

Research on the Interface Design of Persimmon Dyeing Culture based on Situation Construction

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Abstract: China's persimmon dyeing culture has a profound heritage and is rich in national characteristics. However, with the departure of the production artists, the persimmon dyeing culture is facing the severe challenge of rapid extinction. In order to continue to promote Chinese persimmon dyeing culture and improve the public's awareness of persimmon dyeing, by analyzing the historical background, artistic value, and social significance of persimmon dyeing culture, and building a theory based on the situation, a small program of persimmon dyeing culture was constructed to spread Chinese persimmon dyeing, to enhancing user experience and cultural identity. The research adopted a multi-disciplinary research method, which was user-centered and combined with historical document research, sociology, art, and information technology to comprehensively analyze the persimmon dyeing process. User testing and feedback show that the small program is highly interactive, has high user participation and can provide users with an immersive experience. This research not only has important practical value for the inheritance of persimmon dyeing culture, but also provides new perspectives and methods for the digital dissemination of traditional culture.

Keywords: Persimmon Dyeing; Situation Construction; Interface Design; User-centered Design.

1. Introduction

Persimmon dyeing is a plant-based soft color craft with a long history, which first originated in the Tang Dynasty in China. Persimmon dyeing is usually done by squeezing the juice from unripe persimmons and oxidizing it onto the fabric. After exposure to sunlight, the color gradually becomes fuller and darker. Persimmon dyeing can be dyed directly or combined with other dyeing and weaving techniques such as batik and tie-dye [1]. It has good anti-corrosion and moisture-proof properties and unique artistic expression. The art of persimmon dyeing has unique decorative value. From picking fresh green persimmon fruits to processing and juicing the persimmon fruits, there are no additives during the process, and it is a purely natural creation [2].

As a traditional handicraft with unique charm, persimmon dyeing's protection and inheritance have become important issues in the cultural field [3]. However, there are still many shortcomings in the current dissemination and application of persimmon dyeing culture in modern society, such as single communication channels, limited audience groups, insufficient interactive experience, and homogenization of persimmon dyeing textiles [3]. Therefore, this study aims to explore a new path for the dissemination of traditional culture in the digital age by designing a context-based Kakiran cultural applet. First of all, to improve the awareness of persimmon dyeing, people mostly stay at tie-dyeing or batik with blue background flowers for plant dyeing but do not have a deep understanding of the craftsmanship of persimmon dyeing. Secondly, enrich persimmon dyeing products and types, and pay attention to the mechanical expression and pattern application in the dyeing process [1]. Thirdly, expand the communication channels of persimmon

dyeing culture, invite users to participate in the design process, and effectively integrate the relevant elements of persimmon dyeing culture so that the mini program design can better meet the needs of users, create an attractive and educational user experience, and enhance the design of persimmon dyeing culture. the visibility and influence of dye culture.

2. Literature Research

Situated Learning Theory is an educational and psychological theory that emphasizes that the learning of knowledge and skills is in a specific social and cultural context, through practice built for activity and interaction [4]. With the continuous development of the field of design, situation construction theory has become an indispensable tool in design practice. It emphasizes considering the user's behavioral, psychological and environmental factors in the design process to improve the user experience[5]. It has been widely used in the field of design, such as furniture design, teaching models, cultural tourism products, catering spaces, learning environments, etc. Zhu Ying and Xue Xiaorui studied the interaction between people and pets in the home environment through situation construction method, and proposed strategies to optimize the interactive experience[5]. Zhang Lu and others explored the application of VR technology in constructing simulated teaching situations to enhance students' learning interest and problem-solving abilities[6]. Hu Linhui and others use spatial narrative techniques to display national culture and improve the quality of exhibition space design through situational presentation [7]. Although the application of situation construction theory in the design field has made some progress, there are still some shortcomings. For example, existing research may not fully

consider the adaptability of different learning styles and the design of personalized learning paths [8]. Research on cultural and artistic contexts may lack consideration of cross-cultural contexts and exploration of the depth of integration of modern technology [9]. Research on interaction and experience contexts needs to further focus on the persistence and emotional connection of users' long-term interactions [10], while research on service and experience contexts needs to consider more sustainability and social impact [11].

The innovation of persimmon dyeing can be carried out around three aspects: design application, dyeing method, and artistic effect [3]. Therefore, in the process of interface design practice, relevant elements can be used to enrich the visual effects. As a new type of communication medium, mini-programs are widely used in the field of cultural communication. Researchers have explored the role of mini-programs in information dissemination and user interaction. Existing research mostly focuses on the technical characteristics and market applications of mini-programs, and there is far from enough in-depth discussion on how to design mini-programs based on specific cultural content, such as persimmon dyeing culture. Therefore, this article mainly focuses on the following issues:

1. How to reflect the elements and values of persimmon dyeing in small program design?
2. How to use situation construction theory to enhance

users' cognitive and emotional investment in persimmon dyeing culture?

3. In small program design, how to balance the traditional characteristics of persimmon dyeing culture with the innovative application of modern technology?

3. Design Practice

Situation construction theory refers to the fact that learners make the transition from observing and learning at the edge to the center by participating in the practical activities of the community, gradually increasing the depth and breadth of participation, and finally becoming participants in the community. Community members communicate, cooperate, and participate in activities together to build and transfer knowledge [4]. In a specific persimmon-dyeing cultural background, the user's persimmon-dyeing culture learning content is closely related to the learning environment. The user can transition from a persimmon dyeing culture learner to a communicator, and finally to a persimmon dyeing culture builder. As the frequency of use of the persimmon dyeing culture small program continues to increase and community participation increases, the user's identity can change from a novice to an expert.

3.1. Background of the Project



Fig 1. Record of fabric coloring experimental steps



Fig 2. Persimmon dyeing cultural and creative products

As China's persimmon dyeing culture becomes popular in Southeast Asian countries, the government pays more and more attention to the inheritance and development of intangible cultural heritage, and the public gradually favors the art of persimmon dyeing. As a raw material, persimmon has a large output and low cost. Persimmon juice is formed as a dye by extracting, squeezing, or fermenting it. Our team tried to enrich the colors of persimmon dyeing by combining it with different mordants. First, take equal amounts of four mordants, alum, green alum, white alum, and blue alum, in a cup, add water to dilute and mix to equal concentrations; secondly, take six pieces of cloth of the same size and material, put them in the cup, and observe the surface of the cloth color condition, slowly pour the same amount of persimmon paint into the cup and observe the color change of the cloth at this moment, take the cloth out to dry and observe the difference between the cloth and the control group. The experimental steps carried out by our team are shown in Figure 1. Persimmon dyeing cultural and creative products are shown in Figure 2.

3.2. Preliminary Investigation

In the early research stage, it is crucial to have a deep understanding of user needs. Adopting a user-centered design method, combined with situation construction theory, and taking the user's actual usage situation as the starting point, we design a mini program that meets the user's needs and cultural background. We invited 3 interface designers to participate in persimmon dyeing's experimental design process. At the same time, users' level of knowledge, interests, expectations, needs, etc. about persimmon dyeing culture were collected through questionnaires and interviews. The analysis results show that users have a strong interest in the traditional craftsmanship and aesthetic value of persimmon dyeing culture. Still, at the same time, there is also a problem of insufficient understanding of persimmon dyeing culture. Users expect mini programs to provide highly interactive, easy-to-operate interfaces, as well as rich cultural knowledge content. In addition, through literature review, we learned about the historical origins, production techniques, and evolution of persimmon dyeing in different historical periods. We also conducted in-depth interviews with persimmon dyeing craftsmen to obtain the details and characteristics of persimmon dyeing technology. On this basis, we extracted the unique colors, patterns, and production techniques of persimmon dyeing, and discussed how to embed the elements of persimmon dyeing into the mini program interface design to enhance the user's cultural experience.

3.3. Functional Design

In the functional design stage, based on the preliminary user demand analysis, the functions were initially determined as introduction to persimmon dyeing culture, process display, interactive experience, and community communication. The persimmon dyeing culture module mainly provides information on the historical background, production technology, and cultural significance of persimmon dyeing; the process display module displays the production process of persimmon dyeing through a combination of video and pictures; the interactive experience module allows users to experience the dyeing process by simulating it persimmon

dyeing process; the community communication module provides a space for users to share their thoughts and exchange experiences. At the same time, interactive games, Q&A, and other links are designed to enhance user participation and stickiness. Each functional module has a clear goal so that users can quickly find content of interest. These functional modules can not only meet users' needs for understanding persimmon dyeing culture, but also provide a platform for interaction and communication, enhancing users' sense of participation and belonging. When prioritizing functions, based on user feedback and the importance of functions, cultural knowledge introduction and craft display are regarded as core functions, while community communication is used as an auxiliary function.

3.4. Information Architecture Design

In the information architecture design stage, focus on the logic and hierarchy of information design [12]. Divide the interface design into the homepage, social, mall, and mine. The home page can be divided into recommended copywriting, popular videos, craft introductions, historical stories, etc. to facilitate users to understand the knowledge of persimmon dyeing culture. At the same time, DIY reservations and studio collections are also provided. Users can check the dynamic trends of persimmon dyeing, share their experiences, and post comments. The mall page is mainly for displaying information on the homepage, making it convenient for users to make reservations for offline persimmon dyeing experience. The social page is divided into the latest, most popular, following, and households buying or sellers selling persimmon dyeing cultural products. My page includes basic personal information, product order information, social information, and other services. The guide page displays persimmon dyeing clothing and cultural and creative products through IP to attract users' attention. Tabbed navigation allows users to quickly switch between different functions.

3.5. Interface Design

In the prototype design stage, the main focus is on the path for users to complete tasks, drawing user flow charts and designing interaction logic, focusing on the overall layout and content hierarchy to provide an intuitive and consistent user experience. Interactive prototyping helps designers understand the general idea of the design and save costs.

In the interface visual design stage, the colors, icons, font sizes, etc. were first standardized [13]. The traditional colors of persimmon dyeing, such as dark brown, beige, and cyan, are used to convey the unique charm of persimmon dyeing culture. To enhance the comfort and hierarchy of reading, the font size of key contents is increased and bolded, and line spacing and paragraph spacing are reasonably arranged. The design of icons and symbols revolves around persimmon-dyed elements. The icon design of the tab bar is inspired by persimmons, changing the state of the persimmons, and focusing on the simplicity and understandability of icon and symbol design. The patterns and mechanisms of persimmon dyeing are also cleverly integrated into the interface design background or decoration to enhance the cultural characteristics of the mini program. The interface design of the mini program is shown in Figure 3.

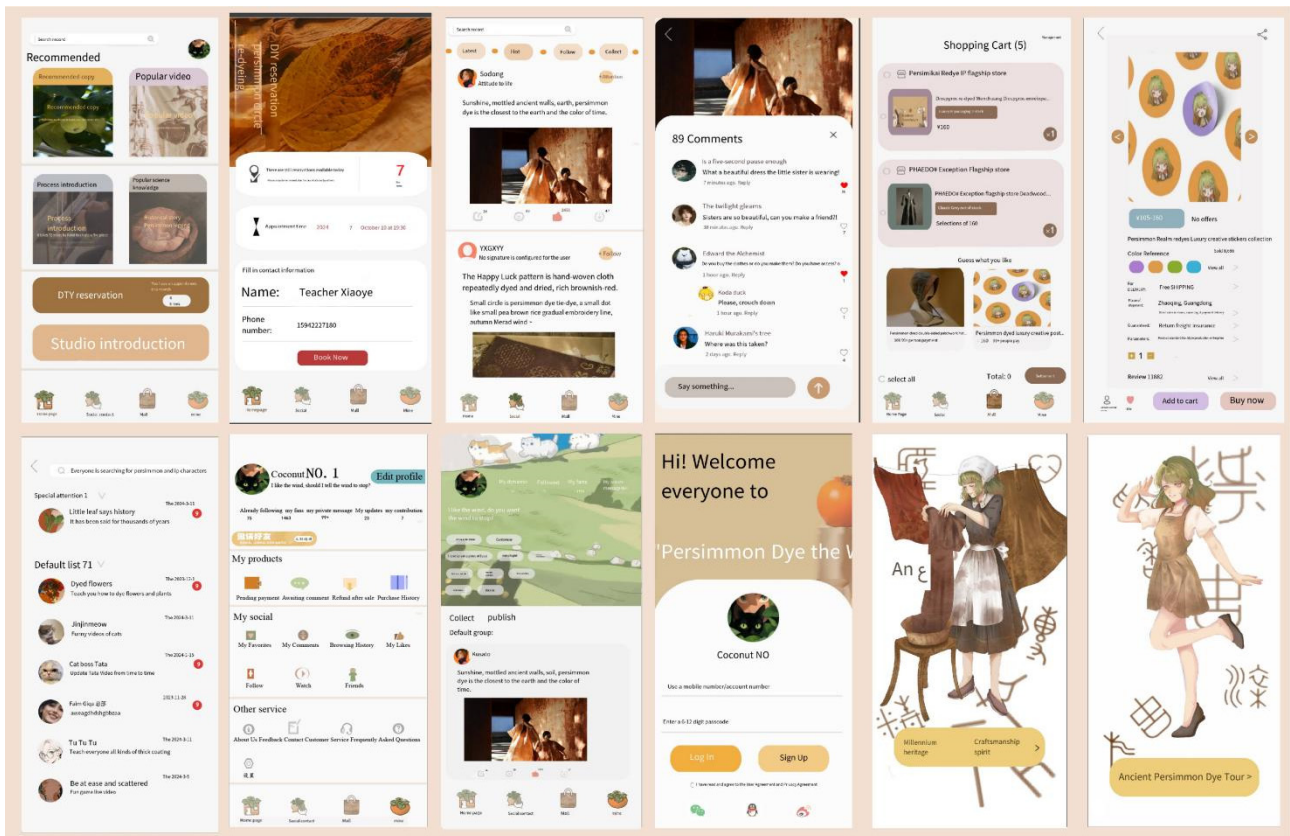


Fig 3. Persimmon dyeing applet interface design

4. Conclusion

Through participatory observation and in-depth interviews, this article conducts an in-depth discussion on the inheritance and development of persimmon dyeing culture in the field of modern design, and conducts the interface design practice of persimmon dyeing cultural mini program. As a traditional dyeing technique, persimmon dyeing not only carries rich historical and cultural connotations but also has unique artistic and practical value in modern society. However, with the acceleration of the modernization process, the inheritance and development of persimmon dyeing culture face dual challenges. There are fewer inheritors of traditional craftsmanship, and the combination of modern design needs and persimmon dyeing techniques is still in the exploratory stage. There is still a lack of research on how persimmon dyeing culture can be better integrated into the modern design field in the digital age, especially the interface design of small programs. Therefore, through multiple stages such as user research, prototype design, and user testing, this study gradually optimizes the mini program design plan to achieve the best user experience and cultural communication effects. First, clarify the target user groups and their perceptions and expectations of persimmon dyeing culture, and construct persimmon dyeing culture experience scenarios under different scenarios. Secondly, explore user needs and determine the functional priority and information architecture of the mini program. Thirdly, integrate the design requirements, complete the interactive prototype design, improve the interactive interface and operation process, and conduct interface visual design. Finally, target users are invited to test the mini program, collect feedback, and optimize the design plan. Based on user feedback and test results, we conduct a comprehensive evaluation of the mini program propose improvement measures, and finally arrive at

a mini program interface design that combines cultural heritage and modern aesthetics. This research not only provides new perspectives and methods for the inheritance and innovation of persimmon dyeing culture, but also provides valuable practical cases for mini program interface design. In the future, we can further explore the application potential of persimmon dyeing culture in different design fields and promote its widespread dissemination in modern society.

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