

Research on the Inheritance and Aesthetic Education Path of Traditional Decorative Patterns in Cultural and Creative Product Design Empowered by Digital Intelligence

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Abstract:

In the current era of rapid development of digital intelligence, the inheritance and innovation of traditional decorative patterns are facing new opportunities and challenges. This paper delves into how digital intelligence technologies empower the inheritance of traditional decorative patterns in cultural and creative product design, analyzes the current application status and existing problems in this field, and explores effective paths to realize aesthetic education through cultural and creative products. The research shows that digital intelligence technologies can optimize the processes of extracting, transforming, and applying traditional decorative patterns, providing innovative ideas for cultural and creative product design. Meanwhile, disseminating the cultural and aesthetic values contained in traditional decorative patterns through cultural and creative products can effectively realize the function of aesthetic education and improve the public's cultural literacy and aesthetic level.

Keywords:

Digital Intelligence Empowerment, Traditional Decorative Patterns, Cultural and Creative Product Design, Aesthetic Education Path

1. Introduction

As an important part of human cultural heritage, traditional decorative patterns carry rich historical and cultural information and unique aesthetic values, embodying the wisdom of various ethnic groups. From ancient Chinese dragon and phoenix patterns, wishful cloud patterns to Western Celtic knots and Arabic vine patterns, these patterns are widely applied in fields such as architecture, clothing, and utensils. They have become important visual symbols of cultural inheritance and possess significant theoretical value and practical significance.

With the rapid development of digital intelligence technologies, the in-depth application of artificial intelligence, virtual reality, augmented reality and other technologies in various fields has brought new opportunities for the inheritance and

innovation of traditional decorative patterns. [1] As carriers of culture and creativity, cultural and creative products have seen a continuous growth in market demand in recent years and have become an important way to inherit and disseminate traditional culture. Combining traditional decorative patterns with cultural and creative product design with the help of digital intelligence technologies can not only promote the living inheritance of traditional decorative patterns, but also realize the function of aesthetic education through the wide circulation of cultural and creative products, thereby improving the public's cultural literacy and aesthetic level. This has important practical significance and research value.

2. Current Application Status of Traditional Decorative Patterns Empowered by Digital Intelligence in Cultural and Creative Product Design

2.1. Digital intelligence technologies facilitate the digital collection and preservation of traditional decorative patterns

Traditional decorative patterns exist extensively in physical carriers such as ancient buildings, cultural relics, and folk handicrafts. For a long time, their preservation has been confronted with risks like natural wear and tear as well as man-made damage. Means in digital intelligence technologies, such as high-precision image collection, 3D reconstruction, and digital modeling, provide reliable solutions for the permanent preservation of traditional decorative patterns. For instance, the Palace Museum uses 3D reconstruction technology to accurately replicate colored painting patterns such as dragons, phoenixes, and spiral patterns on palace buildings, establishing digital archives. This not only realizes the permanent preservation of the patterns but also allows the public to view them anytime and anywhere through forms like virtual exhibitions. [2] In the field of folk crafts, such as Suzhou embroidery and Foshan paper-cutting, high-resolution image collection equipment and digital processing software are used to completely record the complex and exquisite details of the patterns, which are then converted into digital formats for storage, providing abundant materials for subsequent design applications.

2.2. Digital intelligence technology promotes the innovative transformation of traditional decorative patterns

2.2.1. Intelligent Extraction and Recombination of Pattern Elements

Technologies such as image recognition and deep learning algorithms in artificial intelligence can intelligently analyze digitized traditional decorative patterns, extract representative elements, and recombine and innovate them according to design needs. Taking traditional Chinese auspicious patterns as an example, AI algorithms can identify elements such as “bats” (implying “good fortune”) and “peaches” (implying “longevity”). These elements are combined with modern geometric figures or other popular elements to create new patterns that not only have traditional cultural connotations but also conform to contemporary aesthetics, which can be applied in cultural and creative product design, etc. [3]

2.2.2. Diversified Generation of Design Styles

With advanced digital intelligence technologies such as generative adversarial networks, a variety of variant designs with different styles can be generated. For

example, traditional fine brushwork-style flower and bird patterns can be transformed into modern minimalist styles, cartoon styles, or retro pop styles, etc., so as to meet the aesthetic needs of different consumer groups.

2.2.3. Digital intelligence technologies optimize the design process and user experience of cultural and creative products

(1) Intelligent assistance in the design process

Digital intelligence technologies have brought revolutionary changes to the design process of cultural and creative products. Intelligent design software integrates a rich library of traditional decorative pattern materials. Designers can quickly obtain the required patterns through keyword search, style filtering, and other methods, and use the editing tools built into the software to deform, color, and combine the patterns, thereby improving design efficiency. [4]

(2) Innovative upgrading of user experience

In the sales and usage of cultural and creative products, digital intelligence technology brings users a novel shopping experience. By scanning the QR code of cultural and creative products with AR technology, the dynamic effects and relevant information of traditional decorative patterns can be displayed on mobile phones, achieving the effect of virtual-real interaction and enhancing innovation and communicativeness.

3. Problems in the Application of Traditional Decorative Patterns Empowered by Digital Intelligence in Cultural and Creative Product Design

3.1. Insufficient Depth of Technical Application

There are a large number of cases where digital intelligence technology is applied to traditional decorative patterns and cultural and creative products, but the overall depth of application still needs to be improved. Only some cultural and creative enterprises use digital intelligence technology merely as a simple pattern collection software, failing to bring into play the role of artificial intelligence, big data, etc. in aspects such as graphic innovative design and consumer demand. [5]

3.2. Talent Shortage Restricts Development

The development of digital intelligence empowering the fields of traditional decorative patterns and cultural and creative product design requires interdisciplinary talents who not only understand the cultural connotations of traditional decorative patterns but also master digital intelligence technologies and cultural and creative design skills. However, there is a severe shortage of such talents at present. On the one hand, professionals in the field of traditional arts have insufficient mastery of digital intelligence technologies, making it difficult for them to apply new technologies to the innovative design of traditional patterns; on the other hand, professionals in digital intelligence technologies have a shallow understanding of traditional culture, and thus cannot accurately grasp the cultural essence and aesthetic characteristics of traditional decorative patterns in design, resulting in design works being unable to achieve in-depth integration of culture and technology.

4. Inheritance Strategies of Traditional Decorative Patterns Empowered by Digital Intelligence in Cultural and Creative Product Design

4.1. Deepen the application of digital intelligence technologies and promote innovative design of patterns

4.1.1. Strengthen the application of artificial intelligence technology in pattern design

Cultural and creative enterprises and designers should increase investment in and learning of artificial intelligence technology. They should use deep learning algorithms to conduct in-depth analysis of massive traditional decorative patterns, explore the composition rules, cultural connotations and aesthetic characteristics of the patterns, and establish more accurate pattern generation models. [6] Through in-depth learning of traditional Chinese architectural decorative patterns, AI can generate new patterns that conform to architectural styles and cultural meanings, which can be applied to the design of cultural and creative products such as architectural models and home accessories, thus realizing the innovative development of traditional patterns.

4.1.2. Optimize design decisions with the help of big data analysis

The collection and analysis of users' consumption preferences and aesthetic trends using big data technology can assist designers in making decisions regarding cultural and creative products featuring traditional decorative patterns. For patterns that users dislike, they either avoid purchasing products with such patterns or express opposite emotional descriptions about them. This enables targeted improvements to be made in the design of cultural and creative products.

4.2. Cultivate interdisciplinary talents and consolidate the foundation for industrial development

4.2.1. Universities optimize professional curriculum settings

In related majors such as design and art, universities should optimize their curriculum settings and add courses that integrate digital intelligence technology with traditional culture, such as "Digital Art and Traditional Pattern Design", "Artificial Intelligence-Assisted Cultural and Creative Design", and "Cultural Research on Traditional Decorative Patterns". These courses aim to cultivate students' interdisciplinary knowledge and skills. At the same time, universities should strengthen practical teaching by cooperating with cultural and creative enterprises to establish internship bases, enabling students to practice their ability to apply digital intelligence technology and design traditional decorative patterns in actual projects. [7]

4.2.2. Enterprises strengthen employee training and talent introduction

Cultural and creative enterprises should attach importance to employee training, regularly organize internal training courses, and invite experts in digital intelligence technology to give lectures to improve employees' proficiency in digital intelligence technology and their cultural literacy. At the same time, they should actively introduce design talents with a background in digital intelligence technology and cultural research talents to enrich the enterprise's talent team, optimize the talent

structure, and provide talent guarantee for the enterprise's development in the field of digital intelligence-empowered cultural and creative product design with traditional decorative patterns.

5. Aesthetic Education Paths of Traditional Decorative Patterns Empowered by Digital Intelligence in Cultural and Creative Product Design

5.1. Disseminate the aesthetic value of traditional decorative patterns through cultural and creative products

5.1.1. Enhance the aesthetic quality of cultural and creative products

Cultural and creative enterprises and designers should focus on improving the aesthetic quality of cultural and creative products featuring traditional decorative patterns. Starting from aspects such as product shape, color, material, and craftsmanship, they should integrate traditional decorative patterns with modern design concepts to create products with aesthetic appeal and artistic value. When designing cultural and creative tableware themed around traditional blue-and-white porcelain patterns, high-quality ceramic materials should be selected, and exquisite firing techniques should be employed to present the blue-and-white porcelain patterns on the surface of the tableware in a delicate and elegant manner. At the same time, the shape of the tableware should adopt a modern and simple design, so that the products not only reflect the aesthetic charm of traditional blue-and-white porcelain but also conform to modern life aesthetics, allowing consumers to be edified by beauty during use.

5.1.2. Popularize aesthetic knowledge with the help of cultural and creative products

Apply the aesthetic education concept of traditional decorative patterns to the packaging, instructions, or online promotions of cultural and creative products. Present the aesthetic education knowledge of decorative patterns through patterns and texts, so that consumers of cultural and creative products can intuitively and vividly receive aesthetic knowledge education and improve their aesthetic ability.

5.2. Enhance the aesthetic education experience of cultural and creative products by means of digital intelligence technology

5.2.1. Develop interactive aesthetic education cultural and creative products

With the help of digital intelligence technologies such as virtual reality (VR) and augmented reality (AR), develop interactive cultural and creative products for aesthetic education. [8] Utilize VR technology to establish an art exhibition of traditional decorative patterns. After preparing VR equipment, people can enter the exhibition hall to appreciate traditional decorative patterns up close, interact with them, and obtain an immersive aesthetic education experience.

5.2.2. Create personalized aesthetic education services

Grasp consumers' aesthetic preferences and learning needs and push aesthetic education services. E-commerce platforms, based on big data, AI recommendation and other methods, perceive consumers' aesthetic preferences and learning needs, and

provide corresponding aesthetic education services. Cultural and creative enterprises can, according to the consumer's consumption preferences, collect data on their preferred styles and themes of traditional decorative patterns from the products they browse or have purchased on the platform, and provide cultural and creative products as well as aesthetic education products and services that conform to their aesthetics.

5.2.3. Carry out aesthetic education activities in combination with cultural and creative products

(1) Cooperate with school education

Cultural and creative enterprises collaborate with schools to introduce cultural and creative products featuring traditional decorative patterns into school aesthetic education classrooms. These products serve as cultural materials and practical tools in the teaching process of school art creation and practice courses. Schools are provided with traditional decorative pattern design kits, and students can use creative thinking design software based on traditional decorative pattern cultural materials, physical product production tools, etc., to carry out pattern design and product creation, thereby developing their creative ability and aesthetic ability. Excellent cultural and creative designers and experts are organized and guided to enter schools to give lectures, and traditional decorative pattern design workshops for students are held, allowing students to be exposed to traditional culture and innovative design concepts and broaden their cultural horizons. [9]

(2) Carry out community aesthetic education activities

Carry out aesthetic education activities of cultural and creative products with traditional decorative patterns relying on communities. Hold handmade activities of such cultural and creative products in community cultural centers. By utilizing relevant materials developed for cultural and creative products, such as paper-cutting, embroidery, weaving and so on, teachers specialized in the field can be invited to guide community residents in creating traditional decorative patterns by hand. This allows the participants to personally experience and feel the charm of Chinese traditional culture, and improve their aesthetic ability. [10] On the other hand, set up exhibitions and evaluation activities of cultural and creative products with traditional decorative patterns in the community to achieve the goal of showcasing excellent works, publicize the cultural beauty and aesthetic value of traditional decorative patterns, and create a favorable environment for community aesthetic education.

6. Conclusions

The empowerment of digital intelligence leaves ample room for the inheritance and development of traditional decorative patterns in cultural and creative product design. Applications such as digital collection and preservation, innovative transmission, reshaping of pattern design processes and user experience have all brought new opportunities for the inheritance of traditional decorative patterns. In addition, digital intelligence technology realizes the value of spreading beauty through cultural and creative products and carries out aesthetic education activities, enabling people to receive higher-level cultivation of aesthetic literacy. In future development, digital intelligence technology will become increasingly mature, endowing cultural and creative products with more possibilities in form. Decorative elements in traditional culture will achieve better innovative development in future cultural and creative

products, play a greater role in cultural inheritance and the concept of aesthetic education, and promote cultural prosperity and social progress.

Conflicts of Interest

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