire, Fire melting Metal, Metal cutting Wood, Wood depleting Earth, and Earth blocking Water. These cycles help explain how circulation flows and interacts within a space, either promoting balance or causing imbalance.

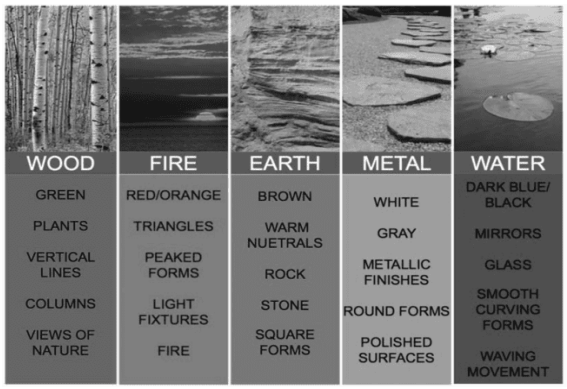
These cycles demonstrate the dynamic balance between the elements, highlighting how energy is transferred, transformed, and regulated in both constructive and destructive ways, maintaining spatial balance in nature and human environments (Kiehl, 2005).

Each of the Five Elements also forms a matrix and corresponds to various categories such as directions, colors, and shapes. For example, the directions are: East – Wood, West – Metal, North – Water, and Center – Earth. The associated colors are: Wood – Green, Fire – Red, Earth – Brown, Metal – Gray, and Water – Blue, as shown in Table 1 and the shape Figure 2.5.

According to Ng (2016), everything in the world belongs to the Five Elements, and people must follow the laws of the productive and destructive cycles to maintain balance. Thus, the application of the Five Elements ensures spatial balance among structures, people, and temporal factors (Ng, 2016). The Five Elements are used to remedy areas that lack balance. An essential aspect of mastering Feng Shui, which remains a subject of lifelong study, is the ability to analyze structural strength according to the Five Element Theory (Ng, 2016). This approach reinforces the Chinese philosophical belief that everything in the world is alive, evolving, and interconnected.

Figure 2.5

Five Elements and their Associated Colors and Forms



Relationship between Feng Shui and Biophilia

The design of fitting Feng Shui and nature is not new. In 1965 the name Biophilia was coined by Erich Fromm, a German psychologist, to describe the human tendency to "love life or the living system". It was made famous by Edward O. Wilson, a Socio-Biologist at Harvard University. He pointed out that everyone is born with the capacity to be aware of nature and other living factors, knowingly and unknowingly (Rovika, 2009). Recent research has also shown that the presence of natural elements, such as an external view through a small window, can enhance productivity, healing, learning, and emotional well-being (Cho, 2021).

The love of nature and other living beings is often deeply embedded in our unconscious minds. Across generations, people have learned essential life skills by recognizing their place in nature and observing the world around them. Humans survived by adapting to natural conditions to gather or hunt food and find safe shelter. This inherent tendency remains with us despite differences in culture and demographics (Chen & Nakama, 2004).

Rovika (2009) explained that biophilia assumes these survival skills are inherited through DNA as part of the natural selection process. However, modern life has alienated people from

nature, causing them to forget these basic survival instincts. Many no longer feel the need to live close to nature to obtain food or find safety. Despite this diminished dependence, humans remain innately connected to nature at a deep, psychological level. Scientific research shows that when selecting landscapes in photographs, individuals of varying backgrounds and ages consistently prefer natural environments (Rovika, 2009). Thus, interaction with nature and other living beings remains crucial for human well-being, supporting both physical and spiritual health.

Feng Shui principles emphasize spatial spatial balance, orientation, and balance in interior environments. These concepts provide an additional framework that can be applied to the spatial organization of classroom environments.

As shown in Table 2.1, previous studies highlight the importance of integrating environmental performance with spatial and psychological factors in classroom design.

Table 2.1.

Summary of Literature on Feng Shui and Sustainable Design

Theme	Key Findings	Author/Year	Design Implications
Learning Environments	Classroom design affects student performance and comfort	Barrett et al., 2015	Flexible and well-designed classrooms improve learning outcomes
Sustainable Design	Environmental quality impacts user health and productivity	Kibert, 2016	Natural lighting and materials enhance indoor environments
Feng Shui Principles	Spatial flow and balance influence user experience	Mak & Ng, 2005	Clear circulation improves comfort and usability
Biophilic Design	Nature improves focus and reduces stress	Kellert, 2008	Plants and natural elements support well-being
Integrated Design	Combining environmental and spatial strategies enhances performance	Wang, 2010	Holistic design improves both comfort and efficiency

Note: The following table summarizes key findings from previous studies related to Feng Shui principles, sustainable design, and learning environments.

Integration of Feng Shui and Sustainable Design

The integration of Feng Shui principles with sustainable interior design provides a comprehensive approach to improving classroom environments. While sustainable design focuses on environmental performance, resource efficiency, and indoor quality, Feng Shui emphasizes spatial organization, circulation, and user comfort. Combining these approaches supports both functional and psychological aspects of learning spaces.

Table 2.2

Conceptual Framework for Integrating Feng Shui and Sustainable Design

Feng Shui Principle	Description	Sustainable Design Strategy	Design Application in Classrooms
Chi (Circulation Flow)	Refers to spatial circulation and movement within a room, influencing user comfort and usability.	The quality of the indoor environment (natural light, air circulation) and the way things are arranged in space.	Make sure there are clear channels for people to walk through, don't block them, and let in as much natural light as possible.
Spatial Balance	Focuses on harmony by organizing and laying out space in a balanced way.	Functional zoning and smart space planning	Create distinct zones for lectures, group work, and moving about to help with different types of learning.
Human Well-being	Emphasizes the connection between users and their surroundings, which helps with comfort and usability.	Strategies for ergonomic design and making people comfortable.	Use furniture that is comfortable to sit in, make sure the temperature is right, and help pupils stay healthy.
Connection to Nature	Integrates natural elements to make the environment better and the user experience better.	Applying natural materials and biophilic design.	In order to feel better and focus better, add plants, natural materials, and natural light.
Orientation and Layout	Focuses on how things are arranged in space to improve functioning, visibility, and movement	Strategies for building orientation and layouts that save energy	Set up classrooms so that they get the most natural light, are easy to see, and use space well.

Note: presents the integration between Feng Shui principles and sustainable design strategies used in this study.

Table 2.2 demonstrates how Feng Shui principles can be systematically aligned with sustainable design strategies to enhance spatial organization, improve user comfort, and support overall classroom performance. This integration highlights the relationship between environmental quality and spatial planning in educational environments.

Following this conceptual framework, it is important to understand the historical foundations of Feng Shui and how these principles were originally applied in spatial design.

Ancient Design with Feng Shui

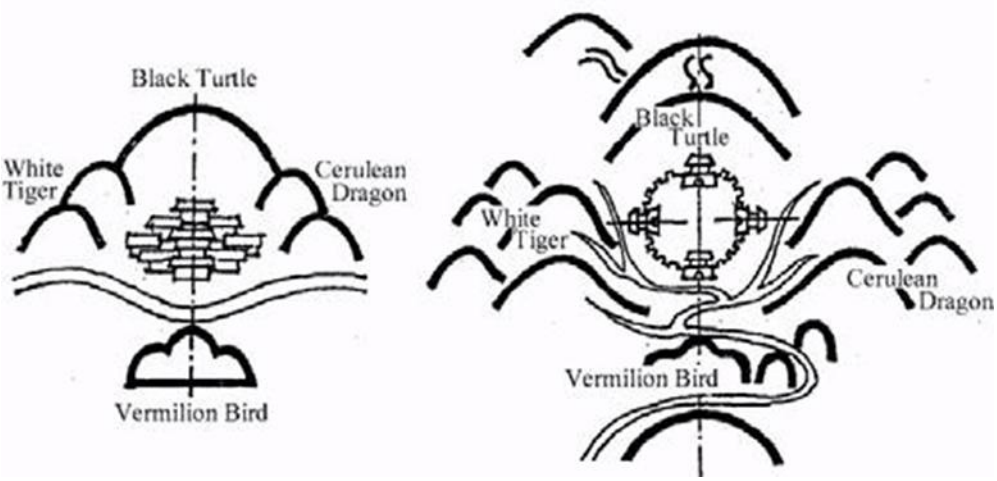
When selecting a building site, designing a room, or arranging living room furniture, taking inspiration from the cycles found in nature can fill the occupants with positive, balanced energy, enhancing their well-being and supporting their success in life.

Since ancient times, Feng Shui experts have been regarded as highly intelligent individuals with a deep understanding of nature, grounded in scientific observation and principles. These wise practitioners could predict moisture levels by examining the underside of pillars, forecast weather by observing the halo around the moon, and assess soil fertility by studying local vegetation (Rossbach & Akçatepe, 2001).

External features—such as hills, rivers, and the boundaries of trees and land, whether natural or artificial—play a critical role in guiding the flow of life energy. The Four Emblems Theory stems from ancient Chinese astronomy, where twenty-eight constellations were divided into four groups. These groups became symbolized as the Four Beasts: Black Turtle, White Tiger, Red Phoenix, and Azure Dragon, representing the North, West, South, and East, respectively (Erdogan & Erdogan, 2014).

Figure 2.6

Appropriate Spatial Patterns of Ancient Cities in Mountainous Areas Based on the Four Symbols Theory



Note: illustrates the spatial configuration based on the Four Symbols theory in Feng Shui, demonstrating the relationship between surrounding landforms and the flow of energy (Erdogan & Erdogan, 2014).

Figure 2.6 provides a conceptual illustration of the Four Beasts. The Chinese use this theory to explain the directions and geographical characteristics of the land, forming the foundation of the Form School Theory in Feng Shui. According to Chinese tradition, the optimal orientation for a building is facing south, which allows the structure to absorb sunlight while blocking cold northern winds. In Feng Shui, the formations and positions of rivers, mountains, roads, trees, and lakes are considered crucial, as they create varying effects on the flow of energy, or Chi. The Chinese took careful measures when modifying landscapes to avoid obstructing chi and to maintain its balance (Kryžanowski, 2021).

With the development of civilization and the construction of man-made roads and buildings, new Feng Shui challenges emerged. These challenges prompted the creation of new methods to harmonize the built environment with natural circulation flows. Ancient principles have thus been adapted to modern contexts—for example, winding roads are preferred over straight ones, as they guide chi in a natural, balanced way, similar to rivers. The symbolic significance of mountains is also influenced by the types of surrounding buildings and land use (Rossbach & Akçatepe, 2001).

Mountains, rivers, wind, and water are not the only factors affecting Feng Shui. Urban and suburban environments must also consider roads, highways, neighboring buildings, trees, public spaces, and parks, all of which significantly influence the balance, richness, and movement of chi (Zwain & Bahauddin, 2015).The main entrance of a building is another critical factor in Feng Shui. The entrance should be visually appealing, easily accessible, and free from obstacles such as pillars, trees, walls, or poles that might block the flow of chi. Strategically placing a tree or plant near the doorway can serve as protection and energy enhancement. Roads surrounding the property also impact the chi flow and should be considered in the design (Chen & Nakama, 2004).

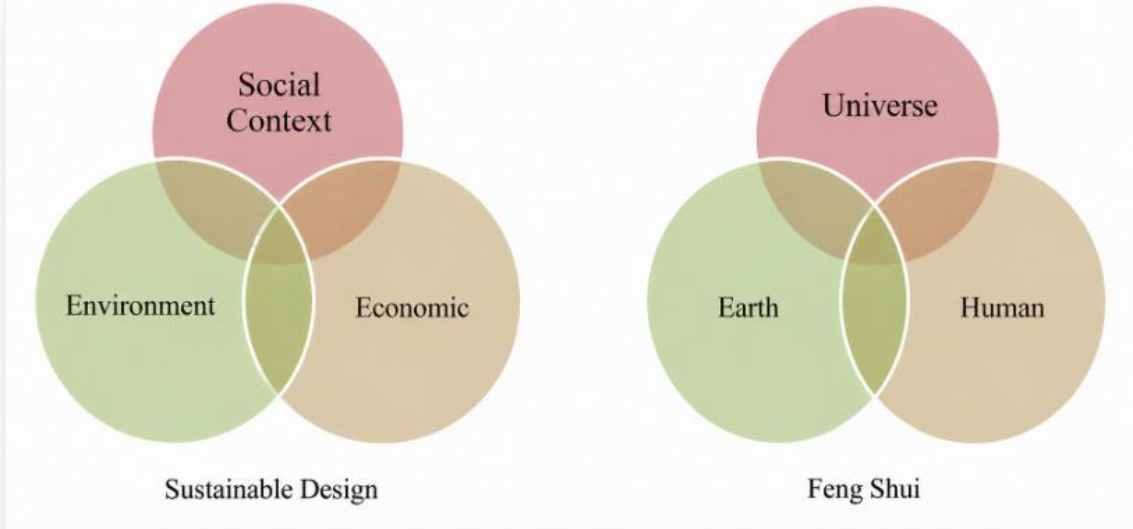
Comparison of Sustainable Design and Principles of Feng Shui

Usually when people compare the concepts of sustainable design with Feng Shui, there are similarities and differences. First, the concept of constructivism interprets into the principles of spatial balance between the universe, the earth, and the man in the art of Feng Shui. The ideal place for Feng Shui is these three elements as they come together and overlap. These three circles can be found in sustainable construction such as social conditions, environment, and people.

In addition, the second principle of Feng Shui is the productive and destructive cycles of five things, similar to the circular design or McDonough's concept of "Cradle to Cradle". The productive and destructive cycles of the five elements in Feng Shui explain how earth, fire, wood, metal, and water interact to either weaken or support one another in a continuous, balanced system. The Third concept of the art of Feng Shui is the harmony and balance.

Figure 2.7

Comparison of Principles of Feng Shui and Green Design



Compares the principles of Feng Shui and green design, highliting the shared focus on human well-being, environmental balance, and holistic integration (Mak & Ge, 2010).
The figure between between Yin and Yang, which is also associated with the concept of sustainable design of the balance between the natural environment and the built environment. In the fourth and fifth sense in sustainable construction, energy efficiency and the purchase of local ideas are clearly focused on resources and the use of natural resources. It emphasizes spatial balance between human spaces and natural elements, which supports energy efficiency in

sustainable construction by encouraging the use of natural light, ventilation, and balanced spatial orientation to decrease consumption of energy.

Applying Feng Shui in Interior Design

According to Farran (2018), experts use several methods to determine any structural problems and to obtain the necessary solutions using Feng Shui principles. The first method (Chaing) is the line system commonly used with a Chinese navigation compass. Then there is the grant method, and finally, there is the octagram method used in construction programs. All of these methods have the same purpose: to establish a balance between the five elements in a building to provide ease and enjoyment with guide lines and tips that help positive circulation flow and prevent negative circulation flow in school buildings (Farran, 2018).

Feng Shui Applications in Classroom Design

According to Heiss (2004), Feng Shui softens the impact of the educational environment. Teachers and students spend one-third of their day in school, one-third at home, and one-third sleep.

When bedtime is over, it leaves half of their waking hours in an area that may be crowded, well organized, and completely uncomfortable. Also, good classroom cleaning will have the same effect on students and their teachers. Moreover, according to Keller (2004) Feng Shui goes beyond cleaning the classroom and moving to a new classroom setting.

When students adapt to nature, they feel more comfortable when they feel accepted in the classroom environment, they come in eager to learn. However, when greeted with dozens of items, desks, paper cupboards, books, work desks, and a busy teacher's evening, these working conditions can cause both students and teachers to feel pressured and expelled. According to

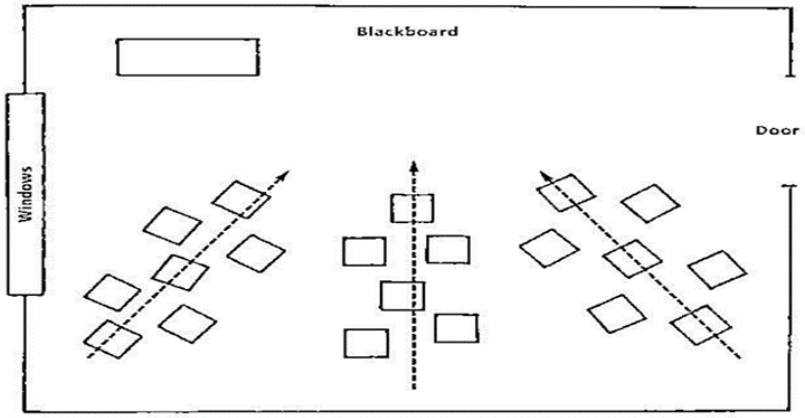
Heiss (2004) using the conventional approach to Feng Shui in the classroom can enhance the comfort of students and teachers.

The door to a Feng Shui classroom should provide a clear and unobstructed path for students to enter and exit the space. Similar to the main entrance of a house, the classroom door should not be blocked, as this may disrupt the flow of energy (Chi) within the space. Maintaining an open and accessible entrance supports a smoother flow of movement and contributes to a more comfortable and balanced learning environment.

Figure 2.8 shows an ideal classroom layout based on Feng Shui principles, designed to enhance comfort, circulation, and overall learning experience (Widiastuti et al., 2020).

Figure 2.8

Classroom Layout based on Feng Shui Principles



Note: illustrates a classroom layout based on Feng Shui principles, demonstrating spatial organization that supports circulation flow and student engagement (University of Central Oklahoma, 2025).

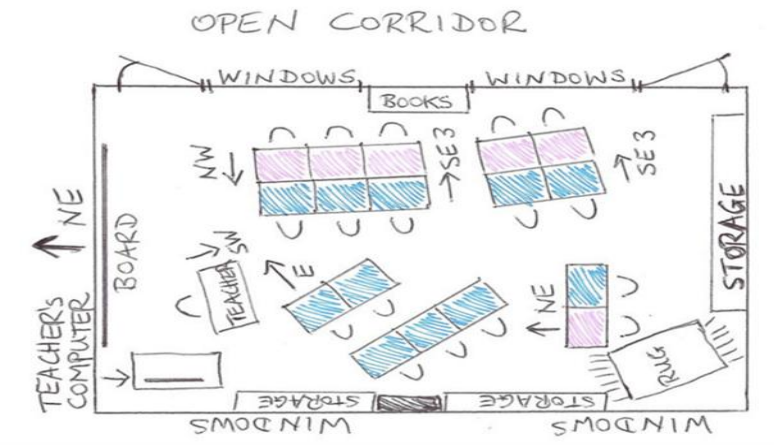
According to Painter (n.d.), several key steps can be followed to create a Feng Shui classroom:

1. Let Chi circulation flow: The goal of a Feng Shui classroom is to create a layout that allows chi energy to flow smoothly throughout the space, similar to a slow and continuous stream. Any obstruction may interrupt this flow and negatively affect the learning environment.
2. Yin–Yang Transition: The transition from active (yang) spaces, such as hallways, to calm (yin) classroom interiors should be smooth and natural. Students move from a dynamic external environment into a more focused internal space, and the entrance should support this transition by being welcoming and visually comfortable.
3. Entrance Enhancement: A well-lit entrance is essential in Feng Shui design. If natural lighting is limited, additional elements such as lighting fixtures or plants can be introduced near the door. However, these elements should be placed carefully to avoid blocking movement or creating obstacles.

Richardson's practical case study demonstrates the application of Feng Shui principles within an elementary classroom. The classroom layout was adjusted based on directional analysis, aligning students' seating positions with their beneficial orientations. This approach aimed to improve concentration, enhance classroom spatial balance, and support student engagement.

Figure 2.9

Feng Shui-Based Classroom Layout



Note: illustrates a Feng Shui-based classroom layout that reflects similar spatial strategies applied in practice (Richardson, (n.d.).

Figure 2.9 illustrates a classroom layout designed according to Feng Shui principles, showing how spatial arrangement can be applied in practice. The layout focuses on creating balance, smooth circulation flow, and a comfortable learning environment. For example, the teacher's desk is usually placed in a commanding position with a clear view of the room, while students' seating is arranged to avoid direct alignment with doors or disruptive pathways. The design aims to reduce spatial discomfort, improve concentration, and support better interaction and well-being within the classroom.

This study used Feng Shui principles to design studio spaces and lecture rooms, with the goal of creating a functional and sustainable learning environment. The design approach focused on organizing the spaces to improve movement, increase user comfort, and support different teaching methods.

The studio spaces were designed to encourage creativity and interaction by providing flexible layouts and balanced spatial arrangements. In contrast, the lecture rooms were organized to support concentration and structured learning through clear orientation and controlled circulation.

Natural elements, appropriate material selection, and spatial zoning were incorporated to achieve environmental balance and improve overall user experience. Combining Feng Shui principles with sustainable design strategies has led to spaces that improve both performance and well-being.

Chapter Summary

This chapter reviewed information on learning environments, sustainable interior design strategies, and the spatial principles of Feng Shui. The importance of classroom design elements, including arrangement, lighting, building materials, sound control, and spatial arrangement, in promoting student welfare and scholastic success is well-documented. Furthermore, Feng Shui principles, which prioritize balance, directionality, and spatial coherence, provide an additional perspective on the organization of interior spaces. These considerations guided the design approach used in this study, thus supporting the classroom design described in the following sections.

This chapter reviewed literature related to learning environments, sustainable design, and Feng Shui principles. It also established the relationship between spatial organization and environmental performance. The integration of these approaches provides a strong foundation for developing classroom design solutions presented in the following chapters

These findings highlight the importance of integrating spatial organization, environmental quality, and user comfort in classroom design. This study builds on these concepts

by combining sustainable design strategies with spatial planning principles to enhance learning environments

In this study, Feng Shui is interpreted as a spatial planning approach rather than a metaphysical system. Concepts such as Chi are translated into circulation flow and movement patterns within space, while spatial organization is used to improve functionality and user comfort.

CHAPTER THREE: METHODOLOGY

This study employed a quantitative research design using an online survey to explore interior design students' perceptions of classroom layout, lighting, environmental comfort, and sustainable features. The methodology was structured to ensure clarity, reproducibility, and alignment with ethical academic standards.

Introduction

This chapter outlines the research methodology used in this study. It describes the research design, data collection methods, and analysis procedures employed to investigate the integration of Feng Shui principles with sustainable interior design in educational environments.

Research Method

This study adopts a quantitative approach to explore the relationship between spatial design and student experience. The research focuses on understanding how design strategies based on Feng Shui and sustainability can influence learning environments in higher education.

The goal of this research is to develop a conceptual School of Design building created by the researcher and situated on the University of Central Oklahoma campus. A computer model of the building was developed just for this study so that the integrated Feng Shui spatial planning and sustainable interior design framework could be tested. It was a design idea used to test classroom layouts, circulation strategies, zoning organization, and environmental design choices.

The conceptual building has design studios for students at different levels, lecture rooms for different ways of teaching, and a computer lab. The building served as a design framework to integrate research findings, survey results, Feng Shui principles, and sustainable design strategies within a cohesive educational setting. The computerized model was designed using Feng Shui principles and sustainable design strategies, with a focus on circulation, spatial organization, and environmental performance.

Rather than designing the whole building, this research focuses specifically on the classroom environments within the building. The selected classrooms (studios, lecture rooms, and computer labs) serve as the primary units of analysis for this study.

Data Collection

Data were collected through a survey conducted among design students at the University of Central Oklahoma (UCO). The survey aimed to identify students' needs, preferences, and perceptions regarding classroom environments, including aspects related to flexibility, lighting, materials, circulation, and overall comfort. The purpose of the survey was not to generate a new design, but to evaluate and validate the effectiveness of the existing design strategies. The findings were used to assess whether the initial design decisions align with user needs and to refine specific elements at the classroom level. Ethical approval was obtained from the

University of Central Oklahoma Institutional Review Board (IRB). The survey was distributed electronically to participants. All participants were informed about the purpose of the study, confidentiality of their responses, and their right to withdraw at any time without penalty.

Data Analysis

Data were analyzed using descriptive statistics (frequencies and percentages) to summarize participant responses. This analysis allowed for identifying dominant patterns in student preferences that later informed the proposed classroom design.

CHAPTER FOUR: RESULTS

Introduction

The results of a quantitative online survey taken by Design students at the University of Central Oklahoma (UCO) are presented in this chapter. The results are further categorized into critical sections, including demographic information, the extent to which individuals are familiar with Feng Shui, their perceptions of its advantages, the anticipated longevity of the practice, the materials they select, natural elements, furniture, technology, and the arrangement of their living space. Figures facilitate comprehension of the results by presenting them in a manner that is comprehensible.

Participant Demographics

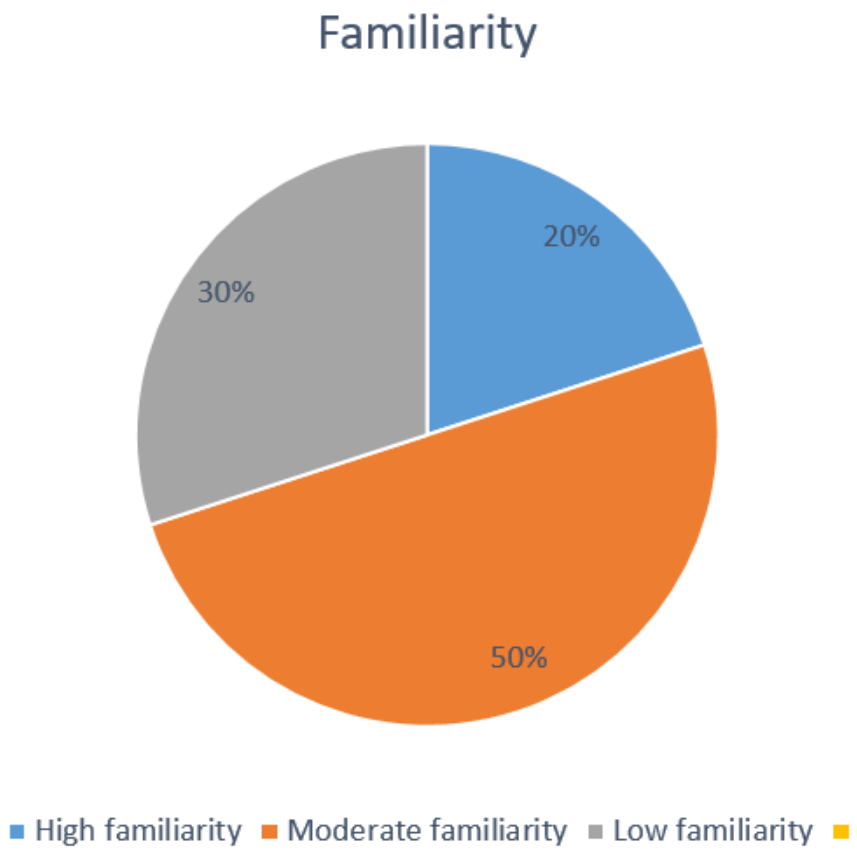
A total of 51 students participated in this study. According to the survey results (Figure 4.1), 84% (n = 43) were undergraduate students, while 16% (n = 8) were graduate-level students.

Familiarity with Feng Shui Concepts

The data indicate that students' familiarity with Feng Shui concepts is generally limited (Figure 4.1). A large portion of participants reported either no familiarity or only slight familiarity, while a smaller percentage indicated moderate to high familiarity..

Figure 4.1

Student Familiarity with Feng Shui



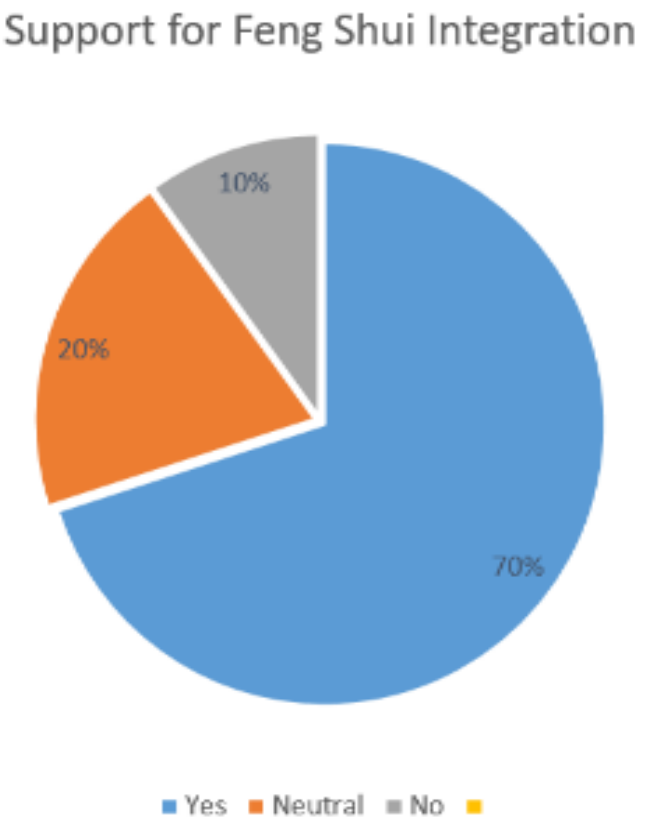
Note: This suggests that although Feng Shui is not widely understood in depth, it is still recognized by students within the context of interior design.

Perception of Feng Shui Benefits

Participants showed generally positive attitudes toward the use of Feng Shui principles in classroom design (Figure 4.2). Most respondents selected “Agree” or “Strongly Agree,” indicating that they believe Feng Shui can contribute to improving learning environments.

Figure 4.2

Agreement with Feng Shui Integration



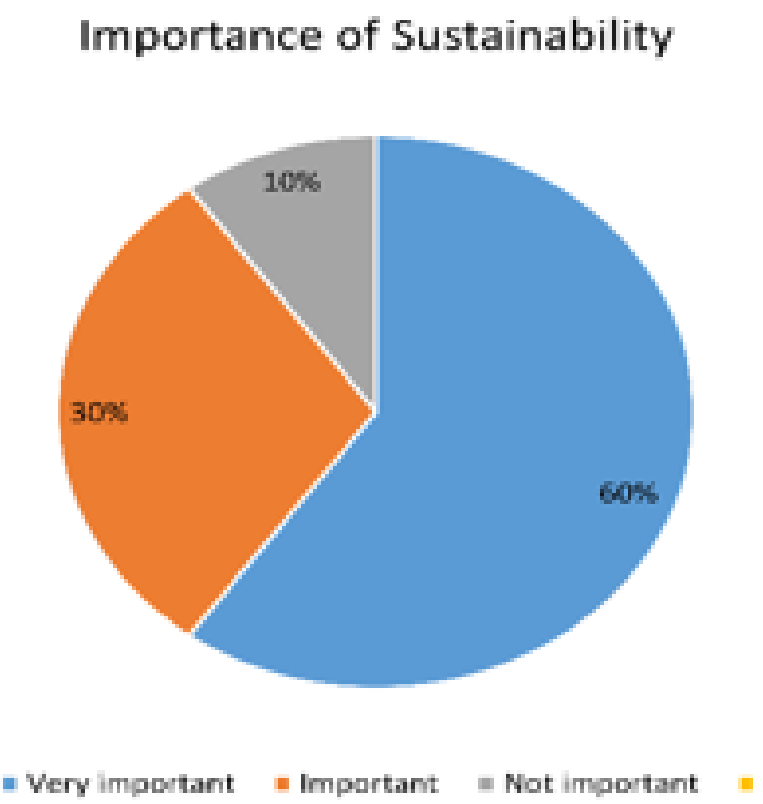
Note: This reflects an appreciation for spatial organization, comfort, and overall user experience within educational spaces.

Importance of Sustainability in Classroom Design

Sustainability was identified as an important factor in classroom design (Figure 4.3). Most participants rated sustainability as either important or very important.

Figure 4.3

Importance of Sustainability in Studio Classroom Design



Note: This finding indicates that students value environmentally responsible design practices, particularly in relation to material selection and overall environmental quality.

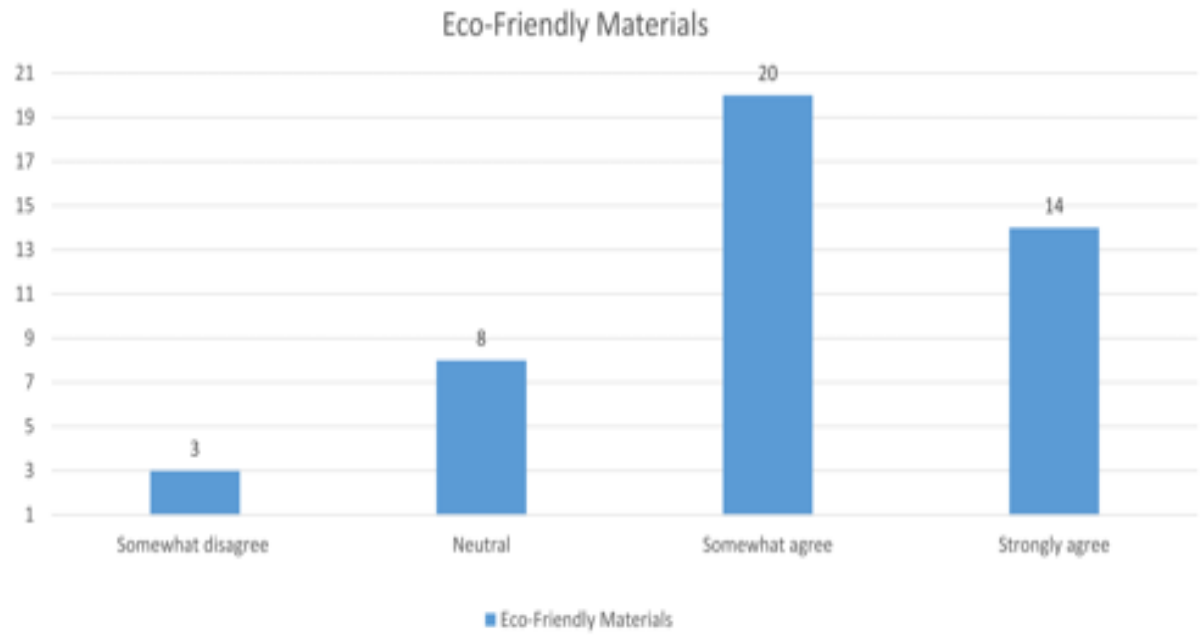
Preference for Eco-Friendly Materials

Students expressed strong support for the use of eco-friendly materials (Figure 4.4). The majority selected “Somewhat Agree” or “Strongly Agree,” with only a small percentage

expressing neutral or negative responses. This reinforces the importance of sustainable material selection in interior design and reflects awareness of environmental responsibility.

Figure 4.4.

Preference for Eco-Friendly Materials



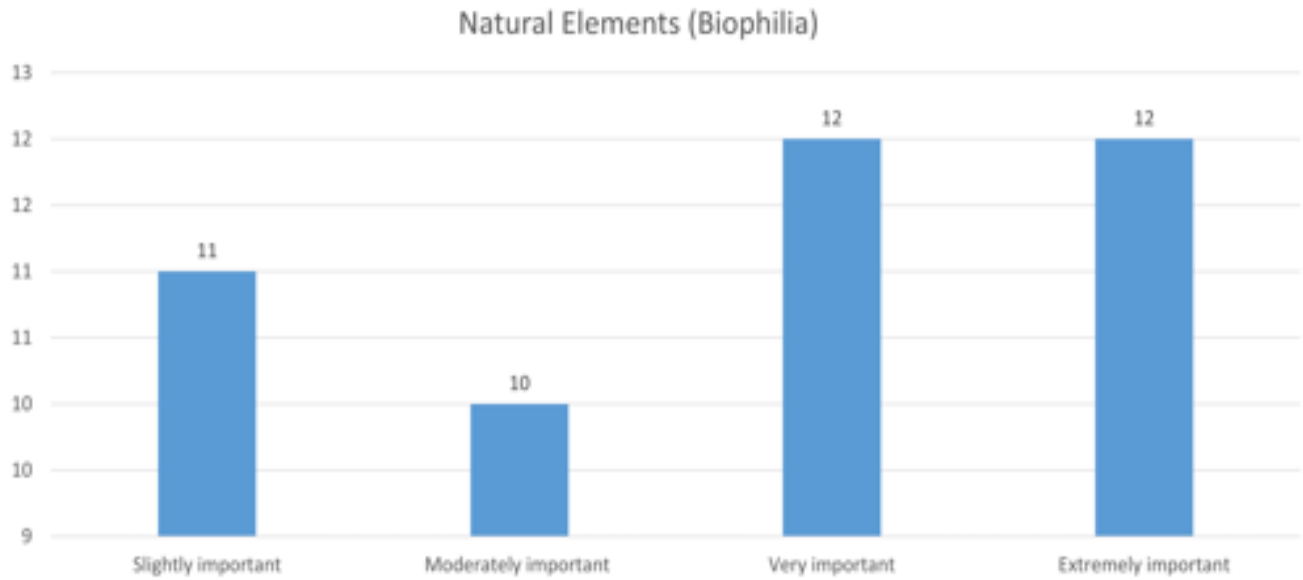
Note: This reinforces the importance of sustainable material selection in interior design and reflects awareness of environmental responsibility.

Importance of Natural Elements (Biophilic)

Participants rated natural elements as very important, to extremely important indicating the need to incorporate biophilic design strategies in classroom environments. In classroom environments (Figure 4.5). Features such as natural light and plants were considered valuable in enhancing comfort and improving the learning experience.

Figure 4.5

Natural Elements (Biophilia)

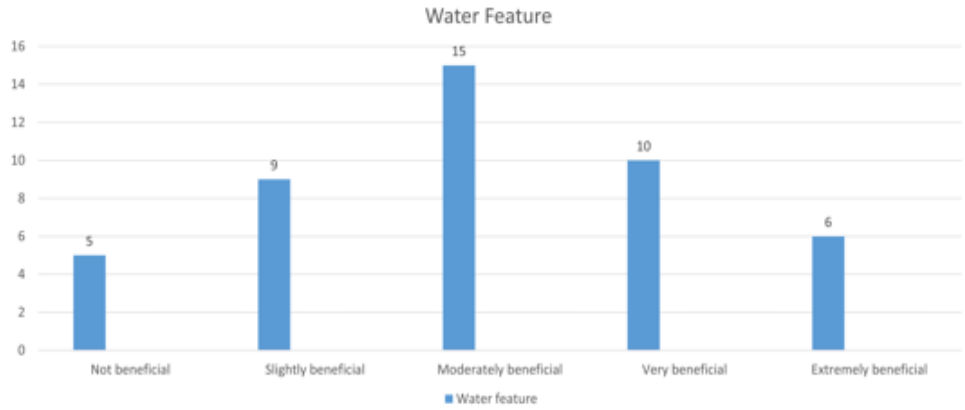


Note: These results highlight the importance of incorporating natural elements into interior spaces to support well-being and user satisfaction.

Perceptions of Water Features

The results indicate mixed opinions regarding the use of water features in classroom environments (Figure 4.6). While some participants considered them moderately to extremely beneficial, others were neutral or disagreed.

Figure 4.6



Perceived Benefits of Water Features in Classroom Environments

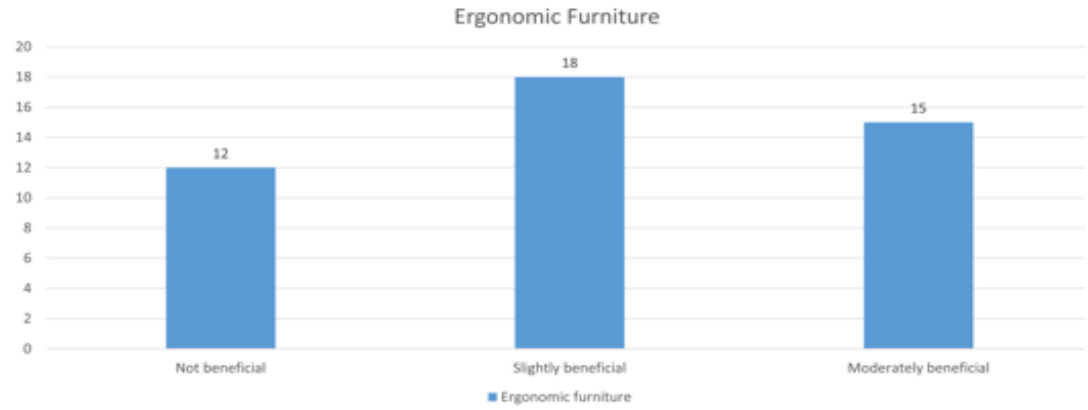
Note: This suggests that water features may not be universally preferred and should be applied carefully based on user needs and context.

Importance of Ergonomic Furniture

Participants emphasized the importance of ergonomic furniture in classroom design (Figure 4.7). Most responses indicate that comfortable and supportive furniture contributes to better focus and learning performance.

Figure 4.7

Importance of Ergonomic Furniture



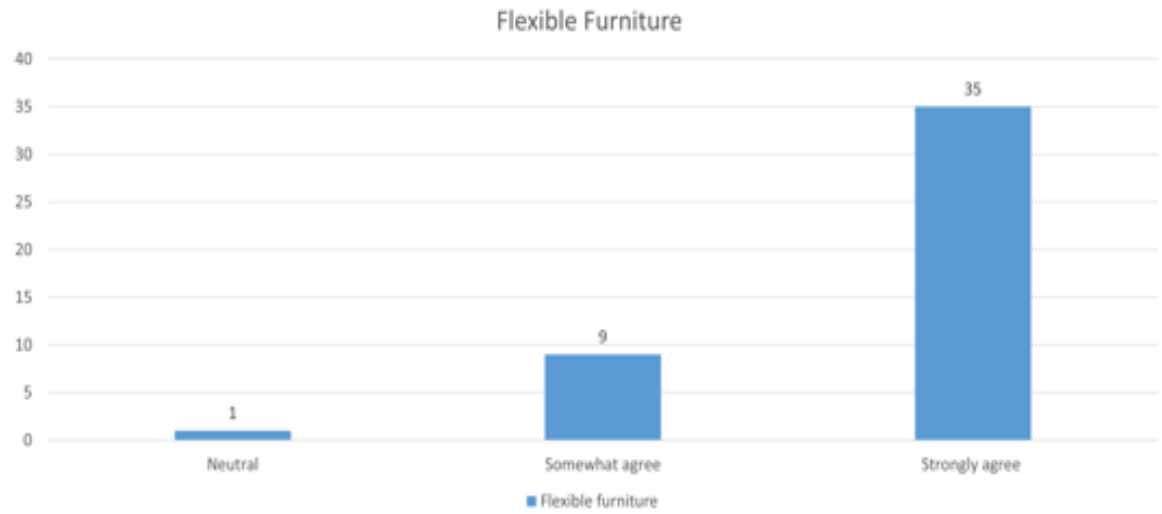
Note: This highlights the role of physical comfort in improving students' learning experience.

Support for Flexible and Movable Furniture

There was strong support for the use of flexible and movable furniture (Figure 4.8). Participants indicated that adaptable layouts enhance collaboration, interaction, and spatial efficiency.

Figure 4.8

Support for Flexible and Movable Furniture



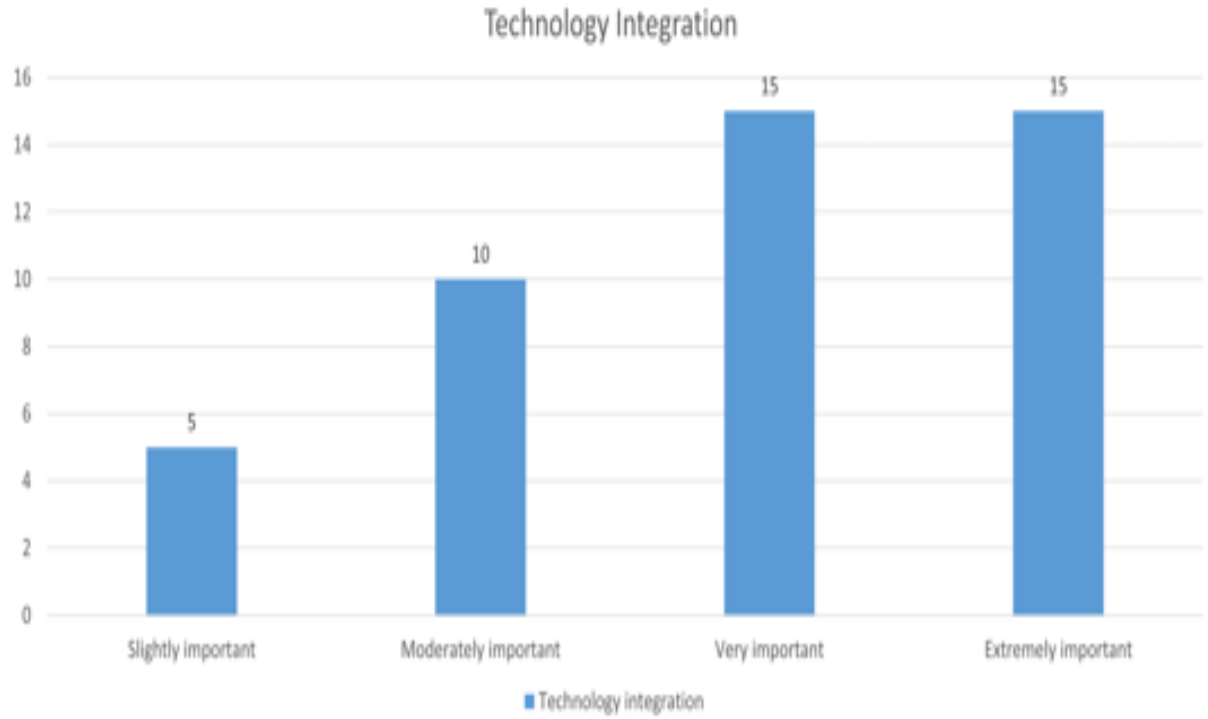
Note: This reflects the importance of flexibility in modern classroom environments.

Importance of Technology in Classroom Spaces

Technology integration was identified as an important component in contemporary learning environments (Figure 4.9). Participants emphasized the need for digital tools such as smartboards, charging stations, and wireless connectivity.

Figure 4.9

Importance of Technology in Studio Classrooms and Student Perception of Circulation and Entry Design



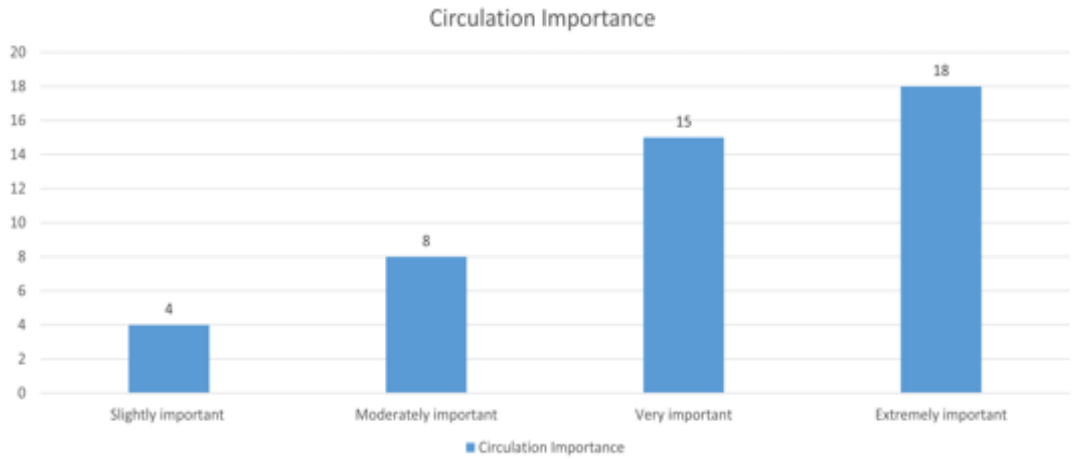
Note: This finding supports the integration of technology to enhance learning and engagement.

Circulation and Entry Design Importance

Participants highlighted the importance of clear circulation paths and well-defined entry points (Figure 4.10). Most responses indicated that ease of movement is essential for comfort and functionality.

Figure.4.10

Circulation Importance



Note: This emphasizes the role of spatial organization in improving usability and overall classroom performance.

Summary of Findings

Overall, the results indicate that student's value several key aspects in classroom design, including sustainability, natural elements, ergonomic and flexible furniture, technology integration, and clear spatial organization. While familiarity with Feng Shui concepts was limited, participants showed positive attitudes toward its application in design. These findings support the integration of both sustainable strategies and spatial design principles to enhance classroom environments.

Discussion

The findings of this study indicate that students prioritize spatial organization, natural elements, ergonomic furniture, and flexibility in classroom design. These findings are consistent

with previous research and highlight the importance of integrating functional and environmental strategies in educational spaces. The goal of this study was to examine the integration of Feng Shui principles with sustainable interior design methodologies to improve the educational atmosphere in classrooms. The survey results tell us what students like and how they feel about things, which helps us decide how to design things. The results show that the participants only had a basic understanding of Feng Shui principles, but they mostly had positive feelings about using Feng Shui in interior design. This suggests that people respond well to spatial features like comfort, organization, and balance, even if they don't know much about theory. This is in line with other studies that stress the importance of eco-friendly practices for improving the quality of the indoor environment and educational results.

The strong preference for eco-friendly materials makes it even more clear how important it is to choose the right materials for sustainable interior design. The results also show how important things like plants and sunlight are for making people feel better and helping them learn. Biophlic design principles say that bringing nature inside can help people focus and feel better. This is in line with those principles. People who took part strongly supported ergonomic and flexible furniture. This shows that comfort and adaptability are very important in modern learning spaces. People really liked flexible layouts because they could be used for different teaching styles and group work. People who took part also thought that using technology in the classroom was an important part of the design. They stressed how important it is to have digital tools and be able to connect to the internet, which shows how technology is becoming more important in school. Finally, circulation and spatial arrangement were brought up as important

factors that affect how comfortable and useful something is. Learning environments that are easy to navigate and have clear pathways are more advantageous and effective.

Integration with Design Proposal

The survey results were used to improve the proposed classroom design and make it more reliable. Participants suggested important features for the design, such as using eco-friendly materials, letting in natural light, using furniture that can be moved around, and having a clear layout.Feng Shui principles were used to plan the spaces, but the focus was on improving the layout, circulation, and zoning, not on spiritual or metaphysical meanings. For instance, Chi was used to describe how people move and flow through a space, and the Bagua Map was used to plan how spaces should be organized and used. The final design is a balanced mix of user preferences and theoretical design principles. This makes the classroom a good place to work and learn

Limitations.

The study's limitations include its small sample size and its focus on students from only one university. The survey also relied on self-reported data, which could be affected by personal biases and experiences.

Recommendations for Future Research

Future research may expand the sample size and include participants from a range of institutions and backgrounds. Moreover, future research may investigate the implementation of Feng Shui principles in various educational settings and assess their

influence on learning outcomes with greater accuracy. These findings support the integration of spatial planning strategies and sustainable design approaches in improving classroom environments.

CHAPTER FIVE: DESIGN APPLICATION

Introduction

This chapter talks about how to use the design framework that was suggested in this study. The design uses Feng Shui's ideas about how to arrange space and eco-friendly tips for decorating the inside of a classroom to make it a better place to learn.

The design choices are based on the literature review (Chapter 2) and the survey (Chapter 4). This makes sure that the approach is based on facts. The conceptual School of Design building is used as an example to show how these ideas can be used in schools to make them more comfortable, useful, and effective for learning.

A space program was made before the classroom design was made to figure out the functional, spatial, and environmental needs. This program makes sure that the proposed design meets the needs of the users and makes the learning environment comfortable and efficient(see Table 5.1).

Design Framework

This study utilizes an evidence-based design framework that amalgamates spatial planning principles with sustainable interior design strategies. Feng Shui is not utilized as a spiritual practice; rather, it is employed to enhance circulation, visibility, and comfort in classrooms through specific organization and arrangement of elements.

The framework is derived from the literature review and survey results. The literature review stresses the importance of spatial organization, natural elements, and environmental quality. The survey results show that students prefer open circulation, flexible furniture, natural light, and ergonomic comfort.

The design framework's goal is to create learning spaces that are useful, adaptable, and good for students' health and academic success by combining these elements. The following section demonstrates how this framework is applied in the overall building layout and classroom design.

Table 5.1

Space Program and Functional Requirement

No.	Space	Area/Unit (SF)	Number of Units	Total Area (SF)	Daylight Access	Privacy Level
1	Quiet Lounge	1,000	1	1,000	Yes	Low
2	Break Lounge	1,520	2	3,040	Yes	Low
3	Rental Gallery	800	1	800	No	Medium
4	Student Gallery	400	2	800	No	Low
5	Faculty Office A	180	6	1,080	Partial	High
6	Faculty Office B	140	5	700	Partial	High
7	Conference Room	360	2	720	Partial	High
8	Restroom	428	2	856	No	High
9	Print Room	320	2	640	No	Low
10	Computer Lab	744	2	1,488	No	Low
11	Design Studio	843	8	6,744	Partial	Medium
12	Photo Studio	648	1	648	No	High
13	Lecture Room	640	2	1,280	Partial	Medium

Site and Orientation

The chosen site for this study is situated on the University of Central Oklahoma (UCO) campus. The building's orientation was meticulously planned to optimize natural daylight and enhance environmental comfort in classroom areas. Proper orientation helps distribute natural light better, which means students don't have to rely as much on artificial light and their eyes will feel better.

The site planning also considers circulation and accessibility, making sure that it's easy and clear to move between different parts of the building. This is in line with the survey results, which showed that clear circulation and spatial organization are important for classroom design. As a result, the design focuses on logical pathways, easy-to-reach entrances, and smooth transitions between spaces.

Figure 5.1

Site Orientation and Sun Path Analysis

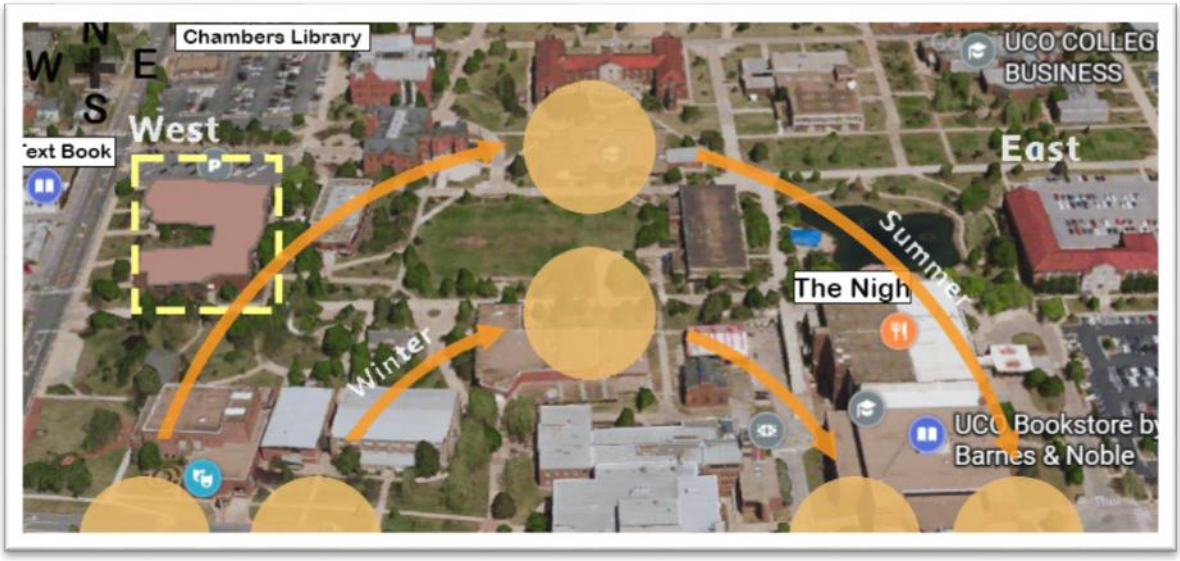


Figure 5.2

Site Circulation and Access Points

These diagrams illustrate how the site planning supports both environmental performance and functional circulation, ensuring that the building responds effectively to user needs and environmental conditions.

Conceptual Building Layout

The conceptual design of the School of Design building is based on a clear spatial organization that makes it easy to use and comfortable for users. The layout is structured so that different activities are kept separate while still allowing for strong visual and physical connections between spaces.

The building is divided into different areas, such as public areas, learning spaces, and service areas. This zoning plan makes the building easier to use by making it easier to get around

and get to all of the main areas. The central circulation spine is an important part of connecting all of the main areas and making sure that transitions go smoothly and there is less confusion.

This approach aligns with the survey findings, which highlighted the importance of clear circulation and well-organized layouts in classroom environments. By prioritizing spatial clarity and functional zoning, the design supports both individual and collaborative learning activities.

Figure 5.3

Floor Plan of the Proposed School of Design

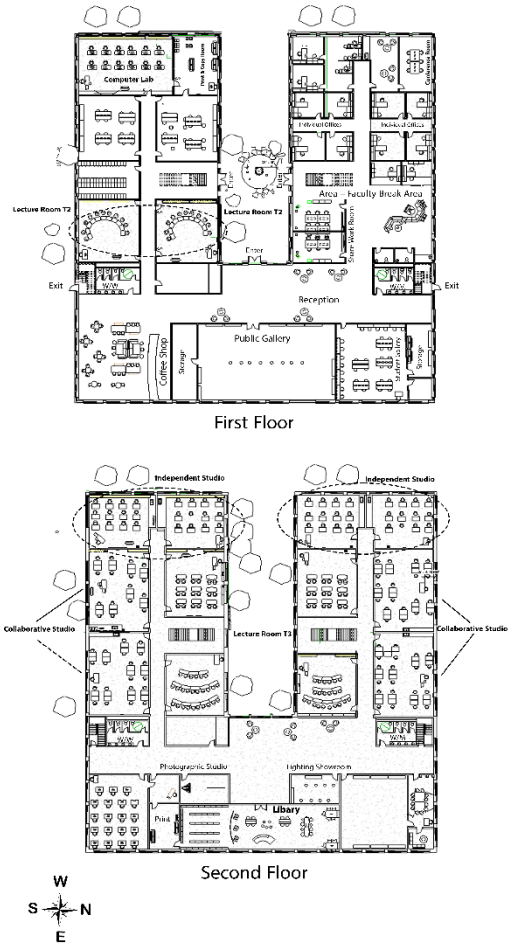
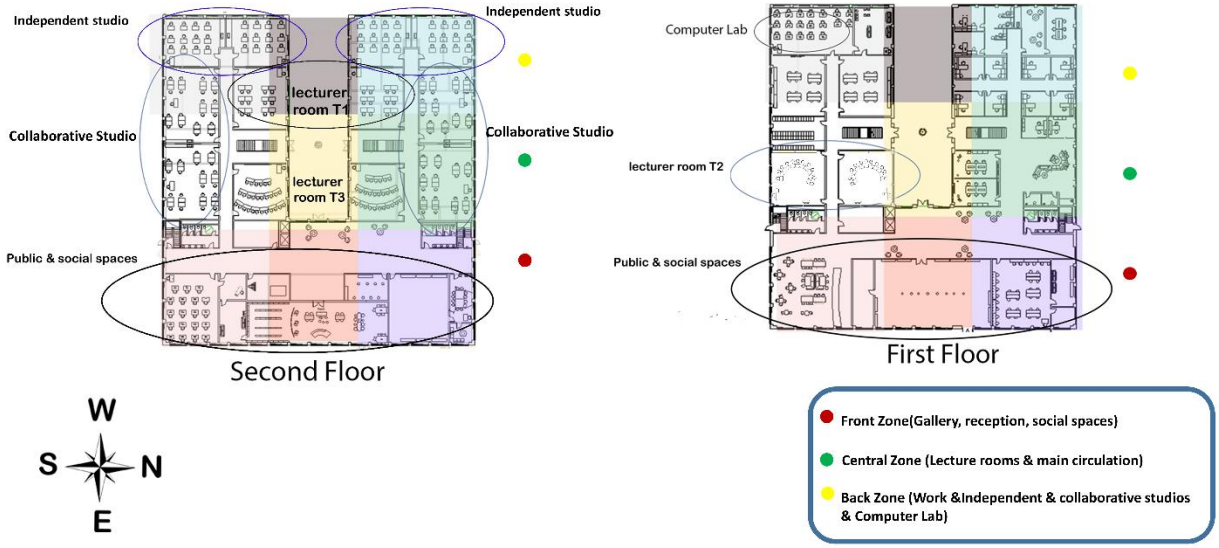


Figure 5.4

Functional Zoning of the Building Layout



The zoning diagram shows how the building is divided into three main functional areas: the front zone, the central zone, and the back zone. The front zone is where people can meet and socialize, and it includes the gallery and reception area, which make for a lively and welcoming entrance. The central zone is where people move around the building and includes lecture rooms, which make it easy to get to shared learning spaces. The back zone is where people can do focused work, and it includes independent studios, collaborative studios, and the computer lab.

This zoning plan makes it easier to get around the building and makes the space more organized. This is in line with what the survey said about how important circulation and functional layout are in classroom design.

This organization also supports different learning modes, including social interaction, structured teaching, and focused individual work.

Classroom Design Development

This section presents the design development of classroom environments based on the integration of Feng Shui principles and sustainable design strategies. The design decisions are informed by the findings of the student survey (Chapter 4) and supported by relevant literature. The following classroom types demonstrate how the proposed framework is translated into practical spatial solutions.

This section presents the design development of classrooms were designed based on the proposed framework and survey results. Each classroom is designed to meet different learning needs, such as individual work, group work, and interactive learning, while also following the rules of spatial organization and sustainability.

The following sections demonstrate how the proposed design strategies are applied across different classroom types.

Independent Studio Classroom

- The independent studio classroom is designed to support focused and individual work by providing a structured and organized layout. The spatial arrangement minimizes distractions and allows students to concentrate on their tasks while maintaining a comfortable learning environment.
- The survey results showed that students thought it was important to have clear pathways, furniture that is easy to use, and access to natural light. As a result, the design includes well-defined pathways, adjustable furniture, and large windows to make the space more comfortable and usable.

- The layout ensures that movement within the classroom is smooth and unobstructed, supporting accessibility and efficient use of space. In addition, the integration of natural materials and daylight contributes to improving overall well-being and creating a more productive learning atmosphere.
- These design decisions are aligned with research highlighting the importance of spatial organization, natural lighting, and ergonomic comfort in improving student performance and well-being (Altomonte et al., 2019; Boyce, 2014). In addition, the layout reflects Feng Shui principles of clear circulation and balanced spatial arrangement, supporting a calm and focused learning environment.

Figure 5.5

Independent Studio Classroom (Type1)

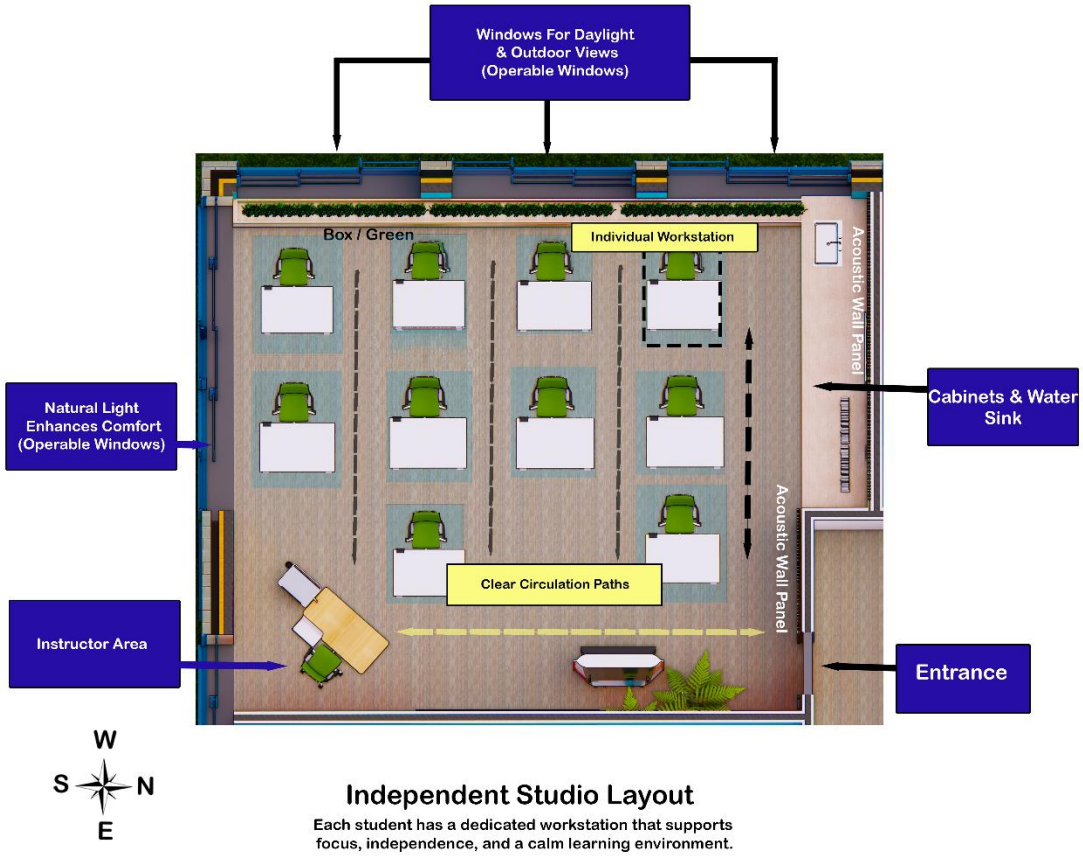


Figure .6

Interior View of Independent Studio Classroom (Type 1)

Table 5.2

Integrating of Feng Shui Principles and Sustainable Design Strategies

Design Aspect	Feng Shui Interpretation (Spatial)	Sustainable Strategy	Design Application in Classroom
Circulation (Chi Flow)	Clear and unobstructed movement within space	Efficient layout planning	Defined pathways between furniture and clear movement zones
Spatial Zoning	Organized distribution of functions	Functional space planning	Separation of lecture, group work, and individual study areas
User Comfort	Balance between users and environment	Ergonomic design	Adjustable furniture and comfortable seating arrangements
Natural Elements	Connection to nature through environment	Biophilic design	Use of plants, natural materials, and daylight
Orientation & Layout	Arrangement supports visibility and clarity	Daylighting strategies	Maximizing natural light and proper furniture orientation

Note: The integration of spatial organization, sustainable strategies, and Feng Shui principles creates a holistic learning environment that supports both functional performance and

psychological well-being. These applications demonstrate how abstract concepts such as balance, flow, and harmony can be translated into practical spatial design solutions.

Collaborative Studio Layout

The collaborative studio classroom is meant to help people work together and learn in a fun way. The furniture can be moved around easily, and there are open spaces for people to move around, which encourages communication and teamwork.

The survey showed that people really liked furniture that could be moved and changed. Because of this, the design includes flexible seating arrangements that make it easy for students to switch between working alone and in a group (see Figure 5.7).

Figure 5.7

Collaborative Studio Classroom Layout (Type 2) Layout

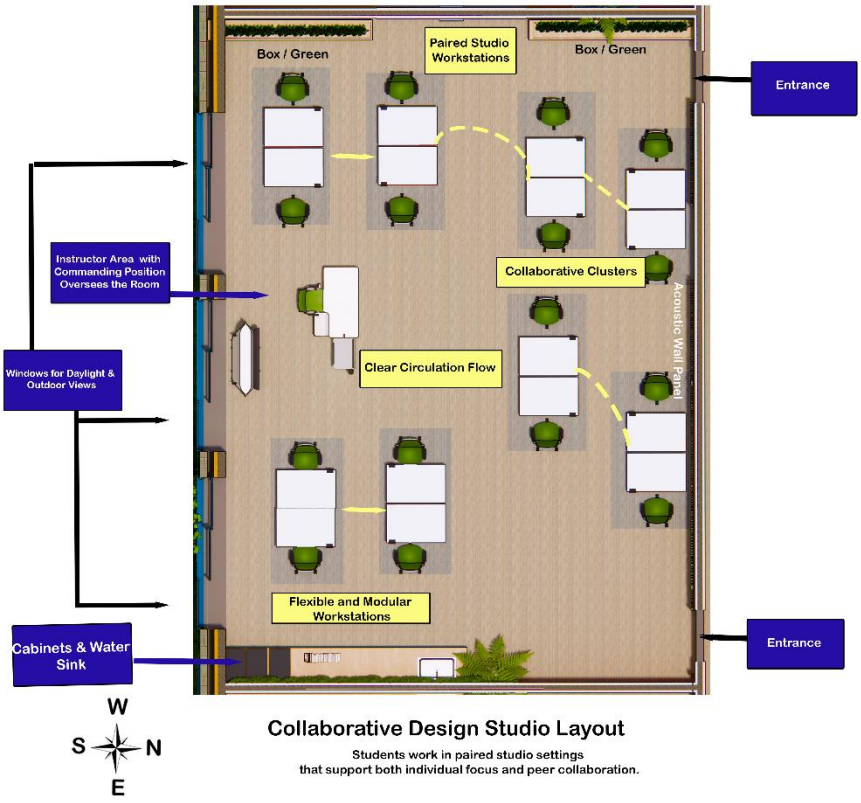
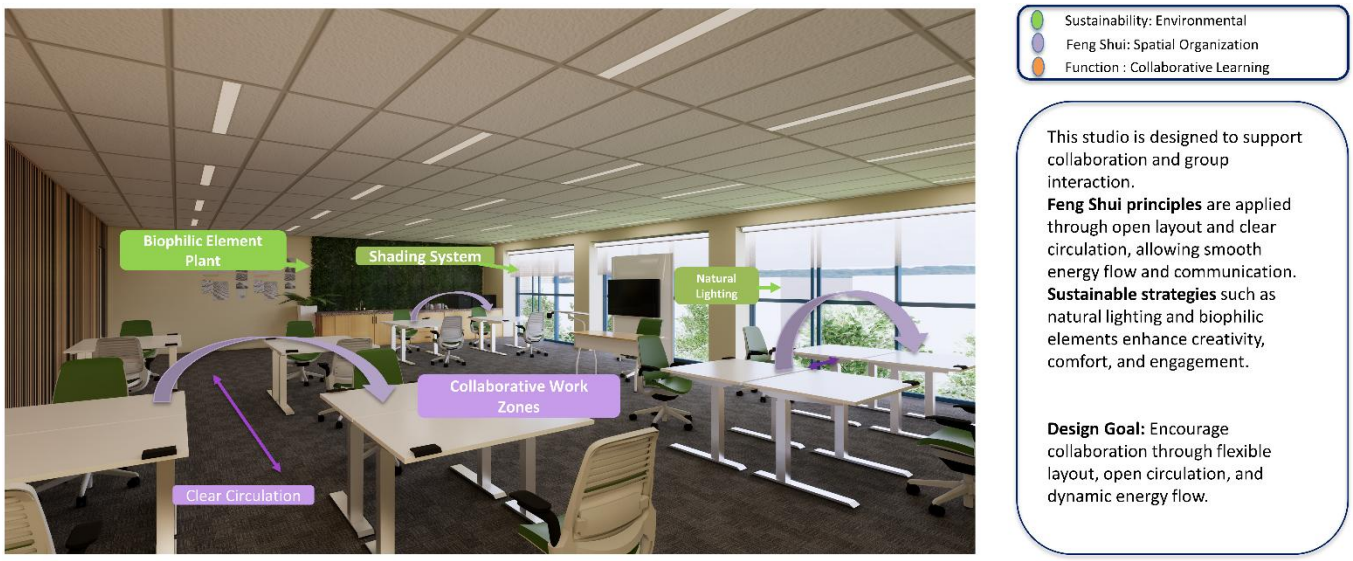


Figure 5.8

Interior View of Collaborative Studio Classroom (Type 2)



This design enhances interaction, adaptability, and spatial efficiency within the classroom environment.

Water feature in the studio

A small water feature is integrated as a biophilic design strategy to enhance sensory comfort and spatial quality within the studio. It serves as a symbolic element, promoting well-being through subtle visual and auditory effects. This feature is designed to augment the user experience without interrupting circulation or primary learning activities, adhering to the principles of sustainable interior design.

Figure 5.9

Integration of Water Feature within Studio Environment

Note: This feature enhances environmental comfort while maintaining functional efficiency within the learning space.

Lecture Rooms

Type 1: Traditional Layout

The traditional lecture classroom is designed to support structured learning through clear visibility and organized seating. The layout improves focus and minimizes distractions by maintaining a direct orientation toward the instructor (see Figure 5.10). This lecture room is designed to support focused, instructor-led learning. Feng Shui principles are applied through a structured layout and clear circulation, allowing balanced and organized energy flow. (see Figure 5.11).

Figure 5.10

Traditional Lecture Room Layout

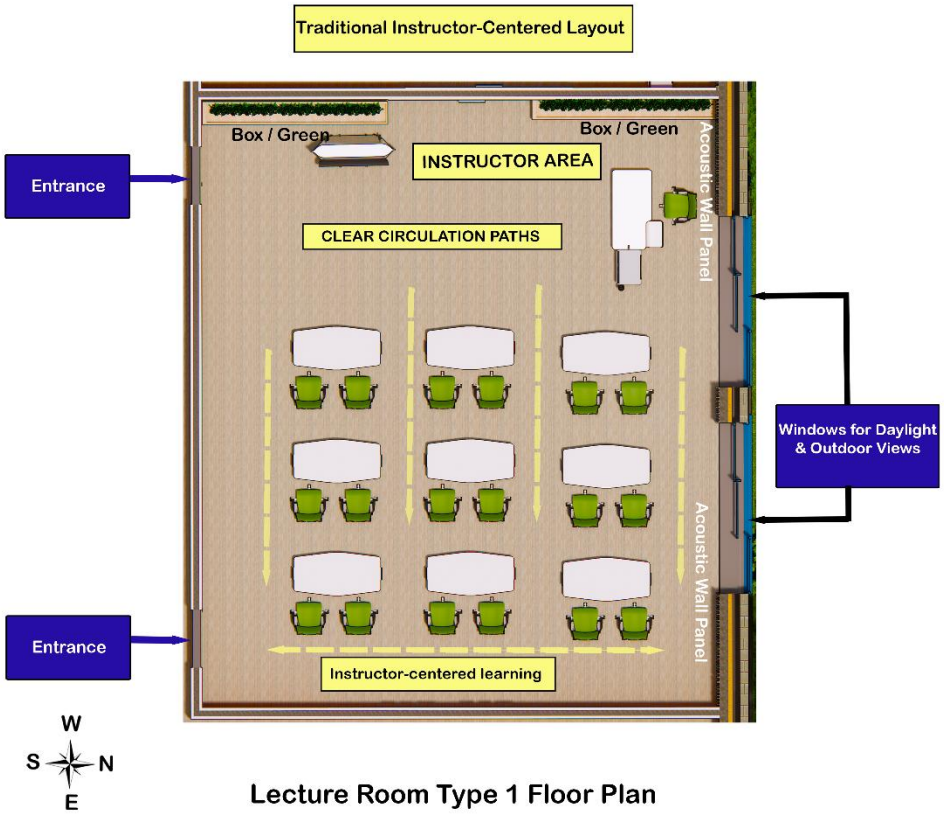
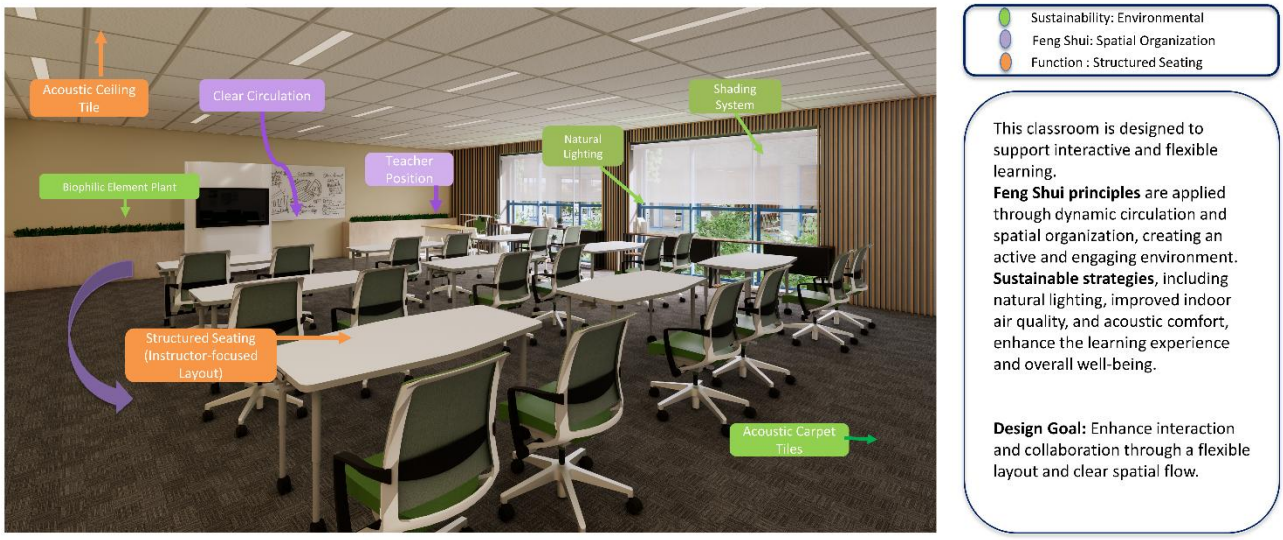


Figure 5.11

Interior View of Traditional Lecture Room



Type 2: Interactive Layout

The interactive classroom layout encourages communication and engagement through a U-shaped arrangement that improves visibility and student interaction (see Figure 5.12). This layout enhances student engagement, as the seating arrangement encourages communication, eye contact, and group discussion. (See Figure 5.13).

Figure 5.12

Interactive Lecture Layout

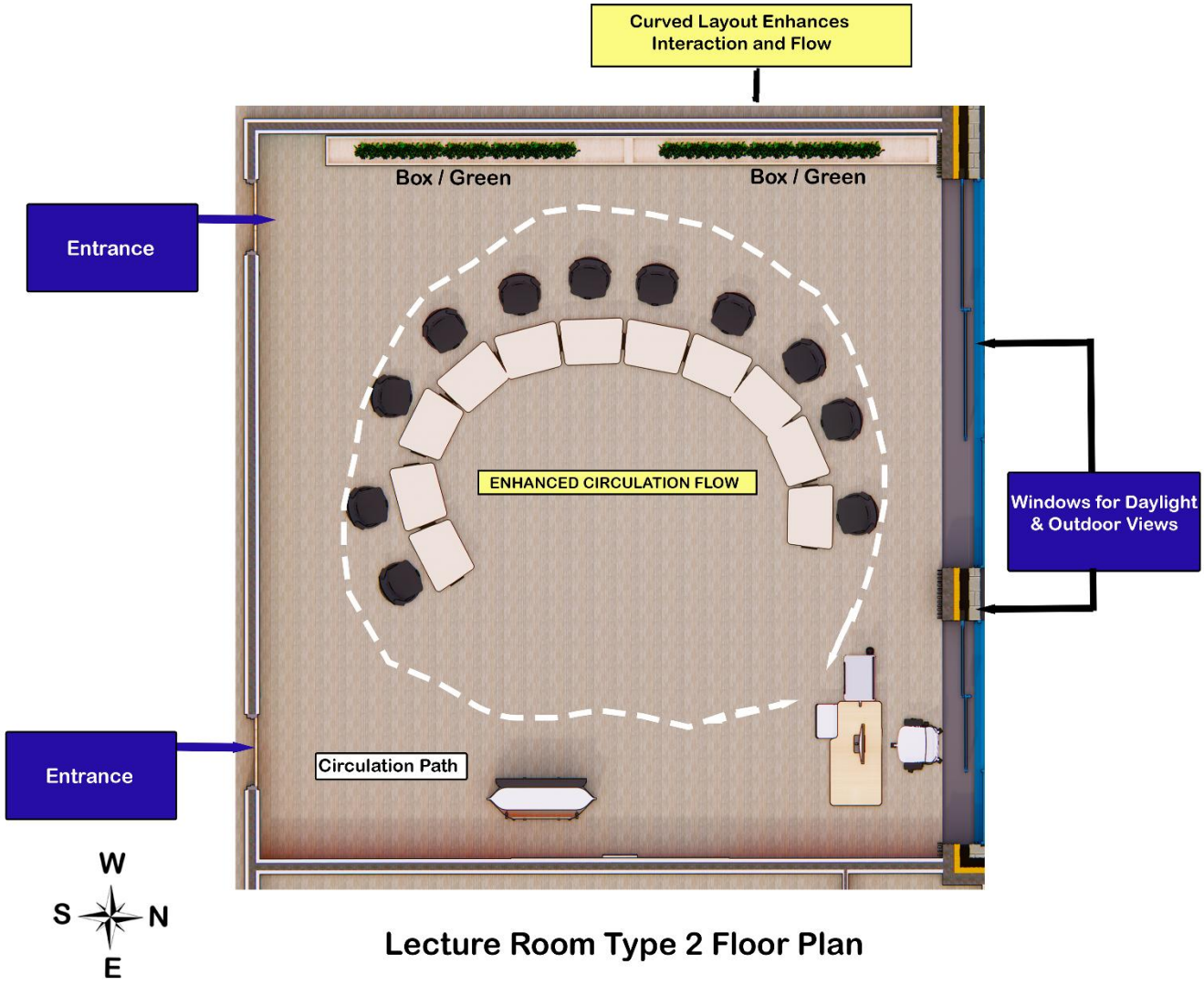
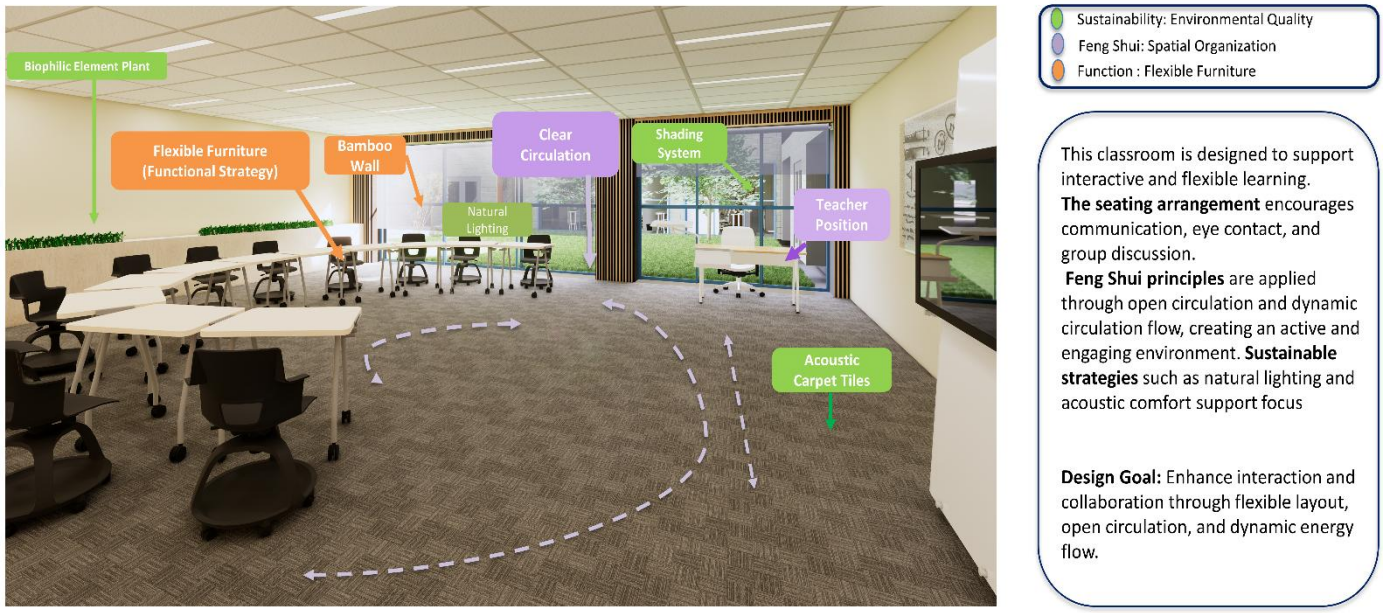


Figure 5.13

Interior View of Interactive Lecture Room



Type 3: Discussion-Based Layout

The discussion-based classroom supports active learning through flexible seating and dynamic movement within the space. The layout enhances participation and collaboration (see Figure 5.14). This configuration supports inclusive interaction, as the circular seating arrangement promotes equality and open communication among students. The layout encourages active interaction by providing students with more flexibility to interact in the learning space. (See Figure 5.16).

Figure 5.14

Discussion-Based Layout

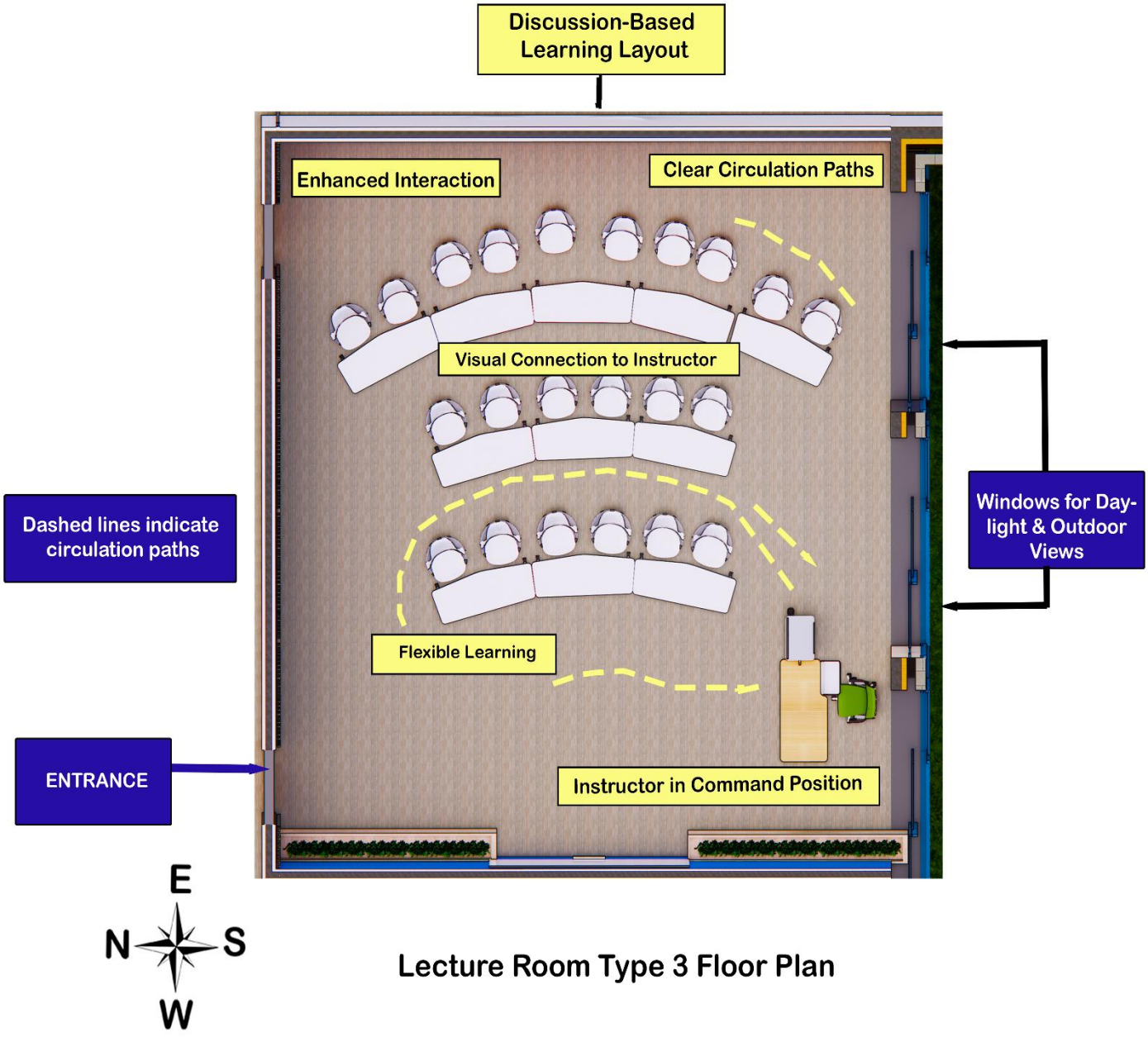
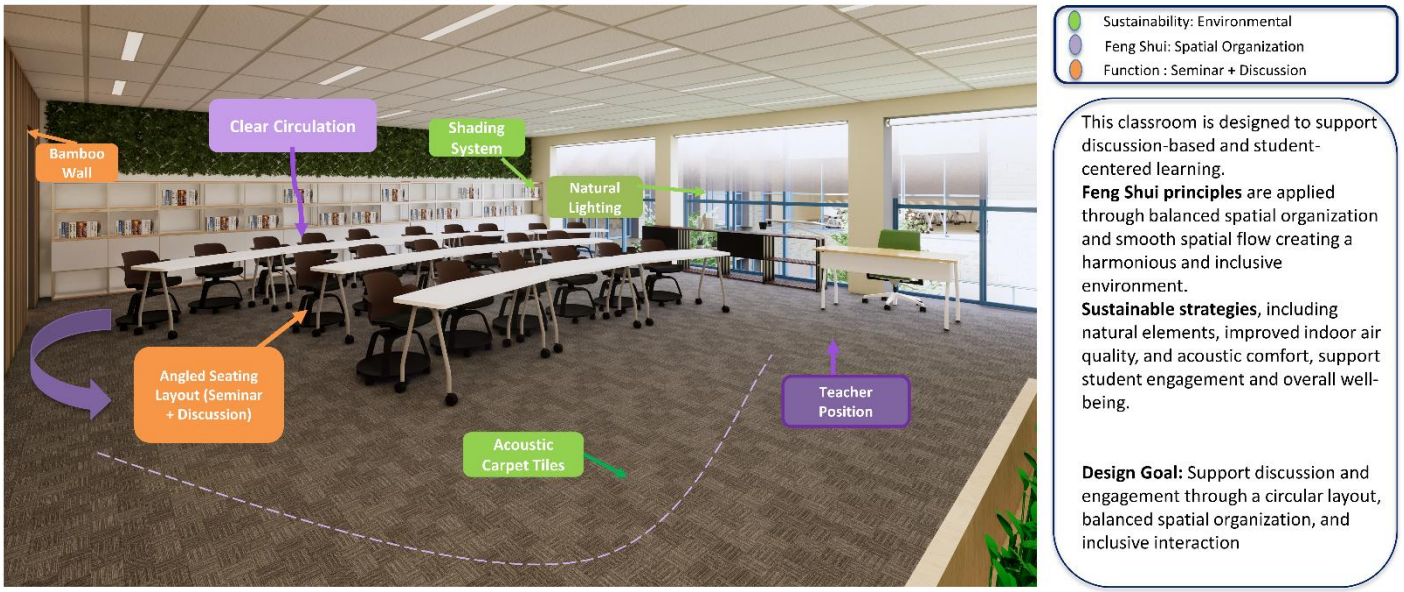


Figure 5.15

Interior View of Discussion Classroom



Computer Lab

The computer lab is designed to support focused digital work through an organized layout and ergonomic seating. Technology integration plays a key role in enhancing usability and efficiency (see Figure 5.16). In addition, this arrangement provides an ordered and distraction-free environment that allows for the effective use of digital tools (see Figure 5.17).

Figure 5.16

Computer Lab Layout

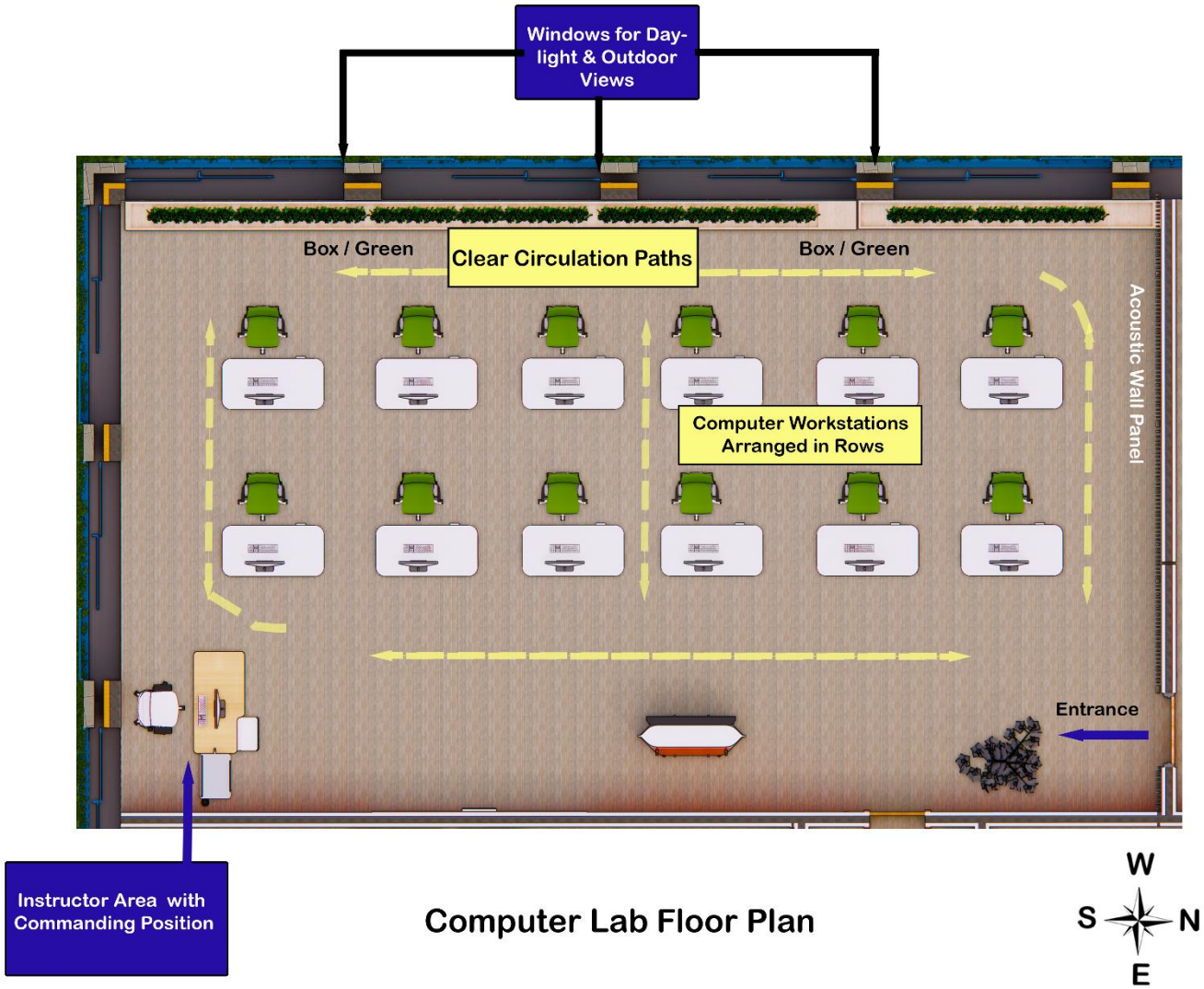
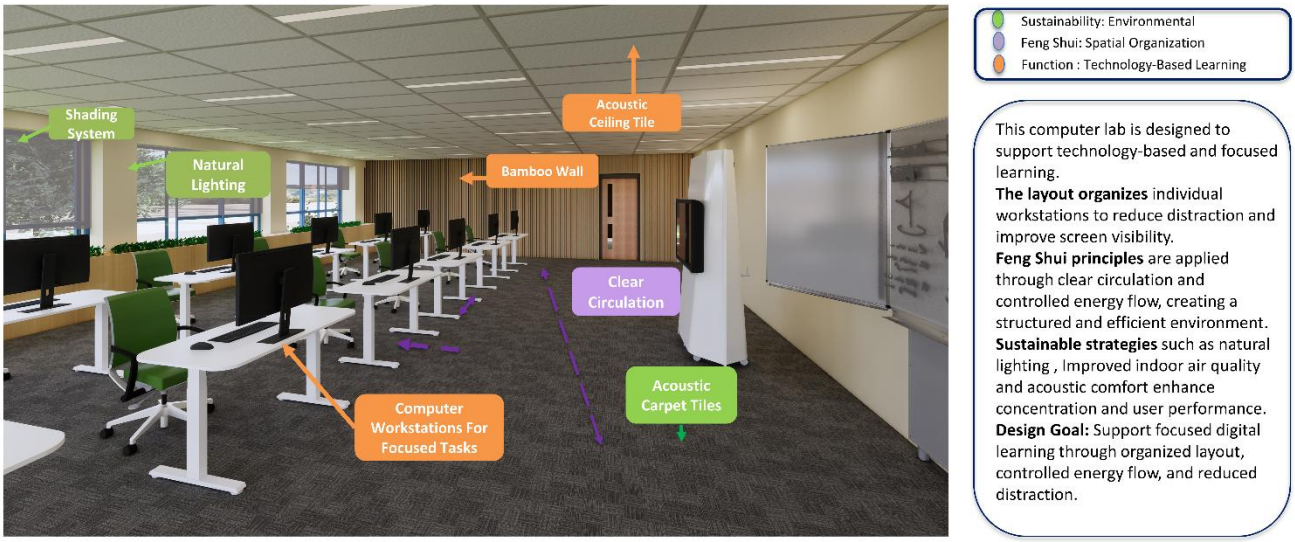


Figure 5.17

Interior View of Computer Lab



CHAPTER SIX: CONCLUSION AND FUTURE RECOMMENDATIONS

This chapter encapsulates the research demonstrating that Feng Shui spatial principles can be interpreted as spatial design strategies and integrated with sustainable design strategies to create educational environments that improve environmental comfort, spatial organization, and student well-being based on user preferences.

This research contributes to the field of interior design by reframing Feng Shui principles as functional spatial strategies rather than symbolic traditions. By aligning these principles with sustainable design approaches, the study provides a structured framework that responds to both environmental performance and user-centered needs in educational spaces.

Summary of the Study

This study investigated the implementation of Feng Shui spatial principles and sustainable interior design practices in educational contexts, specifically targeting university classrooms and studio environments. The central aim was to develop a design framework that synthesizes spatial

organization principles, environmental performance strategies, and user preferences, with the goal of improving learning environments.

The investigation commenced with a literature review, which examined learning environments, sustainable interior design strategies, and Feng Shui spatial principles. The existing literature suggested that classroom layout, lighting, materials, environmental comfort, and spatial organization substantially affect student well-being, concentration, and academic achievement.

A quantitative survey was administered to interior design students at the University of Central Oklahoma to ascertain student preferences concerning classroom environments. The survey results indicated that students preferred classrooms with natural light, flexible furniture, and comfortable environmental conditions. They also favored spaces that included natural elements and had clear pathways.

Drawing upon the literature review and the survey's conclusions, a design proposal for a School of Design building was formulated. The design included studio spaces, lecture halls, and a computer lab, incorporating both Feng Shui principles for spatial arrangement and sustainable design methods.

Unlike previous studies that addressed Feng Shui as a cultural or aesthetic layer, this research positions it as a practical design tool that can guide spatial organization, circulation, and environmental quality in classroom environments.

Contribution of the Study

The primary contribution of this study lies in the development of an integrated design framework that combines Feng Shui spatial principles with sustainable interior design strategies. This framework translates abstract concepts such as balance, flow, and harmony into measurable

design applications, including spatial zoning, circulation clarity, natural lighting integration, and user comfort.

Additionally, the study contributes to bridging the gap between environmental performance and psychological well-being in educational design, offering a user-centered approach supported by empirical survey data.

Recommendations

Future classrooms should be designed with flexible furniture, natural light, environmental comfort, and clear pathways in mind. Moreover, designers should incorporate principles of spatial organization and environmental sustainability when creating educational spaces. To improve student performance and well-being, universities and educational institutions should prioritize environmental comfort, lighting quality, indoor air quality, and flexible learning environments.

Research Findings

These findings confirm that students' preferences are not only functional but also aligned with principles of environmental psychology, where spatial clarity, access to natural elements, and flexibility contribute to cognitive performance and emotional well-being.

This study's findings indicate that Feng Shui spatial principles and sustainable design strategies share several common design goals. These goals include environmental comfort, spatial organization, the use of natural light, the selection of materials, and the well-being of the user. The survey results showed that students value natural light, flexible furniture, comfortable seating, easy movement, and technology integration. These preferences align with both sustainable design principles and Feng Shui ideas about space, particularly those related to how space flows, balance, and environmental comfort.

The design application showed that Feng Shui principles can be understood as spatial planning strategies, rather than just symbolic or cultural elements. Moreover, these principles can be combined with sustainable design methods to improve educational environments.

This study is limited by its sample size and focus on a single institutional context, which may affect the generalizability of the findings.

Future Research

Future studies could explore how Feng Shui principles are used in different building types, such as offices, hospitals, and homes. Further research could also look more closely at the connection between classroom design, student performance, and psychological well-being.

Future research could also explore how to measure environmental comfort and spatial organization in schools using quantitative methods. This research demonstrates that Feng Shui spatial principles can be interpreted as spatial design strategies and integrated with sustainable design strategies to create educational environments that improve environmental comfort, spatial organization, and student well-being based on user preferences.

Final Conclusion

This thesis illustrates that the use of spatial flow (Chi), functional zoning (Bagua Map), sustainable materials, and evidence-based design principles may markedly improve the quality of interior design educational environments. The suggested classroom and departmental designs offer a comprehensive and pragmatic framework to inform future renovations or the construction of new educational facilities. This approach enhances the evolution of classroom learning environments that foster creativity, wellbeing, and academic achievement by basing design choices on student feedback, ergonomic research, and spatial-planning theory.

This research proposes an integrated classroom design framework that combines user preferences, Feng Shui spatial organization principles, and sustainable interior design strategies. Ultimately, this research demonstrates that integrating Feng Shui spatial logic with sustainable design strategies can redefine educational environments to better support human-centered learning, environmental responsibility, and spatial harmony.

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APENDIX A MFA SURVEY BY SHADA SAHLABJI

Survey Questionnaire

Section 1: Introduce Consent to Participate in Research you are invited to participate in a research study conducted by Shada Sahlabji, MFA student at the University of Central Oklahoma, under the supervision of Amy Jacobson-Peters, ajacobsonpeters@uco.edu. Purpose of the Study: This study explores the redesign of design studio classrooms, focusing on sustainability and Feng Shui principles, to understand how classroom environments impact learning. Procedures: If you agree to participate, you will complete an online survey that will take about 10 minutes. Risks: There are no known risks associated with this study beyond those of everyday life (minimal risk). Benefits: Although you may not receive direct benefits, your responses will contribute to knowledge that may help improve classroom design for future students. Confidentiality: Your responses will be anonymous. No personally identifiable information will be collected. Voluntary Participation: Your participation is voluntary. You may stop at any time without penalty. Contacts: If you have any questions about the study, please contact: Shada Sahlabji, MFA Student: Ssahlabji@uco.edu Faculty Mentor: Amy Jacobson-Peters, ajacobsonpeters@uco.edu This project was reviewed by the University of Central Oklahoma Institutional Review Board and was determined to be exempt category research. For questions, you can contact me at: ssahlabji@uco.edu

1. By clicking Agree, you agree to participate in this study. Do you agree to participate in this study?

o I Agree

o I Do Not Agree

2. How familiar are you with the concept of Feng Shui in interior design?

o Not familiar at all

o Slightly familiar

o Moderately familiar

o Very familiar

o Extremely familiar

3. Please indicate your agreement with the following statements

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I believe that integrating Feng Shui principles can support better learning environments.	○	○	○	○	○

4. Please indicate your agreement with the following statements

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
How important is it to integrate sustainability aspects in studio classroom design?	○	○	○	○	○

5. Please indicate your agreement with the following statements

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I prefer the use of eco-friendly materials (e.g., recycled wood, low-toxicity finishes).	○	○	○	○	○

6. Please indicate your agreement with the following statements

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
How important is it to include natural elements (e.g., plants, natural light) in studio classrooms?	○	○	○	○	○

7. How beneficial would a small water feature (e.g., aquarium) be in a classroom environment?

- ○ Not beneficial
- ○ Slightly beneficial
- ○ Moderately beneficial
- ○ Very beneficial
- ○ Extremely beneficial

8. Click to write the question text

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
How important is ergonomic furniture (e.g., adjustable chairs and desks) in classroom design?	○	○	○	○	○

9. Click to write the question text

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I support the use of movable or flexible furniture to allow different classroom layouts depending on the activity (lectures, group work, etc.).	○	○	○	○	○

10. Click to write the question text

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
How important is the integration of modern technology (e.g., smart boards, charging stations, Wi-Fi) in studio classrooms?	○	○	○	○	○
How important is the design of entrances, exits, and circulation in creating a functional classroom?	○	○	○	○	○

11. Section 7: Learning Experience Outcomes

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I feel that the current design of my studio classroom supports my focus and engagement.	○	○	○	○	○
I feel that the design of my studio classroom improves my overall learning experience.	○	○	○	○	○

12. Click to write the question text

	Click to write Scale Point 1	Click to write Scale Point 2	Click to write Scale Point 3
Click to write Statement 1	○	○	○

13. Level of study:

○ Undergraduate

○ Graduate

14. Years of Study in Design:

- ○ 1–2 years
- ○ 3–4 years
- ○ 5+ years

APPENDIX B FURNITURE AND MATERIAL SPECIFICATION SCHEDULE

This appendix presents the complete Furniture and Material Specification Schedule used in the proposed classroom designs.

Each item includes manufacturer information, material description, sustainability notes, and an image placeholder

Item	Manufacturer	Description	Material / Finish	Location Used	Low-Toxicity Notes	Image
Steelcase Series 1 Chair	Steelcase	Ergonomic task chair	Mesh back, fabric seat	Studio	Low-VOC plastics; water-based adhesives; Greenguard-certified fabrics	
Steelcase Node Chair	Steelcase	Flexible 360° learning chair	Polypropylene shell, steel base	Lecture Room	Low-VOC coating; recyclable steel base	
Gesture Instructor Chair	Steelcase	Ergonomic instructor seating	Mesh back, adjustable arms	Instructor Area	Low-emission mesh fabric; powder-coated steel	
Migration SE Desk	Steelcase	Height-adjustable studio desk	Laminate top, steel base	Junior/Senior Studio	Low-formaldehyde core; recycled steel	

Verb Collaborative Table	Steelcase	Mobile teamwork table	Laminate top, metal frame	Lecture Room	Low-emission laminate; powder-coated frame	
LED Ceiling Panel	Philips	Energy-efficient lighting with sensor	Acrylic diffuser, aluminum frame	Studio + Lecture Rooms	Low-energy LED; minimal heat emission	
Blue Wall Paint	Jotun / SW	Focus-enhancing color	HEX #4A90C2	Studio North Wall	Low-VOC paint formula	
Red Accent Paint	Jotun / SW	Presentation anchor wall	HEX #D8432E	Lecture Room Main Wall	Low-VOC paint formula	
Beige Neutral Paint	Jotun / SW	Soft neutral tone	HEX #D9C7A8	Common Walls	Low-VOC paint formula	
Bamboo Wall Cladding	Moso Bamboo	Natural warm finish	Vertical bamboo slats	Studio Back Wall	Natural bamboo; non-toxic sealant	
Indoor Plants	Local Supplier	Improves air quality	Natural greenery	Studios + Lecture Rooms	Chemical-free; improves wellbeing	

Sink / Cleaning Station	Local Contractor	Built-in stainless-steel sink integrated into bamboo base cabinet	Stainless steel + bamboo cabinetry	Design Studio (All Levels)	Renewable bamboo; low-flow faucet	
Acoustic Carpet Tiles / Square Carpet	Milliken	Sound-absorbing, Slip-resistant, High-density backing for noise	(Carpet Floor Squares - Anti-noise)	All class rooms	Reduces indoor toxins Sound-absorbing, Slip-resistant, High-density backing for noise	
Solar Control Shades / Shade Star Systems.	MechoShade	Shade Star - Light Control	Shade Star - Light Control	All classroooms	UV protection, Anti-glare, Thermal insulation to reduce solar heat gain.	
Ergonomic Student Chairs	Furniture Manufacturer	Flexible, ergonomic seating	Polypropylene shell + metal base	Studios + Lecture Rooms	Low-toxicity plastics	Steelcase
Modular Studio Tables	Furniture Manufacturer	Reconfigurable tables	Laminate top + steel frame	Studios	Minimal off-gassing	Steelcase
Smart Teaching Display / Projector	Tech Supplier	Interactive teaching display	Digital screen	Studios + Lecture Rooms	Energy-efficient	

Rubber / Cork Sustainable Flooring	Flooring Supplier	Slip-resistant natural flooring	Recycled rubber / cork	Studios + Corridors	Low-VOC adhesives