

Inheritance and Innovation Practice of Traditional Residential Construction Techniques in Modern Interior Environmental Art Design

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ABSTRACT Traditional residential construction techniques serve as important carriers of Chinese traditional culture, reflecting the ecological wisdom of harmonizing human settlements with the natural environment. As intelligent buildings increasingly integrate digital sensing and environmental monitoring technologies, the preservation and adaptive transformation of traditional spatial knowledge provide valuable references for sustainable architectural design. Against the growing homogenization of modern interior environmental art design, inheriting and innovating traditional residential construction techniques is of significant practical and academic importance. This paper analyzes the core connotations of traditional residential construction techniques and systematically summarizes their characteristics in material application, spatial organization, structural craftsmanship, and cultural symbolism. It further explores inheritance approaches through the extraction of technical essence and the translation of cultural connotations, investigates innovative application modes based on representative design cases, and proposes strategies that reconcile traditional techniques with contemporary living requirements. The study aims to provide theoretical references and practical guidance for promoting the living inheritance of traditional construction techniques and localized interior environmental design while offering useful insights for intelligent environmental perception and sustainable spatial management in modern architectural systems.

INDEX TERMS traditional residences, construction techniques, interior environmental art design, intelligent environmental perception, sustainable architecture

I. INTRODUCTION

A. RESEARCH BACKGROUND

As an emerging discipline, interior environmental art design shares significant commonalities with science and engineering, particularly in the shared focus on material textures, spatial acoustics, and the functional application of decorative fabrics. This interdisciplinary synergy allows for the seamless integration of fiber arts and advanced technologies into the structural planning of modern living environments. Traditional residential decoration has great utilization value in the current interior environmental design process. From the perspective of humanistic value, it reflects traditional culture from multiple angles [1, 2]. At the same time, the exotic customs will further highlight the integration of various ethnic cultures and have a certain impact on the trend of social values [3-5].

As one of the important material representatives of traditional Chinese agricultural culture, traditional residences are not only an important part of ancient Chinese architecture but also a crucial carrier of the Chinese nation's historical memory, production and living wisdom, cultural and artistic

crystallization, and regional cultural characteristics. They carry values in various aspects such as traditional social concepts, cultural thoughts, aesthetic art, and construction technology [6-8]. However, with the rapid development of social economy, foreign cultures and modern industrial cultures have exerted a strong impact on traditional culture. Many interior design works blindly pursue architectural globalization, leading to architectural uniformity and the loss of regional characteristics of local architecture [9, 10], which is not a sound development model. Currently, most interior environmental designs remain at the formal imitation of regional culture, mostly direct application of elements and superficial imitation of traditional architectural characteristics and construction techniques [11, 12]. They fail to deeply explore the cultural connotations and the reasons behind traditional architectural characteristics and construction methods, but simply mix traditional materials with modern materials and structures.

To achieve an ideal design effect, we should start from the core value orientation of traditional culture to create a new cultural atmosphere that better meets people's aesthetic

needs at the current stage. This research adopts a method combining dynamic inheritance and innovative application to integrate the construction wisdom of traditional buildings and the material artistry of heritage into modern architectural design.

B. RESEARCH STATUS

Since the 1980s to the present, the research on traditional residences has entered a more organized, planned, in-depth, and extensive stage. During this period, research has continued to focus on the functional layout, spatial plane, and architectural structure of residences themselves, and a series of residential works with clear regional characteristics have been published successively [13-15]. At the same time, the research on traditional residences has gradually integrated multidisciplinary studies such as sociology, history, archaeology, and folklore, conducting comprehensive investigations on traditional residences and settlements from aspects of architectural culture and social relations [16, 17].

The development of traditional residential construction techniques stagnated after the 1950s, and research did not return to the right track until the 1980s. Relevant research has been carried out one after another, and the research objects have shown diversity [18-20]. According to the construction objects, it can be divided into official large-wood construction and traditional residential construction. According to the cultural communication theory [21], it can be further subdivided into geographical and ethnic types. Geographical type refers to the similarity of residential construction within a cultural region formed by the combined effect of geographical environment, climate conditions and production methods; ethnic type refers to the similarity of residential construction in a cultural region formed by the joint action of ethnic cultural traditions, living customs and geographical adaptation strategies. The two types are not mutually exclusive but interact and influence each other, reflecting the dual adaptation of traditional residences to the natural environment and ethnic culture.

The main research achievements on traditional residential construction techniques include: In 2016, Wang Jialin, in "Research on Traditional Construction Techniques of Folk Architecture in Northwest Shandong", took the natural conditions and social environment of northwest Shandong as the research entry point, and summarized the settlement form, street layout, courtyard space, architectural form, construction process, and construction techniques of northwest Shandong [22]. In 2019, Dai Xiang's "Research on Traditional Residential Construction Techniques in Western Beijing" focused on the construction techniques of traditional residences in western Beijing, sorted out and summarized the natural environment, historical culture, social background, and residential types in western Beijing, and made detailed sorting and research on craftsmen's wisdom and traditional construction techniques [23].

C. DEFICIENCIES OF EXISTING RESEARCH

Overall, existing research has achieved certain results, but there are still deficiencies:

(1) Most studies focus on the application of a single region or a single element, lacking systematic sorting of the core connotation of traditional residential construction techniques and cross-regional comparative analysis;

(2) The discussion on inheritance and innovation paths is not in-depth enough, mostly staying at the stacking of surface elements, failing to realize the in-depth integration of traditional technical essence with modern design concepts and functional needs;

(3) The analysis of practical cases is not comprehensive enough, lacking in-depth analysis of the inheritance and innovation methods, effects, and existing problems in the cases.

D. RESEARCH CONTENT

The main contents of this study include:

(1) Analyze the core connotation and characteristics of traditional residential construction techniques, and sort out their core elements in materials, space, structure, culture, etc.;

(2) Explore the inheritance paths of traditional residential construction techniques in modern interior environmental art design, and clarify the core goals, principles, and specific methods of inheritance;

(3) Analyze the innovative practice modes of traditional residential construction techniques in modern interior design, including material innovation, process innovation, symbol innovation, etc.;

(4) Combine 19 typical cases covering Huizhou-style, Jin-style, Min-style, Chuan-style and other regional residential techniques to analyze the effects of inheritance and innovation practices, and summarize experiences and deficiencies;

(5) Propose optimization strategies for the inheritance and innovation of traditional residential construction techniques in modern interior design.

II. ANALYSIS OF THE CORE CONNOTATION AND CHARACTERISTICS OF TRADITIONAL RESIDENTIAL CONSTRUCTION TECHNIQUES

A. CORE CONNOTATION OF TRADITIONAL RESIDENTIAL CONSTRUCTION TECHNIQUES

Each region has its own regional culture, and influenced by the local climate and terrain, residences in various regions have their own characteristics. The most direct means to study residences is construction techniques. Traditional construction uses ecological raw materials such as earth, wood, bricks, and tiles as construction materials, mortise and tenon joints as prefabricated components, modular system as the scale design method in construction, and master-apprentice system as the link for technical inheritance. As an intangible cultural heritage, the construction techniques of traditional residences are the fundamental reason for the diversity of

traditional residential forms. Its core connotation can be interpreted from the following four dimensions:

(1) Ecologically adaptive construction concept:

As the guiding ideology of traditional residential construction, it emphasizing the harmonious coexistence of buildings and the natural environment, and following scientific designs in site selection, orientation, ventilation, lighting, etc.;

(2) Application of materials adapting to local conditions:

Under the guidance of the ecological adaptation concept, select natural and renewable local materials, and give full play to the material properties to realize the environmental protection and adaptability of buildings;

(3) Exquisite and practical structural craftsmanship:

On the basis of material characteristics, form unique structural systems to ensure the stability, durability and practicality of buildings, and at the same time contain aesthetic value;

(4) Cultural expression with profound meanings:

Integrate regional culture, ethnic customs and people's aesthetic pursuits into the details of buildings such as decoration, layout and color, and realize the inheritance of cultural genes.

B. CORE CHARACTERISTICS OF TRADITIONAL RESIDENTIAL CONSTRUCTION TECHNIQUES

1) Regional Characteristics

China has a vast territory, which makes traditional residential construction techniques show distinct regional characteristics. The differences in core characteristics of traditional residential construction techniques in different regions are shown in Table 1.

2) Ecological Characteristics

The ecological characteristics of traditional residential construction techniques run through the entire construction process, reflecting the concept of harmonious coexistence between humans and nature.

- In terms of site selection, traditional residences pay attention to “being close to mountains and rivers, facing south with backs to north”, making full use of natural terrain and climate conditions to optimize ventilation, lighting, and drainage;
- In terms of material selection, natural renewable materials are mostly used, such as wood, bamboo, raw earth, etc. These materials have good air permeability, thermal insulation, and environmental protection;
- In terms of structural design, natural ventilation and lighting are achieved through reasonable spatial layout, door and window design, roof slope, etc.;
- In terms of greening configuration, traditional residences mostly pay attention to courtyard greening, planting flowers, grass, trees, which not only beautify the environment but also regulate the local climate.

3) Cultural Inheritance Characteristics

Traditional residential construction techniques are an important carrier for the inheritance of regional culture and national culture. Their construction concepts, spatial layout, decorative symbols, etc. all contain rich cultural connotations.

They are passed down from generation to generation through oral teaching and master-apprentice inheritance. In the process of inheritance, not only the techniques themselves are inherited, but also the cultural genes contained in them are passed on.

III. INHERITANCE PATHS OF TRADITIONAL RESIDENTIAL CONSTRUCTION TECHNIQUES IN MODERN INTERIOR ENVIRONMENTAL ART DESIGN

A. CORE GOALS AND PRINCIPLES OF INHERITANCE

1) Core Goals of Inheritance

Firstly, inherit the ecological concept of traditional construction, integrate the concepts of harmony between humans and nature and adaptation to local conditions into modern interior design, and promote the development of green and ecological interior spaces;

Secondly, inherit the technical essence of traditional construction, retain and rationally use traditional structural craftsmanship and decorative craftsmanship, and improve the artistic quality of modern interior design;

Thirdly, inherit the cultural connotations of traditional construction, excavate and translate cultural symbols and values in traditional residences, and enhance the cultural identity and sense of belonging of interior spaces;

Fourthly, promote the innovative development of traditional construction techniques, make traditional techniques adapt to modern living needs, and realize sustainable inheritance.

2) Basic Principles of Inheritance

To achieve the above inheritance goals, inheriting traditional residential construction techniques in modern interior design must follow the following principles:

Firstly, the principle of respecting tradition: fully understand and respect the cultural connotations and technical characteristics of traditional residential construction techniques, and avoid arbitrary modification and abuse of traditional elements;

Secondly, the principle of adapting to modern functions: while inheriting traditional techniques, we must take into account the functional needs of modern life, ensure the practicality and comfort of interior spaces, and not sacrifice functions for the sake of inheritance;

Thirdly, the principle of regional adaptation: combine the regional culture and natural environment of the project location, select appropriate traditional residential construction technique elements for inheritance, and make the interior space coordinate with the regional environment;

Fourthly, the principle of sustainable development: pay attention to the living inheritance of traditional techniques,

TABLE 1. Differences in Core Characteristics of Traditional Residential Construction Techniques in Different Regions

Regional School	Climate-adaptive Design	Core Materials	Typical Structure/Form	Reflection of Cultural Connotations
Huizhou-style Residences	Horse-head walls for drainage and fire prevention, white-washed walls to reflect sunlight, adapting to the humid climate in southern Anhui	Wood, blue bricks, small green tiles	Patio, three carving crafts (brick carving, wood carving, stone carving)	Regular order and elegant aesthetics under the influence of Confucian culture
Jin-style Residences	Thick walls and gentle-slope roofs to resist the cold and dry climate in northern China	Blue bricks, gray tiles, wood	Courtyard layout, high walls and large courtyards, narrow lanes and deep residences	Patriarchal etiquette concept and defensive needs of Jin merchants
Min-style Residences	Circular/square layout and thick walls to resist natural disasters such as typhoons and earthquakes	Raw earth, sand and gravel, bamboo and wood	Earth buildings, circular corridors	Cohesion of family settlement and external defensive awareness
Chuan-style Residences	Transparent space and stilted building design, adapting to the hot and humid climate in the Sichuan Basin	Wood, bamboo	Column-and-tie structure, stilted buildings, patios	Mountain adaptation wisdom and Bashu folk culture

promote the integration of traditional techniques with modern technologies and materials, and realize the sustainable development of traditional techniques.

B. SPECIFIC INHERITANCE PATHS

1) Extraction and Retention of Technical Essence

Many technical essences in traditional residential construction techniques have extremely high practical and artistic value and are worthy of extraction and retention in modern interior design.

In terms of structural craftsmanship, the mortise and tenon structure, as the core structural craftsmanship of traditional wood structure buildings, has the advantages of stable structure, easy disassembly, and environmental protection. It can be applied to furniture design, partition design, etc. in modern interiors. In terms of decorative craftsmanship, traditional decorative crafts such as brick carving, wood carving, and stone carving can be applied to wall decoration, floor decoration, furniture decoration, etc. in modern interiors.

2) Excavation and Translation of Cultural Connotations

Traditional residential construction techniques contain rich cultural connotations. In modern interior design, it is necessary to deeply excavate these cultural connotations and integrate them into the design through reasonable translation methods.

Firstly, excavate cultural symbols in traditional residences, such as door and window shapes, decorative patterns, color matching of traditional residences, etc. These symbols all have specific cultural meanings;

Secondly, translate the excavated cultural symbols to adapt to the needs of modern interior design. There are three main translation methods: direct translation, simplified translation, and reconstructed translation:

- Direct translation: On the basis of deeply understanding the cultural connotation of traditional symbols, apply them to modern interior design in combination with functional needs, such as applying the structural logic

and cultural meaning of traditional lattice windows to modern partition design, and optimizing the size, proportion and material matching according to the spatial function;

- Simplified translation: simplify traditional cultural symbols and retain their core characteristics, such as simplifying complex brick carving patterns into line patterns for wall decoration;
- Reconstructed translation: reorganize and innovate different traditional cultural symbols to form new design elements.

3) Reference and Reconstruction of Spatial Forms

The ecological concept of traditional residential construction has important guiding significance for modern interior design and should be integrated into the entire process of modern interior design.

The inheritance paths and practical methods of traditional ecological construction concepts in modern interior design can be summarized in Table 2:

IV. INNOVATIVE PRACTICE MODES OF TRADITIONAL RESIDENTIAL CONSTRUCTION TECHNIQUES IN MODERN INTERIOR ENVIRONMENTAL ART DESIGN

A. MATERIAL INNOVATION: MODERN APPLICATION OF TRADITIONAL MATERIALS AND TRADITIONAL EXPRESSION OF NEW MATERIALS

1) Modern Application of Traditional Materials

Traditional materials used in traditional residential construction, such as wood, stone, bricks and tiles, bamboo, have the advantages of being natural, environmentally friendly, and having distinct regional characteristics, but they also have certain limitations. In modern interior design, the performance of traditional materials can be improved and their application scope can be expanded through modern processing technology and treatment techniques. For example:

- Treat wood with anti-corrosion, anti-insect, and fire-proof measures to improve the durability and safety

TABLE 2. Inheritance Paths and Practical Methods of Traditional Ecological Construction Concepts in Modern Interior Design

Traditional Ecological Concept	Inheritance Paths in Modern Interior Design	Specific Practical Methods	Core Goals
Harmony between Humans and Nature	Integration of space and natural environment	Utilize natural ventilation and lighting, set up indoor courtyards/bay windows, introduce outdoor landscapes	Create a natural and comfortable indoor environment and reduce energy consumption
Adapting to Local Conditions	Adapting to regional natural and cultural environments	Select local natural materials, learn from regional spatial layout, design adapting to local climate	Enhance the sense of regional belonging of the space and reduce construction and operation costs
Circular and Sustainable	Application of green and environmentally friendly materials and structures	Select renewable materials, adopt energy-saving structures, set up rainwater recycling/waste classification systems	Reduce environmental pollution and realize the sustainable development of design

- of wood, making it applicable to various parts of the interior such as walls, floors, and furniture;
- Process stone into ultra-thin sheets to reduce the weight of stone and lower the construction difficulty, making it applicable to interior ceiling, wall decoration, etc.;
 - Improve traditional bricks and tiles to enhance their thermal insulation performance, making them applicable to interior decoration of modern energy-saving buildings.

2) Traditional Expression of New Materials

With the development of science and technology, a series of new materials have emerged. In modern interior design, these new materials can be used to simulate the texture and form of traditional materials to achieve traditional expression. For example:

- Use new composite materials to simulate the texture and grain of wood to produce furniture, wall decorations, etc. with traditional wood style;
- Use energy-saving glass to simulate the transparency of traditional paper windows, while having good thermal insulation and sound insulation performance, and apply it to interior door and window design;
- Use intelligent materials to make wall materials with traditional decorative patterns, which can automatically adjust color and brightness according to changes in ambient light and temperature, improving the intelligence level and artistic effect of the interior space.

B. PROCESS INNOVATION: INTEGRATION OF TRADITIONAL CRAFTS AND MODERN TECHNOLOGIES

1) Modern Improvement of Traditional Crafts

Traditional residential construction crafts are mostly manual operations, with low production efficiency, long construction cycles, and difficulty in ensuring precision, which are difficult to meet the large-scale and high-efficiency needs of modern interior design.

In modern interior design, traditional crafts can be improved modernly, and modern construction technologies and equipment can be integrated into traditional crafts to

improve production efficiency and construction precision. For example:

- The production of traditional mortise and tenon structures mostly relies on manual work. Modern technologies such as computer-aided design (CAD) can be used to realize the precise design and mass production of mortise and tenon structures;
- Traditional brick carving, wood carving, and stone carving crafts can be combined with laser carving technology to achieve precise carving of complex patterns, while reducing carving difficulty and cost.

2) Expansion of Traditional Crafts by Modern Technologies

The development of modern technologies provides possibilities for the expansion of traditional residential construction crafts. Modern technologies can be used to enrich the expression forms and application scenarios of traditional crafts. For example:

- Use 3D printing technology to replicate decorative components of traditional residences, which can realize the rapid production and precise replication of components, and can also carry out personalized customization according to design needs;
- Use virtual reality (VR) and augmented reality (AR) technologies to present the spatial effect of traditional residential construction techniques in a virtual form, helping owners better understand the design scheme;
- Use intelligent control technology to combine traditional ventilation and lighting design with modern intelligent systems to realize the automatic adjustment of the indoor environment.

V. PRACTICAL CASE ANALYSIS OF TRADITIONAL RESIDENTIAL CONSTRUCTION TECHNIQUES IN MODERN INTERIOR DESIGN

A. OVERVIEW OF 19 TYPICAL CASES

This study selects 19 typical cases covering Huizhou-style, Jin-style, Min-style, Chuan-style and other regional residential techniques, including 5 Huizhou-style homestays, 4 Jin-style restaurants, 3 Min-style cultural centers, 4 Chuan-style

resorts and 3 comprehensive interior design projects. These cases are distributed in Anhui, Shanxi, Fujian, Sichuan and other regions with distinct regional cultural characteristics, and have certain representativeness in the inheritance and innovation of traditional residential construction techniques. The following takes the Huizhou-style homestay project as a key case for detailed analysis, and briefly summarizes the other 18 cases.

B. KEY CASE: APPLICATION OF HUIZHOU-STYLE RESIDENTIAL CONSTRUCTION TECHNIQUES IN MODERN HOMESTAY INTERIOR DESIGN

1) Project Overview

This homestay project is located in Yixian County, Huangshan City, Anhui Province, surrounded by a large number of ancient Huizhou-style residential buildings, with a strong regional cultural atmosphere. The project covers an area of about 800 square meters, with a building area of about 500 square meters, including 10 guest rooms, as well as public spaces such as a living room, restaurant, and courtyard. The design goal is to integrate Huizhou-style residential construction techniques into modern homestay interior design, creating a homestay space with both Huizhou cultural charm and modern comfortable experience.

2) Summary Table of Core Information of the Case

The core information of the application of Huizhou-style residential construction techniques in modern homestay interior design is shown in Table 3.

3) Analysis of Inheritance and Innovation Practices

4) Inheritance

In terms of inheritance, the project fully extracted the core elements of Huizhou-style residential construction techniques:

(1) Inheritance of spatial form

- Drawing on the courtyard-style layout of Huizhou-style residences, a central courtyard was set up, with guest rooms, living rooms, restaurants and other spaces arranged around the courtyard;
- Drawing on the “patio” design of Huizhou-style residences, a small patio was set up between the living room and the restaurant to enhance the lighting and ventilation effect of the space.

(2) Inheritance of materials and crafts

- Selected local traditional materials such as wood, stone, bricks and tiles for interior walls, floors, furniture and other parts;
- Adopted traditional Huizhou wood carving and brick carving crafts, set up brick carving decorative paintings on the living room walls, and carried out wood carving decorations on guest room furniture, enhancing the Huizhou cultural charm of the space.

(3) Inheritance of cultural symbols

Extracted cultural symbols such as door and window shapes, horse-head wall shapes, and interlocking patterns of Huizhou-style residences, and applied them to interior partition, ceiling, decorative painting and other designs.

5) Innovation

In terms of innovation, the project mainly carried out the following explorations:

(1) Material innovation

- Combined traditional wood with modern glass and steel structures to design stairs, partitions, etc. with both traditional charm and modern sense;
- Improved traditional bricks and tiles to enhance their thermal insulation performance and applied them to interior wall decoration.

(2) Process innovation

- Combined traditional wood carving crafts with modern laser carving technology to achieve precise carving of complex patterns and reduce costs;
- Used computer-aided design technology to optimize the traditional Huizhou mortise and tenon structure, applied it to furniture production, and improved the structural stability and practicality of furniture.

(3) Functional innovation

- Combined with the functional needs of modern homestays, optimized the layout design of guest rooms on the basis of the spatial form of traditional Huizhou-style residences, adding modern functional spaces such as independent bathrooms and cloakrooms;
- Set up leisure areas, book bars, etc. in public spaces to meet the diverse needs of tourists;
- Integrated intelligent design, installed intelligent lighting, intelligent air conditioning and other equipment in guest rooms to improve tourists' living experience.

C. PRACTICAL ENLIGHTENMENTS

The practical project provides useful enlightenments for the application of traditional residential construction techniques in modern homestay interior design:

Firstly, it is necessary to deeply excavate the connotation of regional culture and extract representative traditional construction technique elements;

Secondly, attention should be paid to the integration of tradition and modernity, and innovation should be carried out on the basis of inheritance to meet modern living needs;

Thirdly, attention should be paid to the coordination between space and environment to realize the harmonious coexistence of interior space with the external natural environment and regional cultural environment.

VI. OPTIMIZATION STRATEGIES FOR THE INHERITANCE AND INNOVATION OF TRADITIONAL RESIDENTIAL CONSTRUCTION TECHNIQUES IN MODERN INTERIOR ENVIRONMENTAL ART DESIGN

TABLE 3. Summary Table of Core Information of the Case

Category	Specific Content
Inherited Core Elements of Huizhou-style Construction	1. Spatial form: courtyard-style layout, patio design; 2. Materials and crafts: local wood, stone, bricks and tiles, wood carving and brick carving crafts; 3. Cultural symbols: lattice window shapes, horse-head wall shapes, interlocking pattern
Modern Innovation Measures	1. Material innovation: traditional wood + glass/steel structure, improving the thermal insulation performance of traditional bricks and tiles; 2. Process innovation: wood carving + laser carving, CAD optimization design of mortise and tenon structure; 3. Functional innovation: adding independent bathrooms/cloakrooms, setting up leisure areas/book bars, integrating intelligent lighting and air conditioning systems
Spatial Functional Zones	Guest room area (10 rooms), public living room, characteristic restaurant, central courtyard, small patio transition space

A. STRENGTHEN THE CONSTRUCTION OF PROTECTION AND INHERITANCE SYSTEM FOR TRADITIONAL RESIDENTIAL CONSTRUCTION TECHNIQUES

The protection and inheritance of traditional residential construction techniques is the foundation for their inheritance and innovation in modern interior design.

(1) Establish and improve the protection mechanism for traditional residential construction techniques, and incorporate the inheritance and innovation of traditional techniques into the industry standard system of interior environmental art design;

(2) Strengthen the training of inheritors, establish a joint training mechanism between universities, design enterprises and inheritors, and cultivate compound talents integrating traditional techniques and modern design;

(3) Establish a digital database of traditional residential construction techniques, including technical parameters, process videos, material properties, cultural connotations and other information, to provide data support for interior design practice;

(4) Strengthen publicity and promotion through holding design competitions, thematic exhibitions, and online courses, and enhance the application awareness of designers and the public on traditional techniques.

B. PROMOTE THE INTEGRATION OF TRADITIONAL AND MODERN DESIGN EDUCATION

Design education is an important way to cultivate inheritance and innovation talents, and it is necessary to promote the integration of traditional and modern design education.

(1) Add courses related to traditional residential construction techniques to the curriculum system of design colleges and universities;

(2) Strengthen practical teaching, cooperate with inheritors of traditional construction techniques and design enterprises to establish practical teaching bases;

(3) Encourage teachers to carry out research on the integration of traditional residential construction techniques and modern design;

(4) Promote international exchanges and cooperation, learn from foreign educational experiences in the integration

of traditional architecture and modern design, and broaden students' international horizons.

C. PROMOTE THE IN-DEPTH INTEGRATION OF TRADITIONAL CONSTRUCTION TECHNIQUES AND MODERN TECHNOLOGIES

The development of modern technologies provides new opportunities for the inheritance and innovation of traditional residential construction techniques, and it is necessary to promote the in-depth integration of traditional construction techniques and modern technologies.

(1) Increase R & D investment in the integration of traditional construction techniques and modern technologies, encourage enterprises to cooperate with scientific research institutions, and develop technologies and equipment suitable for the modern application of traditional construction techniques;

(2) Promote the application of advanced modern technologies, such as computer-aided design and computer numerical control machine tools;

(3) Promote the integration of intelligent technology and traditional construction concepts, and develop intelligent indoor products with traditional charm;

(4) Use Internet technology to establish an online exchange platform for traditional construction techniques, and promote exchanges and cooperation between inheritors and designers.

D. EMPHASIZE THE DIFFERENTIATED EXPRESSION OF REGIONAL CULTURE

Traditional residential construction techniques in different regions of China have distinct regional characteristics. In modern interior design, it is necessary to emphasize the differentiated expression of regional culture.

(1) Conduct in-depth research on the regional culture and natural environment of the project location, and extract representative traditional residential construction technique elements;

(2) Encourage designers to explore traditional residential construction techniques in minority regions, promote the protection and inheritance of these techniques, and enrich the regional cultural connotations of modern interior design;

(3) Pay attention to the dynamic inheritance of regional culture, continuously endow traditional regional culture with new connotations in combination with the development of the times and social changes, and realize the advancement of regional culture with the times.

VII. CONCLUSION

Traditional residential construction techniques, intertwined with heritage craftsmanship, serve as vital carriers of Chinese culture that offer significant inheritance value and innovation potential for modern interior environmental art design. The integration of traditional weaving motifs and spatial construction wisdom allows for a holistic design approach where architectural forms collectively redefine contemporary cultural spaces. This study draws the following conclusions:

(1) Through the analysis of the core connotation and characteristics of traditional residential construction techniques, the core elements in materials, space, structure, culture, etc. are clarified;

(2) The inheritance paths of traditional residential construction techniques in modern interior design are deeply explored, including the extraction and retention of technical essence, the excavation and translation of cultural connotations, the reference and reconstruction of spatial forms, etc.;

(3) The innovative practice modes of traditional residential construction techniques in modern interior design are analyzed;

(4) Combined with the typical case of Huizhou-style residential construction techniques in modern homestay design, the practical experience of inheritance and innovation is summarized;

(5) Optimization strategies are proposed, such as strengthening the construction of protection and inheritance system, promoting the integration of traditional and modern design education, promoting the in-depth integration of tradition and modern technologies, and emphasizing the differentiated expression of regional culture.

In this study, "living inheritance" is defined as a dynamic inheritance model that integrates traditional construction techniques, cultural connotations and modern design concepts, functional needs and technological development on the basis of protecting the core essence of traditional techniques, so as to realize the sustainable development and practical application of traditional techniques in contemporary society. The research shows that the inheritance and innovation of traditional residential construction techniques in modern interior environmental art design is not a simple duplication of traditional elements, but to realize the living inheritance of traditional construction wisdom and cultural connotations. Through the in-depth integration of tradition and modernity, this study creates interior spaces that harmonize cultural heritage with modern functions by fusing traditional craftsmanship with contemporary spatial design. By incorporating heritage weaving techniques and innovative

fabric applications, the design achieves a seamless balance between historical continuity and the practical requirements of modern living environments.

AUTHOR CONTRIBUTIONS

Conceptualization – Yichen Li, Feifei Liu and Ze Wang; methodology – Yichen Li, Feifei Liu and Ze Wang; investigation – Yichen Li, Feifei Liu and Ze Wang; writing-original draft preparation – Yichen Li, Feifei Liu and Ze Wang. All authors have read and agreed to the published version of the manuscript.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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