E-BOOK OF EXTENDED ABSTRACT

THE 14TH INTERNATIONAL INVENTION, INNOVATION & DESIGN COMPETITION 2025

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ADJUSTABLE SMOKE CERAMIC MABKHARA USING LOCAL CLAY FOR TRADITIONAL FRAGRANCE APPLICATION

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ABSTRACT

This project introduces an innovative reinterpretation of the traditional mabkhara (incense burner) using local clay ceramic material combined with an adjustable smoke release system. Unlike conventional mabkharas that emit fragrance without control, this new design allows users to manually regulate the intensity and direction of the smoke through a rotatable or sliding vent system. The integration of natural, heat-resistant clay with a user-controlled ventilation system offers a safer, eco-friendly, and culturally rich alternative. The design is modular and aesthetically inspired by traditional Islamic and Malay forms while accommodating modern lifestyle needs. The product is suitable for various spaces including homes, prayer rooms, spas, and boutique commercial environments.

1. INTRODUCTION

The use of incense burners, or mabkhara, is deeply rooted in various cultural and religious practices across the Middle East, Southeast Asia, and parts of Africa. Traditionally used to burn bakhur—a mixture of aromatic resins, wood chips, and essential oils—the mabkhara serves not only as a tool for fragrance diffusion but also as a symbol of ritual, hospitality, and spiritual cleansing. Despite its long-standing significance, the design of conventional mabkharas remains largely unchanged, often relying on open flames or charcoal, which pose safety and usability concerns in modern domestic and enclosed settings.

In response to these limitations, this project explores the innovation of a ceramic mabkhara constructed from locally sourced clay, enhanced with a manual smoke-control system. This approach not only preserves the cultural and material authenticity of the object but also integrates user-centric improvements that address contemporary concerns regarding safety, sustainability, and environmental consciousness. By reimagining the mabkhara through the lens of design innovation, the project seeks to bridge heritage craftsmanship with functional modernity.

2. METHODOLOGY

2.1 Resources

This project utilized a combination of traditional and contemporary materials and tools, specifically chosen to support heat resistance, cultural authenticity, and functional design testing.

a. Material:

- Locally sourced earthenware clay — selected for its availability, affordability, and natural thermal resistance.

- Clay body was processed through hand-kneading (wedging) to ensure homogeneity and remove air pockets.

b. Tools and Equipment:

- Basic hand-building tools: loop tools, rib, sponge, and pin tool.
- Kiln: electric, fired to bisque temperature (~1000°C) for structural strength.
- Prototype modelling tools: sketching materials, cardboard, 3D papers templates (for vent positioning).
- Fragrance testing: natural bakhur, essential oils, and incense wood chips.

c. Design Reference & User Input:

- Cultural visual references: traditional Islamic and Malay geometric motifs.
- Informal feedback from users familiar with incense usage (e.g. in homes and prayer spaces).

2.2 Technical

The development of the adjustable ceramic Baaaakhur followed a practice-based iterative design method, consisting of the following steps:

a. Form Design & Modelling

- Sketching and prototyping various mabkhara forms that allow air circulation and modular separation.
- Consideration of ergonomics: lid grip, base stability, and smoke flow direction.

b. Ventilation Mechanism Development

- Design of rotate-able or slid-able ceramic discs to cover/uncover ventilation holes.
- Integration of multiple vent holes into the upper body of the mabkhara for adjustable flow.
- Testing several positions to balance scent release and heat retention.

c. Construction & Firing

- Hand-building the mabkhara using throwing and slab techniques to form thick, durable walls.
- Assembling parts (base, chamber, lid, vent system) before bisque firing.
- Bisque firing conducted at ~900°C to preserve raw, matte ceramic texture.

d. Functionality Testing

- Burning trials using natural incense materials to observe:
  - Smoke flow behaviour through vents
  - Surface temperature (touch safety)
  - Scent distribution effectiveness
- Adjustments made based on smoke output, ergonomics, and usability

3. FINDINGS

From the initial research and prototype testing, it was found that bakhur continues to play a significant role in cultural and spiritual practices across East Asia, the Middle East, and parts of Southeast Asia, particularly among Muslim communities. However, traditional incense burners often present limitations in safety, usability, and efficiency of scent release.

The ceramic mabkhara developed in this project successfully demonstrated core functionality, particularly in regulating the intensity of smoke through a manually adjustable vent system. The porous, heat-resistant nature of earthenware clay proved suitable for sustained incense burning without compromising structural integrity or user safety.

User feedback highlighted key strengths of the design, including:

- Better control over smoke dispersion
- Reduced risk of overheating or accidental burns
- Aesthetic appeal rooted in traditional yet modern form

Additionally, the project shows potential for reducing long-term user costs by allowing more efficient burning and prolonged fragrance release—thereby minimizing the need for frequent replenishment.

These findings support the viability of combining traditional craftsmanship with contemporary design innovation to meet both cultural expectations and modern lifestyle needs.

Figure 1 The initial reference of how we want the shape to look like

Figure 2 Variations from figure 1 shapes

Figure 3 Modern day aroma diffuser with similar base design

Figure 4 A variation with similar concept in terms of technicality

4. CONCLUSION

The development of the adjustable smoke ceramic mabkhara using locally sourced clay demonstrates the potential of integrating traditional craftsmanship with modern design thinking. By introducing a manual smoke control system, the innovation addresses key limitations found in conventional incense burners—specifically in terms of safety, user comfort, and efficiency of scent diffusion.

Technically, the use of earthenware clay has proven effective in withstanding heat while maintaining structural integrity, making it a suitable material for sustained incense burning. The modular design also enhances usability, allowing for easy cleaning, handling, and replacement of fragrance materials. Most notably, the ability to regulate smoke intensity makes the product adaptable for a variety of indoor settings, including private residences, wellness spaces, and spiritual environments.

In essence, this project offers a meaningful response to the evolving needs of modern users while preserving the cultural and aesthetic value of the mabkhara. It holds strong potential for future development and commercialization as a sustainable, functional, and culturally embedded lifestyle product. Further technical refinement and market testing are recommended to support its broader adoption.

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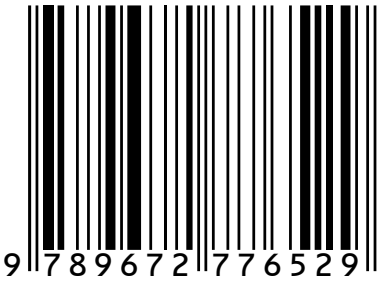

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