

Research on the Environmental Art Design Expression of Local Markets in Hainan Free Trade Port and the Integration of Industry and Education in Educational Models

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Abstract: Against the backdrop of the national strategy for developing the Hainan Free Trade Port, this study focuses on cultural preservation and innovative environmental art design in local market spaces. From an interdisciplinary perspective combining cultural geography and design studies, it examines the spatial manifestations of Li and Miao cultures alongside Southeast Asian cultures within traditional markets, exploring regional approaches to environmental art expression. The study proposes a tripartite educational framework centered on “cultural genes–design transformation–industry-education synergy,” establishing a collaborative industry-education integration system involving schools, enterprises, and communities. Empirical evidence demonstrates that this mechanism effectively cultivates interdisciplinary talents with both local cultural literacy and modern design capabilities, facilitating the transformation of market spaces from function-oriented to culture-scenario-oriented environments. It provides a replicable practical model for rural revitalization and culturally distinctive design education. The findings hold significant theoretical and practical implications for enhancing the cultural soft power of the Hainan Free Trade Port and ensuring the dynamic preservation of regional cultural heritage.

Keywords: Local farmers’ market; Environmental art expression; Industry-education integration; Hainan Free Trade Port; Cultural heritage preservation

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1. Introduction

The accelerated development of the Hainan Free Trade Port has created a strategic opportunity for rural cultural revitalization. As the core vehicle of rural cultural ecosystems, local markets preserve the living memories of ethnic minorities like the Li and Miao communities, along with the cultural integration of Southeast Asian overseas Chinese heritage. However, contemporary market spaces face challenges such as weakened cultural symbolism, homogenized spatial functions, and a structural shortage of design professionals, making it difficult to meet the synergistic demands of cultural preservation and industrial development in the Free Trade Port context. Existing research predominantly focuses on superficial analyses of economic functions or isolated cultural elements, lacking systematic exploration of

cultural spaces and in-depth investigation of industry-education collaborative education mechanisms. This study examines Hainan's local markets, transcending traditional design research perspectives by integrating the spatial narratives of Li/Miao and Southeast Asian cultures into environmental art design theories. It establishes an industry-education integrated education mechanism aimed at fostering dynamic synergy between cultural preservation and spatial creation. Grounded in the rural revitalization strategy, this research provides replicable practical models for ethnic-specific design education, promoting organic integration of cultural and industrial elements within the Free Trade Port ^[1].

2. Cultural spatial characteristics of Hainan's local markets

The spatial configuration of Hainan's traditional rural markets represents an organic integration of historical accumulation, geographical environment, and cultural traditions. Aligned with the terrain, its spatial structure forms a dynamic network system of "settlements–paths–nodes," where trading zones, dining areas, and cultural exhibition spaces are seamlessly connected through natural pathways, embodying the ecological philosophy of "harmony between humanity and nature." The incorporation of cultural symbols extends beyond superficial decoration; they are deeply integrated into the spatial functional framework: Li ethnic brocade patterns persist in the fabric designs of stall canopies, Miao silver ornament elements are transformed into metallic textures of public seating to reinforce ethnic identity, while the arcade-style verandas characteristic of Southeast Asian Chinese immigrants serve as central visual anchors and carriers of historical memory within the spatial framework. This spatial expression elevates the market beyond its singular function as a static trading venue, establishing it as a dynamic cultural practice space.

Against the backdrop of the deepened implementation of the Hainan Free Trade Port strategy, market spaces urgently need to balance modern functional requirements with the preservation of cultural authenticity. The structural conflict between traditional market activities (such as rising with the sun and resting at sunset) and contemporary consumption habits has led to a continuous decline in spatial vitality. Some markets, in pursuit of commercial efficiency, have demolished traditional buildings and replaced them with standardized shops, significantly weakening cultural identity and community belonging. Empirical analysis based on systematic field investigations reveals that the sustainability of cultural spaces hinges on whether historical memory can be integrated organically into contemporary living experiences. Therefore, spatial design should move beyond superficial symbolic displays and instead achieve seamless cultural integration through systematic optimization of layout logic, localized application of material textures, and refined behavioral guidance designs, allowing culture to naturally permeate the space's "breathability" and fostering a symbiotic relationship between culture and space. This core principle not only elucidates the operational logic of cultural spaces but also provides an irreplaceable theoretical foundation and practical starting point for subsequent environmental art design.

3. Uncovering the spatial imprints of Li Miao culture and Nanyang culture

The Li and Miao cultures have left unique spatial imprints in Hainan's local markets, forming the core cultural DNA of the environmental art design. Li culture centers on the spatial philosophy of "boat-shaped houses," with its circular settlement layout shaping the enclosed form of the city center square; the "frog patterns" and "human-shaped motifs" found in brocade are transformed into abstract paving designs, symbolizing the cycle of life and ethnic memory. Miao culture materializes these spaces through "silver ornament craftsmanship" and the "Lusheng dance": silver ornament patterns integrate into the open structures of public art installations, while the rhythmic movements of the Lusheng dance create variations in path patterns. These imprints are not static symbols but dynamic cultural practices, the Li tradition of "duet singing" gives rise to open performance areas, while the Miao custom of "Moon Jumping" creates vibrant nighttime lighting events ^[2].

The cultural imprint of Nanyang is manifested through the spatial translation of overseas Chinese history: The "arcaded street" pattern formed by overseas Chinese returning to build homes in the 19th century has been preserved as sun-shading

corridors in the market; Nanyang-style Baroque decorative elements (such as arches and reliefs) have been simplified into the visual language of stall signs. The implicit expression of cultural integration runs deeper: The “Sino-Western fusion” food stalls in the market (e.g., Hainan chicken rice paired with Nanyang coconut tea) construct a spatial narrative logic, highlighting the daily practice of cultural symbiosis. Through an analysis of the “spatial translation” of cultural symbols, this study reveals how the imprint evolved from a historical context into a contemporary spatial language. Its core lies in identifying the dual attributes of “function and emotion”: Li ethnic brocade patterns combine aesthetic value with the function of reinforcing ethnic identity, while the Nanyang-style arcade corridors serve both practical sun-shading purposes and function as public carriers of overseas Chinese memories. This in-depth exploration provides irreplaceable cultural coordinates for environmental art design.

4. Theoretical framework of the industry-education integration education model

The core of the industry-education integration education model lies in establishing a closed-loop mechanism that integrates “cultural inheritance–design capability–spatial practice,” effectively overcoming the traditional separation between culture and design in education. This study proposes a “triple synergy” theoretical framework, with schools (design institutions), enterprises (cultural operation organizations), and communities (rural stakeholders) serving as collaborative actors. The framework builds its content foundation upon a cultural gene pool and employs project-based learning as the implementation approach. Schools led curriculum development and provide theoretical guidance; enterprises engage deeply in project design and market validation; while communities offer authentic cultural contexts and practical implementation venues.

The program innovatively implements a “preparatory cultural literacy” strategy, systematically integrating Li and Miao cultural studies and Nanyang overseas Chinese cultural courses into the design program’s compulsory curriculum. Through structured cultural fieldwork, students master spatial narrative logic and cultural translation methodologies. The curriculum follows a “dual-track” approach: the cultural track focuses on courses such as Li and Miao ritual spaces and Nanyang overseas Chinese history, enhancing students’ capacity for in-depth cultural interpretation; the design track emphasizes practical courses like spatial narrative and material translation, improving their ability to apply design concepts in practice.

The implementation mechanism centers on “school-enterprise studios” as its core platform, enabling students to complete the entire design process, from research to execution, in authentic market renovation projects. For instance, student teams conducted spatial research on Li ethnic settlements and designed stall systems incorporating brocade patterns, with enterprises assisting in collaborating with local artisans to implement the craftsmanship. This approach effectively addresses the disconnect between education and industry, ensuring talent development precisely meets cultural preservation needs. The pivotal innovation lies in the “feedback mechanism”: student designs directly inform market space development practices, while market feedback continuously refines the curriculum system, creating a sustainable “design–practice–feedback” iterative cycle. This theoretical framework establishes a systematic approach that organically integrates cultural depth with practical breadth in design education, providing robust theoretical support for cultivating designers with distinctive ethnic expertise^[3].

5. Practical approaches to expressing environmental art design

The essence of environmental art design lies in transforming cultural imprints into organic spatial language, rather than mere accumulation of symbols. The practical approach adopts “cultural translation” as its theoretical foundation, emphasizing a systematic conversion from cultural logic to spatial expression. As a key strategy, spatial narrative design draws on the Li and Miao ethnic groups’ “colony-ritual” spatial philosophy: the city center square is designed as a circular enclosed form that naturally guides pedestrian flow into a central hub for cultural experiences. Meanwhile, the “memories

of overseas Chinese communities” from Nanyang culture are conveyed through shop signs featuring “arcaded silhouettes” and textual installations of “overseas Chinese quotes,” creating a continuous historical narrative that transforms the space into a dynamic carrier of cultural memory. Innovations in materials and craftsmanship profoundly reflect regional characteristics: Li bamboo weaving techniques are applied to sunshade structures, Miao silver jewelry craftsmanship is adapted into metallic pendant elements for public spaces, and coconut shell materials from Nanyang culture serve as textured flooring surfaces. These materials not only reduce design costs but also strengthen cultural identity and spatial belonging through localized craftsmanship, embedding cultural expression within the spatial fabric.

Interactive experience design serves as a pivotal element in deepening cultural engagement, transforming cultural reception from passive acceptance to active immersion. For instance, the market entrance features an “Li Ethnic Brocade Interactive Wall,” where visitors trigger dynamic projections of textile patterns through touch interactions, enabling real-time interaction with cultural symbols. The Nanyang Cultural Zone incorporates an “Overseas Chinese Story Audio Station,” allowing visitors to listen to immersive historical narratives by scanning QR codes, thereby enhancing the depth and coherence of cultural experiences. The design process strictly adheres to the principle of “community co-governance,” with student teams collaborating with villagers in planning spatial elements to ensure organic alignment between design logic and cultural understanding. Additionally, excessive commercialization is avoided, for example, the market’s dining area retains the traditional Li ethnic cooking method of “bamboo tube rice,” with spatial designs emphasizing visual expressions of cultural rituals rather than altering core cultural practices. Practice demonstrates that environmental art should ground itself in cultural essence while utilizing space as its framework, elevating markets from functional trading venues into immersive cultural experience spaces. This approach not only validates the sustainable transformation of cultural elements in modern design but also highlights the practical value of rural markets as living carriers of cultural heritage, providing a replicable operational model for localized environmental art design ^[4].

6. The interactive mechanism between industry-education integration and cultural heritage preservation

The industry-academia integration model establishes a dynamic circulation system for cultural preservation through a bidirectional empowerment mechanism of “talent–space.” Students serve as the “new medium” for cultural inheritance, deeply internalizing cultural logic through project-based practices. Taking the renovation of the Li and Miao Market as an example, students conducted systematic field research to grasp the philosophical essence of life perspectives embodied in the brocade patterns. During the design process, they actively avoided symbolic proliferation, instead conveying the cultural core through organic spatial arrangements. The design outcomes directly informed the market’s operational practices: the students’ developed “cultural tour route” significantly extended visitor dwell times, while stall pattern designs not only enhanced visual recognizability but also boosted sales and preserved local brocade craftsmanship, achieving synergistic cultural and economic benefits. Thus, cultural preservation transcends the static model of “museum-style preservation” toward a dynamic path of “everyday practice,” transforming rural markets into organic carriers of living cultural heritage.

The deep involvement of community stakeholders forms the core foundation of this operational mechanism. Villagers learn design languages through school-enterprise collaborative studios, while Miao elders guide students in accurately interpreting the emotional symbolism and cultural metaphors embedded in silver jewelry patterns, ensuring designs authentically reflect cultural essence. Enterprises dynamically refine their curriculum based on market feedback—real-time analysis of cultural product sales data from local markets is fed back to universities, driving continuous updates to cultural course content. This mechanism creates an organic “education-practice-feedback” cycle: students hone their design skills through real-world projects, cultural spaces gain renewed vitality, community cultural confidence strengthens, ultimately fostering systematic endogenous development momentum for rural areas. Research confirms that industry-education integration represents not a one-way resource transfer but a systemic restructuring of cultural inheritance ecosystems,

transforming rural markets from mere cultural “carriers” into active cultural “creators”, achieving deep synergy between cultural preservation and sustainable rural revitalization ^[5].

7. Practical approaches in the context of rural revitalization

Against the backdrop of the comprehensive advancement of the rural revitalization strategy, the environmental art design of local market spaces and the industry-education integration model have become pivotal drivers for cultural empowerment of rural industrial development. Practical implementation should fully leverage the policy advantages of the Hainan Free Trade Port to establish a collaborative governance mechanism characterized by “government guidance–school support–community leadership.” At the governmental level, specialized subsidy policies for cultural space renovation should be introduced, incorporating local market systems into regional rural tourism route planning. At the educational level, distinctive “Hainan Local Design” academic programs should be established to cultivate localized design professionals with deep cultural literacy. At the community level, “Cultural Operation Cooperatives” should be founded, empowering villagers to oversee daily market operations and cultural preservation efforts. Taking a pilot market as an example, the “Li and Miao Cultural Market” themed space designed by student teams through industry-education integration projects effectively attracted visitors, significantly boosting occupancy rates at surrounding homestays and sales of handicraft products. Villagers actively participated in design decision-making processes, achieving a win-win synergy between cultural preservation and economic benefits.

This approach emphasizes a dual-driven strategy of “culture-industry synergy”: Environmental art design focuses on enhancing the cultural value of markets, enriching visitor immersion through spatial storytelling, for instance, the Nanyang Cultural Zone features an immersive theater themed “Return of Overseas Chinese,” transforming historical memories into tangible experiential spaces. The industry-education integration mechanism cultivates local design talent, enabling graduates to become key players in rural design for sustainable development. Moving beyond traditional “blood transfusion” -style assistance, it fosters self-sustaining growth through educational incubation. Within the Free Trade Port framework, this model successfully converts cultural resources into momentum for rural development, offering a replicable “Hainan model” for nationwide revitalization, where cultural preservation no longer relies on external inputs but achieves living inheritance and value regeneration through internal educational forces, highlighting the intrinsic drive and cultural confidence of rural revitalization. This practice not only validates the feasibility of cultural empowerment of industries but also establishes an organic ecosystem linking cultural preservation, talent development, and industrial growth, providing a systematic solution for rural revitalization in the Free Trade Port context ^[6].

8. Conclusion

This study systematically explored the profound spatial imprints of Li and Miao cultures alongside Nanyang culture in Hainan’s local markets, innovatively establishing a synergistic mechanism integrating environmental art design with industry-education collaboration. Empirical findings demonstrate that the approach, driving design expression through cultural genes, cultivating interdisciplinary talents via industry-education integration, and revitalizing cultural heritage through spatial rehabilitation, effectively revitalizes the cultural vitality of these markets. The research not only provides actionable models for enhancing the cultural soft power of the Hainan Free Trade Port but also reveals the fundamental interaction between regional cultural preservation and rural revitalization: cultural inheritance must be rooted in spatial practices, while spatial innovation relies heavily on sustained educational empowerment. Future studies should further refine institutional frameworks for industry-education integration, deepen the contextual interpretation of cultural imprints in contemporary settings, and expand their applications in rural revitalization. This will transform local markets into dynamic carriers of cultural confidence and pivotal pillars for sustainable development within the Free Trade Port, offering

replicable systematic solutions for nationwide cultural empowerment of rural communities.

Disclosure statement

The author declares no conflict of interest.

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