

Research on the influence and application of transdisciplinary thinking and methods in the digital inheritance of the Cizhou kiln ceramic art

Abstract

This essay explores the impact and application of transdisciplinary thinking and methods in the digital transmission of Cizhou kiln ceramic art, combined with augmented reality (AR) technology. The research focuses on how to reconstruct and re-contextualize the cultural symbols of Cizhou kiln ceramics through digital technology to enhance their dissemination and recognition in modern society. First, the essay reviews the relevant progress of digital technology application and interdisciplinary research in the field of cultural heritage protection through literature review, identifies the gaps in current research, and provides a basis for constructing the theoretical framework of this research. Next, the essay provides an in-depth analysis of the concept of “transdisciplinarity”, clarifying its differences from multidisciplinary and interdisciplinary, and further exploring the importance of transdisciplinary thinking and methods in this research. Based on this, the essay systematically reviews relevant domestic and foreign cases of digital preservation and dissemination practices, analyzes their experiences, and provides a reference for this research. The impact and application of transdisciplinary thinking on the theory of this research is then analyzed. The research also explores the challenges in transdisciplinary practice, especially the balance between art and technology, the obstacles to communication and collaboration between different disciplines, proposes solutions, and looks forward to the prospects of transdisciplinary collaborative innovation, especially the potential in the integration of digital technology and traditional culture and art. Finally, the paper summarizes the research results and proposes possible paths for the future promotion of the inheritance and innovation of Cizhou Kiln ceramic art through transdisciplinary

collaboration.

Keywords: Transdisciplinary thinking and practice, Cizhou Kiln ceramics, AR augmented reality, inheritance and innovation

1. Introduction

1.1 research background

The visual characteristics of Cizhou Kiln ceramics not only reflect the craftsmanship and technology, but also the ideology, aesthetic tendencies and daily habits of northern society, providing a perspective that touches on the multi-dimensional historical scene of northern society since the Song and Yuan dynasties. With the rapid development of digital media technology, especially the application of augmented reality (AR) technology, the protection and dissemination of cultural heritage is undergoing profound transformation (Galani and Vosinakis, 2024). AR technology is not limited to information overlay and 3D reconstruction, but also provides a framework for researchers and the public to experience culture in a multi-level and interactive way (Kazanidis et al., 2022). At the same time, AR and other digital technologies also provide audiences with the experience of “participatory heritage”. Audiences are no longer simply receivers of information, but can recreate or interpret traditional artistic elements through gesture recognition, virtual experimentation, and other methods (Silva, Zagalo and Mário Vairinhos, 2023). This transdisciplinary collaboration model is not simply a tool integration, but a problem-oriented practice. This synergy not only avoids the simplification or distortion of traditional art, but also provides a new form of existence for the recreation of traditional culture in the context of globalization and digitalization. This research provides new perspectives and practical paths for the protection and dissemination of cultural heritage in the digital age.

1.2 Research questions

The cultural characteristics and attributes of ceramic art are like “genes” in the biological sense. These cultural “genes” are not static, but need to be constantly adapted, restructured and evolved in

the flow of time and space in order to respond to the new era environment and technological ecology. When digital media technologies such as (AR) rise, can the cultural “genes” of traditional Cizhou kiln be made “active” again in the present through these modern media means, combined with transdisciplinary thinking and practical methods? Based on the above observations and reflections, the research question of this thesis is: Can transdisciplinary theories and methods be combined to use digital media technology (especially AR) as a means to digitally reconstruct and re-contextualize the patterns, shapes and cultural symbols of the ceramic art of the Cizhou Kiln, so that it can “evolve” in the contemporary media environment and adapt to the appreciation patterns and aesthetic needs of a new generation of audiences, just as if it had active genes?

1.3 Significance of the Research

Starting from transdisciplinary thinking, it explains the mechanism of knowledge integration between multiple disciplines and theories, clarifies the necessary conditions and paradigms in this mode of knowledge production, so that transdisciplinary practice is no longer just a stacking of tools, but an effective framework that can dynamically adapt and promote the evolution of “cultural genes”. Construct a transdisciplinary methodology model to guide the reconstruction and interactive expression of the artistic elements of the Cizhou Kiln in an AR scene. This model will provide actionable design and analysis paths for the future digital inheritance of cultural heritage, as well as research strategies and guidelines to enable traditional art to gain lasting vitality and growth space in the contemporary digital environment.

1.4 Road map

This research roadmap aims to explore how to use augmented reality (AR) technology from an transdisciplinary perspective to reconstruct and re-contextualize the cultural symbols of Cizhou ware

ceramic art, in order to promote its inheritance and innovation in modern society. The research will first review the research progress in related fields through a literature review, especially the application of digital technology in the protection and dissemination of cultural heritage, as well as the practice and results of transdisciplinary research in the field of intangible cultural heritage, in order to clarify the gaps in current research and provide a basis for constructing a theoretical framework for this research. Next, this essay will conduct an in-depth analysis of the concept of “transdisciplinarity,” clarifying its differences from multidisciplinary and interdisciplinarity, and exploring the importance and necessity of transdisciplinary thinking and methods in this research. On this basis, the essay will systematically analyze relevant domestic and foreign cases of digital preservation and dissemination practices, analyze their successful experiences and shortcomings, and propose the significance of transdisciplinary perspectives for this research, as well as provide a reference for future research. Furthermore, the dissertation will focus on the challenges that may be encountered in the process of transdisciplinary practice, such as the balance between art and technology, and the obstacles to communication and collaboration between disciplines. Through in-depth analysis of these challenges, solutions will be proposed, and the advantages and prospects of transdisciplinary practice will be explored, especially the potential in the integration of digital technology and traditional culture and art. Finally, the dissertation will summarize the research results and look ahead to future research directions, especially how to achieve transdisciplinary collaborative innovation to promote the inheritance and innovation of Cizhou Kiln ceramic art in the digital age.

2. Literature review

2.1 Related research on transdisciplinarity in intangible cultural heritage

The protection of intangible cultural heritage requires a transdisciplinary perspective and cooperation. Ferreira (2023) pointed out that transdisciplinary design plays an important role in the documentation of intangible cultural heritage. Collaboration between researchers, technology developers and cultural inheritors in different fields can achieve knowledge sharing and promote innovation in conservation methods. Schneider (2019) emphasizes that cultural heritage is a “cultural process” and that the construction of its meaning and value requires the joint efforts of multiple disciplines such as sociology, art, and communication. Chen (2024) further points out that the communication and perception of cultural symbols is an important part of transdisciplinary research. As a symbolic system, cultural heritage cannot be reconstructed without in-depth transdisciplinary interpretation. In the protection of cultural heritage, transdisciplinary research is considered an important means of achieving innovative protection. Galani. et al. (2020) propose that a transdisciplinary approach not only provides technical support for digital transformation, but also enhances the communication effect and public participation of digital cultural heritage through the integration of sociology and cultural studies. For example, in the study of ceramics, history helps to restore its historical context, materials science analyzes its production process, and art explores its aesthetic value. The integration of knowledge can comprehensively understand the cultural significance of porcelain and provide theoretical support for its protection and dissemination.

2.2 Digital technology in the study of cultural heritage

Skublewska-Paszkowska, et al. (2022) point out that 3D modeling technology can not only accurately record the morphological characteristics of tangible heritage, but also provide a scientific basis for the restoration of damaged cultural relics. In intangible cultural heritage, 3D technology can reproduce the process, such as the firing and decoration process of ceramics, so as to more intuitively

demonstrate the uniqueness of the skills. The application of AI and big data technology in cultural heritage research includes the analysis of historical documents, image recognition and cultural pattern extraction (Abgaz, 2021). These technologies provide data support for the digital protection of intangible cultural heritage and optimize protection strategies by extracting hidden cultural values. Bekele and Champion (2019) proposes that virtual and augmented reality technologies can enhance cultural engagement through immersive experiences, allowing audiences to perceive the historical and artistic value of cultural heritage through interaction.

2.3 Current research gaps

Many studies tend to be purely technology-oriented, and it is difficult to break through the influence of a single discipline, resulting in an overemphasis on the presentation of technology (such as AR and VR effects) and a neglect of in-depth interpretation of cultural content . This approach can easily lead to a loss of cultural value in digital projects. Many current digital projects focus more on data storage and visualization, and lack a detailed analysis of cultural contexts and symbolic systems. For example, the digitization of intangible cultural heritage mostly focuses on the reproduction of patterns and shapes, while there is less interpretation of its cultural connotations and craftsmanship. Compared with tangible cultural heritage, research on the digital protection and inheritance of intangible cultural heritage is relatively weak. In particular, there is still a lack of a systematic framework for the dynamic display and innovative protection of traditional craftsmanship and artistic aesthetics.

As the above literature shows, digital technology provides new possibilities for the protection and dissemination of cultural heritage, but there are still significant deficiencies in the dynamic transmission and interpretation of the cultural connotations of intangible cultural heritage. This study

hopes to promote the protection, dissemination and innovation of the ceramic art of the Cizhou Kiln by constructing a transdisciplinary framework with culture at its core, providing theoretical and practical support for the digital research of cultural heritage.

3. Theoretical framework

3.1 Transdisciplinary practice theory, the difference with multidisciplinary and interdisciplinary

Cockburn (2022) defines transdisciplinarity as “thinking beyond the paradigm of a single discipline, and forming a holistic understanding at a higher level through the integration of knowledge and practices from different disciplines.” Its core features include the following: Unlike traditional single-disciplinary research, transdisciplinary practice focuses on the integration of disciplines, not just the intersection of disciplines. Through this integration, new theories, concepts and methodologies are generated, breaking through disciplinary boundaries. Secondly, it is oriented towards solving complex and multi-level problems and responding to global or social challenges. Taking the protection of cultural heritage as an example, the combination of digital media technology and traditional handicrafts, through the in-depth integration of fields such as art, history, computer science and user experience, forms an innovative theoretical and practical framework, which is a typical manifestation of transdisciplinary practice. Finally, the core of transdisciplinary practice lies in the creation of new forms of knowledge through deliberate integration. Klein (2008) sees this integration as a comprehensive approach, that is, the development of an overall integrated system through the transdisciplinary application of theories, concepts or methods. Compared with other disciplinary approaches, this approach encourages researchers to go beyond disciplinary boundaries and use new understandings to advance their own disciplines .

In contrast, Multidisciplinary Practice and Interdisciplinary Practice also involve interaction between disciplines, but there are significant differences in terms of the depth of integration and theoretical innovation. Multidisciplinary Practice emphasizes the “collaborative juxtaposition” of disciplines. Experts from various disciplines study the same problem from their own disciplinary perspectives, resulting in independent multidisciplinary project reports. However, the connections between disciplines are relatively loose and lack in-depth integration. This type of practice is suitable for scenarios that require multiple perspectives but do not require deep integration of knowledge (Hogan, 2018). The core feature of this model is “collaboration without integration”. Interdisciplinary Practice goes one step further than Multidisciplinary Practice and emphasizes the “interaction and integration” between disciplines. By drawing on each other's theories and methods, deeper integration of knowledge is achieved, but the boundaries between disciplines are maintained, and no new theoretical or methodological systems are created (Hausler, 2021). Therefore, in cultural heritage research, Transdisciplinary Practice, as an advanced form of disciplinary integration, transcends the superficial cooperation of Multidisciplinary Practice and the methodological interaction of Interdisciplinary Practice. It provides the possibility of solving complex cultural heritage protection and dissemination problems by creating brand new theories, methods and knowledge systems.

3.2 Analysis of the necessity of transdisciplinarity in this topic

Cizhou kiln porcelain is an important object of research for cultural heritage protection and innovative design due to its unique artistic characteristics. First, Cizhou ware porcelain is known for its strong decorative nature, with a variety of decorative techniques, including scratching, engraving and painting. The decorative patterns cover plants, animals, people and folk tales. These decorations

reflect a strong folk culture and not only have the value of cultural heritage, but also provide highly operable materials for digital pattern extraction and redesign. The involvement of digital technology, such as artificial intelligence and image processing technology, can achieve efficient extraction and classification of patterns, laying the foundation for the digital protection and recreation of traditional decorative patterns. Secondly, Cizhou kiln is known for its simple and elegant shape and “black and white” decorative style, and its distinctive visual impact has become an important manifestation of its artistic charm. Zhang (2000) pointed out that this formal beauty not only has local cultural value, but also has cross-cultural aesthetic appeal. This characteristic endows Cizhou kiln art with the potential for modern design innovation in the context of globalization, especially in the integration of design concepts and visual languages, which shows unique advantages. In addition, Cizhou ware is a folk kiln, and most of the works are daily necessities. The combination of functionality and artistry reflects its deep connection with popular culture. This characteristic provides a wealth of narrative resources for the re-creation of Cizhou kiln ceramics in the modern context. By combining narrative theory and cultural transmission theory, the historical and technological background of the Cizhou Kiln can be transformed into digital content that is suitable for contemporary audiences, further enhancing the impact of its cultural transmission. Finally, the “black and white contrast” style of the Cizhou Kiln has natural adaptability in contemporary design, especially in the framework of minimalist and modernist design concepts. Through transdisciplinary research methods, innovative paths can be explored that combine traditional culture with modern design. For example, applying the pattern elements of the Cizhou Kiln to virtual reality scenes or digital design products not only achieves the modern dissemination of culture, but also creates artistic products and decorative designs with contemporary aesthetic value.

3.3 Case study of transdisciplinary practice in digital preservation

Digital technology has been widely used in the field of intangible cultural heritage (ICH) protection, especially in the protection, dissemination and innovation of traditional crafts (such as embroidery and paper cutting). The introduction of these technologies is not only a tool-level innovation, but also a deep integration of transdisciplinary knowledge systems, reflecting the intersection and interaction of multiple disciplines such as art, technology, culture and communication. The following practical application cases of digital technology in ICH protection are used as examples to analyze the embodiment of transdisciplinary practice and explore the reference significance of these experiences in this topic.

First, the digital preservation project of Chinese Suzhou embroidery, which uses precision scanning, 3D modeling, artificial intelligence (AI) assisted design, and virtual reality (VR) technology to gradually realize the digital archiving and display of traditional embroidery techniques. Through image processing technology and artificial intelligence algorithms, the project trains models to recognize elements such as the geometric shape and color matching of embroidery patterns to generate new design schemes (Jimoh, 2020). Virtual reality technology also simulates the process of embroidery production, so that viewers can not only appreciate the finished embroidery, but also immerse themselves in the details and techniques of the creation. This project demonstrates the deep integration of art and computer science, while also introducing cultural anthropology and sociology perspectives to analyze the cultural context of embroidery techniques (Jimoh, 2020). Cultural anthropology research reveals the cultural symbolic meaning of embroidery patterns, which not only limits the application of digital technology to form reproduction, but also further explores the cultural connotations behind it, providing theoretical support for the cultural application of

technology.

The second example is the “Digital Exhibition of Blue and White Porcelain” at the Palace Museum. The “Digital Exhibition of Blue and White Porcelain” project at the Palace Museum uses digital scanning and motion imaging technology to recreate the creative process of blue and white porcelain and its historical and cultural background. This digital display has greatly enhanced the interactivity and communication effect of blue and white porcelain (Bebek and Canduran ,2024). In this project, the combination of art design and digital technology has promoted the modern expression of blue and white porcelain, while also achieving in-depth transdisciplinary cooperation, including the intersection of art, computer science, and materials science. By simulating the firing process, the project shows the color changes of the glaze at different temperatures and its chemical reactions (Zhang et al., 2020). Although digital technology enhances the visual effects of the display, the lack of a physical porcelain object for the audience to touch may weaken their perception of the materiality of the blue and white porcelain, which in turn affects the transmission of its cultural depth.

Based on this, the digital preservation and dissemination of Cizhou Kiln ceramics requires transdisciplinary cooperation and communication to avoid the limitations that a single discipline may bring. The unique decorative style of Cizhou Kiln ceramics and their simple and elegant shapes have natural adaptability in modern design. However, the digital research not only needs technical implementation, but also needs to focus on the combination of cultural narrative and user experience, avoiding only staying at the formal and technical level. By integrating transdisciplinary perspectives such as art, cultural communication and user experience design, the coordinated development of technology and culture can be achieved in the digital protection of Cizhou Kiln ceramics, which not

only ensures the authenticity of cultural content, but also innovates communication forms to enhance its communication power and influence in modern society.

4. The impact and application of transdisciplinary thinking on theory

This research involves the combination of Cizhou ware ceramic art and digital media technology. This topic itself is at the intersection of multiple disciplines. As a transdisciplinary study, it requires a transdisciplinary theoretical framework that can both deal with the deeper meaning of traditional cultural symbols and respond to the changes in modern digital communication technology.

4.1 Influence and application of semiotics

Semiotics, as a discipline that studies signs, meanings and their relationship with culture and society, not only focuses on the physical representation of signs (such as the form and content of ceramic patterns) during the digital transformation of cultural heritage, but also, more importantly, explores the process of generating the cultural meaning and value behind the signs. From a transdisciplinary perspective, the relationship between the signifier and signified of a symbol shifts from a fixed and stable form to a dynamic one. The multiple interpretations and re-creations of symbols are an important extension of semiotic theory. Hu (2020) emphasizes that symbols are not fixed and unchanging “references”, but are fluid and open to interpretation. Symbols not only convey information at the linguistic and visual levels, but also change in the cultural context and the audience's interpretation. Li (2024) further pointed out that the “openness” of symbols means that their meaning is multi-layered and dynamic. Especially in the context of digital communication, this theory provides us with a new perspective. Neige (2020) mentioned in “The Medium is the Man” that the medium is not only a carrier of information, but also shapes the way information is presented

and received. In the digital environment, the nature of symbols as information carriers has undergone a fundamental transformation, from traditional one-way communication to participatory and multi-directional interaction. In this context, the symbols of Majolica ceramics are transformed through the digital process into three-dimensional models or dynamic images in virtual reality. This transformation not only retains the core characteristics of traditional symbols, but also incorporates new cultural interpretations and technical forms of expression. This transformation process has prompted traditional symbols to re-enter the context of cultural communication, thus forming a kind of “reconstruction” and “recreation” of cultural symbols.

4.2 Influence and application to cultural communication studies

As a cultural medium, ceramics is characterized by a strong emphasis on continuity over time. Through long-term preservation, inheritance and interpretation, it carries the cultural value of the times. However, immersive interactive media breaks through this limitation. It can not only transmit visual, auditory, and tactile information, but also realize multi-dimensional cultural transmission through the interaction of space and time. When transdisciplinary practices are carried out, and immersive interactive experiences are introduced into the art of Cizhou ware ceramics, the medium-specific characteristics of ceramics are transformed, and it becomes a cultural medium that takes into account both space and time and has the ability to transmit in multiple dimensions. The theory of cultural communication itself is a transdisciplinary field of study that not only involves communication studies, but is also closely related to cultural studies, sociology, anthropology and other disciplines. In the era of globalization, cultural communication is a multi-level and multi-dimensional process. As a local cultural symbol, Cizhou Kiln ceramics has been introduced into the context of global communication through digital transformation. In this process, cultural

communication studies can analyze key issues such as cultural reproduction, audience interpretation and cultural adaptation. In the traditional cultural communication model, the audience is usually a passive recipient. However, in the digital age, the role of the audience has changed. They are no longer just receivers of ceramic art symbols, but also co-creators of these symbols and co-constructors of cultural meaning. “Communicative culture” emphasizes that digital media gives the audience more initiative, and that the audience not only participates in the decoding of ceramic symbols, but also participates in the creation of symbols and the reconstruction of cultural meaning. This process of “cultural co-construction” requires a participatory form of communication that meets the needs of contemporary society for individual autonomy and interactivity (Cizek and Uricchio, 2022). In the context of globalization, the dissemination of cultural symbols transcends geographical and cultural boundaries, and the meaning of symbols continues to change and blend on a global scale. In his book *The Cultural Dimension of Globalization*, Cizhou kiln ceramics in different cultural contexts, these elements will also gain new interpretations and diverse meanings. Digitalization is not the homogenization of culture, but the reconstruction and strengthening of local culture. It allows local culture to spread in the context of globalization and maintain its unique cultural identity.

4.3 Impact and application of the immersive experience

In immersive experiences, the decoding of symbols becomes more dynamic, and their meaning is expanded and deepened through the audience's interactive behaviour and sensory experience. Thanks to augmented reality (AR) technology, the ceramic kiln is no longer just a visual symbol, but an interactive system of cultural symbols. The audience can recreate and interpret these symbols by touching, rotating and listening to the soundtracks in the background. This process of ‘symbolic reconstruction’ not only breaks through the boundaries of traditional symbol decoding, but also

enriches the interpretation of the meaning of symbols. Through immersive experiences, the meaning of symbols is not only determined by external visual and auditory representations, but also by the audience's participation and behaviour. This participation reinforces the 'generative' nature of semiotic research. Immersive experiences not only expand the 'meaning' of symbols from traditional semiology to 'generativity,' but also give new life to cultural symbols in the context of global cultural flows (Eco, 1976).

5. The impact and application of transdisciplinary thinking on research methods

In this study, an integrated methodological approach is key, especially in a transdisciplinary context, combining qualitative and quantitative research methods to explore the digital transformation and communication effects of Cizhou kiln ceramic symbols in a comprehensive and in-depth manner. Qualitative research methods, mainly through literature analysis, art history research and semiotic interpretation, explore in depth the cultural context and symbolic meaning of the ceramic patterns of the Cizhou Kiln. Literature analysis helps to sort out the historical background, artistic characteristics and cultural connotations of Cizhou Kiln ceramics (Holé, 2022). Semiotic analysis, on the other hand, focuses on the symbolic system embedded in ceramic patterns and explores how these symbols convey specific cultural and historical information (Eco, 1976). In addition, qualitative research methods in interpretive phenomenology also collect audience members' cultural identity and emotional responses to Cizhou ware ceramics through in-depth interviews and other methods, especially during the digital display process, how the audience understands and recreates the process of ceramic symbols (Watson, 2024). These methods can deeply explore the cognitive and emotional responses of the audience in the immersive experience, thus providing theoretical support for subsequent design and communication strategies. Quantitative research

methods focus on systematically assessing audience acceptance and interactive experiences with digital displays through data collection and analysis. Specifically, this study will collect survey data and other information from visitors to augmented reality (AR) displays (Li, 2024) . This quantitative data can reveal the patterns of visitor interaction with ceramic works in digital displays and differences in the perception of cultural symbols in different virtual environments. The case study method can provide useful reference for the practical design of this study. By studying other digital display projects of cultural heritage, it is possible to understand the problems and challenges that may be encountered in the digitalization process, especially how to effectively balance the need for cultural authenticity and innovation in the process of reproducing and disseminating cultural symbols (Schauer et al.,2023) . It can also provide practical experience and theoretical support for this study. By comparing the implementation effects of different projects, it can help determine the digital display strategy and dissemination method suitable for Cizhou Kiln ceramics.

6. Discussion

6.1 Challenges in Transdisciplinary Integration

Transdisciplinary integration faces many challenges in the process of combining art and technology. First, the combination of art and technology often creates contradictions. For example, there is a huge contradiction between the standardization of technology and the individualisation of art. Technical requirements usually focus on functionality and universality, while artistic creation emphasises uniqueness and individuality (Soreanu, 2021). This contradiction is particularly evident in the digitalisation of ceramic art. When designing immersive experiences, the balance between the data structure of digital media and the aesthetic expression of ceramic art is a major challenge. For example, digital displays must comply with certain technical standards and formats, but these

formats may not adequately reflect the delicate details and cultural connotations of ceramic art. Secondly, the barriers to transdisciplinary dialogue should not be underestimated. Differences among disciplines in terms of theoretical background, research methods, evaluation criteria, timeframes and expectations often lead to communication difficulties when collaborating (Guyotte et al., 2024). One of the keys to research success is to effectively overcome these differences and integrate them into a unified system.

6.2 Potential Strategies and Solutions

In order to effectively meet the challenges of transdisciplinary integration, it is necessary to clarify the contributions and limitations of each discipline and avoid theoretical conflicts caused by excessive integration. In the specific process of transdisciplinary collaboration, researchers often face the challenge of ‘the problem is not mine, it's ours.’ In this collaborative process, participants must not only adapt to the transformation of their interdisciplinary identity, but also to significant differences from their accustomed individual creative methods. It is therefore necessary to view problems from a collective perspective, not just an individual one. This process prompts people to rethink how creativity is generated and what role collaboration plays in the innovation and problem-solving process. In design challenges, a key factor in successful creativity is how to combine individual creativity with the overall goals of the team (Guyotte et al., 2024). Transdisciplinary collaboration not only challenges individual creative habits, but also deepens thinking about how to find a balance in a team.

6.3 Advantages and Future Direction

In future research, technologies such as VR and AI-enhanced interactive technologies can be further introduced to broaden the scope of application of interdisciplinary practices in the digital

innovation of global cultural heritage. Through these new technologies, ceramic art can be presented in a more vivid way in an immersive environment, not only showcasing the visual art of ceramics, but also allowing the audience to more intuitively understand the production process and cultural background of ceramics through virtual experiences. For example, the 2023 Shanghai “Horizon of Khufu – An Immersive Exploration of the Pyramids of Giza” exhibition is an immersive virtual reality experience created by the French VR/AR content brand Excurio and the Harvard University Giza Project archaeological team. In the exhibition hall, wearing a special “backpack” and VR headset, the audience can explore the interior and surroundings of the Khufu Pyramid in Egypt as if they were really there. The underlying logic of this project is to build an immersive exploration platform to graft cultural IP. This model can be extended to ceramic art. Through VR storytelling, ceramic culture can be used as the narrative background. The combination of the two gives traditional IP market value, making the project have strong traffic dissemination response and commercial value. With the development of AI technology, the combination of ceramic art and AI has also ushered in new opportunities. By using AI to learn, analyze and extract the unique cultural symbols and aesthetic characteristics of each piece of porcelain, real-time images can be generated to further enhance the immersive experience. This intelligent reconstruction not only achieves a combination of tradition and modernity, but also provides new possibilities for the integration of diversity under transdisciplinarity (Norton and Veciana, 2024). Especially in a cross-cultural context, it is possible to combine Western culture with traditional Chinese ceramic cultural elements, providing new ideas for the design of future cultural and creative products .

7. Conclusion

This study explores how digital media technology can be combined with the art of Cizhou ware

ceramics from a transdisciplinary perspective, and analyzes the profound impact of digitization on the protection, dissemination, and innovation of traditional ceramic art. The study shows that digital technology not only protects Cizhou kiln ceramics, an important cultural heritage, but also broadens dissemination channels through innovative display methods, enhances audience interaction and participation, and promotes the inheritance of ceramic culture in modern society. The transdisciplinary practical application can break through the limitations of time and space, display Cizhou kiln ceramics in a novel way, and facilitate understanding of their deep cultural significance by audiences from different cultural backgrounds. Transdisciplinary integration is not just a combination of technologies. It provides a multi-dimensional analytical framework for this research, which can comprehensively evaluate the digital dissemination and cultural reconstruction of Cizhou kiln ceramics from multiple perspectives. This research framework not only promotes the effective integration of art and technology, but also provides innovative ideas for the digital dissemination of global cultural heritage.

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