

A Study on the Digital Empowerment of Revitalization and International Dissemination of Liling Underglaze Polychrome Porcelain

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Abstract: As a cultural treasure in the Chinese ceramics industry, Liling underglaze polychrome porcelain embodies profound cultural heritage and artistic value. However, amid the rapid development of the modern digital economy and the continuous integration of diverse cultures, its preservation and development face numerous challenges. Liling underglaze polychrome porcelain confronts a dual dilemma: the industrialization bottleneck of “gaining critical acclaim but failing to gain commercial success” and its relatively low international recognition. Drawing on consumer psychology as an entry point, this paper explores a “three-dimensional revitalization” approach driven by digital technologies—covering products, aesthetics, and distribution channels—and proposes recommendations for the preservation and global promotion of Liling underglaze polychrome porcelain, thereby enhancing its international visibility.

Keywords: Digital technologies; Liling underglaze polychrome porcelain; Intangible cultural heritage; International communication

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1. Introduction

In recent years, the preservation and transmission of intangible cultural heritage have experienced a surge driven by the rise of digital media. The global dissemination of intangible cultural heritage has evolved from simple cultural displays to a more profound engagement involving IP development and aesthetic recognition. Internationally, public perception of ceramics often remains limited to their role as high-end artifacts—such as exhibition pieces or collectibles—yet the growing tension between their premium craftsmanship positioning and modern everyday usage demands has become increasingly evident, posing significant challenges and issues for the inheritance and sustainable development of ceramics. Consequently, research into the preservation and innovation of Liling underglaze polychrome porcelain has become ever more crucial.

2. Primary artistic characteristics of Liling underglaze polychrome porcelain

Liling underglaze polychrome porcelain stands out in the ceramic world with its unique craftsmanship, intricate patterns, and delicate hues, earning it the title of “timeless Eastern aesthetics.” As one of China’s four renowned porcelain varieties, it is celebrated for its “white as jade, bright as a mirror, thin as paper, and resonant as a chime.” The history of Liling porcelain dates back to the Yongzheng era of the Qing Dynasty, initially producing rough folkware. By the late Qing Dynasty, new firing techniques—underglaze painting—were introduced, a “sandwiched” process where color layers are securely sealed between a durable glaze and porcelain body. Abundant water resources, along with rich deposits of kaolin and high-alumina clay low in iron, enable the production of lightweight, smooth porcelain bodies. The process involves pigment painting, transparent glazing, and high-temperature firing. This technique yields vibrant, soft, and elegant porcelain with a crystalline sheen, offering advantages like wear resistance, acid-base resistance, and permanent color retention. Upon its debut, it quickly garnered widespread acclaim and attention^[1].

Liling underglaze polychrome porcelain is renowned worldwide for its unique ink line and watercolor blending technique, the most crucial craftsmanship of underglaze polychrome porcelain and a hallmark that distinguishes it from other styles^[2]. Liling underglaze polychrome porcelain exudes a fresh and elegant aesthetic, with artists employing the “watercolor blending technique” to depict scenes on plain clay. Through layered washes, the refined colors create a distinctive tone and artistic conception in the finished product. This porcelain style adheres to the principles of Chinese painting, such as hierarchy, spacing, and dynamic balance, achieving artistic harmony and unity. The compositions typically feature clear focal points and interplay between positive and negative spaces, often leaving viewers with ample room for imagination^[3].

3. Current status of the overseas development of Liling underglaze polychrome porcelain

We must “go global” and “think long-term.” The international dissemination of intangible cultural heritage should not merely stop at exhibitions but also focus on building cultural brands to gain aesthetic recognition from overseas audiences. As a national treasure, Liling underglaze polychrome porcelain currently faces three major challenges.

First, the older generation of enthusiasts has aged, and high-end craftsmanship struggles to adapt to today’s daily consumer market. Traditional ceramics, with their relatively fixed uses, remain stuck in outdated styles and aesthetics. Contemporary young people prioritize both aesthetic appeal and practical value, especially when choosing tableware and household decorations, each with their own merits. A surge of new ceramic products has emerged on the market, such as tableware and teacups co-branded with popular anime IPs, as well as various novel mini ornaments and small vases.

Second, overseas dissemination is prone to “cultural discount,” making it difficult for ordinary foreign audiences to comprehend traditional culture and identify with aesthetic expressions. When foreigners view our colored porcelain, they may struggle to understand that peony patterns symbolize wealth and honor, fish and algae motifs represent prosperity year after year, and quails signify peace. Terms like “sea blue,” “ochre,” and “agate red” also leave them baffled. Therefore, when going global, we cannot force-feed; we must first translate Chinese culture into relatable, everyday language for foreigners.

Third, it is difficult to balance inheritance and innovation. Today, some traditional crafts are at risk of being lost, such as brush-painted glaze, layered color glaze, underglaze ink color, and underglaze ochre

color. The decline of these traditional techniques has led to the fading of unique patterns and methods from public view, leaving many contemporary ceramic artisans focused solely on the latest trends. The design of Liling underglaze polychrome porcelain remains stuck in imitation, as younger generations pursue popular aesthetics and market demands without fully understanding the craftsmanship. This makes inheritance a challenge, let alone innovation.

4. The digital technology-driven “three-dimensional revitalization” approach for Liling underglaze polychrome porcelain

4.1. Product activation: Digital design transformation from art porcelain to life porcelain

In response to the structural contradiction of “high-end positioning - niche market” of Liling underglaze multicolored porcelain, big data can be used to shift the design of intangible cultural heritage from experience-driven to data-driven. Consumers in the Z era are more inclined towards self-aesthetic and cost-effective products, especially the new generation of women who pay more attention to the social attributes of photography and have a certain pursuit of beautiful objects. The working group prefers things with a sense of storytelling that can provide emotional value. Therefore, art porcelain should move towards life and the general public.

By utilizing campus-based questionnaires and social media sentiment analysis—such as the “Tea Sets & Vases” topic on Xiaohongshu or comment sections on self-media platforms—businesses can gain insights into the preferences and needs of the new generation of consumers and create a consumer persona for the Gen Z demographic.

The essence of product revitalization is not “downgrading,” but “dimensional reduction.” By transforming high-end collectible pieces into everyday aesthetic companions—integrating colorful porcelain into everyday life—companies can develop a product portfolio characterized by low entry barriers, high frequency of use, and strong lifestyle relevance, all while preserving the core “underglaze color painting” craftsmanship. For example, the teaware collection could partner with local teahouses, beverage shops, and study rooms to launch distinctive tea sets, recreating traditional intricate patterns and designs on modern teacups, teapots, and tea bowls, complemented by a unique Eastern aesthetic, allowing consumers to experience the texture and cultural significance of underglaze color painting up close. For the international market, a “coffee collection” could be introduced, incorporating a variety of colors—such as grass green, sea blue, vibrant black, ochre, and agate red—into pour-over coffee pots and cups. Additionally, aligning with mainstream trends by incorporating new patterns and designs could attract a broader audience. Furthermore, a “campus culture collection” could be launched, utilizing the miniature underglaze color painting technique to create university-branded bookmarks, phone stands, water bottles, chopsticks, and more; this approach preserves the distinctive characteristics of intangible cultural heritage while transforming Liling underglaze polychrome porcelain into a portable campus cultural symbol carried by students. Moreover, by leveraging 3D modeling and printing technology, students can be engaged in designing intangible cultural heritage-themed products, truly integrating cultural preservation into everyday life.

4.2. Aesthetic revitalization: The reconstruction of aesthetic discourse in digital narration

Will foreigners really be willing to pay for China’s intangible cultural heritage? The answer is yes, but what they purchase may not align with our conventional understanding of such heritage. Many believe that the

greatest challenge in promoting intangible cultural heritage abroad lies in the differences in foreign cultures and aesthetics—making it difficult for foreigners to appreciate these traditions and, consequently, unwilling to consume them. However, a look at the artifacts displayed in various shopping malls and museums across international markets reveals a unified appreciation of beauty. In reality, Western consumers harbor a strong curiosity about China’s tea culture, incense culture, Eastern aesthetics, traditional crafts, and more, and are willing to pay for these experiences. Yet, their consumption logic differs significantly from that of domestic consumers; rather than focusing on titles such as “national intangible cultural heritage,” the status of inheritors, or various certificates, they place greater value on the aesthetic appeal of the products themselves, the stories behind them, and the interactive experiences that allow them to engage directly.

When purchasing household goods, Western consumers tend to favor items that combine functionality with aesthetics—such as scented candles, illustrated artworks, or ceramic vases—while their purchase share for purely decorative ornaments remains relatively low. In contrast, domestic consumers generally prefer artistic decorative pieces or “blind box” -style ornaments. When expanding into the domestic market, intangible cultural heritage (ICH) brands typically conduct thorough research on their target audience, analyze consumer profiles, and carefully deliberate on potential product usage scenarios. However, when targeting international markets, these brands often subjectively assume that foreign consumers will inevitably appreciate their products, neglecting proper research into overseas consumers’ preferences and being unwilling to adapt their products to meet those specific needs. This dual approach reflects two cognitive biases: first, equating national pride with market judgment—thereby conflating the concepts of “the inherent excellence of the culture” and “product suitability”; and second, the reluctance among some inheritors or practitioners to “betray tradition,” believing that catering to international demands would undermine the authenticity of the craftsmanship, while overlooking the fact that domestic ICH products are continuously innovating and adapting to market trends to stay relevant among younger consumer segments.

The true globalization of intangible cultural heritage does not merely involve bringing popular domestic products to overseas markets; rather, it entails studying the lifestyle habits of international consumers, upholding one’s own cultural identity, and ensuring that product design undergoes necessary contextual iterations. We can integrate traditional colors, patterns, and craftsmanship into product presentations in an accessible manner, and by combining these with digital media—through videos or storytelling—we can help consumers understand the underlying culture and symbolism. Furthermore, based on the diverse needs of overseas consumers, China’s traditional culture can be infused into porcelain products, allowing them to perceive “nobility, prosperity, and resilience” within a simple teacup, or “integrity and purity, remaining unstained by the mud” within a vase. Additionally, the preservation and innovation of intangible cultural heritage are inextricably linked ^[4]. On one hand, it is essential to cultivate a new generation of inheritors who gain as deep an understanding as possible of traditional craftsmanship and its historical development; on the other hand, it is crucial to understand consumers’ needs and aesthetic preferences in order to develop and innovate colorful porcelain from a fresh perspective. For instance, the characteristic of underglaze polychrome porcelain—being “as thin as paper and as resonant as a chime”—can be aligned with the international minimalist design discourse; its “lead-free, acid-and alkali-resistant” properties can be integrated with the global concept of a healthy lifestyle.

4.3. Channel activation: A practical approach to digital global expansion

Cultural export is of paramount importance; digital globalization should not remain merely a conceptual notion—it is essential to identify the actual hubs where overseas users consume content. We are currently living in an era dominated by AI-driven video content, which presents greater opportunities for the digital dissemination of intangible cultural heritage worldwide. Popular social media platforms such as TikTok, YouTube, and Instagram are characterized by “vertical screen display and strong visual appeal”; leveraging these features enables the creation of AI-driven micro-narrative shots that align seamlessly with the aesthetic qualities of underglaze polychrome porcelain. On these platforms, two types of videos can be designed. The first type is the “Craftsmanship Relaxation Series,” which uses macro photography to document the transformation of a cup—from raw clay to finished product—accompanied by explanations from professional artisans at each stage, supplemented by various ASMR sound effects during the manufacturing process, thereby lowering the public’s cognitive barrier to understanding craftsmanship through visual impact and soothing experiences. The second type is the “Visual Impact Series,” which selects the most popular and aesthetically pleasing finished polychrome porcelain pieces from various platforms and compiles them into video collections based on specific categories or styles. This approach fosters an exchange of inspiration by integrating the cultures and ceramics of different countries—for example, combining traditional Chinese decorative motifs, landscape paintings, and ink-wash techniques with Western influences such as Monet-style designs, bubble glazes, or anime characters.

Virtual reality technology has been widely adopted across various fields, including education and entertainment ^[5]. AI-generated content and short-form dramas have gained significant popularity worldwide; leveraging this trend, underglaze polychrome porcelain can forge a new dissemination pathway known as “Intangible Cultural Heritage + AI Short-Form Dramas.” Specifically, AI-based drawing and video generation technologies can be employed to replace everyday objects—such as teacups, dining plates, coffeeware, and decorative vases—used by characters in animations and short-form dramas set against themes like ancient Chinese culture, modern urban life, or *xianxia* fantasy with pieces made of underglaze polychrome porcelain. Designers need not explicitly explain the craftsmanship behind these objects: a sea-blue teacup can be placed on the desk of a *xianxia* character; a large vase depicting a spreading-winged crane can be positioned within the palace setting of an historical drama; or a blue-inked lotus-patterned coffee cup can be placed beside a modern urban white-collar worker. By repeatedly featuring these visual symbols, the audience can gradually embrace and develop an interest in this aesthetic. Animation and short-form dramas inherently possess cross-cultural appeal; overseas audiences do not need to first understand the concept of “intangible cultural heritage”—they are immediately drawn to the beauty and texture of these objects. Universities can also offer relevant courses, enabling students majoring in animation or media studies to form teams and participate in AI-driven content co-creation, transforming underglaze polychrome porcelain from a cultural artifact displayed for exhibition into an everyday object integrated into visual narratives. Cultural influence can transcend national borders; as the plot unfolds, viewers will unconsciously absorb and understand the associated culture during their entertainment experience.

The integration of underglaze polychrome porcelain with short videos and short-form dramas addresses the issue of visibility, while deep cultural engagement still relies on cloud-based communication mechanisms. Following the pandemic, “cloud-based cultural diplomacy” has emerged as a key force in international communication; universities should therefore transition from being mere cultural audiences to active

facilitators of cultural outreach. Specifically, they can collaborate with Confucius Institutes abroad to share the content of the “Liling Underglaze Polychrome Porcelain Digital Cloud Exhibition”—which includes high-resolution scanned images of renowned polychrome porcelain pieces, VR-based craftsmanship restoration videos, and multilingual explanatory videos. Additionally, universities can leverage the reverse dissemination effect among international students by encouraging them to participate in underglaze polychrome porcelain workshops and bring back to their home countries the porcelain or handicrafts they have personally crafted as a “Chinese memory.” This experiential and commemorative approach to communication is often more effective than purely mechanical dissemination methods.

Furthermore, immersive interactive programs for underglaze polychrome porcelain could be further developed to lower the cognitive barrier for Gen Z users and international consumers by adopting a first-person game perspective. Through mini-programs or app platforms, a full-process experience titled “Swipe Right, Fire Up the Kiln” could be created. Users could first select their preferred vessel type—such as cups, vases, tableware, or decorative items—and then choose from a range of classic patterns on an electronic greenware surface to complete the hand-painting and coloring process; alternatively, they could import favorite patterns from their personal photo albums or create custom designs using their own hand-drawn artwork. Upon completion of the design, the system would offer two kiln firing options: 600°C or 1,380°C. By clicking “Furnace,” users could watch the entire kiln transformation process and view the final product appearance after high-temperature firing. At 600°C, the system would indicate potential firing failures or uneven coloring, whereas 1,380°C yields the optimal color rendering. This experiential approach allows users to truly appreciate the decisive role of the 1,380°C firing temperature in underglaze polychrome porcelain—where the glaze layer locks in the colors at high temperatures, ensuring a lead-free finish and permanent color retention—while also enabling international consumers to intuitively experience the unique craftsmanship and charm of polychrome porcelain. Students majoring in design or computer science at universities could collaborate with traditional artisans to develop such programs; these programs could serve not only as practical training platforms for promoting intangible cultural heritage on campus but also be integrated into international social media and cross-border e-commerce platforms, allowing potential consumers to forge an emotional connection with intangible cultural heritage through entertainment, thereby facilitating the transition from virtual experience to physical purchase.

5. Conclusion

In conclusion, the challenges confronting Liling underglaze polychrome porcelain are not merely issues of “lack of popularity” or “difficulty in global market penetration,” but rather stem from the absence of a sustainable transmission of traditional craftsmanship and its disconnection from modern lifestyles, the misalignment between its cultural identity and overseas aesthetic preferences, and the inherent difficulties in both preserving tradition and fostering innovation. The solution proposed in this paper centers on leveraging universities as pivotal hubs to utilize digital technologies to simultaneously facilitate both the revitalization of the craft and its expansion into international markets. At the product level, user insights can drive the transformation of artistic porcelain into everyday-use ceramics; at the aesthetic level, it involves exploring overseas market demands and integrating cultural elements into the porcelain design; at the distribution channel level, the integration of short-form video content, AI-generated short dramas, VR immersive

experiences, and online interactive platforms can enable a broader audience to understand the profound essence of the 1,380°C high-temperature color-locking technique through the engaging experience of “swiping right to open the kiln.” For international market expansion, universities can cultivate Gen Z communicators who possess a deep understanding of the historical legacy, craftsmanship, digital literacy, and cross-cultural narrative skills associated with Liling underglaze polychrome porcelain, thereby translating its aesthetic discourse into an internationally accessible, everyday language. The global promotion of intangible cultural heritage is not about simply relocating culture to foreign contexts, but about conducting targeted cultural outreach and product innovation tailored to overseas consumers. In the future, with the advancement of AI, the international dissemination of underglaze polychrome porcelain may shift from being “observed” to being “used,” truly achieving a transformative leap from “going global” to “integrating into local markets.”

Disclosure statement

The authors declare no conflict of interest.

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