

Integrating Sustainability Principles into Design Education

Prof. H. ChinnaSaidulu¹, Ar. Manu²

^{1,2}Jawaharlal Nehru Architecture and Fine Arts University

Abstract—As architecture educators, we have long believed that design has the power to shape not only the spaces we live in but also the future of our planet. The challenges of climate change, resource depletion, and social inequality demand that we rethink how we approach the built environment. In our teaching, we strive to integrate sustainability principles into every aspect of design, equipping students with the tools, knowledge, and mindset needed to create responsible, environmentally conscious solutions. A key part of our approach is introducing students to sustainable materials and practices that promote a circular, low-impact approach to architecture. Through organizing and teaching sustainable cane workshops, along with participating in sustainability-focused design competitions, we aim to inspire the next generation of architects to design with both innovation and responsibility.

Index-Terms— sustainably, environmental impact

INTRODUCTION

As architecture educators, we have long believed that design has the power to shape not only the spaces we live in but also the future of our planet. The challenges of climate change, resource depletion, and social inequality demand that we rethink how we approach the built environment. In our teaching, we strive to integrate sustainability principles into every aspect of design, equipping students with the tools, knowledge, and mindset needed to create responsible, environmentally conscious solutions. A key part of our approach is introducing students to sustainable materials and practices that promote a circular, low-impact approach to architecture. Through organizing and teaching sustainable cane workshops, along with participating in sustainability-focused design competitions, we aim to inspire the next generation of architects to design with both innovation and responsibility.

One of the most impactful ways we integrate sustainability into our curriculum is through the organization of sustainable cane workshops at our university. Cane is a fast-growing, renewable resource that can be used in a variety of architectural applications, from structural elements to decorative finishes. In these workshops, students learn about the unique properties of cane as a sustainable material, including its strength, flexibility, and minimal environmental impact. By working directly with cane, students gain hands-on experience, and an understanding of how sustainable materials can be effectively incorporated into architectural design. These workshops also provide an opportunity for students to explore innovative uses of cane and experiment with how it can be integrated into modern architectural forms while reducing the need for more resource-intensive materials.

Beyond material exploration, these workshops emphasize the importance of understanding the lifecycle of materials and how they can contribute to a more sustainable built environment. We encourage students to consider the regenerative potential of cane as part of a circular economy—one that values reuse, recycling, and minimizing waste. Through these experiences, students learn how to make design decisions that are not only innovative but also environmentally responsible. They come to understand the importance of sourcing materials sustainably, considering the embodied carbon of materials, and designing with minimal environmental impact.

In addition to the hands-on work with sustainable materials, we actively engage students in design competitions where the brief focuses on sustainability. These competitions present real-world challenges that push students to think critically about how to address environmental issues in architecture. Working with in these briefs, students have the opportunity to apply the sustainability concepts they have learned in a practical

context, such as designing low-energy buildings, creating adaptive reuse strategies, or utilizing renewable materials. These competitions provide a platform for students to explore cutting-edge sustainable solutions, refine their ideas, and see how their designs could make a tangible impact on the built environment.

Sustainability in architecture, for us, is not just about using environmentally friendly materials or reducing energy consumption—it is about creating designs that support the well-being of communities and respond to the needs of future generations. We stress the importance of social and economic sustainability in our curriculum, helping students recognize that sustainable architecture is not only about the environment but also about improving the quality of life for the people who will inhabit these spaces. Whether through affordable housing projects, community-driven designs, or ecologically sensitive urban planning, we encourage students to design with both people and the planet in mind.

Through our workshops, competitions, and teaching, we aim to foster a mindset that values sustainability as a core principle of architectural practice. We want students to leave our programs equipped with the skills and confidence to create designs that are not only innovative and functional but also sustainable. By integrating sustainability principles into every aspect of our curriculum, from material selection to energy-efficient design strategies and circular economies, we ensure that students are prepared to face the complex challenges of the built environment in the 21st century.



In addition to the hands-on work with sustainable materials, we actively engage students in design competitions where the brief focuses on sustainability. These competitions present real-world challenges that push students to think critically about how to address environmental issues in architecture. Working with in these briefs, students have the opportunity to apply the sustainability concepts they have learned in a practical context, such as designing low-energy buildings, creating adaptive reuse strategies, or utilizing renewable materials. These competitions provide a platform for students to explore cutting-edge sustainable solutions, refine their ideas, and see how their designs could make a tangible impact on the built environment.

Sustainability in architecture, for us, is not just about using environmentally friendly materials or reducing energy consumption—it is about creating designs that support the well-being of communities and respond to the needs of future generations. We stress the importance of social and economic sustainability in our curriculum, helping students recognize that sustainable architecture is not only about the environment but also about improving the quality of life for the people who will inhabit these spaces. Whether through affordable housing projects, community-driven designs, or ecologically sensitive



urban planning, we encourage students to design with both people and the planet in mind.



Through our workshops, competitions, and teaching, we aim to foster a mindset that values sustainability as a core principle of architectural practice. We want students to leave our programs equipped with the skills and confidence to create designs that are not only innovative and functional but also sustainable. By integrating sustainability principles into every aspect of our curriculum, from material selection to energy-efficient design strategies and circular economies, we ensure that students are prepared to face the complex challenges of the built environment in the 21st century

CANE WORKSHOP

CONCEPT DEVELOPMENT: SAVANNA GLOW

Design Theme:
The lamp embodies the graceful elegance of a giraffe, capturing its iconic long neck, spotted coat, and savanna habitat. The design merges functionality with artistic representation.

Key Elements:

- 1. Tall and Slender Form:**
 1. The lamp structure mirrors a giraffe's elongated neck.
 2. The light source at the top represents the giraffe's head with light ball.
- 2. Weaving Patterns:**
 1. Assam cane weaving for a spotted texture resembling a giraffe's coat.
 2. Delicate, open-weave patterns on the light fixture to cast soft, organic shadows.
- 3. Base:**
 1. Four sturdy cane-wrapped legs, mimicking a giraffe's legs, provide stability.

MAKING PROCESS:

Materials Required:

- Cane sticks of varying thicknesses.
- Brown and clear varnish.
- Light bulb and electrical fittings.

Steps:

- 1. Frame Construction:**
 1. Create a skeletal structure with cane for stability.
 2. Shape the frame to mimic a giraffe's neck and legs.
- 2. Cane Weaving:**
 1. Wrap the frame with Assam cane using traditional weaving techniques.
 2. Add spots by weaving in darker strips or dyeing sections.
- 3. Light Fixture:**
 1. Craft a spherical or head-shaped woven shade for the light source.
 2. Attach small woven "ears" and "horns" (ossicones) for a whimsical touch.
- 4. Base Design:**
 1. Assemble four cane-wrapped legs for the base.
- 5. Electrical Setup:**
 1. Install the bulb and wiring within the shade.
 2. Ensure the wiring runs seamlessly through the neck for a clean look.

FINAL RESULT :

2401INA014

CANE WORKSHOP

Project Brief: Sofa Side Lamp Design

Sofa Side Lamp project focuses on creating a practical and aesthetically pleasing lighting solution specifically designed for placement beside a sofa. This lamp will combine functionality with modern design, providing ambient lighting while enhancing the overall decor of living spaces. It will offer a perfect balance between a source of light and a stylish accent piece, ideal for relaxed settings like living rooms or reading corners.

Materials:

- Lamp Base and Frame:** High-quality materials such as metal, wood, or a combination of both will be used to ensure stability and style.
- Lamp Shade:** Fabric, glass, or other materials that will diffuse the light for a warm, soft glow.
- Lighting:** Energy-efficient LED bulbs with adjustable brightness or color temperature, offering both soft and bright lighting as required.
- Additional Elements:** Depending on design, materials such as marble, brass, or ceramic could be used to elevate the aesthetic appeal.

Materials:

- Lamp Base and Frame:** High-quality materials such as metal, wood, or a combination of both will be used to ensure stability and style.
- Lamp Shade:** Fabric, glass, or other materials that will diffuse the light for a warm, soft glow.
- Lighting:** Energy-efficient LED bulbs with adjustable brightness or color temperature, offering both soft and bright lighting as required.
- Additional Elements:** Depending on design, materials such as marble, brass, or ceramic could be used to elevate the aesthetic appeal.

This is my handmade cane workshop model, crafted with sustainability and thoughtful design at its core. I wanted to create something that feels natural yet functional—something that not only serves a purpose but also tells a story.

Using carefully selected sustainable cane, I shaped this piece to flow organically, with soft curves that bring a sense of harmony. The woven lampshade adds warmth, diffusing light in a way that feels cozy and inviting. The integrated stand, though simple in form, showcases the strength and versatility of cane, proving that sustainable materials can be both durable and elegant.

For me, working with cane isn't just about making furniture—it's about embracing traditional craftsmanship while reimagining it for the modern world. This model is a small step toward a future where design and sustainability go hand in hand.

CANE WORKSHOP

CONDUCTED BY MANU MAM

DESCRIPTION

A Giant canebrake (Arundo Donax)Cane is any of various tall, perennial grasses with flexible, woody stalks.

Depending on strength, cane can be fashioned for various purposes, including walking sticks, crutches, assistive cane or judicial or school canes.

Cane historically has been used for many other purposes such as baskets, furniture, boats, roofs and wherever stiff, with sticks can be put to good use.

TYPES OF CANE

Cane furniture is also known as wicker furniture. The material include natural and synthetic options such as cane, rattan, willow, reed, rush, resins, vinyl and splints to name a few off course, the most common application of wicker is creating furniture for home and workplace.

There are four major types of organic materials oded for indoor wicker furniture i.e., rattan, reed, willow and bamboo, with rattan being the most popular for use.

MATERIALS USED

1. Thick canes
2. Thick flexible cane strips
3. Thin flexible cane strips
4. Jute thread
5. Nails

PROCESS OF MAKING PENDANT LIGHT

1. Cutting the thick cane stick for making triangular frame with proper corners.
2. Making a triangular frame with bottom support for extensions of cane.
3. Providing a set of extensions on each side of the triangular face with different levels.
4. Adding more extensions series wise with 2" of gap.
5. Providing vertical cane members with small vertical pieces of cane of length 1".
6. Finally adding the 2 set of vertical angular members from bottom on 3 sides to provide some height of 1' to give support and makes easy to access all footwear from different directions.

S. VIDHNU SAI | I901NADI | SEM-I | M ARCH | INTERIOR DESIGN



