Design Thinking Driven Digital Cultural and Creative Design: Pattern Construction and Practice Examples

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Abstract: In the digital era, it is important to explore innovative approaches for integrating Chinese excellent traditional culture with digital technology, and provide design practice examples for the digital transformation and dissemination of excellent traditional culture in the new era. In response to the Xin'An river landscape gallery Hongzhuang Museum, a series of digital cultural and creative products such as emojis, wallpapers, e-invitations, and profile picture were designed and developed based on a design pattern rooted in design thinking and leveraging innovative applications of digital technology. The development of digital cultural and creative products at the Xin'An river landscape gallery Hongzhuang Museum contributes to its digital transformation, strengthens the fusion of traditional Huizhou Hongzhuang culture with modern elements, expands the dissemination channels of Huizhou Hongzhuang culture, achieves sustainable development of Hongzhuang culture, and enhances its influence in contemporary society. Practical evidence shows that design patterns built on design thinking effectively support digital cultural and creative design practices, enabling creative inspiration and successful implementation. This practice can serve as a reference for the digital transformation and dissemination of Chinese excellent traditional culture.

Keywords: Design thinking, Digital cultural creative design, Traditional culture, Digital transformation and dissemination

1. Introduction

The report of the 20th National Congress of the Party points out that promoting cultural self-confidence and self-improvement, implementing the national cultural digitization strategy, is an important task of building a cultural power. Chinese excellent traditional culture is a carrier for the continuation of Chinese civilization, which has significant meaning in building a cultural power. Vigorously promoting cultural and technological innovation, promoting the digital development of excellent traditional culture,[1] integrating it with the daily life of contemporary people, has become a basic cultural policy in the strategy of cultural power. [2] Digital technology has the advantages of resource integration, diversity, and a wide audience. It can effectively overcome some difficulties in the process of traditional cultural inheritance, such as fragmentation of ideas, single means, and systematic faulting, [3] which helps to realize the systematization of traditional cultural resources, diversification of inheritance methods, and innovation of products. Promote the protection, inheritance, and development of traditional culture in contemporary society. Digital cultural and creative products relying on technological progress have become an important carrier for the contemporary inheritance and dissemination of traditional culture.^[4] However, there are still many problems in the design of digital cultural creation. In the field of practice, there are quite a few digital cultural and creative products with simple element mapping, serious homogeneity, unreasonable use of technology, and lack of deep integration with traditional culture; [5] In related theoretical research, few researchers explore the design mode of digital cultural creation from a practical theoretical perspective. [6] Based on this, this article draws on the theory of "Design Thinking", innovates design models, and carries out digital cultural creation design practice.

This paper uses the Xin'An river landscape gallery Hongzhuang Museum as a case study, aiming to fully excavate the cultural resources of the Hongzhuang Museum, use the advantages of new media technology and mobile terminal transmission, and design digital cultural and creative products that meet consumer needs. Allow users to have a good visual experience, interactive experience and spiritual resonance, so as to better understand the connotation of Hongzhuang culture, and further

promote the inheritance and development of excellent traditional culture.

2. Literature Review

2.1 Design Thinking

The concept of design thinking originated from the "designer system method" proposed by Leonard Bruce Archer. Due to the continuous expansion of the connotation of design thinking, the application field is also constantly expanding, so there is no exact definition, but generally, its definition mainly includes the following three types:

The first is the method view. Design thinking is a method system for problem solving and design innovation, formed in the 1960s, and was initially considered an innovative methodology based on the practice and actions of architects, designers, and engineers.^[8] Tim Brown^[9], CEO and President of IDEO, believes that design thinking is a methodology that can meet people's needs and desires in technology and strategy at the same time. With the wide application in multiple disciplinary fields, design thinking is no longer simply limited to the innovative methods of designers,^[10] but can be a universal innovative methodology in various professional fields.^[11]

The second is the innovative process view. Design thinking is an innovative process to find the best solution to a problem. Li Yanyan et al. [12] propose that the essence of design thinking is a nonlinear, iterative, and cyclical innovative process from identifying problems to solving problems. Rim Razzouk et al. [13] define design thinking as a complex creative process, which gives people the opportunity to experiment, build prototypes, collect feedback, and redesign.

The third is the cognitive ability view. Design thinking is an innovative thinking ability that starts from the perspective of the designer, thinks and solves problems in a unique way, grasps the process of design, rather than the results of design. [14] Chen Xin et al. [15] believe that design thinking is a people-oriented, user-centered.

These three theories are all mappings and applications of the concept of design thinking. Fundamentally, design thinking is a process that helps people to use their existing knowledge and abilities in an integrated way when dealing with complex problems, adopting effective thinking frameworks and methods, starting from defining the problem, through creativity, conception, prototype iteration, testing, etc., to ultimately achieve the solution of the problem.^[16]

2.2 Digital Cultural Creative Design

The digital culture industry refers to the emerging industry of cultural creation, production, dissemination, and services that integrates networking, digitization, and intelligence, with cultural creativity as the content and digital technology as the basis. [17] Its main carrier is digital cultural creative products. Digital cultural creative design should aim for high-quality works, with excellent spiritual culture as the content, innovative ideas as the catalyst, and digital display as the medium, to create outstanding cultural creative products that integrate culture and education. [18] However, there are still many problems in the current digital cultural creative design, such as insufficient development consciousness, uneven design level, and insufficient collaborative innovation. [19] Excellent digital cultural creative design should fully utilize the role of digital technology and comprehensively intervene and change the concepts, methods, processes, and results of cultural creative design. [20] Paying attention to the essence of cultural innovation, enriching the content and form of digital cultural creative products, [21] and strengthening the spiritual and cultural core of digital cultural creative design are the main directions for the future development of digital cultural creative design.

Looking at past research, the related research on digital cultural creative design mainly focuses on discussing its current status, problems, and development trends from a macro perspective. Only a minority of studies focus on the methods and strategies of digital cultural and creative design, and these are often scattered within comprehensive cultural and creative design research. There are relatively few studies specifically exploring the practice of digital cultural and creative design. Therefore, this paper attempts to develop a new design model with design thinking as the theoretical prototype. Using the Xin'an River Landscape Gallery and Hongzhuang Museum as the subject, it explores the practice of digital cultural creative design, hoping to provide new ideas and methods for the practice of digital cultural creative design.

2.3 The Intrinsic Compatibility of Design Thinking and Digital Cultural and Creative Design

Although design thinking is widely applied in various fields, it originates from the design field, so its core philosophy naturally aligns with the goals of digital creative design. Design thinking has been highly recognized in the process of product and service development. Among these, the following three basic characteristics are particularly prominent: ① Empathy, this is the core philosophy of design thinking, emphasizing a human-centered approach and valuing the needs and feelings of users; ② Socialization, design thinking emphasizes full-process research on project problems, striving to accurately grasp and define the overall situation of the project to be solved; ③ Iterativity, design thinking requires constant trial and error and revisions in practice, inspiring thinking through a non-linear iterative process. Digital creative design takes the combination of digital technology and cultural innovation as its goal, emphasizes a human-centered design approach, pays attention to user experience, and values the collaborative work of enterprises, designers, production personnel, and computer technology personnel in the design process, focusing on the development and application of virtual products. The final design results are often presented in a non-material, digitized form, and great emphasis is placed on the renewal and replacement of products and services.

Overall, design thinking aligns with the requirements of digital creative design in terms of operational methods, practical concepts, result objectives, and applicability, and can play an important role in the current development of digital creative design. Therefore, the integration and application of design thinking can enrich the practical and theoretical foundations of digital creative design. [24]

3. Digital Cultural and Creative Design Pattern under the Guidance of Design Thinking Model

The design thinking model shows the theoretical framework in design thinking, with different users constantly transforming and innovating it based on their needs. Among these, the design thinking model of Stanford University Design School is the most widely used and relatively mature. In this model, the design thinking model is divided into five stages: empathy, definition, ideation, prototyping, and testing. The core goal of empathy is to fully understand the users and their various needs, laying the foundation for the following definition and ideation; definition helps designers find pain points and needs from research results, and after analysis and summary, define key problems; ideation is to generate concepts for the core problems, generally done in a group, with members proposing concepts and organizing ideas through various brainstorming techniques; prototyping visualizes the initial scheme, and by continuously creating, testing and revising, gradually generates the solution that best fits the user's needs; testing is handing over the design prototype to all parties for testing and getting feedback, thereby continuously improving the product scheme. [25]

This article integrates the digital cultural and creative design patterns with the help of the design thinking model from Stanford University's School of Design. Considering the realism and effectiveness of the design theme, it retains the core concepts of the existing model, integrates the process and reassigns the connotation, and finally forms a digital cultural and creative design pattern containing three stages (as shown in Figure 1).

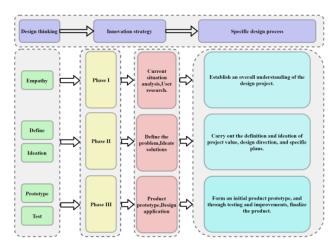


Figure 1: Illustration of digital cultural and creative design patterns.

First stage: Status quo analysis and user research. This stage aims to establish an overall understanding of the project by conducting in-depth research to understand user needs. First, it is necessary to perform a status quo analysis, exploring the real problems faced by the design object in the development of contemporary society. For example, the combination of digital technology and cultural innovation lacks flexibility, product promotion is insufficient, and the product presentation form is monotonous, etc. The next is user research, which is the core of this stage and the focus of the entire design process. It is necessary to grasp the principle of user-centricity, observe the daily behavioral habits of the target group, enter real-life situations to explore the explicit and implicit needs of users. By contacting users through various methods such as interviews and questionnaires, try to understand the users' real thoughts as much as possible.

Second stage: Defining problems and conceiving solutions. Based on the research results of the first stage, gather the collective wisdom of the team to define and conceive the project value, design direction, and specific solutions. In defining the problem, it is first necessary to sort out the data to clarify the central value of the product, and to systematically classify the focus points that can reflect the project value, thereby defining the core problems. For example, the cultural, entertainment, and practicality of the product. In the ideation of solutions, the team needs to work together, using brainstorming to continuously inspire inspiration, promoting the innovative vitality and creative thinking of team members, and finally determine the optimal design scheme through voting and negotiation.

Stage three: Product prototype and design application. The main task of this stage is to form an initial product prototype based on the previously determined design plan, and through testing and improvement, form the final product. In the design prototype phase, it is necessary to systematically sort out the project design ideas based on the survey results of the first stage and the project definition and plan of the second stage. The conceptualized and ideologized outline of the definition stage is transformed into visualized and substantial expressions to form a prototype of the work. In the design application phase, the product prototype needs to undergo user experience testing. Analyze problems that users may encounter during use, improve and update, and output a higher quality product for final application.

4. Design Practice

4.1 Phase I: Current Situation Analysis

After on-site investigation and collection and organization of literature, I have a comprehensive understanding of the HongZhuang Museum.In terms of strengths, the collections in the Hong Zhuang Museum are uniquely characterized by Huizhou wedding culture, and the museum displays luxurious and exquisite ancient Huizhou wedding items, possessing a strong potential for digital transformation. The HongZhuang Museum has a distinct theme, unique features, and certain advantages in publicity. Additionally, the ancient Huizhou wedding culture embodies a vision of harmonious and beautiful marriages, which is beneficial in positively guiding the marriage concepts of contemporary people and has a positive significance for the harmonious development of society. In terms of weaknesses, firstly, the HongZhuang Museum is located in a remote area with inconvenient transportation and relatively low popularity. Secondly, as a small folk museum, the HongZhuang Museum has relatively limited funds, making it difficult to support large-scale, high-end digital cultural creative design development and promotion. Lastly, the HongZhuang Museum itself has weak awareness of promotion, relatively single means of publicity, and neglects the importance of digital cultural creative product development, which has a certain gap with market demand.

Based on the above analysis, in the following digital cultural creative design development, we can make full use of the advantages and characteristics of the HongZhuang Museum, design digital cultural creative products that meet market demands, and promote them through appropriate publicity means. At the same time, propose corresponding solutions for the weaknesses, increase popularity and attractiveness through innovative design, and attract more audiences and tourists.

4.1.1 User Research

User research was conducted using online questionnaires, with the aim of understanding users' true intentions towards digital cultural creative products. The questionnaire is divided into three parts: basic user information, user theme opinions, and user product preference surveys. The survey was conducted in January 2023, a total of 275 questionnaires were distributed, and 265 valid questionnaires were

collected.

4.1.2 Results of Basic User Information Survey

The gender ratio of the survey respondents was fairly balanced, and most had at least a bachelor's degree. The targeted users are typically proficient in using the internet and electronic media, which fits the main user group currently interacting with digital creative cultural products.

4.1.3 User Theme Opinion Survey Results

Most users focus on the cultural value of museum digital creative cultural products when choosing them, with the main purposes for purchasing being travel memorabilia and personal hobbies. They reported that there are still some issues with current museum digital creative cultural products, including insufficient integration of traditional culture and digital design, a strong commercial bias, lack of educational significance, a single mode of communication, inadequate publicity, and monotony in product presentation.

4.1.4 User Preference Survey Results

First, users generally lack a comprehensive understanding of the Hongzhuang Museum.Next, users hope that the digital creative products of the Hongzhuang Museum can be used on chatting platforms (such as Facebook) and entertainment platforms (like short videos, games).In terms of creative carriers, users prefer forms like personalized profile picture, selfie decorative elements, wallpaper backgrounds, and emoticons.Furthermore, users believe that the digital creative products of the Hongzhuang Museum should be boldly innovative, while respecting and inheriting traditional culture. They expect the products to have aesthetic designs, unique creativity, and to reflect cultural values. Finally, users hope that the digital creative products of the Red Makeup Museum can convey meanings of wellbeing, longevity, blissful love, and abundant fortune. In terms of design style, the Chinese style is the most popular among users.

4.2 Phase II: Problem Definition

Through the analysis of the first phase, it has been determined that the core of this design is to highlight the cultural value of Hongzhuang and promote its inheritance and dissemination based on this. As a concentrated manifestation of Huizhou wedding culture, the collections in the Hongzhuang Museum have a profound cultural heritage and rich cultural connotations. However, with the rapid development of modern society, these Hongzhuang items are gradually drifting away from the lives of contemporary people, causing challenges to the inheritance of traditional culture. When designing, it is important to grasp the core essence of the Hongzhuang Museum, combine it with digital technology, and develop its cultural value in line with the times, promoting the excellent cultural traditions of Huizhou Hongzhuang culture that are in line with the development of the times and the aesthetic needs of contemporary people. Furthermore, due to the size limitations of the Hongzhuang Museum itself, its publicity channels are relatively scarce, and it is necessary to use a variety of types of digital creative products to expand its cultural dissemination channels. In summary, during the design process, it is necessary to reflect the characteristics of Hongzhuang culture while considering consumer aesthetic preferences, control the experience cost and usage difficulty of the product, and at the same time improve the dissemination of the product.

4.2.1 Conceptualize the Plan

This session mainly uses the online brainstorming method. A group of five design professionals conduct the brainstorming, and the design plan is established through voting. The total process lasts eighty minutes, and the final result is shown in Figure 2.



Figure 2: Brainstorming process and results presentation.

The brainstorming process for digital creative design includes the following steps:Step 1, reach a consensus. First, introduce the basic situation of the Hongzhuang Museum to the group members, including its history, theme, collection, and style; secondly, clarify the purpose of this brainstorming, that is, digital creative design for the Hongzhuang Museum; finally, introduce the process and rules of brainstorming.Step 2, categorize and communicate. Using the preliminary survey data as a reference, the theme is categorized.Step 3, brainstorming. Participants output their opinions freely. Participants freely express their views, with each person using a sticky note of a certain color to represent an idea.Step 4, voting and organizing. The team members vote separately for the theme, metaphor, carrier, and style. Each person can cast 4 votes for the first three options and 2 votes for the style option. After organizing, the following creative associations were finally obtained:

- (1) Themes: Juxtaposed Lotus, pomegranate, bat, happiness.
- (2) Implications: Good things happen, childhood sweethearts, wealth rolling, many children, many blessings.
 - (3) Medium: Red envelope cover, watermark, profile picture, emojis.
 - (4) Styles: Chinese style, pixel style.

After integrating the research and brainstorming from the first and second stages, the perspectives of users and designers are organically combined. The final product forms are determined as emoji packs, wallpapers, electronic invitations, profile picture decorations, and selfie effects. Traditional Chinese red is, without exception, designated as the thematic color for marriage culture. By combining auspicious elements from the Hongzhuang Museum with brainstorming creative fruit, the digital cultural and creative product design is carried out.

4.3 Phase 3: Product Prototype

4.3.1 Emojis

The inspiration for the emojis comes from the circular longevity patterns (main element) and Lang Wu-style decorative patterns (secondary element two) in the Hongzhuang Museum, supplemented by other traditional Chinese auspicious elements, for deconstruction and recombination, forming emojis that are imbued with traditional Chinese imagery. The prototype series of emojis includes the following four groups: a combination of the word "Lu" in circular form and a money tree pattern to represent wealth and good fortune, the word "Xi" in circular form combined with a cloud pattern for Overjoyed beyond expectations, the word "Fu" in circular form with a lotus pattern for continuous good luck, and

the word "Shou" in circular form combined with a bat pattern for good fortune and longevity come to the door. (See Table 1).

Name	Main Elements	Secondary Element I	econdary Element II	Composition Method	Implication
Wealth and rank bring auspiciousness				Axial symmetry	Symbolizes a smooth career and continuous wealth.
Overjoyed beyond expectations		E 230		Axial symmetry	Implies encountering unexpected lucky events.
Continuous good fortune				Axial symmetry	Hopes for continuous happy events in life.
Good fortune and longevity come to the door				Axial symmetry	Represents a happy life, long life, and health.

Table 1: The combination of elements of emojis design.

4.3.2 Wallpaper

The wallpaper combines the creative results of the brainstorm with the auspicious elements of the Bridal Gallery, establishing three themes: good things happening, childhood sweethearts, and certain wish fulfillment."Good things happening" abstracts traditional elements such as persimmons, peanuts, lotus flowers, and gold ingots, organically combining them with the floral patterns in the Bridal Gallery. In traditional Chinese culture, "persimmons," "lotus," and "peanuts" all symbolize blessings of good fortune and many children for the newlyweds. The design of "Childhood Sweethearts" uses the traditional ice bamboo pattern as the base, with hand-drawn plum blossom patterns as decoration. The homophonic bamboo and plum symbolize pure and profound affection between the sexes. The idea of "Certain Wish Fulfillment" comes from traditional Chinese auspicious patterns. It uses the homophony of "pen" and "ingot," with a pen and a gold ingot as the main elements, and the "Ruyi" pattern as the base, bearing the blessings for the newlyweds' future life to be smooth and satisfying. (See Table 2).

Background Composition Method **Implication** Name **Main Elements Elements** The homophony of Continuous pattern in four persimmons and Good things squares, Main elements peanuts symbolizes happen randomly scattered. good things happening. The ice bamboo Childhood pattern and plum Main elements randomly sweethearts scattered. blossom symbolize deep emotions. The background is a The homophony of continuous two-square pen and ingot Surely satisfactory pattern, with main elements symbolizes a life as arranged alternately. one wishes.

Table 2: The combination of elements of wallpaper design.

4.3.3 Electronic Invitation

In contemporary wedding culture, notifying relatives and friends of wedding information through online methods such as Email and Facebook is a popular emerging invitation method. The prototype design of the electronic invitation uses the costume accessories from ancient weddings as the main element, combines the implication of double happiness, and is designed through a combination of various auspicious elements. (See Table 3).

Table 3: The combination of elements of electronic invitation design.

Name	Draft	Decorative Background	Composition	Lesson be Learned
Happy events happen at the same time			Axial symmetry	Romantic Love happy and beautiful.

4.3.4 Profile Picture Decorations and Selfie Effects

Profile picture decorations and selfie effects are among the most popular online social products today. The design prototype is mainly inspired by the traditional wedding attire of "Feng Guan Xia Pei" were clothing accessories worn by women in ancient times when they got married, and are important symbols of honor and wealth at specific moments. Based on this, the groom's crown is combined to design the online avatar accessories and selfie effects needed in a digital context. (See Table 4).

Table 4: The combination of elements of Headwear accessories and selfie effects design.

Name	Sketch	Source of Inspiration
"Feng Guan Xia Pei"I		Ancient headdress for weddings.
"Feng Guan Xia Pei"II		Ancient headdress for weddings.

4.4 Design Application

Soliciting opinions from design professionals and users, the design prototype is integrated and modified. After iterative improvement, the following design results are finally formed.

4.4.1 "Fu Lu Shou Xi"Series of emojis (Figure 3)



Figure 3: "Fu Lu Shou Xi" series of emojis (Author's homemade).

4.4.2 Fresh and Ancient Style Series Wallpaper (Figure 4)



Figure 4: "Fresh Ancient Style" series wallpaper (Author's homemade).

4.4.3 "Xi Xiang Feng" Electronic Invitation (Figure 5)



Figure 5: "Xi Xiang Feng" electronic invitation (Author's homemade).

4.4.4 Profile Picture Accessories and Selfie Effects of the "Feng Guan Xia Pei "Series (Figure 6)



Figure 6: "Feng Guan Xia Pei "series (Author's homemade).

5. Conclusion

Huizhou's Hongzhuang culture is an integral part of Chinese regional folk culture, and the Xin'An river landscape gallery Hongzhuang Museum bears the important mission of protecting and inheriting traditional wedding culture. Under the guidance of the design thinking model framework, this article has formed a new digital creative design process and conducted the digital creative design practice of the Xin'An river landscape gallery Hongzhuang Museum, which truly considers the problems faced by the Hongzhuang museum itself and user needs, and is committed to enhancing the integration of Huizhou's Hongzhuang culture into the modern era and widening the dissemination of Hongzhuang culture. Through practical verification, the application of the design thinking model framework and its innovative design patterns allows designers to consider problems more comprehensively, provide users with a better digital cultural experience, and provide new ideas for the inheritance and dissemination of folk culture.

Chinese outstanding traditional culture is the root and soul of the Chinese nation and the crystallization of Chinese civilization's wisdom. In the process of building a modern socialist country, Chinese outstanding traditional culture has always been our source of thought, historical foundation, and cultural heritage. ^[26] We are currently in a significant global shift unseen in a century. Unearthing content from tradition that aligns with the times, and promoting the adaptation and coordination of excellent Chinese traditional cultural resources with modern society, are the key cores in this significant shift. ^[27] Excellent traditional culture has never lacked the genes that align with the times, but only lacks fresh perspectives and communication means that conform to the trends of the times. The digital cultural creative design model under the guidance of the design thinking model can provide innovative path references for the digital transformation and dissemination of traditional culture, give traditional culture a new life through design innovation, break through traditional limitations, expand communication boundaries, and inject new vitality into its subsequent development. Using digital design to tell Chinese stories can promote the wider dissemination of excellent Chinese traditional culture, demonstrate the cultural confidence of the Chinese nation in the new era, and is also an important mission entrusted to designers and practitioners in the new era.

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References

- [1] Wei Pengju. The Digital Path to a Culturally Strong Country[J]. Frontiers, 2022(23): 40-47.
- [2] Fan Zhou. From "pan-entertainment" to "new cultural creativity" Where is the new "new cultural creativity" where is the road of cultural and creative industry?[J]. People's Tribune, 2018(22): 125-127.
- [3] Zhou Jianxin. The Rational Approach and Practical Innovation: Digitizing Excellent Traditional Chinese Culture[J]. Theory Monthly, 2022(10): 82-88.
- [4] Pan Daoyuan. From Technological Change to Creative Drive: the Cultural and Creative Mechanism of the Paradigm Shift of Economic Innovation in the Digital Era[J]. Journal of Shenzhen University (Humanities & Social Sciences), 2020, 37(04): 74-81.
- [5] Tang Xiaoying, Li Wanying. Digital Cultural Creative Design of Folk Museum from the Aesthetic Perspective of MOETANG [J]. Packaging Engineering, 2022, 43(24). 306-315+323.
- [6] Lin Lin, Shen Shusheng. The Connotation and Training Strategies of the Design Thinking[J]. Modern Distance Education Research, 2016(06): 18-25.
- [7] Chen Xin. Research on the Application of Design Thinking in Public Library: laking the Maker Space of Guangzhou Libraryas an Example[J]. Library, 2020(04): 79-84.
- [8] Xu Jun, Liu Gang, Huang Xiandong. Teaching Experiment of Design Thinking Based for the Innovation Course: Taking DET Innovation Workshop of Nanjing College of Information Technology for Example [J]. Art & Design, 2017(09): 75-77.
- [9] Brown T. Design Thinkng. Harvard business review, 2008(6): p1-9.
- [10] Qian Xiaobo. Challenges and Perspectives of Embedding Design Thinking in the Organizational Culture [J]. Art & Design, 2018(04):90-93.
- [11] Guan Guanghai, Zhang Pengfeng, Zhang Xusheng. Empathy: the Key of Design Thinking Training [J]. Journal of Shanghai Educational Research, 2020(11):10-14.
- [12] Li Yanyan, Xie Haixia. A Study on the integration of innovation and Entrepreneurship Education and Design Thinking [J]. Research in Higher Education of Engineering, 2019(0 3):156-161.
- [13] Razzouk R, Shute V. What Is Design Thinking and Why Is It Important? Review of Educational Research, 2012. 82(3): p330-348.
- [14] Zhou Ziming, Zhang Zhi, Yuan Lei. STEAM Education Integrated with Design Thinking: Model Construction and Case Analysis [J]. Modern Distance Education, 2021(01):56-62.
- [15] Chen Xin, Ke Ping. Application Research of Design Thinking in Library[J]. Library Work and Study, 2019(05):37-41
- [16] Yan Hanbing, Zheng Donafang, Li Xiaoying. Design Thinking: An Indispensable Enabling Methodology in Maker Education[J]. e-Education Research, 2017, 38(06):34-40+46.
- [17] Zheng Wei, Wu Jingqi. New Patterns and Trends of Digital Cultural Industry [J]. Journal of Shenzhen University (Humanities & Social Sciences), 2022, 39(01):60-68.

- [18] Lu Rui. An analysis of the digital presentation and brand promotion of cultural and creative products. [J]. View on Publishing, 2020(13):92-94.
- [19] Gu Liangliang. Research on the design strategies of digital cultural and creative products for archives. [J]. Archives & Construction, 2022, (02):55-56.
- [20] Wang Mingyue, Li Xiuyuan. Digital Cultural and Creative Design of Traditional Crafts under the Concept of Simultaneous Development of Tao and Qi [J]. Arts Criticism, 2020(12):139-150.
- [21] Fan Zhou. Innovation and Development of Cultural Industry in the Revolution of Digital Economy [J]. Journal of Shenzhen University (Humanities & Social Sciences), 2020, 37(01):50-56.
- [22] Wang Xiaoming, Li Han. Exploring the digital communication strategy of minority non-material cultural heritage in Heilongjiang Province from the perspective of "Internet Plus". [J]. Heilongjiang National Series, 2019(02):88-93.
- [23] Zhang Hongying, Zhuang Junming, Liu Lu, Wang Zhijun. Research on Innovative Course Design Guided by Design Thinking [J]. Modern Educational Technology, 2019, 29(10):100-107.
- [24] Hong Liu, Peng Shiqi, Xu Ke, Chen Yu. Service-Learning Curriculum Design: A Practical Framework Based on Design Thinking [J]. Fudan Education Forum, 2020, 18(05):63-70.
- [25] Chen Peng, Huang Ronghuai. Design Thinking: from the Maker Movement to the Cultivation of Innovation Ability [J]. China Educational Technology, 2017(09):6-12.
- [26] Liu Yuli. Fine traditional Chinese culture: the historical root and cultural foundation of building China into a great modern socialist country [J/OL]. Gansu Social Sciences: 1-9[2023-03-15].
- [27] Li Shaoduo. The Innovated Transformation of Chinese Excellent Traditional Cultural Resources: A Change of Perspective Centered on Youth Culture [J]. Theory Monthly, 2023(01):103-110.