PROTECTION AND DISSEMINATION OF INTANGIBLE CULTURAL HERITAGE FROM THE PERSPECTIVE OF COMMUNICATION: CASE STUDY OF YILIANG CROCHET TIE-DYE

By
Mr. Xiang GAO

A Thesis Submitted in Partial Fulfillment of the Requirements
for Doctor of Philosophy Culture - Based Design Arts
Silpakorn University
Academic Year 2025

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Mr.Xiang GAO

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Title	Protection and dissemination of intangible cultural heritage from the perspective of communication: Case Study of Yiliang crochet tie-dye
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Mr. Xiang GAO : Protection and dissemination of intangible cultural heritage from the perspective of communication: Case Study of Yiliang crochet tie-dye Thesis advisor : Assistant Professor Sarawuth Pintong, Ph.D.

This study investigates the protection and dissemination of Yiliang Crochet Tie-Dye, a provincial-level intangible cultural heritage in Yunnan, China, endangered by inefficient oral transmission, outdated tools, fragmented knowledge, and limited public participation. Grounded in ICH safeguarding theory and Lasswell's 5W communication model, the research develops the CDDF Systematic Design Method—an iterative cycle of Culture, Design, Dissemination, and Feedback.

Using a mixed-methods approach, the study combines fieldwork, interviews, and focus groups with experimental design, surveys, and digital dissemination analysis. Four design experiments were conducted: (1) a dual-format visual database to document techniques; (2) a modular toolkit with a learning handbook and lightweight crochet tools; (3) dissemination tests in classrooms, communities, tourism, and social media; and (4) a feedback system integrating multi-stakeholder evaluation.

Results show that structured digital resources and redesigned tools greatly enhance accessibility, learning efficiency, and cultural engagement while preserving authenticity. Children, elderly participants, and design students all achieved effective outcomes, and social media dissemination expanded reach, strengthened identity, and increased participation.

Theoretically, the study reframes ICH preservation as a communicative process by integrating cultural heritage theory with design and communication models. Practically, it delivers a replicable framework balancing preservation and innovation. The CDDF method demonstrates how design-driven dissemination can revitalize endangered crafts and provide scalable strategies for safeguarding intangible cultural heritage in contemporary society.

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My heartfelt thanks go out to the artisans of Yiliang Crochet Tie-Dye. Your hard sweat, profound gazes, and weather-worn hands have narrated every intricate tale behind this craft. Through you, I have understood that this is not merely a skill but an embodiment of emotions, dedication, and profound respect for traditions passed down through generations.

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I also greatly thank my family, whose silent sacrifices have been my bedrock. Your care and your vigil over my journey have fortified my academic pursuits. Amidst the exhaustive days of research, the warmth and support of my family have been the balm to my spirit.

Lastly, I earnestly hope my research shines as a beacon for transmitting the Yiliang crochet tie-dye technique. This contribution would be the crowning achievement of all my dedication, efforts, and sacrifices.

At this moment, brimming with gratitude, I pen these words. I hope every reader can sense the depth of my sincerity and appreciation.

Xiang GAO

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1.1 Statement of the Problems

Yiliang Crochet Tie-Dye, a traditional handicraft originating from Yunnan Province, China, has been listed as a provincial-level intangible cultural heritage and is considered a candidate for national-level recognition. Despite its official status, this craft faces severe threats to its survival-reflecting structural challenges common to many intangible cultural heritage items in China and around the world, particularly those within the traditional craft category. Characterized by intricate patterns formed through crochet-based thread wrapping, this technique embodies rich cultural layers and refined aesthetics. However, it is currently endangered due to both internal obstacles to transmission and external difficulties in dissemination. This study addresses the significance of these problems across three dimensions: national context, local realities, and user experience.

At the national level, while China has recognized more than 10,000 ICH items, data from the Ministry of Culture and Tourism indicate that only about 14% have undergone systematic documentation-including complete technical procedures, annotated visual materials, and structured semantic knowledge. Many traditional crafts are now on the verge of extinction or are preserved only by a few elderly artisans, resulting in a "museumization" of heritage that detaches such practices from their living cultural systems.

Internally, Yiliang Crochet Tie-Dye still relies on the traditional "oral transmission and apprenticeship" model, which is time-consuming and inefficient. The high learning threshold prevents the craft from being widely taught or adopted. Moreover, the crochet tools used in this technique are bulky, expensive, and difficult to obtain, further limiting accessibility and replication. The current knowledge carriers are fragmented, lacking visualized instruction or structured systems that support modern learners' needs for organized and modular content.

Externally, the general public demonstrates low awareness and interest in traditional tie-dye practices. There are few lightweight, emotionally rewarding cultural experiences that can engage broader audiences. Survey results show a strong

desire among users to "complete a work with low barriers" in order to gain a sense of participation, yet the necessary design resources are absent. Furthermore, digital dissemination remains weak, with no centralized platforms or visual guidance content to facilitate engagement via short videos or community-based media.

In summary, the problems outlined above are both urgent and contextually grounded. Without design-driven intervention and a reconstructed dissemination system, Yiliang Crochet Tie-Dye faces irreversible outcomes-including the disappearance of craftsmanship, the erosion of cultural memory, and the fading of its societal value. This research not only responds to the endangered status of this specific heritage practice, but also establishes a foundation for a new framework that integrates ICH theory with dissemination-oriented design strategies. The findings are expected to offer methodological references for the preservation and dissemination of other local intangible heritage projects in China and beyond.

1.2 Research Objectives

1.2.1 Historical Documentation & Visual Archiving

To investigate the history, cultural significance, and craftsmanship of Yiliang Crochet Tie-Dye, and to establish a visual database for documenting traditional techniques.

1.2.2 Issue Analysis & Dissemination Strategy

To analyze contemporary challenges in the protection of Yiliang Crochet Tie-Dye, and to explore relevant communication theories and dissemination mechanisms in order to develop innovative strategies.

1.2.3 Toolkit Design & Experimental Validation

To design a Yiliang crochet tie-dye toolkit, including a visual database and specialized tools for the craft. Conduct experimental research to evaluate its effectiveness in supporting the preservation, documentation, and dissemination of the craft.

1.3 Hypothesis

If the production process and key tools of Yiliang Crochet Tie-Dye are transformed into a modular toolkit and integrated with a design-driven dissemination

strategy informed by communication theory, it can significantly enhance the efficiency of knowledge transmission, expand participation beyond traditional family-based inheritance, and support the sustainable preservation and public engagement of the craft.

1.4 Research Methodology

This research is grounded in a dual-theoretical foundation that integrates Intangible Cultural Heritage theory with communication studies, specifically Lasswell's 5W communication model. The ICH theory offers a cultural foundation for understanding the essential characteristics, dissemination conditions, and values of traditional crafts, while Lasswell's model provides a structured lens to analyze the flow and impact of dissemination efforts. These two complementary theoretical pillars form the basis for both the analytical and practical components of the study.

The core of the research centers on Yiliang crochet tie-dye, a unique textile craft rooted in Yunnan, China. The research content is structured to encompass a comprehensive understanding of the technique's historical evolution, transmission mechanisms, craftsmanship, cultural values, and current challenges. These dimensions collectively define the cultural inheritance core of Yiliang crochet tie-dye, serving as the primary object of investigation. This holistic understanding is essential for identifying the structural barriers to its preservation and dissemination.

To address these issues, the study adopts a methodological approach centered on cultural documentation. This includes a multi-step process: data collection through fieldwork and interviews, data encoding to extract meaningful patterns, visual documentation to capture technical details, classification of techniques based on their procedural attributes, and the development of a visual database. The visual database—comprising static and dynamic components—serves as a structured digital archive that transforms tacit knowledge into accessible and reproducible information.

The research framework also emphasizes the transformation from cultural understanding to practical design intervention. This is realized through two dissemination paths: cultural protection and cultural dissemination. Cultural protection is achieved via the establishment of a visual database, which systematizes the craft's procedural and semantic knowledge. Cultural dissemination, on the other

hand, is realized through the development of a toolkit that includes a visual learning handbook and modular practice tools. These outputs are designed to be adaptable to various dissemination contexts such as social media platforms, educational workshops, and classroom environments, allowing for scalable engagement across user groups.

In summary, this research framework integrates theoretical, analytical, and practical dimensions in a cohesive structure. By aligning the cultural logic of intangible heritage with the dissemination logic of communication theory, the framework enables a multidimensional response to the decline of traditional craftsmanship. It not only provides a methodology for documentation and intervention but also establishes a replicable model for revitalizing endangered intangible cultural heritage in a contemporary context.

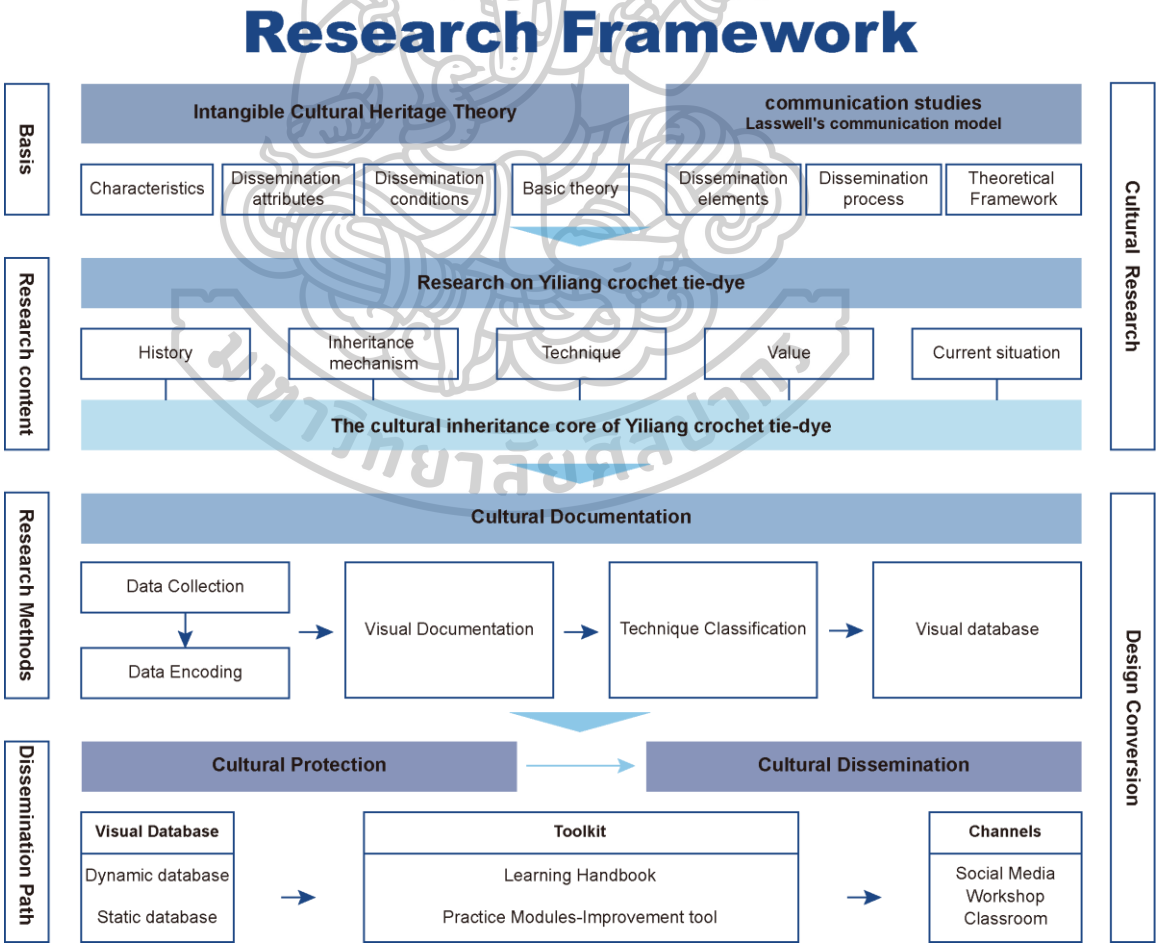


Figure 1 Research methodology and framework (Gao, 2024)

1.5 Scope of the Study and Limitations

1.5.1 Scope of the Study

This study focuses on the documentation, tool innovation, and dissemination of Yiliang crochet tie-dye, a traditional intangible cultural heritage craft in Yunnan, China. The content scope includes the technique system of Yiliang crochet tie-dye, the physical properties of traditional tools, visual documentation strategies, and the development of digital dissemination tools such as handbooks and toolkits.

The population scope covers both technology holders and cultural learners. Technology holders include one provincial-level inheritor (aged 55) and three local craftsmen. Cultural learners comprise 14 local residents (including 12 children and 2 middle-aged and elderly participants) and two university design students. Participants were selected based on their stakeholder roles, with recruitment supported by researchers and the Yiliang County Cultural Center. All participants voluntarily agreed to join the study.

The geographical scope is centered on Yiliang County and its surrounding areas, selected based on their inclusion in the Yunnan Provincial ICH List and their high concentration of active practitioners. The study also involves limited extended engagement with external cultural groups, such as university communities, for testing dissemination effects. This research strictly focuses on Yiliang crochet tie-dye and excludes other tie-dye techniques, ensuring clarity in research boundaries.

Overall, the study defines a focused, multi-level research scope addressing traditional knowledge holders, non-expert learners, and targeted dissemination pathways in both local and extended cultural environments.

1.5.2 Limitations

This study has several limitations that may affect the generalizability and scalability of its findings. First, the research is geographically limited to Yiliang County and its surrounding communities, which may not represent the broader practices of crochet tie-dye or other intangible cultural heritage forms across China. Second, due to resource constraints, the sample size of participants—particularly cultural learners—remained relatively small, with only 16 individuals engaged in testing and feedback activities. Third, the dissemination strategies were primarily

tested in localized or small-scale digital environments, such as social media platforms and workshops, limiting insights into their effectiveness on a national or international level. Lastly, the toolkit and handbook were designed based on one specific tie-dye technique, which may require adaptation when applied to other ICH contexts. These limitations suggest that future research should expand in scope, scale, and cross-regional comparisons to validate and extend the study's findings.

1.6 Terminology

1.6.1 Intangible cultural heritage

As defined by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in the "Convention for the Safeguarding of the Intangible Cultural Heritage," ICH refers to various social practices, expressions, forms, knowledge, skills, and related tools, objects, handicrafts, and cultural spaces that communities, groups, or sometimes individuals recognize as part of their cultural heritage.

1.6.2 Yiliang Crochet Tie-Dye

A traditional handicraft technique from Yiliang County, Yunnan Province, China, involving the crochet and tie-dyeing of fabrics. The technique is characterized by fine, point-based tie-dyeing on fabric using a crochet hook, creating a unique artistic effect. This is the specific research subject of this study.

1.6.3 Communication Studies

Communication Studies, also known as Communicology or Semiotics, is a discipline that studies various communication activities by integrating different perspectives and methodologies. It is the study of the laws governing the occurrence and development of human communication behaviors and processes, as well as the relationship between communication and individuals and society. It is the scientific study of social information systems and their operating laws.

1.6.4 Cultural Identity

Cultural identity is an individual's sense of belonging to a particular social group. It is a subject in cultural sociology and is closely related to psychology, encompassing one's self-concept and self-awareness.

Chapter 2
Literature Review

In the context of globalization and modernization, the inheritance and dissemination of intangible cultural heritage face challenges, necessitating innovative solutions in both theory and practice. The purpose of this literature review is to synthesize relevant research, establish the theoretical foundation for this study, and clarify the key issues and directions of the research. This chapter is divided into three main sections: the dissemination and transmission of ICH, the current research status of Yiliang Crochet Tie-Dye, and the application of communication theories. The aim is to analyze the theoretical background and practical significance of the study.

Section 1: The dissemination and Transmission of Intangible Cultural Heritage

This section analyzes the concept, characteristics, and dissemination attributes of ICH from the perspective of cultural dissemination. It explores the difficulties encountered in the transmission process. By combining existing dissemination methods with modern inheritance conditions, the theoretical issues of ICH dissemination and transmission are examined. This section will establish the cultural dissemination analysis framework for this study.

Section 2: Yiliang Crochet Tie-Dye-History, Cultural Value, and Craft Characteristics

Taking Yiliang Crochet Tie-Dye as an example, this section reviews its historical development, cultural value, and craft characteristics. A comparison with Bai tie-dyeing is made to analyze the uniqueness and research value of Yiliang Crochet Tie-Dye. This section summarizes the existing research findings and identifies gaps in the research, providing support for the practical aspects of this study.

Section 3: The Application of Communication Theories in ICH Protection

Based on communication studies theory, especially Harold Lasswell's 5W model, this section explores its application in ICH protection. It analyzes existing research findings in communication studies, providing theoretical support for the study, and explores the potential for innovation in communication theory within the field of ICH.

Section 4: Focus Group Method in Data Collection and Analysis

This section provides a detailed introduction to the use of the focus group method in data collection and analysis. It combines a summary of the method and recommendations to provide practical guidance for research design.

Through the analysis of the above sections, this chapter summarizes the core issues in the protection and dissemination of Yiliang Crochet Tie-Dye and clarifies the theoretical and practical value of this research in the digital protection of ICH. The chapter aims to provide comprehensive theoretical support for the study of the digital dissemination of Yiliang Crochet Tie-Dye and explores effective paths for the modernization of ICH dissemination.

2.1 From the Perspective of Cultural dissemination: Examining Intangible Cultural Heritage

2.1.1 Concept and Characteristics of Intangible Cultural Heritage

2.1.1.1 Concept of Intangible Cultural Heritage

The concept of intangible cultural heritage originated from the idea of "intangible cultural properties" proposed in Japan's Cultural Properties Protection Law in 1950, which significantly influenced international discussions on the subject. In 1992, UNESCO renamed "intangible heritage" as "intangible cultural heritage." The Convention for the Safeguarding of the Intangible Cultural Heritage was adopted at the 32nd UNESCO General Conference in 2003, clearly defining the core of ICH protection to include traditional festivals, craftsmanship, dance, music, and other cultural expressions. The convention stipulates that ICH includes cultural expressions, skills, artifacts, and cultural spaces recognized by groups and communities as part of their heritage, reflecting respect for human creativity and cultural diversity. The convention came into effect in 2006 (UNESCO, 2006; UNESCO, 2020). ICH covers five major categories.

Table 1 The five major contents of intangible cultural heritage defined in the Convention

No.	Content
1	Oral traditions and expressions, including related languages,
2	Performing Arts
3	Social practices, rituals, festivals
4	Knowledge and practice concerning nature and the universe
5	Traditional Handicrafts

In China, the concept of ICH has been further developed to fit local realities. In 2005, the State Council issued the Opinions on Strengthening the Protection of Intangible Cultural Heritage in China, referencing the UNESCO definition and establishing a system of cataloging ICH with ten major categories. In 2020, the Interim Measures for the Application and Evaluation of National Intangible Cultural Heritage Representative Works supplemented the definition of ICH, stating that ICH refers to traditional cultural expressions closely related to the lives of people, passed down through generations (General Office of the State Council of the People's Republic of China, 2020).

In 2011, the Intangible Cultural Heritage Law further refined the definition of ICH. The law emphasized that ICH consists of traditional cultural expressions passed down through generations by various ethnic groups, as well as related artifacts and cultural sites, which are considered part of their cultural heritage (The People's Republic of China, 2011). ICH not only reflects the production and lifestyle of ethnic groups, communities, or societies, but also continues to be passed down through techniques, knowledge, and oral traditions.

In summary, intangible cultural heritage showcases human cultural diversity and creativity. From Japan's concept of "intangible cultural properties" to UNESCO's Convention for the Safeguarding of the Intangible Cultural Heritage, the concept has evolved over time. In China, this concept has been practically developed into a unique cataloging system, further refined through the Intangible Cultural Heritage Law, which emphasizes the living transmission of ICH. As a cultural manifestation of the production and lifestyle of communities and ethnic groups, ICH is transmitted through techniques, knowledge, and oral traditions, providing a solid theoretical foundation for the study of heritage transmission and dissemination.

2.1.1.2 Characteristics of Intangible Cultural Heritage

Intangible cultural heritage is a dynamic cultural system that demonstrates a distinct vitality. It evolves through social interactions and human creativity, with individuals serving both as creators and transmitters of heritage. Through practice and expression, ICH is perpetuated (He, 2010). For example, each piece of Yiliang crochet tie-dye is unique, reflecting the individual understanding of

the artisans and inheritors, and showcases the distinctive patterns and techniques, thus demonstrating the personality and cultural vitality of the heritage.

The ecological nature of ICH is evident in its dependence on natural resources. It develops within specific natural environments and cultural contexts, adapting to the needs of production. The Yiliang crochet tie-dye technique relies on local plant-based dyes and community resources, and has evolved over time to reflect its flexible ecological adaptability.

The inheritance of ICH is its core characteristic. It relies on intergenerational transmission for its continued existence. However, in modern society, generational changes and shifting interests among younger generations pose challenges to traditional methods of oral transmission. For instance, the transmission of Yiliang crochet tie-dye faces difficulties due to the aging of its inheritors and the decreasing interest among younger people. Learning handbooks of techniques and modern educational systems are seen as effective solutions to support the sustainable development of ICH.

The variability of ICH is reflected in its adjustment of content and form over time and in response to social changes. This change is an expression of cultural adaptability but may lead to the loss of certain traditional elements. The transmission and dissemination methods of Yiliang crochet tie-dye should adapt to the needs of the times, seeking new pathways for development through innovation. This presents both a challenge for cultural development and an opportunity for integrative innovation.

In summary, intangible cultural heritage is characterized by its vitality, ecological dependence, inheritance, and variability. These characteristics make the processes of transmission and dissemination complex and diverse.

2.1.2 The Dissemination Attributes of Intangible Cultural Heritage

2.1.2.1 The Relationship between Culture and Dissemination

"Culture or civilization is a complex whole which includes knowledge, belief, art, morals, law, customs, and any other capabilities and habits acquired by man as a member of society" (Taylor, 1988, p. 5). This study focuses on the nominal form of "culture" and adheres to Taylor's definition.

Regarding the composition of culture, "Culture is a system of meaning patterns transmitted through symbols across generations in human history. These patterns express inherited ideas in symbolic forms, allowing dissemination, continuity, and the development of knowledge and attitudes about life"(Geertz, 1999, p. 11). These perspectives illustrate the dissemination attributes of culture, emphasizing the importance of symbols and transmission in the process.

Since the 19th century, the connection between "dissemination" and "culture" has been central to the development of cultural dissemination studies. Guo Qingguang asserts, "Dissemination is the transmission of social information or the operation of the social information system" (Guo, 2011, p. 11). Dong Tianze further elaborates that dissemination is the process through which individuals or groups convey information, ideas, attitudes, or emotions to others through symbols (Don, 2002). The common foundation of both culture and dissemination is the construction and transmission of symbols. From individual cognition to collective memory, culture forms and develops through processes such as interpersonal dissemination, organizational dissemination, and human-to-human interaction. Dissemination is not only the means by which culture is formed but also the key to its existence and transmission.

In summary, culture forms meaning patterns through dissemination and continues to develop and evolve within the dissemination process. Dissemination is both the manifestation and the driving force of cultural development. For this study, the relationship between culture and dissemination provides a theoretical foundation for the transmission and dissemination of intangible cultural heritage. Through the construction and transmission of symbols, intangible cultural heritage projects like Yiliang crochet tie-dye can achieve the transmission and recreation of cultural connotations in modern society, thereby establishing key pathways for digital preservation and innovative dissemination.

2.1.2.2 The Connotation of the Dissemination of Intangible Cultural Heritage

Intangible cultural heritage is a cultural phenomenon, and its dissemination is the core process of formation, continuation, and development, reflecting the dissemination attributes and intrinsic essence of culture. The

dissemination of intangible cultural heritage underpins its vital, ecological, transmissive, and transformative characteristics, which are essential supports for these features.

The dissemination of intangible cultural heritage depends on three main conditions: historical, scientific, and artistic values; transmission methods passed down through generations; and transmission modes carried by individuals. These conditions endow intangible cultural heritage with strong communicative capabilities and vitality. As both disseminators and receivers, humans contribute to the process with their autonomy and creativity, making the dissemination process dynamic and adaptable.

The motivations for the dissemination of intangible cultural heritage can be divided into two levels: practical and spiritual. The practical motivation arises from fulfilling life needs, such as folk medicine and culinary skills, which not only provide practical value but also create economic benefits. The spiritual motivation, on the other hand, embodies the aesthetic pursuits and life ideals inherent in intangible cultural heritage. For instance, the art of the guqin not only carries technical skills but also transmits profound spiritual connotations. This spiritual drive is typically more enduring than the practical drive and is the core force behind the intergenerational transmission of intangible cultural heritage.

Figure 2 Chinese Guqin
(Source: https://mt.sohu.com/20170928/n515131338.shtml)

Through dissemination, the cultural connotations of intangible cultural heritage are preserved, providing a foundation for its digital protection and innovative development in contemporary society. Dissemination not only enriches the cultural expressions of intangible cultural heritage but also enhances its adaptability and vitality in modern society. This dissemination process lays the theoretical foundation for this study to explore digital dissemination paths.

2.1.2.3 The necessity of spreading intangible cultural heritage

The dissemination of intangible cultural heritage is crucial for preserving cultural diversity, enhancing national identity, and sustaining human civilization. First and foremost, intangible cultural heritage enriches the cultural ecosystem through intergenerational transmission, maintaining cultural diversity both globally and within ethnic groups. This diversity not only provides a source of freedom and creativity for the human spirit, emotions, and lifestyles but also strengthens emotional connections with tradition.

Secondly, the dissemination of intangible cultural heritage holds significant practical relevance in the context of globalization. The dissemination and exchange of ethnic cultures can overcome racial discrimination, resolve cultural

prejudices, and promote cultural equality and world peace. Simultaneously, the dissemination of traditional culture helps to enhance national self-confidence, resist the erosion of foreign cultures, and achieve cultural independence and strength.

Furthermore, intangible cultural heritage carries the cultural genes of human civilization, and its dissemination is an important means of preserving history and civilization. These cultures reflect humanity's exploration of nature and life at different historical periods, documenting the evolution of human thought and creativity. Even primitive worship embodies profound cognitive values.

The dissemination of intangible cultural heritage also enriches modern human life. Its unique rituals, festivals, handicrafts, and spiritual values provide individuals with a source of cultural identity and self-awareness. However, the interruption of dissemination will lead to the disappearance of culture and the weakening of social emotions.

In summary, the dissemination of intangible cultural heritage is an essential means of preserving cultural diversity, enhancing national identity, and ensuring the continuity of human civilization. Through effective dissemination, intangible cultural heritage can not only sustain the diversity of cultural ecosystems, promote national cultural confidence and independence, but also transmit the cultural genes of human history, enriching modern life. However, the impact of modernization and globalization threatens the core values of intangible cultural heritage. Therefore, this study emphasizes achieving the sustainable development of intangible cultural heritage through scientific intervention, ensuring its inheritance and innovation in contemporary society.

2.1.3 The dilemma of intangible cultural heritage

2.1.3.1 The impact of modernization and globalization

"Culture is essentially the way of life of a group of people, and its form is determined by the living environment, which in turn defines the characteristics of culture" (Fei, 2010, p. 12). With the advancement of modernization, Chinese society has gradually moved away from traditional agrarian culture. Under the dual forces of modernization and globalization, intangible cultural heritage faces severe challenges to its survival.

Modernization has brought about tremendous changes in production methods and social structures. Technological advancements and industrialization have marginalized traditional handicrafts, with efficient mechanized production replacing many traditional crafts. Gao points out that intangible cultural heritage increasingly becomes a "tradition within a vanished cultural environment." Agricultural mechanization and commercialization further weaken the cultural foundations upon which intangible cultural heritage relies (Gao, 2008). At the same time, urbanization has driven a large rural population to migrate to cities, gradually diminishing rural culture and worsening the environment for the inheritance of intangible cultural heritage.

Globalization has intensified the crisis facing traditional culture. Tomlinson describes globalization as "a complex and dense network of interconnectedness in modern society" (Tomlinson, 2002, p. 2). While globalization has facilitated cultural exchange and innovation, it has also led to a "cultural deficit," where dominant cultures suppress indigenous cultures in China. Western culture, through mass media and cultural industries, has deeply infiltrated and gradually altered people's sense of identity with traditional culture. Cultural globalization weakens the communicative power of local cultures, while simultaneously diminishing national cohesion and cultural pride.

Both modernization and globalization have shaped the survival environment of intangible cultural heritage. Under the vertical changes brought by modernization and the horizontal impacts of globalization, people have gradually become aware of the crisis facing traditional culture, which has also sparked a "cultural self-awareness" regarding local culture. Zhou Xian notes that "the expansion of modernization and globalization has not only driven social development but has also triggered an awareness of local culture and a nostalgic emotional attachment to the traditional 'homeland'" (Zhou, 2008, p. 22).

In summary, the impact of modernization and globalization on intangible cultural heritage is dual in nature. These changes have weakened the cultural environment and social foundations upon which intangible cultural heritage depends, while also altering people's perception of local culture. This dual impact underscores the urgency of intangible cultural heritage protection and dissemination.

2.1.3.2 The Dilemma of Survival and Inheritance of Intangible Cultural Heritage

Xiang Yunju points out that, under the backdrop of modernization and globalization, intangible cultural heritage is facing severe challenges to its survival. He states, "In the age of television and movies, do myths, stories, and legends told around the fire still have a market? In the era of ubiquitous internet searches, can proverbs, riddles, work songs, and epic poetry continue to be the primary means of knowledge transmission? When mechanized and intelligent products dominate human material life, how can handicrafts find their place? And when the environment deteriorates, resources are depleted, and ecological changes occur, will traditional cultures, dependent on specific regional ecologies, inevitably face extinction?" (Xiang, 2013, p. 58). This analysis profoundly reveals the survival dilemmas of intangible cultural heritage in contemporary society.

Firstly, the rapid development of industrialization and urbanization has gradually weakened the functions and value of intangible cultural heritage. The continuity of culture relies on meeting societal needs, but changes in social structures and lifestyles have marginalized traditional handicrafts, thereby diminishing both their material and spiritual functions. Furthermore, modern cultural psychology has also undergone shifts. Under the influence of modernization and multiple cultural movements, intangible cultural heritage is often regarded as "old" or "backward," weakening public identification and pride in it. This psychological shift has directly led to the loss of broad social support for intangible cultural heritage.

Secondly, intangible cultural heritage is primarily inherited through oral transmission. However, this "human-mediated" method of inheritance is extremely fragile in modern society. The decreasing number of inheritors and the lack of successors have led to many crafts and traditions being on the verge of extinction. When the inheritors pass away without successors, certain cultural forms may permanently disappear.

In summary, modernization and globalization are accelerating the marginalization of intangible cultural heritage, presenting significant challenges to its survival and inheritance. This situation further highlights the necessity and urgency of protecting and disseminating intangible cultural heritage.

2.1.4 Conditions for the dissemination of intangible cultural heritage

2.1.4.1 Internal Factors in the Inheritance of Intangible Cultural Heritage in Contemporary Society

The reintegration of intangible cultural heritage into daily life is key to its inheritance. Intangible cultural heritage is rooted in people's production and daily life, and its preservation, detached from modern life, is unsustainable in the long term. Gao Xiaokang points out that preservation methods lacking connection to contemporary society fail to imbue ICH with new vitality (Gao, 2007). Therefore, the inheritance of ICH must reintegrate into daily life. Although its functions and status are no longer central in traditional societies, by aligning with modern lifestyles, ICH can still become an integral part of contemporary culture.

Adjusting and expanding the functions of ICH is another important factor. Changes in modern life have weakened the original functions of ICH, posing obstacles to its inheritance. Wang Jushan emphasizes that "the survival and development of ICH depend on the realization of its functions. Modern society provides conditions for the reconstruction of ICH functions" (Wang, 2012, p. 36). For example, Chen Shaofeng mentions that Longquan swords have transformed from cold weapons into art collectibles, and this functional reshaping demonstrates the adaptability and innovative potential of ICH (Chen, 2014). By repositioning and expanding its functions, ICH can meet the new needs of contemporary society, thereby revitalizing itself.

Figure 3 Longquan House Guarding Sword

(Source: https://detail.1688.com/offer/712059985920.html)

The creation of an inheritance atmosphere and cultural identity is also indispensable. The sustainable inheritance of ICH requires a foundation in social atmosphere and cultural identity. The success of cultural heritage protection in Japan benefits from the public's awareness of preservation. The Convention for the Safeguarding of the Intangible Cultural Heritage emphasizes that enhancing the cultural identity of communities is a key objective in ICH protection. Only when ICH is psychologically accepted by community members and imbued with cultural pride can its inheritance have enduring momentum. This psychological identification not only energizes ICH preservation but also supports cultural diversity.

By reconnecting ICH with modern life, adjusting and expanding its functions, and cultivating an inheritance atmosphere, the path for ICH inheritance in contemporary society becomes clearer. This study will use Yiliang Crochet Tie-dye as a case study to validate the feasibility and effectiveness of these inheritance strategies.

2.1.4.2 External Conditions for the Dissemination of Intangible Cultural Heritage in Contemporary Society

1. Digital Technology and Data-Driven Approaches

Digital technology and data-driven methods provide foundational support for the dissemination of ICH. With advancements in technology, the widespread use of the internet and mobile smart devices has made digital dissemination of ICH possible. Huang Moqiao points out that technologies such as virtual reality, augmented reality, 3D printing, 5G dissemination, big data, and artificial intelligence have broken spatial and temporal limitations, allowing the cultural connotations of ICH to be presented more vividly (Huang, 2014). Jie Mengwei and Hou Xiaofeng propose that digital media, through virtual technologies, have enabled the long-term preservation and sharing of ICH information, with inheritors, creators, and enthusiasts all becoming dissemination agents, thus driving the dynamic development of ICH (Jie & Hou, 2021) .

The core of data technology lies in processing and analyzing multidimensional data, providing tools for ICH preservation and dissemination. Diverse forms of data create archiving and display databases, and through cloud computing and artificial intelligence, user preferences can be extracted, optimizing dissemination strategies. Li Chaoyi mentions that traditional Chinese paper-cutting,

combined with 3D printing technology, not only innovates the form of inheritance but also adapts to modern aesthetic demands (Li, 2022). Feng Jie and Li Xinhua use 3D animation to demonstrate the weaving process of Shengzhou bamboo weaving, effectively overcoming limitations such as the insufficient number of inheritors, enhancing learning outcomes and immersive experiences (Feng & Li, 2024). Wang Jianyan and Ji Feng, in their study of ICH along the northern segment of the Grand Canal, highlight that digital technology can accurately record ICH information, ensuring its authenticity and integrity (Wang & Ji, 2024). However, current digital dissemination methods remain relatively simplistic, lacking in-depth interpretations of ICH's cultural connotations and diverse dissemination channels.

Figure 4 Intangible Cultural Heritage and Cultural and Creative Products
(Source: https://www.puchedu.cn/jianzhi/6e7badb6d11a7f22.html)

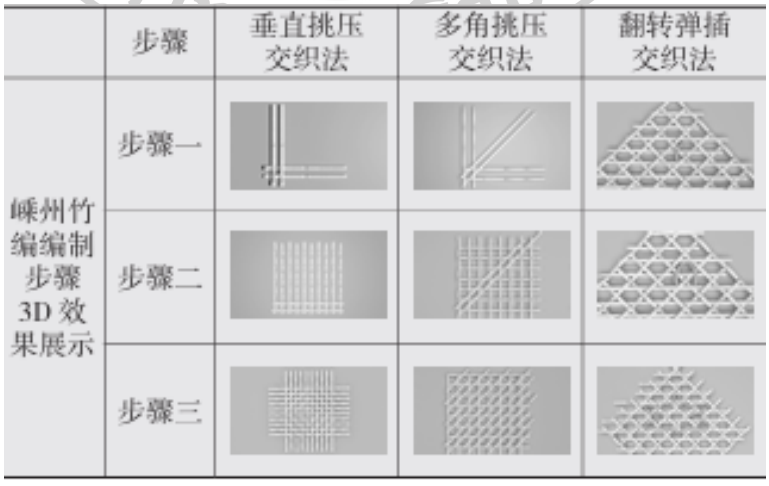


Figure 5 3D effect display of Shengzhou bamboo weaving steps
(Source: Research on the display design of traditional bamboo weaving crafts based on digital virtual display technology —Taking Shengzhou bamboo weaving as an example)

Figure 6 The Grand Canal Museum of China uses interactive screens, AR augmented reality, etc.
(Source: https://news.sohu.com/a/570679610_121123723)

Big data technology has shown significant advantages in analyzing audience behavior. ICH dissemination organizations can more precisely formulate dissemination strategies by analyzing users' online behavior. For instance, the Palace Museum's cultural products optimize online platform content through user behavior data and develop products and services that meet public demand based on feedback from social digital media platforms (Sohu, 2018) . However, Ma Jin et al. point out that some regional protection units lack comprehensive new media systems and content, failing to fully reflect the importance and systematic nature of ICH protection (Ma et al., 2023) .

Figure 7 Palace Museum Cultural and Creative ProductsMuseum
(Source: https://www.sohu.com/a/282453840_387251)

Although digital technology provides opportunities for dissemination,

challenges remain. Beate Engelbrecht and Man Penghui point out that the completeness and systematization of ICH archives have not received sufficient attention (Engelbrecht & Man, 2018) . Wen Wen and Zhao Mengdi argue that China's ICH databases focus too much on display and neglect the recording of core techniques (Wen & Zhao, 2022) .

In summary, data-driven digital technology opens up possibilities for ICH dissemination but still requires improvements in database construction and dissemination strategies to more comprehensively showcase ICH's cultural content.

2. Youth Groups: Core Audience and Dissemination Drivers for ICH

Youth groups' preferences for digital content and visual aesthetics present an opportunity for ICH dissemination. They tend to acquire information through social digital platforms and exhibit a "community-based" characteristic. The 2017 Youth Interest Social White Paper shows that 41% of youth social interactions are based on shared interests (Xinhua, 2018). ICH content that aligns with the aesthetic preferences of youth can achieve wide dissemination within interest communities.

In summary, youth are not only an important audience for ICH dissemination but also a key force driving the development of ICH. Promoting ICH in forms that align with youth aesthetics and values can enhance its appeal and sense of identity.

3. MMobile Media and Contextualized Experiences: Expanding the Multidimensional Space for ICH Dissemination

Mobile media and contextualized experiences provide a multidimensional space for ICH dissemination. With the development of social digital platforms and short video channels, dissemination models have shifted from linear, one-way dissemination to interactive, two-way dissemination (Ma, 2014). Mobile devices facilitate "omni-time and space connectivity," enabling ICH dissemination to seamlessly integrate into daily life. Pu Qiuxia points out that contextualized dissemination, with "socialization, localization, and mobility" at its core, enhances user immersion by emotionally connecting them, making them both recipients and communicators (Pu, 2018).

New media platforms like Douyin (TikTok) and Xiaohongshu (Little

Red Book) have constructed social dissemination scenarios. The "ICH Data Report" reveals that by May 2021, Douyin had over 140 million videos related to national-level ICH in China, covering 97.94% of the country's population (Yue, 2021). Xu Yang and Yang Haowen's study found that short videos of Bai tie-dyeing on Xiaohongshu significantly expanded their dissemination range through interaction (Xu & Yang, 2022). Zhang Yeqing and Zhou Xinyi suggest that using converged media to comprehensively collect, record, and integrate the Bai tie-dyeing art of Dali is one of the best ways to inherit and develop ethnic culture (Zhang & Zhou, 2022).

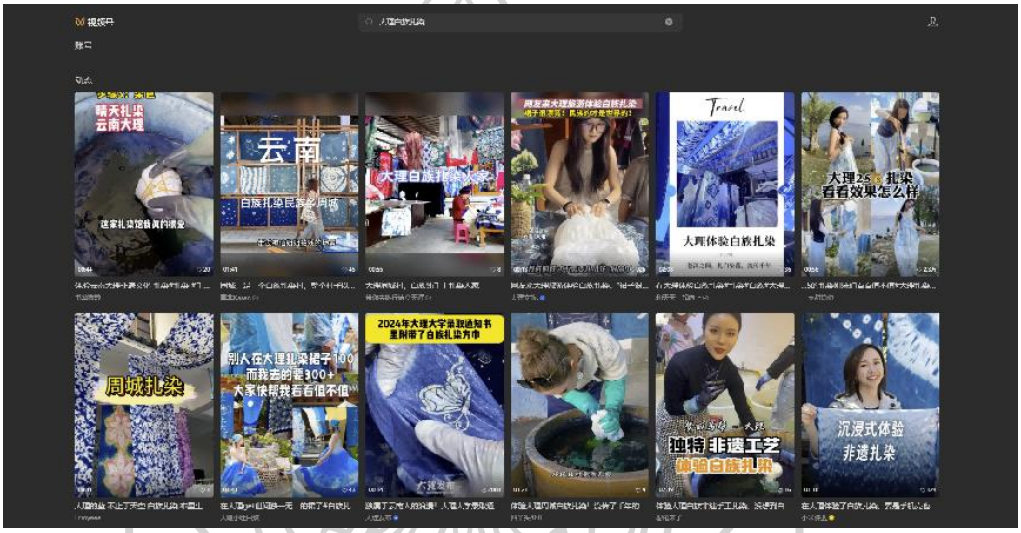


Figure 8 Dali Bai group tie-dyeing displayed on social media
(Source: WeChat Video Account)

However, digital dissemination of ICH still faces challenges. Xue Ke and Long Jingyi point out that inheritors' insufficient understanding of digital technology and limited involvement of social technological forces increase dissemination costs and hinder the effectiveness of inheritance (Xue & Long Jingyi, 2020).

In summary, mobile media provide a contextualized platform for ICH dissemination. By appropriately utilizing these media, user engagement and ICH identity can be enhanced, facilitating the digital and popular dissemination of ICH.

2.1.5 Other methods of communicating intangible cultural heritage

2.1.5.1 Inheritance and Dissemination in the Cultural Industry

In 2005, the China General Office of the State Council issued the "Opinions on Strengthening the Protection of Intangible Cultural Heritage in China," and in 2011, the "Intangible Cultural Heritage Law" was enacted, which clearly outlined the policy of "rational utilization" of ICH resources. Article 37 of the "Intangible Cultural Heritage Law" emphasizes the development of cultural products and services with local and ethnic characteristics and market potential, based on effective protection. By integrating into modern cultural industries, ICH has expanded its dissemination channels and has become more easily accepted by modern society. According to the National Bureau of Statistics, in 2023, China's cultural and creative industries achieved a transaction volume of 74.88 billion RMB, with the cultural industry continuing to grow. Traditional fields such as cultural office supplies are gradually transforming and upgrading, and digital technology is driving the expansion of the cultural products market.

According to a survey by Mob Research Institute involving 243 respondents, 95.5% of people expressed an interest in purchasing cultural and creative products, with collecting and daily use being the primary purposes. Female consumers born after 2000 are the main driving force, and there has been a noticeable increase in consumers from second- and third-tier cities, showing the development potential of the lower-tier markets. Personal interest and the popularity of co-branded products are significant drivers of cultural product consumption, and these products have gradually become carriers of cultural inheritance and emotional expression (Mob Research Institute, 2023).

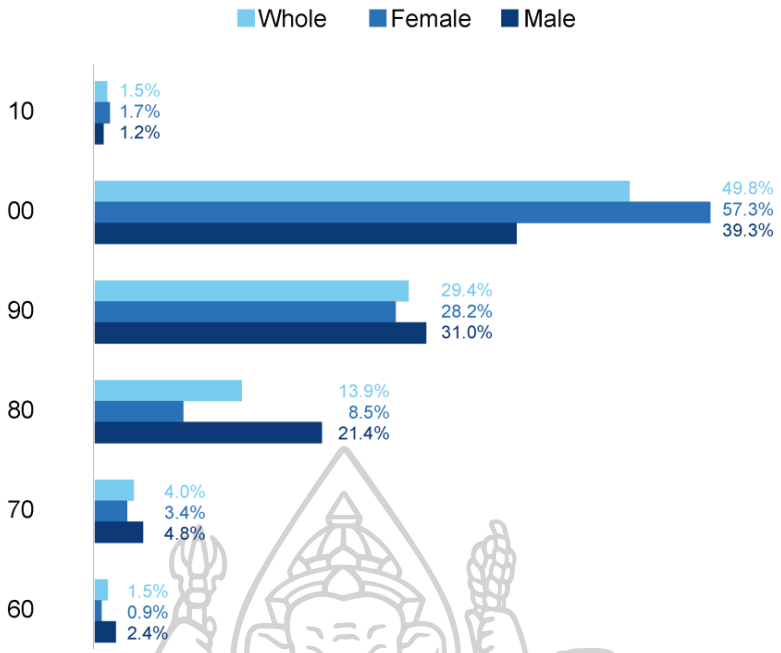


Figure 9 Gender and age distribution of consumers purchasing cultural and creative products (Gao, 2024)

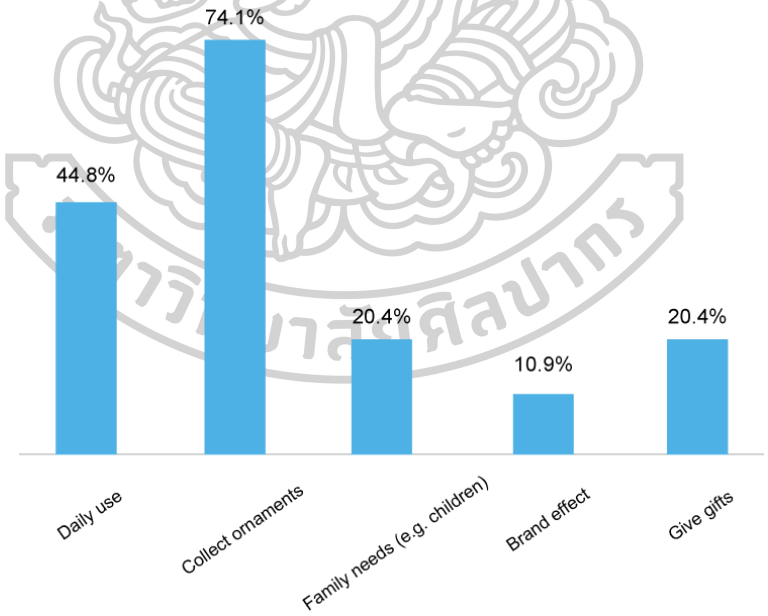


Figure 10 Purpose of consumers purchasing cultural and creative products (Gao, 2024)

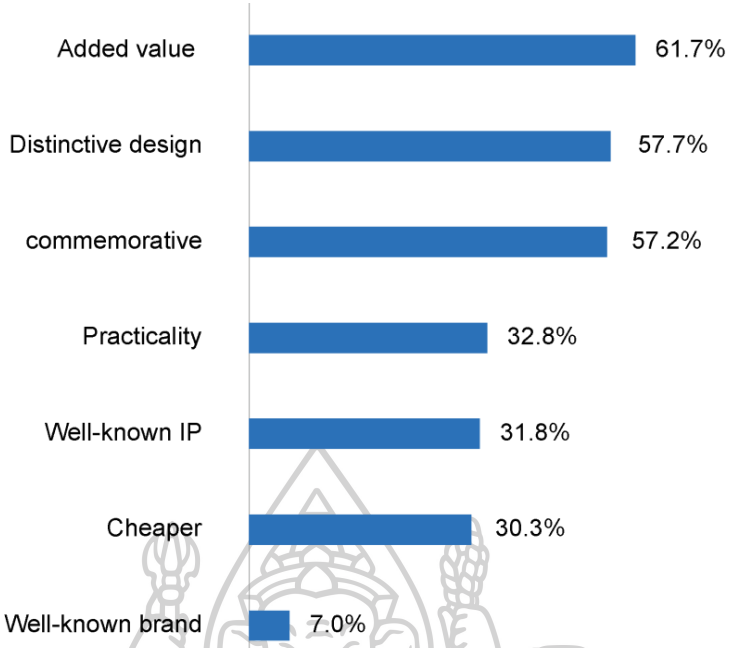


Figure 11 Consumers' purchasing factors for cultural and creative products (Gao, 2024)

Zhang Jiangang points out that the cultural industry is essentially the commercial dissemination of culture, a commercial activity using replication technology to spread culture (Zhang, 2013, p. 76). This industrialization pathway has transformed ICH from traditional craftsmanship into marketable cultural products, enhancing its social influence. Hesmondhalgh mentions that the cultural industry, through the creation and dissemination of "textual" products, influences the way people understand the world (Hesmondhalgh, 2011, p. 27). Wang Jiafei emphasizes that by integrating elements of ICH into modern design to create cultural products that align with contemporary aesthetics, cultural identity can be strengthened (Wang, 2019). Xing Yan's research shows the potential of combining 3D printing technology with "Xuhang Grass Weaving" to design cultural products, providing a direction for the sustainable development of ICH (Xing, 2022).

Figure 12 Architectural model created by combining Xu Xing straw weaving and 3D printing
(Source: Research on the design of ICH cultural and creative products based on red culture, taking 3D printing technology combined with "Xu Xing Cao Weaving" as an example of red cultural and creative products)

Although the integration of ICH with the cultural industry has brought opportunities, there are still some problems in the current cultural and creative product market. Wen Xinmiao points out that some products remain superficial, lacking a deep understanding of cultural connotations (Wen et al., 2021). Yang Huizi also believes that the design of cultural products lacks innovation, the market types are homogeneous, and the consumer base is limited, failing to fully explore market potential (Yang, 2017).

In summary, the cultural industry provides opportunities for innovative expressions of ICH and endows it with economic value, injecting lasting momentum into its inheritance. However, in order to promote the sustainable development of ICH culture, deeper cultural interpretation and innovative design are needed to address current issues and better combine ICH culture with market demands.

2.1.5.2 Inheritance and Dissemination in Modern Education

The inheritance of intangible cultural heritage within modern educational systems has become a widely accepted consensus. The "Convention for the Safeguarding of the Intangible Cultural Heritage" suggests ensuring the vitality of ICH through both formal and informal education. China places great importance on the educational inheritance of ICH, and the "Notice on Strengthening the Protection of Intangible Cultural Heritage" issued by the State Council calls for the integration of

traditional culture into the curriculum, aiming to cultivate young people's interest and enthusiasm for ICH (Central Committee of the Communist Party of China & State Council, 2005) . As outlined in the "14th Five-Year Plan for Intangible Cultural Heritage Protection" (2021-2025), the Chinese government prioritized the cultivation of young practitioners by integrating traditional transmission methods with modern institutional education mechanisms. Specifically, the plan stipulated that "for eligible projects, the modern education system should be utilized to train more young practitioners. Graduates participating in the protection and inheritance of intangible cultural heritage are encouraged and supported, with qualified individuals recognized as certified transmitters. Financial support mechanisms, such as scholarships and grants, are implemented to incentivize youth to acquire relevant skills and become successors. Additionally, training programs, exhibition platforms, and market integration channels are organized to provide comprehensive support for young practitioners, fostering a favorable environment for their professional development" (Ministry of Culture and Tourism of the People's Republic of China, 2021, p. 8). Sang Shengyi and Xiao Qinghua believe that schools should carry out ICH education and transform it from a "memory form" into a "knowledge form" carried through textbooks and courses (Sang & Xiao, 2011). This approach shifts "master-apprentice transmission" to "teacher-student transmission," making the inheritance of ICH more stable and efficient.

Tan Hong points out that courses should be designed to fit the characteristics of ICH at different educational stages. In early childhood education, parent-child activities can be used to cultivate children's sensory awareness of ICH (Tan, 2015). In primary and secondary schools, ICH content should be incorporated into the curriculum to enhance students' national cultural identity. In higher education, attention should be paid to both cultural inheritance and innovation, cultivating students' cultural confidence and social responsibility. Su Zheng emphasizes that ICH's entry into schools can enrich art education, combining culture and aesthetic education to enhance students' aesthetic ability and cultural identity (Su, 2021).

Lin Di proposes that museums and cultural venues are important platforms for informal education (Lin,2020). By organizing community-based ICH education activities, they can enhance the public's cultural identity and sense of

participation. Extracurricular experiential courses have also become an important form of ICH dissemination, providing the public with more direct opportunities to engage and learn.

Liu Xiaoping points out that the Lunjiao community, through its "Xiangyunsha Protection Base" educational tourism program, has transformed Xiangyunsha into a public resource for both "education + cultural tourism." This program serves as a cultural medium, allowing the public to experience the beauty of ICH from multiple dimensions while also communicating ICH culture (Liu, 2023).

Figure 13 Xiangyunsha study tour pictures
(Source: The commercialization of ICH and its impact on the community from a trans-local perspective: A case study of "Xiangyunsha dyeing and finishing techniques")

In summary, the modern education system provides reliable channels for the inheritance and dissemination of ICH. Through both formal and informal education, ICH culture is promoted among young people, contributing to society's recognition and identification with traditional culture. This lays an important foundation for the sustainable development of ICH.

2.1.6 Discussion

This section summarizes the characteristics of intangible cultural heritage, including its vitality, ecological nature, inheritability, and variability. It also explores its important role in maintaining cultural diversity, enhancing national identity, and continuing human civilization. At the same time, emerging dissemination methods such as digital technology, modern education, and the cultural industry offer new possibilities for the modern dissemination of ICH. However, existing research in the

field of ICH dissemination still has some shortcomings.

First, current research tends to focus on qualitative analysis and descriptive studies, lacking in-depth exploration of systematic methodologies. Although this research model helps to clarify the basic characteristics and cultural value of ICH, it fails to answer key questions in ICH dissemination, such as: What is the core of traditional craftsmanship dissemination? How can an effective dissemination system be built while meeting the needs of modern society? How can both the skills and cultural content be fully protected and communicated? These questions remain unanswered.

Second, there is a notable issue of insufficient depth when exploring the core techniques and cultural connotations of ICH. For instance, many digital presentations only focus on showcasing the finished products of ICH and overlook an in-depth interpretation of the production process, key steps, and artistic features. While such displays may attract audiences, they often fail to touch the core elements of ICH—namely the craftsmanship. The audience's participation tends to be more of a "superficial glance," lacking opportunities for in-depth experience or understanding of the techniques and cultural connotations behind the craftsmanship, making it difficult to achieve the intended dissemination goals.

Finally, the integration of the cultural industry with ICH lacks innovation, leading to serious product homogenization. Some designs based on ICH elements rely too heavily on simplified symbolic transplantation rather than deeply recreating and combining the cultural essence of ICH. This not only weakens the uniqueness and market appeal of ICH products but also diminishes their value as cultural dissemination media.

2.2 Research Overview on Yiliang Crochet Tie-Dye

2.2.1 Historical development and inheritance

2.2.1.1 Historical Development

Tie-dyeing is a traditional handicraft centered on the technique of tying and dyeing fabric. Its history dates back to the Qin and Han Dynasties, more than two thousand years ago. Through the process of tying and dyeing the fabric, tie-dyeing creates a variety of patterns and has become an important part of Chinese traditional craftsmanship. During the

Wei, Jin, and Northern and Southern Dynasties, the tie-dyeing technique gradually matured, reaching its peak in production and application. However, during the Northern Song Dynasty, due to the high production costs and the complexity of the process, tie-dyeing experienced a decline in the Central Plains, while it continued in the southwestern ethnic minority regions.

Figure 14 Chinese tie-dye
(Source: https://www.230890.com/zhan/43115.html)

During the Ming and Qing Dynasties, the tie-dyeing technique flourished once again in the frontier ethnic minority regions. Among these, the Bai people of Dali became a representative of the craft, with their unique techniques and artistic style, reflecting the diversity of regional cultures. This period of large-scale population migration from the Central Plains and cultural integration laid the foundation for the spread of tie-dyeing techniques to the southwestern regions. Yiliang Crochet Tie-Dye gradually emerged as a regional craft within this historical context.

The origins of Yiliang Crochet Tie-Dye can be traced back to the Ming Dynasty, with the technique evolving as a result of the integration of Central Plains traditional culture and Dali Bai craftsmanship. At the same time, Yiliang County's unique natural environment and cultural atmosphere played an important role in the development of this craft. Yiliang's rich plant resources, such as indigo and sappan wood, provided the basis for acquiring natural dyes (Yiliang County Gazetteer, 2015) . The region's mild climate and fertile land also created favorable conditions for

the transmission of tie-dyeing techniques, making Yiliang Crochet Tie-Dye a representative of traditional handicrafts in the region.

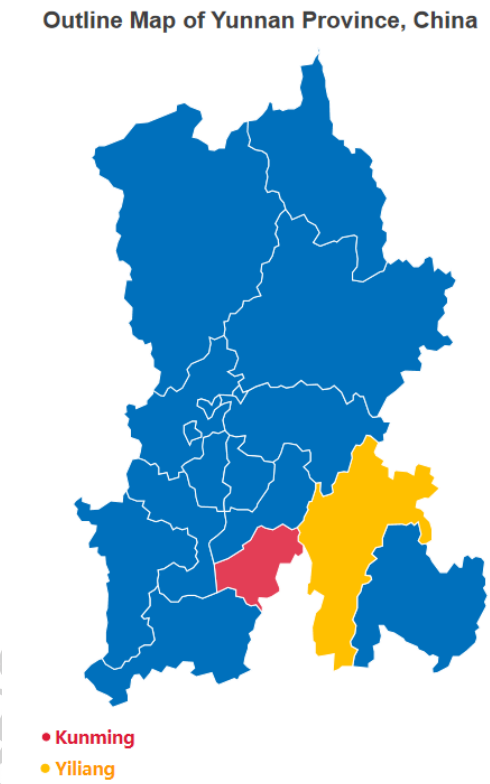


Figure 15 Outline Map of Yunnan Province, China (Gao, 2023)

Figure 16 Jiuxiang Scenic Area, Yiliang County, Yunnan Province, China (Source: Jiuxiang Scenic Area, Yiliang County, Yunnan Province, China)

Entering the 20th century, Yiliang Crochet Tie-Dye entered a phase of revival and innovation. After the founding of the People's Republic of China, the Xu family, as the representative inheritors, actively promoted the craft, earning widespread recognition both in the local and international markets. Yiliang Crochet Tie-Dye products were exported to France, the UK, Japan, South Korea, and other countries, receiving high praise in international cultural exchanges. This craft not only showcased the unique charm of traditional Chinese culture but also invigorated local economic development.

The historical development of Yiliang Crochet Tie-Dye reflects the innovation of the tie-dyeing technique in the context of cultural integration. By combining natural resources with regional culture, this craft has not only become a symbol of local culture but has also demonstrated the value and vitality of intangible cultural heritage on the international stage.

2.2.1.2 Current Situation

The inheritance of Yiliang Crochet Tie-Dye is centered around the Xu family, forming a unique generational inheritance model. From the late Qing Dynasty to the Republic of China period, the Xu family lived in the Yuxi and Guandu areas of Kunming, Yunnan, making a living from the Crochet Tie-Dye craft. After the founding of the People's Republic of China, Xu Cunxian, the third-generation inheritor of the Xu family, served as the technical advisor at a state-owned textile factory, laying the professional foundation for the transmission and promotion of the craft. In 1991, the Baofeng Tie-Dye Factory was established in Yiliang, with Xu Cunxian serving as the factory director, reviving Yiliang Crochet Tie-Dye in its place of origin. In 1995, the Baofeng Tie-Dye Factory was renamed Yiliang Yangsheng Craft Factory, with Xu Cunxian's daughter-in-law, Guo Qiongfeng, taking over as the factory director, driving the continuation and development of the craft in modern society.

Figure 17 The old Xu family business in Yuxi
(Source: courtesy of Ms. Guo Qiongfen)

Figure 18 Ms. Xu Cunxian during her study tour in Japan (fifth from the left)
(Source: courtesy of Ms. Guo Qiongfen)

Figure 19 Baofeng Factory at the time of its opening
(Source: courtesy of Ms. Guo Qiongfen)

Figure 20 Ms Guo Qiongfen at Baofeng Tie-Dye Factory
(Source: courtesy of Ms. Guo Qiongfen)

The family inheritance model has provided important support for the protection and development of Yiliang Crochet Tie-Dye. On the one hand, this model ensures the purity and continuity of the craft. Through generational transmission, the inheritors not only master the core techniques but also accumulate rich practical experience. On the other hand, family members have a deep cultural identification with Crochet Tie-Dye, which drives them to pursue excellence in both quality and originality. Furthermore, the family-based workshop model has, to some extent, preserved the traditional characteristics of Crochet Tie-Dye, allowing its artistic value and cultural connotation to be retained.

However, the family inheritance model also faces severe challenges. With the rapid development of society, the scope of family inheritance has gradually shrunk, and the younger generation has shown reduced interest in traditional crafts, leading to a disruption in the transmission of techniques. For example, during an interview with the fourth-generation inheritor, Guo Qiongfeng, the researcher learned that no members of the fifth generation of the Xu family are engaged in the Crochet Tie-Dye craft, and Guo Qiongfeng herself has not taken on any apprentices. If this issue is not addressed, Yiliang Crochet Tie-Dye may face the risk of disappearing.

Currently, the main transmission method, which is based on oral teaching, although flexible, exposes many issues. The craft may become distorted due to breaks in the transmission chain or the loss of details. Additionally, the lack of a unified recording system limits the spread and standardization of the craft, while also hindering the cultivation of new inheritors. Modern society's demand for innovation is

also difficult to integrate into the traditional inheritance model.

External environmental changes have exacerbated these problems. Since 2000, the industrial structure of the Yiliang region has undergone adjustments, with a large portion of the labor force shifting to the tertiary industry or more lucrative flower planting industries. Additionally, the shrinking of overseas markets has led to a sharp decrease in orders. Factories that once employed thousands of workers now have fewer than 20 employees, with production capacity significantly reduced. The long-term reliance on subcontracting has resulted in a low level of recognition for Yiliang Crochet Tie-Dye in domestic markets.

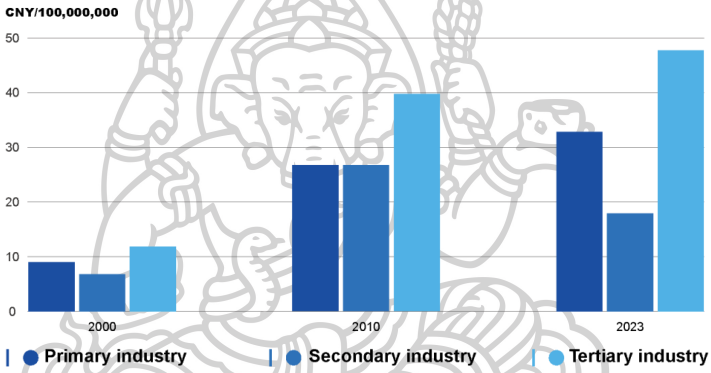


Figure 21 Yiling County Industrial Change Chart
(Source: Statistical Communiqué of Yiling County's National Economic and Social Development 2000-2023)

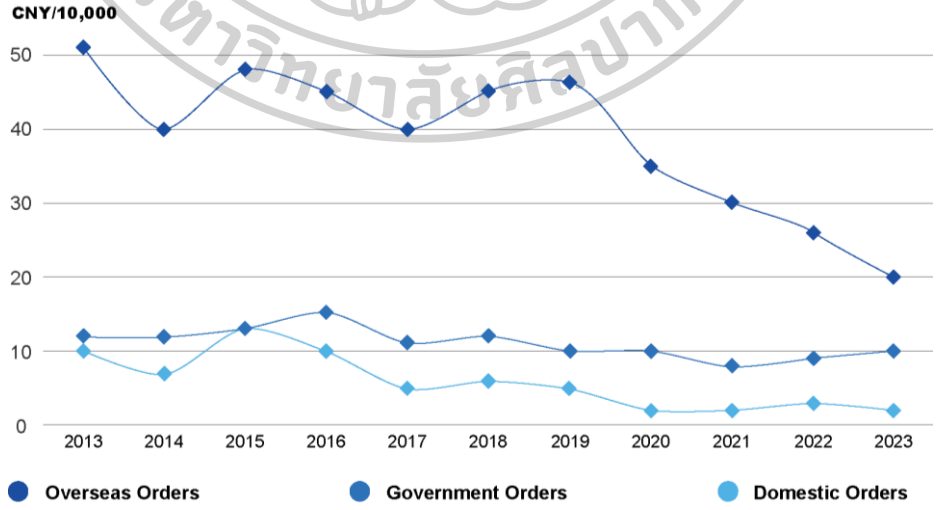


Figure 22 Yangsheng Arts and Crafts Factory Financial Change Chart
(Source: Yangsheng Arts & Crafts Factory Finance Office 2010-2023)

According to street interview data collected from 20 people in Yiliang, 90% of local young people have a noticeable lack of knowledge about Crochet Tie-Dye. They generally lack the opportunity and resources to learn the craft, such as online educational courses, which reflects the shortcomings in the spread of Crochet Tie-Dye.

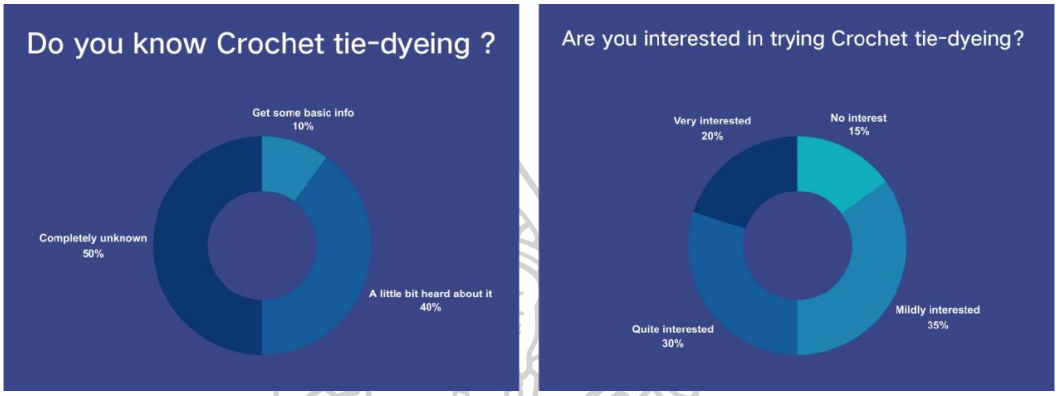


Figure 23 Questionnaire data summary 1 (Gao, 2024)

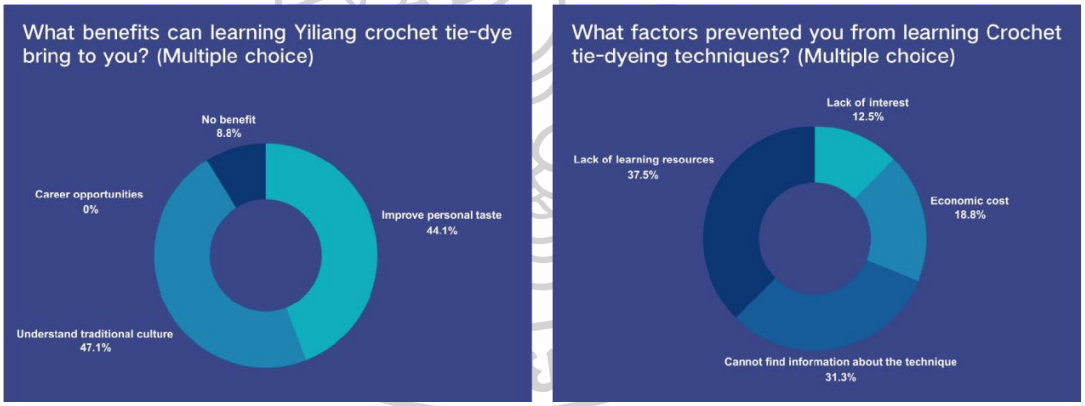


Figure 24 Questionnaire data summary 2 (Gao, 2024)

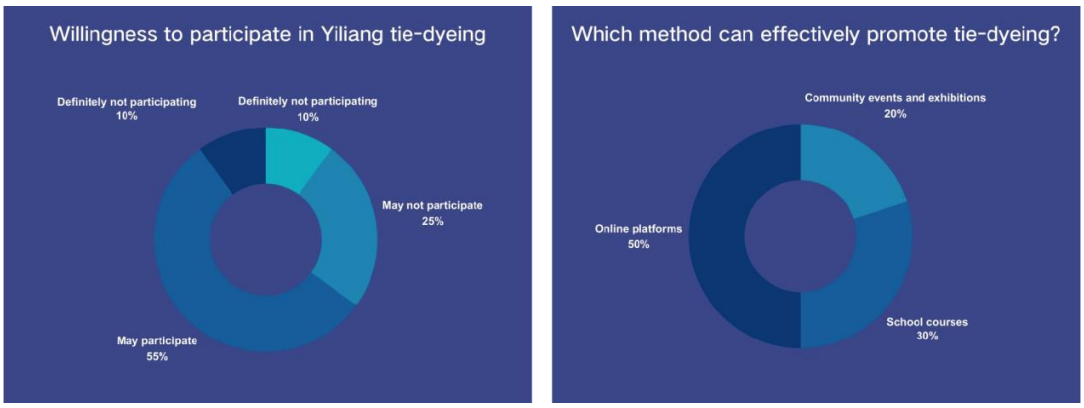


Figure 25 Questionnaire data summary 3 (Gao, 2024)

To address the above issues, this study will explore new methods for the protection and inheritance of Yiliang Crochet Tie-Dye, to adapt to the needs and changes in modern society and the environment.

2.2.2 Cultural and Social Value of Yiliang Crochet Tie-Dye

2.2.2.1 Historical inheritance and cultural identity

Yiliang Crochet Tie-Dye, as an important representative of Yunnan's intangible cultural heritage, carries the historical memories and cultural spirit of the Yiliang region. It is not only a handicraft technique but also a symbol of regional culture.

Figure 26 Traditional crochet tie-dye - Double Lion Peony Figure (Gao, 2024)

First, Yiliang Crochet Tie-Dye witnesses the development of Chinese Tie-Dye techniques. Spanning multiple historical stages, it integrates the cultural characteristics of different regions, while also showcasing the close connection between Yiliang and traditional Chinese handicrafts. Its intricate patterns and the use of natural dyes convey the wisdom and creativity passed down through generations. Each piece of Tie-Dye fabric reflects the profound fusion of regional culture and history.

Secondly, this craft is a symbol of Yiliang's local culture. Through exquisite craftsmanship and unique designs, it incorporates the harmonious concept of the relationship between humans and nature, reflecting the core values of traditional Chinese culture. The patterns and colors of the Tie-Dye works are not just artistic expressions but also miniature representations of local culture, enhancing the cultural identity and pride of the people of Yiliang.

Yiliang Crochet Tie-Dye is both a witness to history and a symbol of culture. It connects the past and the present, demonstrating the continuity of traditional Chinese handicrafts and the deep cultural heritage of Yiliang. At the same time, it provides important spiritual support for the inheritance and development of local culture.

2.2.2.2 Artistic Value and Aesthetic Uniqueness

Yiliang Crochet Tie-Dye, as a model of traditional Chinese handicrafts, demonstrates distinctive artistic value and aesthetic characteristics through its unique artistic style and exquisite craftsmanship, highlighting the local features and cultural connotations of Yiliang.

Firstly, its artistic style is derived from nature and life, blending animal and plant motifs with traditional auspicious patterns. This reflects a celebration of nature and a beautiful vision of life. Common patterns such as flowers and butterflies are vivid and lively, rich in symbolic meaning, and reflect the aesthetic taste of the people of Yiliang.

Secondly, the Crochet tie-dye technique is characterized by exceptional craftsmanship and intricate techniques. By using a crochet hook to precisely wrap small areas, it creates rich textures and a sense of depth, breaking away from the

traditional single-line representations of tie-dye. The delicate use of color and the combination of floral patterns give the works a vibrant visual effect, endowing the fabric with a distinct personality and showcasing its irreplaceable artistic value.

Figure 27 Yiliang Crochet Tie-Dye special patterns - jisuan (Gao, 2021)

Additionally, the aesthetic expression of Crochet tie-dye is deeply rooted in the natural landscapes and cultural traditions of Yiliang. Its works, inspired by landscapes and folk culture, use complex patterns and vibrant colors to exhibit the diversity and richness of regional culture.

Figure 28 Traditional crochet tie-dye - Bamboo (Gao, 2021)

Yiliang Crochet Tie-Dye, with its unique artistic style, superb craftsmanship, and cultural connotation, presents the artistic value and aesthetic charm of intangible cultural heritage, embodying an important fusion of tradition and modernity.

2.2.2.3 Social functions and economic contributions

Yiliang Crochet Tie-Dye, as a model of traditional Chinese craftsmanship, demonstrates significant value in both economic and social aspects. By promoting local economies, fostering community culture, and practicing sustainable development, it aligns with the needs of modern society.

Firstly, Yiliang Crochet Tie-Dye has made significant contributions to local economic development. Through the overseas handicraft market, this craft has created numerous employment opportunities for Yiliang and surrounding areas. For example, in the 1980s and 1990s, Yiliang Yangsheng Craft Factory not only introduced tie-dye to international markets but also helped more than 300 rural women achieve flexible employment, increasing household income. In 2000, the company achieved sales revenue of over 8 million yuan and paid taxes of nearly 700,000 yuan, injecting vitality into the local economy.

Secondly, Yiliang Crochet Tie-Dye has enhanced community cultural identity. Its inheritance and development, through training and production activities, have promoted cooperation and interaction among community members. For example, "Intangible Cultural Heritage Experience Activities" and "Yiliang County Primary and Secondary School Kindergarten Teacher Skill Training" have sparked the interest of educators in tie-dye, ensuring the inheritance and innovation of the craft while cultivating the younger generation's recognition and enthusiasm for traditional culture. Additionally, the craft has entered schools, giving students the opportunity to engage closely with and understand this art. For instance, in 2017, Kunming University and the Kunming Cultural Center jointly held the "2017 Kunming Intangible Cultural Heritage Inheritor Training Class" .

Figure 29 Parent-child activities
(Source: Courtesy of Ms. Guo Qiongfen)

Figure 30 Transmission activities
(Source: Courtesy of Ms. Guo Qiongfen)

Figure 31 Tie-dye craftsmanship in universities
(Source: Courtesy of Ms. Guo Qiongfen)

Furthermore, Yiliang Crochet Tie-Dye has kept pace with market demands, integrating modern design concepts, thus expanding its application scope. Its products have extended from traditional clothing to home décor and lifestyle accessories, characterized by natural materials and hand-dyeing, in line with today's emphasis on environmental protection and sustainable development (Image 23). This combination of tradition and modernity not only satisfies consumer aesthetic needs but also enhances recognition in the international market.

Figure 32 Bag made with Yiliang Crochet Tie-Dye technique
(Source: courtesy of Ms. Guo Qiongfen)

In summary, Yiliang Crochet Tie-Dye demonstrates unique value in economic development, cultural identity, and sustainable development, providing a successful example for the protection and dissemination of traditional crafts in modern society.

2.2.2.4 Cultural Dissemination and International Exchange

Yiliang Crochet Tie-Dye, as a representative of traditional Chinese craftsmanship, plays an important role in cultural dissemination and international exchange in the context of globalization. Its unique artistic characteristics and profound cultural connotations make it an effective medium for showcasing Chinese traditional culture, while also serving as a model for intercultural exchange and cultural diversity.

Firstly, Yiliang Crochet Tie-Dye has showcased the charm of Chinese traditional craftsmanship through international exhibitions and cross-cultural exchange activities. For example, at the 2015 Tokyo Order Fair, its exquisite patterns and rich colors attracted widespread attention, with French clients praising it as "fabric cloisonné." This title not only reflects the international recognition of its artistic value but also highlights its appeal in cross-cultural dissemination. Through these activities, Yiliang Crochet Tie-Dye successfully opened up overseas markets and promoted two-way cultural exchange between China and other countries.

Figure 33 Yiliang Crochet Tie-Dye products at an ordering event in Tokyo, Japan, 2015 (Source: courtesy of Ms Guo Qiongfen)

Secondly, Yiliang Crochet Tie-Dye has played the role of a "cultural ambassador" in international dissemination. Its craft details and cultural meanings transcend language barriers through visual language, allowing global audiences to directly feel the traditional style and cultural values of Yiliang. This form of cultural symbol dissemination has enhanced the world's understanding and recognition of Chinese traditional culture.

Yiliang Crochet Tie-Dye has already demonstrated its unique value in international cultural dissemination. In the future, by deepening exhibition activities, optimizing digital dissemination strategies, and enhancing artistic expression, it will further promote the global dissemination of Chinese traditional culture and provide experience and reference for the internationalization of other intangible cultural heritage.

In summary, Yiliang Crochet Tie-Dye, as an important representative of Yunnan's intangible cultural heritage, not only carries rich historical memories and cultural identity but also showcases the cultural characteristics of the Yiliang region through its unique artistic style and exquisite craftsmanship. In terms of economic and

social functions, it has effectively promoted regional economic development, enhanced social cohesion, and actively practiced sustainable development concepts. As a bridge for cultural dissemination and international exchange, with its exquisite craftsmanship and profound cultural connotations, it has expanded the influence of Chinese traditional culture in international exhibitions and digital media dissemination.

2.2.3 Techniques and Crafting Process

2.2.3.1 Tie-Dye Techniques

The core value of Yiliang Crochet Tie-Dye lies in the Tie-Dye Technique, which is the soul of this craft, giving dyed fabrics unique patterns and artistic vitality. The Tie-Dye Technique mainly includes the sewing Technique, Tying Technique, and Crochet Technique, each showcasing distinct craftsmanship characteristics and cultural heritage.

Sewing Technique: The sewing technique involves tightening specific areas of the fabric using needle and thread, creating unique pleats and patterns that present exquisite designs during the dyeing process. This technique includes six major categories and twelve specific methods, enabling diverse designs, such as geometric shapes or natural forms. The craftsmanship of the sewing technique is refined, requiring high precision in pattern planning and needlework. Despite being time-consuming and requiring a high level of proficiency, the resulting lines are smooth and delicate, offering exceptional visual appeal, and it serves as one of the core expressions of Tie-Dye Art.

Table 2 Introduction to sewing techniques 1

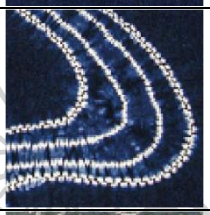
Encoding	Technique Name	legend	Technique Database QR Code
a-1	Straight seam		
a-2	Curved flat seam		
a-3	Fold line flat seam		
a-4	Regular shape flat seam		
a-5	Special-shaped flat seam		
Brief introduction to techniques	Flat stitching employs flat needles to create staggered stitches along outlined patterns, forming continuous linear or geometric shapes.		

Table 3 Introduction to sewing techniques 2

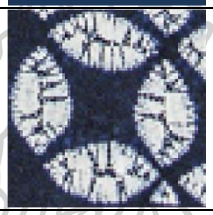
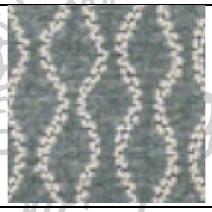
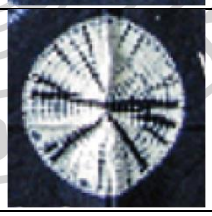
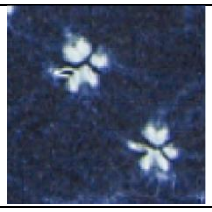
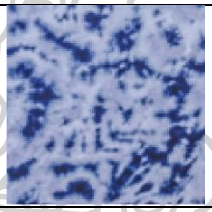
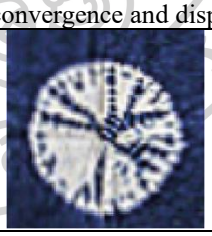
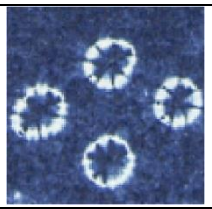
Encoding	Technique Name	legend	Technique Database QR Code
b-1	Straight fold seam		
b-2	Curved fold seam		
b-3	Scattered graphic fold seam		
b-4	All-over graphic fold seam		
b-5	Three-fold folding seam		
b-6	Merge sewing		
Brief introduction to techniques	The folding method emphasizes symmetry by first folding the fabric and then stitching along the crease with flat needles, producing staggered, continuous stitches in a single direction.		

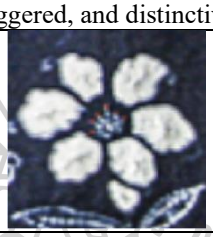
Table 4 Introduction to sewing techniques 3

Encoding	Technique Name	legend	Technique Database QR Code
c	Around sewing		
Brief introduction to techniques	The around-sewing method employs circular stitching on folded fabric, with the needle inserted sequentially from one direction, allowing the thread to encircle and tighten the crease to form the pattern.		
d	Overlap sewing		
Brief introduction to techniques	Overlap sewing folds the fabric into multiple layers, outlines the pattern on the folded surface, and applies flat stitching along the design before.		
e-1	Root seam root tie		
e-2	Root seam all tie		
Brief introduction to techniques	Root seams are suitable for large-area graphic expression and are the most common production technique.		
f	Bee pattern		
Brief introduction to techniques	The bee pattern is made by folding the fabric in different directions and angles, sewing it with the stir-stitch stitch method, and then tightening and tying it along the seams.		

Tying Technique: The tying technique involves tying or compressing specific parts of the fabric with string to prevent the dye from penetrating, forming block-like or dot-like patterns, often with natural blurred edges. This technique is simple and easy to learn, suitable for beginners, and shows a natural, spontaneous artistic effect. However, the tying technique has limitations in expressing intricate details, and the edges are not as defined. Complex designs require more advanced skills. Nevertheless, its intuitiveness and natural beauty give it an important role in the transmission of the craft.

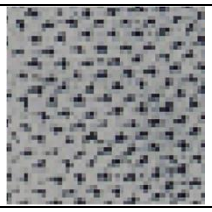
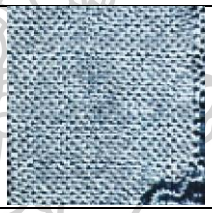
Table 5 Introduction to tying techniques

Encoding	**Technique Name**	**legend**	**Technique Database QR Code**
g	Ice pattern tie		
Brief introduction to techniques	Ice-pattern tie-dye produces crack-like textures characterized by dynamic variations, blending illusion and reality with natural convergence and dispersion.		
h	Curly tie		
Brief introduction to techniques	The curly-tie method twists and binds fabric to create spiral textures, producing patterns of rhythmic curvature and layered density.		
i	Wrap the items and tie them up		
Brief introduction to techniques	This technique generates uniform or irregular radial motifs, with object-impressed edges leaving sharp traces that contrast with the softer surrounding areas, reinforcing the interplay of illusion and reality.		

Encoding	Technique Name	legend	Technique Database QR Code
j	Tornado pattern tie		
Brief introduction to techniques	The tornado-tie method produces vortex-like textures, particularly striking on thicker fabrics, where the patterns appear vigorous, staggered, and distinctive.		
k	Hat tie		
Brief introduction to techniques	The hat-tie method involves stitching designated areas, tightening along the seams, and wrapping the gathered sections with plastic to shape the pattern.		
l	Board tie		
Brief introduction to techniques	The board-tie method folds fabric into geometric shapes and clamps it with plywood templates, which are then tightly bound for symmetrical dyeing effects.		

Crochet Technique: The Crochet Technique is the core feature of Yiliang Crochet Tie-Dye and the most recognizable aspect of this craft. This technique uses a unique Crochet Hook to create intricate dot patterns on the fabric, overcoming the limitations of traditional tie-dye methods, which involve large-scale tying. It can create finely detailed dot patterns, as small as the size of a grain of rice, which are then connected to form complex textures or geometric shapes. The Crochet Technique is divided into three sub-techniques: "Sanpu," "Si Juan," and "Renmu," each reflecting superb craftsmanship and artistic beauty. This technique is highly versatile and suitable for expressing delicate textures, but it demands exceptional skill from the practitioner. The process is time-consuming, and it is difficult to master quickly, adding to the challenge of passing down the craft.

Table 6 Introduction to hook techniques

Encoding	Technique Name	legend	Technique Database QR Code
m	Sanpu		
Brief introduction to techniques	Sanpu, a distinctive Yiliang crochet tie-dye technique, outlines the desired motif and uses a crochet hook to knot the fabric along the contour, each knot measuring about 10 mm.		
n	Sijuan		
Brief introduction to techniques	Sijuan, another unique Yiliang crochet tie-dye technique, traces the outlined motif with a fixed crochet hook, forming knots of approximately 6 – 8 mm along the contour.		
o	Renmu		
Brief introduction to techniques	Renmu, a distinctive Yiliang crochet tie-dye technique, follows the outlined motif with a fixed crochet hook, producing knots of about 5 mm along the contour.		

The Tie-Dye Techniques of Yiliang Crochet Tie-Dye showcase the superb skills and innovative potential of traditional Chinese craftsmanship. Their diverse methods not only embody the deep connotations of traditional craft but also provide rich inspiration for modern design and artistic expression, making them an essential cultural symbol of intangible cultural heritage.

2.2.3.2 Unique Crochet Production Tool

As a material carrier carrying local cultural characteristics, the traditional production tools of Yiliang hook tie-dye are the iconic elements that distinguish it from other tie-dyes. Its physical properties and process characteristics

profoundly shape the boundaries of the dissemination of skills. This tool has been certified by the national patent. It consists of a wooden workbench, a connecting rod, and a special crochet hook as a structural whole. The slightly curved design of the tip of the crochet hook ensures the accuracy and efficiency of the tying action. At the process level, the tool can achieve uniform distribution of hook points and rapid disassembly of slip knots. This greatly improves the clarity of patterns and the success rate of dyeing, reflecting the technical rationality of the traditional craftsmanship system.

However, the huge physical scale of the tool—a total length of 1060 cm and a weight of 8 kg—strictly anchors its use scenario in a professional workshop space. The heavy cast iron structure and fixed installation requirements make it difficult for teaching and experience activities to break through the physical limitations of the physical workshop. It is difficult for the general public to see and experience it in conventional cultural and tourism scenes. This physical isolation has caused the cultural experience to stop at the general tie-dyeing level, and the local knowledge of the crochet technique has always been hidden within the high walls of the workshop.

Figure 34 Traditional Crochet Production Tool (Gao, 2024)

The production cycle and cost have further exacerbated the dissemination dilemma. The production cost of a single tool is about 1,000 yuan and the construction period is as long as 30 days, which not only restricts the large-scale

teaching and promotion but also raises the economic threshold for novice learning. When cultural experiencers can only watch the crochet process from a distance through videos, the material absence of the tools eliminates the integrity of the skill cognition, and the so-called cultural inheritance becomes a flat appropriation of symbols. This physical barrier not only breaks the perceptual dimension of skill dissemination but also deeply erodes the vitality of the intangible cultural heritage gene.

2.2.3.3 Dyeing techniques

The dyeing technique in Yiliang Crochet Tie-Dye is an indispensable key link in the production process. Through methods such as tying, folding, sewing, or crocheting, the technique prevents the dye from penetrating, presenting unique and diverse patterns. The dyeing techniques, combined with plant-based dyes (such as indigo and sappan wood), endow the fabric with natural colors, while imbuing each Yiliang Crochet Tie-Dye piece with distinct artistic value and cultural significance. As a core component of the craft, dyeing techniques serve as an important carrier of cultural heritage, and through their varied expressions, they enhance the artistry and cultural value.

Ms. Guo Qiongfen, a Yiliang Crochet Tie-Dye inheritor, mentioned in an interview: "The dyeing technique of Yiliang Crochet Tie-Dye, including materials and tools, is consistent with other tie-dye techniques." Further literature research indicates that both domestic and international scholars and professionals have extensively studied plant-based dyes and their dyeing techniques. For example, Naoko Kiwaguchi provided a detailed introduction to the growth habits, dyeing steps, techniques, and tools of common plant dyes (Kiwaguchi, 2019); Sasha Diel demonstrated practical methods for extracting plant dyes from vegetables, fruits, flowers, and trees (Diel, 2018); and Huang Ronghua systematically reviewed the history, techniques, and comparative analysis of traditional Chinese plant dyeing (Huang, 2018). These studies provide substantial academic support for tie-dye techniques.

Therefore, this study does not extensively record the dyeing process of Yiliang Crochet Tie-Dye but instead organizes its commonly used natural dyes to

highlight the focus of the research and avoid overlap with existing studies.

2.2.3.4 Production process

Through field research in the Yiliang region, the researcher gained an in-depth understanding of the production process of Crochet Tie-Dye and its significance within the local community through interviews, observations, and interactions. This traditional craft relies entirely on the expertise of skilled artisans to complete the work by hand. The production process is meticulously designed and rigorously implemented to ensure that each piece showcases the unique charm and intricate details of Crochet Tie-Dye (Table 3). Every step of the Yiliang Crochet Tie-Dye production process demands the artisan's exceptional skill and careful operation. This fully handbook process not only guarantees the high quality of the final product but also fully reflects the cultural value and craftsmanship of this intangible cultural heritage. The detailed execution and rigorous inspection of each link not only convey the aesthetic essence of Crochet Tie-Dye but also provide the indispensable foundation for the protection and transmission of its craft.

Table 7 Production process

No.	Name	Picture
1	Handmade Prints	
2	Hand-tied and hooked	

No.	Name	Picture
3	Designing before dyeing	
4	Handmade vegetable dyeing	
5	Rinsing after dyeing	
6	Drying after rinsing	
7	Thread removal by hand	
8	Rinsing and drying after thread removal	

No.	Name	Picture
9	Ironing	
10	Cutting	
11	Turning	
12	Packing	

Existing research and inheritance practices indicate that Yiliang Crochet Tie-Dye exhibits a high level of complexity and artistry in both technique and production process. Through literature research, the researcher found that the academic community has not yet conducted research or compiled information on Yiliang Crochet Tie-Dye.

2.2.4 Comparison of Yiliang Crochet Tie-Dye and Bai Tie-Dye Techniques

Located along the cultural radiation zone of the Southwestern Silk Road in China, both Dali Bai tie-dye and Yiliang Crochet Tie-Dye represent distinct regional branches of traditional textile craftsmanship shaped by their differing geographic and

socio-cultural contexts. Dali, protected by the natural barrier of the Cangshan-Erhai region, developed a sacred and ritualized form of tie-dye deeply intertwined with the preservation of its indigenous Benzhu religious beliefs. In contrast, Yiliang, situated within a culturally interwoven area of Han and ethnic minority influences, reconstructed its dyeing paradigm through refined crochet techniques, forming a meticulous and intricate pattern system. While both traditions share a common historical thread along the Southwestern Silk Road, they evolved divergent symbolic vocabularies—Dali emphasizing "sacredness" and Yiliang highlighting "inter-embeddedness." This comparative framework reveals how geographic and cultural environments fundamentally shape the forms of intangible cultural heritage. Moreover, Yiliang's millimeter-scale Tying and use of natural plant-based dyes exemplify how peripheral regions serve as experimental zones for cultural hybridity, offering a living and spatially grounded example for understanding the diversity and adaptability of Chinese tie-dye traditions.

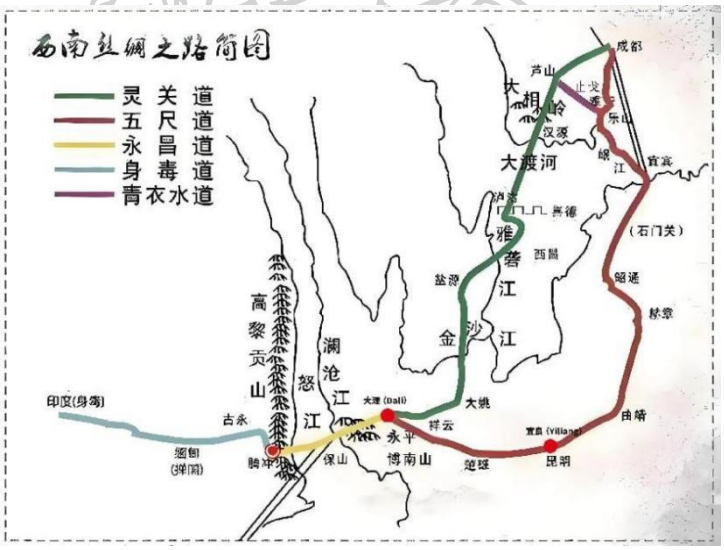


Figure 35 Southwest Silk Road Route Map
(Source: http://www.360doc.com/content/22/0325/07/5844101_1023200589.shtml)

2.2.4.1 Comparison of Geography and Culture between Bai tie-dye and Yiliang Crochet Tie-Dye

The Bai tie-dye tradition of Dali is deeply rooted in the geographically enclosed core of the Cangshan-Erhai region. The natural barrier of the Erhai basin has

historically shielded the local culture from external influences, allowing the Bai people to develop a distinct cultural identity. Tie-dye in Dali is closely intertwined with the indigenous Benzhu belief system, where totems such as butterflies and multicolored Cangshan clouds embody both nature worship and collective psychological expressions of fertility and ancestry. The use of Isatis root dye produces a pure indigo hue that, when combined with the Bai cultural reverence for the color white, symbolically conveys the ethnic ideal of "clarity and purity." In Zhoucheng village, where nearly every household operates a dye vat, tie-dyeing serves as both a spiritual medium and a livelihood. Traditionally passed down within clans, the craft has gradually shifted its function from daily wear to tourism-oriented commodities.

Figure 36 Cangshan Mountain and Erhai Lake
(Source: https://www.sohu.com/a/391154974_372652)

Figure 37 Bai Nationality
(Source: https://m.dianping.com/ugcdetail/203313460?bizType=29)

Figure 38 Traditional Bai Tie-Dye-Double Fish
(Source: https://dp.pconline.com.cn/dphoto/list_4862222.html)

In contrast, the uniqueness of Yiliang Crochet Tie-Dye emerges from its location at the cultural margins where Han and ethnic minority traditions converge in the suburbs of Kunming. As part of the Southwestern Silk Road and the Tea Horse Road corridor, Yiliang became a contact zone where Han agrarian practices merged with Bai textile techniques. The crochet technique, structurally derived from Han needlecraft, integrates Bai tie-dye methods to develop a refined craftsmanship characterized by millimeter-level point-Tying. Motifs such as indigo qilin patterns blend agrarian prayers with philosophical notions of harmony between nature and humanity. Plant-based dyeing continues the ecological wisdom of ethnic minorities, while the functional scope of Yiliang tie-dye has evolved from coarse household textiles to customized international products. Its transmission model has moved beyond familial inheritance to encompass multi-ethnic training bases and integrations with the agriculture, culture, and tourism sectors, positioning crochet tie-dye as a living specimen of intercultural symbiosis.

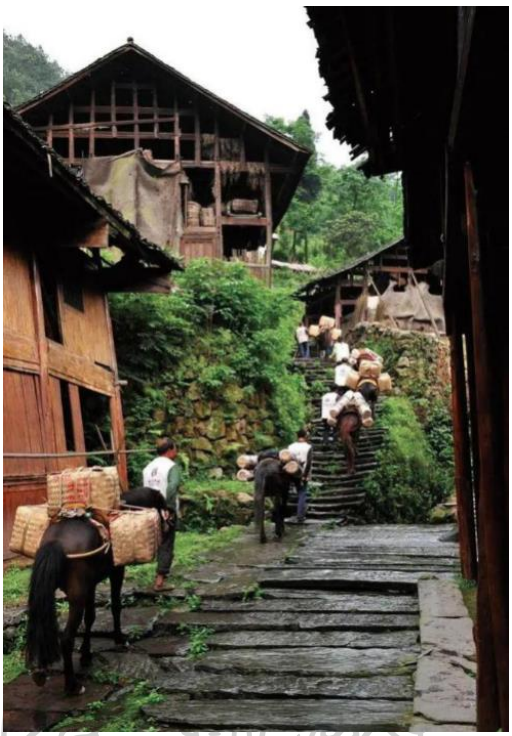


Figure 39 Tea Horse Road
(Source: https://www.163.com/dy/article/HHMRE97K0518HKK2.html)

Figure 40 Vietnam Railway-Yiliang Station
(Source: https://www.clzg.cn/article/447609.html)

Figure 41 Han Nationality
(Source: https://www.zhe2.com/note/536253624324)

Figure 42 Traditional Yiliang crochet tie-dye-Peony (Gao, 2024)

Figure 43 Chinese painting-Peony
(Source: https://weibo.com/1590289003/PorumFJoz)

While Dali tie-dye protects cultural purity through geographic closure and religious integration, Yiliang crochet tie-dye reflects a hybridized craft form born of cultural interpenetration between Han and minority traditions. It represents neither complete isolation nor unilateral openness, but rather a fusion process grounded in transitional geography. Through this marginal positioning, Yiliang absorbs diverse ethnic knowledge and transforms agrarian symbols into globalized artisanal products. In comparison, Yiliang crochet tie-dye achieves cultural integration through geographic transience, offering a contemporary narrative of inter-ethnic craft entanglement within the historical folds of the Tea Horse Road.

2.2.4.2 Comparison of the techniques and tools of Bai Tie-dye and Yiliang Crochet Tie-Dye

Bai tie-dye is centered on traditional resist-dyeing techniques, relying on physical binding to prevent dye penetration and emphasizing geometric precision. Its core craftsmanship lies in the combination of sewing and tying methods, where fabric is sewn and tied into small protrusions ("nodules") that act as resist points during multiple dyeing cycles with indigo (Isatis tinctoria Linnaeus). The sewing

method is coarse, and the specialized needles used are relatively long (60 – 67 mm in length, 1.3 – 2 mm in diameter), producing larger punctures that suit the creation of symbolic patterns such as butterfly motifs and Cangshan cloud formations. The dyeing process results in ice-crack textures around the pattern edges, creating a natural gradient known as "blue emerging from blue." The production system primarily involves wooden dye vats and handlooms. Indigo is the sole dye source, providing a single-color palette with high chromatic purity and antimicrobial properties.

Figure 44 Bai tie-dye sewing method (Gao, 2022)

Figure 45 Bai tie-dye tying method (Gao, 2022)

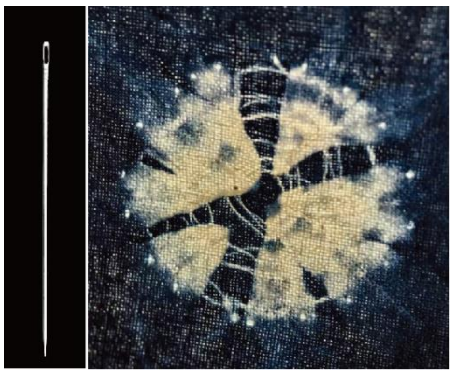


Figure 46 Needle and pattern effects-Bai tie-dye (Gao, 2022)

In contrast, Yiliang crochet tie-dye departs from traditional resist logic by integrating Han crochet techniques with Bai sewing and tying methods to form a hybrid process combining point-based floral knots and botanical dyeing. The craft utilizes ultra-fine domestic needles (40 – 45 mm in length, 0.65 – 0.8 mm in diameter) alongside specially designed crochet tools previously introduced in this study. This enables millimeter-level precision: a single garment may require up to 600,000 crochet knots, taking approximately four months to complete. Patterns emerge from the accumulation of tiny points, achieving a level of refinement far beyond conventional tie-dye. While indigo remains the dominant dye, supplementary use of local plants such as gardenia, chestnut husk, and Eupatorium adds olfactory and antimicrobial properties to the final product. The tool system includes crochet hooks, spinning machines, and modern drying devices, balancing traditional ecological wisdom with contemporary production efficiency.

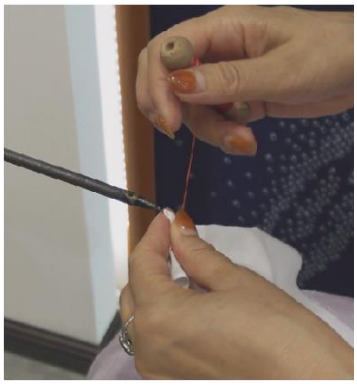


Figure 47 Yiliang Crochet Tie-Dye's unique Hooking (Gao, 2024)

Figure 48 Needle and pattern effects-Yiliang Crochet Tie-Dye (Gao, 2022)

Bai tie-dye is defined by coarse resist methods and a single-plant dye source, with its motifs deeply tied to the Benzhu religious system. In contrast, Yiliang crochet tie-dye exemplifies technical hybridity, achieved through the fusion of precise crochet craftsmanship and a diverse plant-based dye system. These technical differences reflect broader geographic-cultural genes: the cultural enclosure of Dali sustains the purity of Bai craftsmanship, whereas Yiliang's marginal position serves as a laboratory for multi-ethnic knowledge exchange. The choice of tools and dyes further accentuates this distinction—wooden vats and indigo anchor Dali's blue-and-white spiritual aesthetic, while Yiliang's crochet hooks and plant-dye innovations represent a localized ecological design sensibility within the suburban landscape of Kunming.

2.2.4.3 Comparison of artistic symbols between Bai tie-dye and Yiliang Crochet Tie-Dye

Bai tie-dye emphasizes geometric pattern construction, with symmetrical and continuous motifs such as butterfly designs and the clouds of Cangshan Mountain forming a visually rhythmic and orderly structure. These motifs are deeply embedded in the Bai people's Benzhu belief system, where the butterfly symbolizes fertility and the rippling patterns of Erhai Lake metaphorically represent divine natural forces. The patterns carry a sacred, non-transferable meaning, functioning as spiritual totems. Visually, the black-and-white contrast is flat and strong, with ice-crack textures at the edges enhancing the raw aesthetic. The clear separation between motif and background, devoid of light-shadow gradation, reinforces the purity and timelessness of the faith it represents.

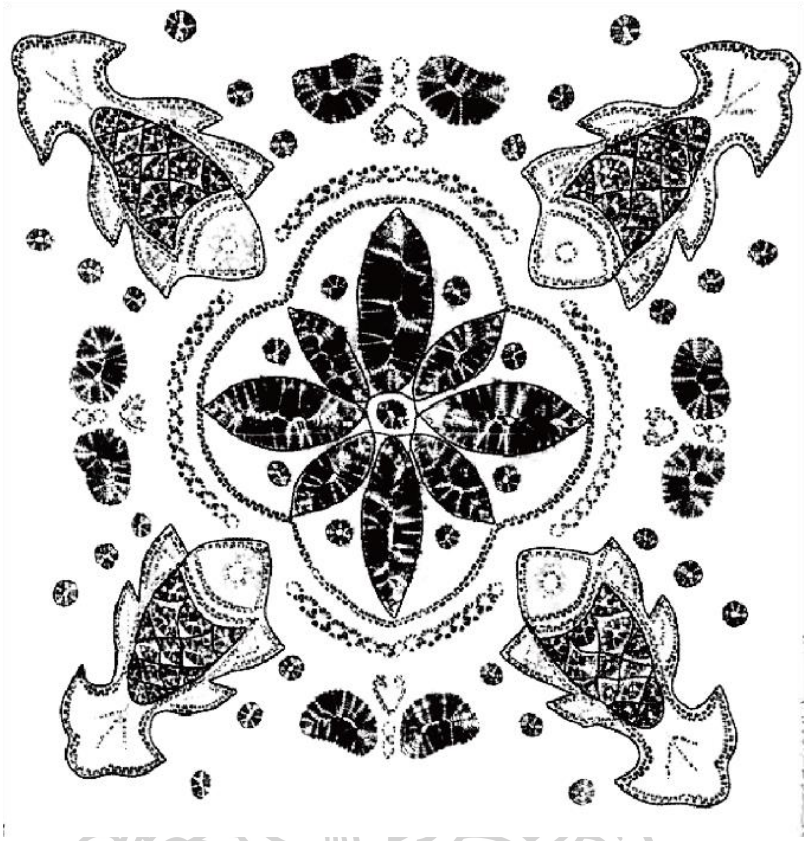


Figure 49 Reverse color draft of Bai tie-dye works (Gao, 2025)

In contrast, Yiliang crochet tie-dye breaks away from planar restrictions by constructing motifs from a micro to macro level using millimeter-scale knotting. This technique produces intricate images such as landscapes and qilin figures through dense dot matrices. From afar, the visual effect resembles ink wash gradients; up close, it reveals technical precision. The symbolic semantics of the patterns are de-sacralized—auspicious Han cultural motifs like qilin festivities and the Four Gentlemen (plum, orchid, bamboo, chrysanthemum) replace ethnic totems. White crochet elements on a dark blue background resemble brushwork in negative space, embodying the Confucian ideal of harmony between nature and humanity. The black-and-white inversion generates a dynamic interplay of light and shadow, with varied knot densities simulating three-dimensional shading. The fabric surface presents a relief-like texture akin to embroidery, blending tactile depth with visual elegance.

Figure 50 Reverse color draft of Yiliang Crochet Tie-Dye works (Gao, 2025)

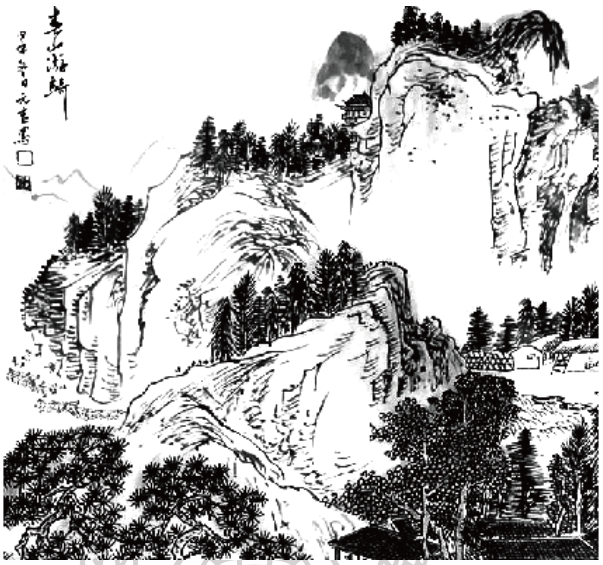


Figure 51 Reverse color draft of Traditional Chinese Painting works (Gao, 2025)

Figure 52 Chinese porcelain with lion motifs
(Source: https://www.sohu.com/a/224213974_99896587)

While Dali's Bai tie-dye preserves geometric sanctity and spiritual symbolism, Yiliang crochet tie-dye reconfigures traditional aesthetics through perspectival construction using crochet-based pointillism. These symbolic divergences reflect underlying geographical-cultural genes: Dali's enclosed geography safeguards the purity of totemic traditions, whereas Yiliang—located in the multicultural periphery of Kunming—fosters a literati reinterpretation of traditional

crafts. Technical methods further amplify these distinctions: Dali's thick needles and wide stitch holes anchor solemn religious meaning, while Yiliang's refined crochet work inscribes agricultural poetics within minimal space.

In summary, Yiliang crochet tie-dye emerges as a hybrid craft rooted in the cultural intersection of Han and ethnic minority traditions near suburban Kunming. It leverages its transitional geographic context to transcend the ethnic boundaries of craft forms. The technique fuses Han crochet precision with Bai resist-dye logic, using millimeter-scale dot structures to simulate visual depth and gradient, while botanical cold-dyeing captures the ecological intelligence of agrarian civilizations. The symbolic shift from sacred totems to literati aesthetics—through motifs like the qilin and ink-style landscapes—creates a dual effect of embroidered dimensionality and poetic dye diffusion. Compared to the spiritual purity of Dali tie-dye, Yiliang crochet tie-dye exemplifies the dynamic embedding of multi-ethnic craftsmanship. It offers a distinctive model for revitalizing intangible heritage, simultaneously preserving local agricultural symbols and expanding the contemporary aesthetic possibilities of tie-dye through hybridized techniques.

2.2.5 Discussion

As a representative of Yunnan's intangible cultural heritage, this study analyzes Yiliang Crochet Tie-Dye from multiple perspectives, including historical transmission, artistic value, social functions, and cultural dissemination. The research demonstrates that Yiliang Crochet Tie-Dye blends Central Plains Han culture with Bai tie-dye techniques, forming a unique local craft that reflects deep regional cultural heritage. Its exquisite craftsmanship and diverse design styles not only enrich the aesthetic of tie-dye art but also breathe new life into this traditional craft. At the same time, Yiliang Crochet Tie-Dye has driven local economic and social-cultural development through the handicraft market and community education. Moreover, its dissemination through international exhibitions and digital media further showcases the diversity of Chinese traditional culture and its global influence.

However, the study also reveals several issues facing Yiliang Crochet Tie-Dye. Firstly, the craft urgently requires urgent protection, as only one inheritor remains, and they are nearly 60 years old. Without effective transmission, this craft may disappear

within the next few decades. Secondly, its Crochet Tie-Dye techniques and production processes lack systematic documentation, especially the operational methods and innovative practices of the core crochet techniques, which have yet to be thoroughly researched. Furthermore, academic research on this craft is virtually non-existent, limiting scientific exploration into its protection and dissemination.

Based on these issues, this study explores the craft's historical and transmission aspects, examining the technical characteristics and social functions of Yiliang Crochet Tie-Dye, and proposes practical strategies for its protection and dissemination through digital means. Focusing on the Crochet Tie-Dye technique as the core, the study emphasizes its integration with modern demands and provides scientific evidence and practical directions for the innovative dissemination of intangible cultural heritage.

The research on Yiliang Crochet Tie-Dye is positioned to explore innovative models for the protection and dissemination of intangible cultural heritage through systematic documentation and digital presentation. As a typical case of Yunnan's intangible heritage, it holds significant research value. Yiliang Crochet Tie-Dye not only showcases the cultural depth and artistic value of traditional Chinese handicrafts but also provides a practical reference for the protection and development of other intangible cultural heritage techniques in the context of globalization. This study provides a theoretical foundation for heritage protection and establishes a feasible path for the protection and dissemination of Yiliang Crochet Tie-Dye.

2.3 Application of Dissemination Theory in Intangible Cultural Heritage

2.3.1 Overview of H. Lasswell's 5W Model

Dissemination is a complex and dynamic process involving the sharing and transmission of information. As a discipline that studies human dissemination behaviors and their relationships with society, communication theory focuses on the operational patterns of social information systems, covering the multi-layered characteristics of information transmission. The essence of dissemination includes the content of information, the channels through which it is transmitted, and the roles and functions it serves in social interactions.

Lasswell's 5W model is one of the foundational theories in communication

studies. Proposed by American political scientist Harold Lasswell in his 1948 article "The Structure and Function of Communication in Society," the model identifies three major functions of dissemination: monitoring the environment, connecting society, and transmitting heritage. The model summarizes the five basic elements of the dissemination process: the communicator (Who), the content of dissemination (Says What), the dissemination channel (In Which Channel), the audience (To Whom), and the effects of dissemination (With What Effect) (Lasswell, 1948). Through this theoretical framework, Lasswell systematically outlined the key processes and functions of dissemination, providing a core structure for the study of communication.

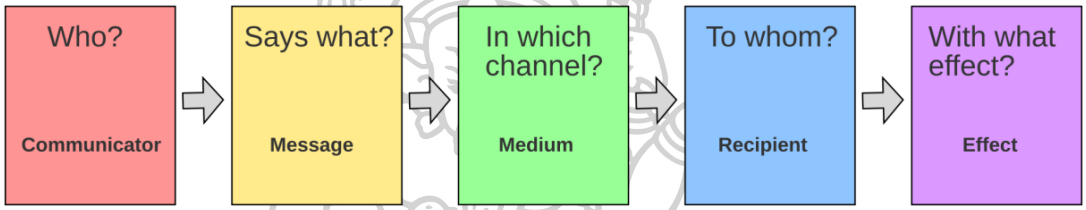


Figure 53 Lasswell's model of communication
(Source: https://www.communicationtheory.org/lasswells-model/)

2.3.1.1 Core elements of the model

Communicator (Who): Refers to the producer and sender of the information, which may be an individual, a group, or an organization. They determine the composition, processing, and transmission strategy of the information content.

Content of dissemination (Says What): Represents the information carrier, which is selected and designed by the communicator, typically presented in the form of linguistic or non-linguistic symbols.

Dissemination Channel (In Which Channel): Refers to the medium or material carrier through which the information is transmitted, such as traditional media, digital platforms, etc.

Audience (To Whom): Refers to the target group that receives the information. The characteristics of the audience directly affect the formulation of dissemination strategies.

Effects of dissemination (With What Effect): Measures whether the

dissemination process achieves its intended purpose, assessed through changes in the audience's cognition, emotions, and behaviors.

The "5W Model" effectively summarizes the basic process of dissemination and forms the five main areas of analysis in communication studies: analysis of the subject, analysis of content, analysis of the media, analysis of the audience, and analysis of effects. This theoretical framework provides a clear pathway for studying various dissemination phenomena.

2.3.1.2 Advantages and limitations of the 5W model

Lasswell's "5W Model" reveals the core components of the dissemination process with its clear logic and comprehensive structure. It systematically breaks down the dissemination process into five essential elements: the communicator, the content of dissemination, the dissemination channel, the audience, and the effects of dissemination, making it a significant theoretical tool in communication studies. However, as a linear dissemination model, it primarily focuses on one-way information flow and lacks a thorough exploration of feedback and interaction.

However, as Zhang Guoliang records in his book, Lasswell noted: "Modern mass dissemination tools provide significant advantages to the controllers of printing presses, broadcasting equipment, and other forms of fixed and specialized assets. But it should also be noted that the audience might 'respond' after a slight delay. Many mass dissemination controllers adopt scientific methods such as sample surveys to expedite the completion of the entire dissemination loop" (Zhang, 2003, p.199). Nevertheless, Lasswell's discussion on the feedback mechanism is somewhat limited. This shortcoming is mainly due to the technological conditions and disciplinary development levels at the time the model was proposed. Therefore, the "5W Model" shows certain limitations when applied to modern dissemination scenarios characterized by high interactivity and multi-directional information flow.

Despite these limitations, the "5W Model" remains a foundational element in communication studies. With the rapid development of modern dissemination technologies, the model has been expanded by incorporating disciplines such as journalism, linguistics, cultural studies, and sociology, thereby broadening its

theoretical application. For example, in this study, the researcher introduced real-time feedback and the concept of two-way interaction, compensating for the model's limitations in feedback mechanisms in digital dissemination and new media, making it more applicable to contemporary dissemination contexts.

Thus, this study chose Harold Lasswell's 5W Model as the theoretical framework for the following reasons:

Firstly, the 5W model (Who, Says What, In Which Channel, To Whom, With What Effect) is a classic and concise framework in communication studies that enables systematic analysis of any dissemination activity based on the fundamental elements of dissemination. For this study, the core elements of the 5W model are highly aligned with the digital dissemination of intangible cultural heritage. Specifically, "Who" (the communicator) includes the inheritors of Yiliang Crochet Tie-Dye, the database design team, and the researchers or communicators posting content on social media. "Says What" (the content of dissemination) includes the knowledge of Yiliang Crochet Tie-Dye skills, cultural background, and modern design products. "In Which Channel" (the dissemination channel) is social media. "To Whom" (the audience) includes the public, community members, and academic groups. "With What Effect" (the effects of dissemination) includes changes in the audience's cognition, interest, cultural identity, and willingness to purchase. The structural analysis of the 5W model is simple and clear, making it suitable for planning and analyzing the results of various design experiments in this study.

Secondly, the model aligns with the research objectives. The core goals of this study need to be achieved through the dissemination process, and the 5W model provides theoretical support for these objectives. The dissemination goal involves analyzing the needs of the audience through "Who" and "To Whom" to design databases and educational content. The dissemination strategy uses "Which Channel" to guide social media outreach and enhance the social recognition of Yiliang Crochet Tie-Dye. The design goal uses "Effect" to assess the cultural impact of the design outputs, ensuring the effectiveness of the dissemination content. The 5W model helps create a logical chain for formulating dissemination strategies, optimizing content, and evaluating the effectiveness of dissemination in this study.

Additionally, the model meets the unique needs of intangible cultural

heritage dissemination. Compared to other complex communication theories such as cross-cultural communication theory or the two-step flow model, the 5W model is more suitable for addressing the digital dissemination of intangible cultural heritage, especially in terms of content diversity, such as skills, cultural background, and design innovation. The simple framework of the 5W model effectively adapts to the complex yet core needs of intangible cultural heritage dissemination, breaking down complex dissemination issues into five core dimensions. This approach provides strong logic and high practicality, making it well-suited to address the complexity and diversity of intangible cultural heritage dissemination.

Lastly, it avoids overly broad or unrealistic theories. Although there are other theories in communication studies, their applicability may be too broad or not fully aligned with the core issues of this research. For example, cross-cultural communication theory primarily involves communication between different cultures, while the audience of this study is predominantly domestic, making the applicability of cross-cultural communication limited. In contrast, the 5W model, with its comprehensive and simple nature, can serve the content and experimental design of this study more effectively and precisely.

In summary, this study chose Harold Lasswell's 5W Model as the theoretical framework because it clearly and concisely analyzes the five major elements of dissemination, directly supporting the design of dissemination strategies, the construction of experimental frameworks, and the analysis of results. The 5W model's strong applicability and clear structure will help researchers systematically explain and validate how to expand the dissemination scope of Yiliang Crochet Tie-Dye through digital dissemination, enhancing social recognition and cultural identity, while avoiding the issues of overly broad and complex theories.

In summary, Lasswell's "5W Model" provides a fundamental framework for communication studies, particularly in the field of cultural dissemination. Although its linear dissemination model has limitations, its adaptability has been enhanced with the addition of feedback mechanisms. This model provides theoretical support and analytical tools for exploring the dissemination pathways of intangible cultural heritage and lays a solid foundation for optimizing dissemination strategies in the future.

2.3.2 Research on Communication Theory in Intangible Cultural Heritage

This section reviews the research on the dissemination of intangible cultural heritage in both Chinese and English literature over the past 14 years. It aims to explore the applicability of communication theories, especially Harold Lasswell's 5W model, in ICH preservation and dissemination, providing theoretical support and practical reference for ICH protection from the perspective of cultural ecology. This study gathered 158 relevant articles through databases such as WOS, CNKI, Google Scholar, and Baidu Scholar.

Communication theory provides a systematic analytical framework for the dissemination of ICH, and Lasswell's 5W model, with its clear logic and comprehensive structure, has been widely applied in the study of ICH dissemination. The review covers the existing research progress from five aspects: the dissemination subject, content design, media integration, audience characteristics, and dissemination effects.

The dissemination subjects include traditional craftsmanship inheritors, local governments, cultural institutions, and enterprises. The diversity of these subjects and their collaborative relationships have become key research focuses. Inheritors are the core of ICH dissemination, and their traditional methods of oral transmission face challenges in modern society. There is a need to transform these practices through digitalization and organization (Zhao, 2024). Local governments and cultural enterprises play a key role in policy support, resource integration, and market promotion. For example, the "China Intangible Cultural Heritage Inheritors' Training Program" has provided substantial support for the modernization of ICH dissemination (Wang, 2021). At the same time, dissemination and cooperation between governments and inheritors are crucial for the protection of cultural heritage (Nie Hualin et al., 2012).

Research on dissemination content focuses on the extraction of cultural symbols and the design of disseminated information to enhance its emotional appeal and memorability. Symbolic design has become central to dissemination, enhancing the audience's cultural memory and cognition through visual and auditory language (Yuan, 2023; Wang & Li, 2024). Emotional storytelling is also a key topic. For instance, "Intangible Heritage in China" combines multimedia forms to present ICH

through experiences and dialogues, opening up new pathways for dissemination (Zhou, 2024).

The study of dissemination channels centers on the integration of traditional media and digital media, as well as the application of emerging technologies. Social digital dissemination platforms enhance the sense of participation and influence in ICH dissemination through interaction and sharing (Zhu, 2018; Wu, 2019). Short video platforms, with their intuitive and vivid content forms, have broken the limitations of time and space, expanding the reach of dissemination (Lin, 2023). AR and VR technologies offer immersive experiences, enhancing recognition and emotional resonance with ICH culture (Scanning, 2023). These emerging technologies demonstrate great potential in the field of ICH dissemination.

Audience research focuses on the psychological acceptance and behavioral characteristics of different groups in relation to ICH dissemination. The youth group, with its high digital literacy and interest preferences, has become an important target for ICH dissemination. Studies have found that short video and live-streaming platforms, through interactive and entertaining content, attract a large number of young audiences while enhancing their sense of identity with traditional culture (Quan, 2024).

Research on dissemination effects focuses on the impact of ICH dissemination on the audience's cognition, emotions, and behavior. For example, when evaluating dissemination effects, it is essential to consider aspects of cultural exchange, cultural education, and cultural popularization (Chai & Lü, 2016). Effective feedback systems, such as surveys and data analysis, can optimize dissemination strategies and enhance the spread and influence of ICH culture.

In summary, existing research provides multiple perspectives on ICH dissemination. However, issues such as the lack of theoretical systematization and limited practical application remain. Future research needs to further integrate communication theories with modern media technologies to achieve innovation and optimization in the dissemination of ICH.

2.3.3 Discussion

Communication theory provides an important framework for the dissemination

and protection of intangible cultural heritage, but there is still a significant gap between theory and practice in existing research, which offers directions for further improvement in this study.

Firstly, existing research often focuses on individual dissemination elements, such as the dissemination subject, content design, or channel analysis, lacking a systematic framework that covers the entire dissemination process. This fragmented approach makes it difficult to reveal the overall interactive nature of ICH dissemination, especially in new media environments and with multiple participants involved, which hampers the comprehensive optimization of dissemination strategies.

Secondly, there is a clear shortcoming in case studies and field validation. Many studies remain at the theoretical level, lacking real-world analysis and data support. For example, while new media technologies are considered important tools for ICH dissemination, the specific application methods and their effectiveness have not been systematically verified, limiting the potential for theoretical translation into practice.

Thirdly, the integration of digital technologies is insufficiently explored. Although technologies such as short videos, AR/VR, etc. However, although they are frequently mentioned in ICH dissemination, there is a lack of research on how to integrate them into the entire dissemination process, particularly in terms of how they align with traditional cultural symbols. As a result, the potential of technological innovation in ICH dissemination has not been fully realized.

Furthermore, content design often becomes formalistic and fails to deeply explore the skills and cultural connotations of ICH. The lack of uniqueness in content design makes it difficult to engage the audience in a deeper understanding of ICH, especially among the youth, where the dissemination struggles to trigger emotional resonance and produce long-term impact.

There is also insufficient research on the target audience, especially a lack of in-depth analysis of the psychological characteristics and cultural needs of youth groups. As an important audience for ICH dissemination, the digital lifestyles and cultural preferences of young people have not been accurately identified, which affects the effectiveness of dissemination strategies.

Finally, the lack of feedback mechanisms limits the ability to optimize

dissemination activities. Existing research lacks quantitative analysis of dissemination effects, such as the impact on audience cognition, emotions, and behavior, and lacks scientific evaluation tools, making it difficult to continually improve dissemination strategies.

In summary, the application of communication theory in ICH dissemination faces issues such as systemic inadequacies, a lack of empirical research, weak integration of digital technologies, insufficient content depth, lagging audience research, and inadequate feedback mechanisms. This study, based on Harold Lasswell's 5W model, proposes a bidirectional closed-loop dissemination framework and, through the case of Yiliang Crochet Tie-Dye, explores innovative paths for ICH dissemination in a digital environment. This framework not only improves the theoretical system but also provides practical references for the modernization of ICH protection and dissemination.

2.4 Focus Groups

2.4.1 Overview of Focus Groups

A focus group is a qualitative research method that involves interactive discussions to gain in-depth insights into participants' perspectives and needs on specific topics. In the context of intangible cultural heritage research, focus groups, through the exchange of diverse viewpoints, elucidate the relationships between the key components of ICH dissemination, including the roles of dissemination participants, content design, dissemination channels, audience preferences, and dissemination effects. This method effectively addresses the limitations of traditional research methodologies.

In this study, combining Harold Lasswell's 5W model, focus groups are employed to systematically analyze the critical elements of ICH dissemination, including the role adaptation of dissemination participants, the optimization of digital media in content design, and the behavioral characteristics of target audiences. Additionally, the focus groups provide valuable insights into the exploration of digital pathways, cross-cultural dissemination, and collaborative mechanism design, laying the foundation for optimizing the dissemination strategy of Yiliang Crochet Tie-Dye.

As an essential tool for bridging theory and practice, focus groups allow for a

comprehensive analysis of the complex issues surrounding ICH dissemination, facilitating the development of Yiliang Crochet Tie-Dye in digital, symbolic, and contextualized dissemination.

2.4.2 Design and Implementation of Focus Groups

2.4.2.1 Purpose

The primary objective of the focus groups in this study is to systematically address the multifaceted challenges that Yiliang Crochet Tie-Dye faces in contemporary dissemination through dialogue among diverse participants. This dialogue will serve as the foundation for subsequent design practices by establishing demand anchors and value consensus. Participants include practitioners such as craft inheritors, artisans, cultural managers, educators, design innovators, university students, and community members. The goal is to create a cross-disciplinary dialogue space that uncovers the intricate tension between "traditional preservation" and "modern transformation" in the protection of ICH.

2.4.2.2 Selection of participants

To ensure the effectiveness and diversity of the focus group discussions, the study employs a meticulously designed selection criterion for participants:

1.Yiliang Crochet Tie-Dye Inheritors: Individuals with extensive experience in the Crochet Tie-Dye technique, capable of providing profound insights into the transmission and innovation of the craft.

2.Yiliang Crochet Tie-Dye Artisans: Workers engaged in the daily practice of the Crochet Tie-Dye technique, possessing firsthand knowledge of the production processes and technical challenges involved.

3.Relevant Government Personnel: Officials responsible for cultural heritage protection and promotion, offering perspectives on policy support and preservation measures.

4.Cultural dissemination Company Personnel: Professionals involved in cultural dissemination and promotion, who provide valuable insights into market demand and dissemination strategies.

5.Teachers and Cultural Researchers: Academics and educators

working in relevant fields, contributing theoretical and educational perspectives.

6.Community Residents and Students: Individuals from the Yiliang community or those with a strong interest in Yiliang Crochet Tie-Dye culture, representing the voices of the local community and younger generations.

Through these selection criteria, the study ensures that the focus group consists of participants from diverse backgrounds who are closely linked to Yiliang Crochet Tie-Dye, thus enabling comprehensive and in-depth discussions.

2.4.2.3 Focus Group Setup

This study employs a combination of online and offline focus group methods to overcome geographical constraints, expand participant reach, and facilitate in-depth discussions.

The offline discussion was held on March 6, 2024, from 10:30 AM to 12:00 PM at the Yiliang Cultural Center, a key venue for the transmission of Yiliang's intangible cultural heritage, which offers a rich cultural atmosphere. Participants will include Yiliang Crochet Tie-Dye inheritors, artisans, government officials, and community residents.

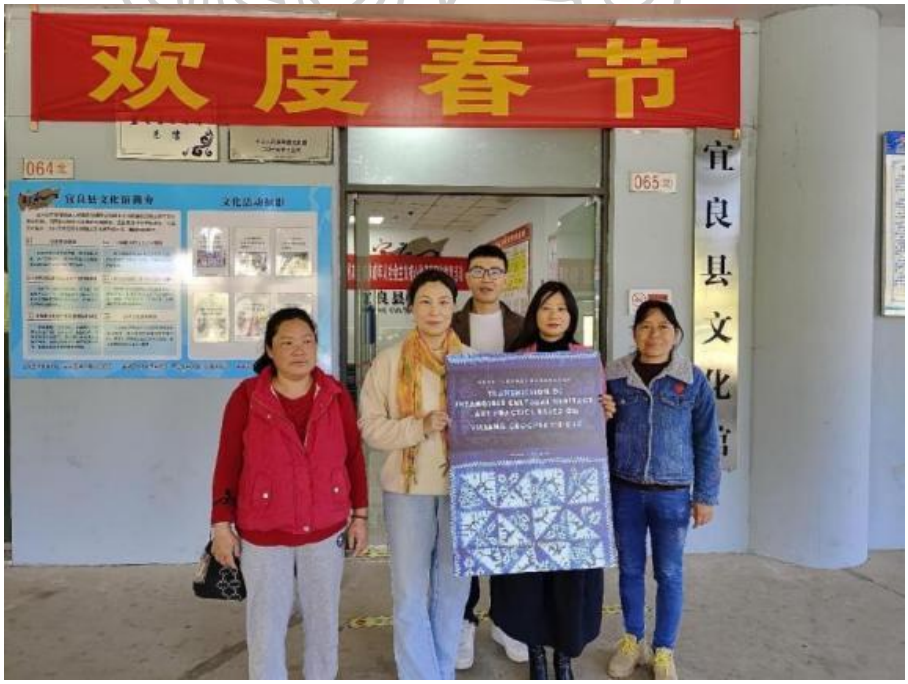


Figure 54 Group photo of focus group members (Gao, 2024)

Figure 55 Focus group offline meeting (Gao, 2024)

The online discussion will take place via the Tencent Meeting platform, with invited participants from cultural dissemination companies, educators, cultural researchers, and students. Online and offline participants will be able to interact in real-time and engage in discussions on Crochet Tie-Dye techniques and related topics.

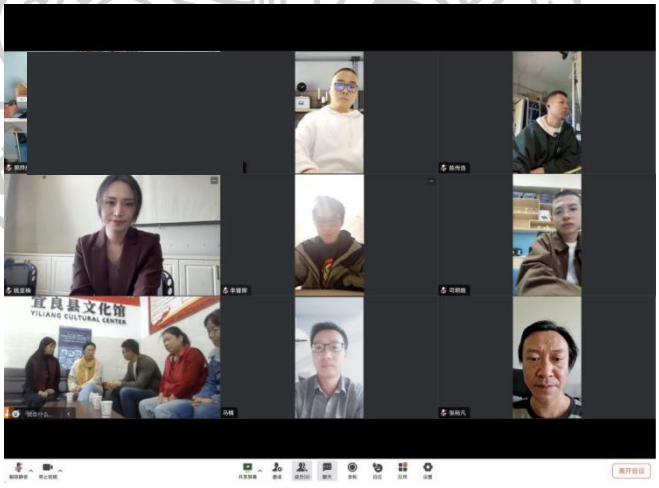


Figure 56 Online focus group participants (Gao, 2024)

Due to the offline discussion taking place within a government department, video and audio recording will be prohibited. The content of the discussion will be preserved through paper-based records to ensure all viewpoints are fully captured. The Tencent Meeting software will support real-time dissemination, ensuring online participants are synchronized with the offline event.

This hybrid setup, incorporating both online and offline components, aims to gather a comprehensive understanding of the inheritance and innovation pathways of Yiliang Crochet Tie-Dye through the perspectives and insights of participants from diverse backgrounds, providing multidimensional support for the research.

2.4.2.4 Focus Group Discussion Themes and Questions

Theme 1: The Real Challenges of Skill Inheritance

Inheritor's Perspective:

"What is the most energy-consuming aspect when you teach the Crochet Technique?"

"If you were to record a video tutorial of your experience, what details must be preserved?"

Craftsman's Perspective:

"Which aspects of the tools you use are inconvenient?"

"What are the common repetitive mistakes made by young apprentices?"

Theme 2: Practical Contradictions in Educational dissemination

Teacher's Perspective:

"What are the main cost expenditures when implementing intangible cultural heritage courses in schools?"

"How do you explain the cultural significance behind the patterns to your students?"

Student's Perspective:

"Which steps in learning Tie-Dye make you lose patience the most?"

"What type of creative inspiration would you like to gain from ICH?" (Linking the need for skill learning with innovative transformation.)

Theme 3: The Ethical Boundaries of Digital Intervention

Researcher's Perspective:

"How do you think traditional patterns can be made acceptable to modern audiences?"

"Do you think showcasing core techniques in short videos will

diminish the value of the skill?"

Government Administrator's Perspective:

"What policies restrict the integration of ICH into schools?"

"What is your view on the data traffic indicators in ICH dissemination?"

Theme 4: The Sustainability of Community Involvement

Resident's Perspective:

"How much time would you be willing for your children to spend learning Tie-Dye?"

"What do you think the Crochet Tie-Dye works can be used for in daily life?"

All Participants:

"If you could only improve one aspect, would you choose tools, teaching materials, or dissemination methods?"

"In your opinion, should true ICH preservation remain intact or evolve with innovation?"

2.4.3 Findings from the Focus Group

The discussions revealed that the core conflict in the inheritance of traditional skills lies in the tension between the highly individualized nature of experiential transmission and modern society's demand for standardized, replicable knowledge systems. Inheritors generally acknowledge the advantages of the oral and hands-on teaching method for delivering cultural depth. However, they candidly admitted that it is difficult to overcome regional and generational limitations, particularly in conveying the precise use of tools and technical details, which presents a significant efficiency bottleneck.

Educators pointed out that existing ICH teaching resources are highly fragmented, lacking a systematic course framework and quantifiable assessment standards, leading to inconsistent teaching quality.

Discussions among young learners and community residents revealed a close link between willingness to participate and the barriers to entry. Public awareness of ICH often remains at the level of appreciation, and hands-on participation is often

hindered by the heaviness of the tools and the complexity of the steps. However, there was also a strong emotional desire to "create a culturally meaningful work with their own hands." This mismatch between "low willingness to engage" and "high emotional demand" highlights the need for a lightweight experiential design.

In the cross-disciplinary dialogue, the intervention of digital tools sparked ethical concerns. Inheritors expressed worry that video-based teaching would diminish the sanctity of the craft. However, researchers argued that, if digital technologies could precisely preserve core craft parameters, they could enhance the stability of cultural genetics. Government officials emphasized that ICH dissemination must explore ways to organically integrate with contemporary education systems and the cultural tourism industry, while maintaining its authenticity.

The discussions ultimately led to key agreements: Tool improvements should address the pain points of current traditional tools without altering the essence of the craft; knowledge dissemination should establish a tiered content system to accommodate various learning needs; and cultural interpretation should strengthen the connection between pattern symbols and regional life. These findings established a dual-value direction for subsequent design practices, emphasizing "respecting traditional logic" while "responding to modern needs."

2.5 Problem Analysis

Through a comprehensive review of the current state of intangible cultural heritage dissemination, the practice and challenges of Yiliang Crochet Tie-Dye, and the application of communication theories, this study identifies a series of interrelated problems that hinder effective inheritance and sustainable development. These problems form the theoretical and practical foundation for the research and guide the development of a systematic solution based on cultural design and digital dissemination.

One core issue is the lack of a systematic and operational framework for the protection and inheritance of intangible cultural heritage. Due to the dynamic, experiential, and tacit nature of ICH, existing studies tend to focus on descriptive or qualitative documentation, often neglecting the translation of traditional knowledge

into structured, replicable, and teachable forms. This gap becomes especially apparent in the digital era, where the absence of standardized knowledge systems—such as digitized procedural breakdowns or multimedia teaching materials—prevents traditional crafts from being effectively disseminated across generational or regional boundaries.

Yiliang Crochet Tie-Dye, as a representative heritage item of Yunnan Province, suffers from both material and immaterial crises. On the material level, production tools are outdated, inaccessible, and unsuitable for portable, public-facing workshops. On the immaterial level, the process of knowledge transmission is highly dependent on oral instruction and individual apprenticeship, lacking modular and scalable formats for widespread learning. Field research reveals that the only remaining provincial-level inheritor is over 70 years old, and that there is a significant absence of recorded crochet techniques, particularly in terms of step-by-step procedures, symbolic interpretation, and innovation principles. Without intervention, this traditional craft is at serious risk of disappearing.

Additionally, current communication studies applied to ICH dissemination lack systematic integration with design practice. While existing literature acknowledges the value of communication theories such as Lasswell's 5W model or Schramm's interaction model, most research focuses on either media channels or message content in isolation, rather than on creating closed-loop systems that connect cultural insight extraction, user-oriented co-design, multichannel dissemination, and feedback analysis. The absence of practical validation through user-centered experiments limits the real-world effectiveness of these theories.

The deficiency of feedback mechanisms and scientific evaluation systems further impedes dissemination optimization. Current ICH dissemination projects rarely evaluate how different audiences cognitively and emotionally respond to heritage content, nor do they measure how dissemination formats influence learning outcomes, cultural identity, or behavioral intention. Without empirical data to guide iteration, dissemination efforts remain static and are often mismatched with user needs.

Moreover, the pathways for dissemination are overly homogeneous, often confined to exhibitions, performances, or static product design. This lack of diversity

and interactivity limits the appeal of ICH to younger or non-specialist audiences.

Lastly, the structural constraints in Yiliang County represent a significant barrier to sustainable ICH protection. According to an interview with Zhang Rui, a staff member at the Yiliang Intangible Cultural Heritage Protection Center, the local team comprises only six individuals, with an annual provincial funding allocation of just 2,000 RMB per project. This limited institutional support places a heavy burden on individual inheritors to sustain and disseminate the craft, often without professional design assistance or technical infrastructure.

In summary, the transmission and dissemination of Yiliang Crochet Tie-Dye face challenges at multiple levels—methodological, communicative, institutional, and technical. These issues not only highlight the urgency of designing a systematic, design-driven dissemination model but also underscore the need for integrating cultural preservation with digital innovation, stakeholder collaboration, and audience-centered feedback loops.

2.6 Summary

This chapter systematically reviews the current literature on intangible cultural heritage and the specific case of Yiliang Crochet Tie-Dye, and identifies significant gaps in theory, methodology, and practical application. By analyzing issues related to the lack of structured protection mechanisms, the fragmented application of communication theories, the scarcity of dissemination tools, and institutional limitations in Yiliang County, the chapter clarifies the core challenges facing the sustainable dissemination of Yiliang Crochet Tie-Dye. Special attention is given to the absence of modular, teachable resources, the outdated and inaccessible nature of traditional tools, and the insufficient feedback mechanisms for assessing dissemination effectiveness.

Looking forward, the research will build upon these findings by developing a systematic digital database for documenting and disseminating Yiliang Crochet Tie-Dye techniques, designing multi-platform dissemination strategies, and implementing a closed-loop evaluation system that measures cultural impact. Through the integration of cultural design, digital tools, and participatory dissemination methods, this study aims to construct a comprehensive and replicable framework for

safeguarding ICH in modern society.

In sum, this chapter lays the conceptual foundation for the research design and offers a problem-oriented rationale for the subsequent chapters. By addressing both theoretical and practical deficiencies, it provides a clear direction for the innovation-driven protection and dissemination of Yiliang Crochet Tie-Dye and contributes to the broader discourse on the sustainable development of intangible cultural heritage in the digital era.

Chapter 3
Research Methodology

This chapter outlines the research methodology employed in this study, detailing the theoretical foundations for the methods chosen and their practical application in the research process. The study utilizes a mixed-methods approach, combining both qualitative and quantitative research methodologies. The qualitative research primarily involves field observations, interviews, and focus group discussions to gain an in-depth understanding of the historical context, technical characteristics, and current transmission status of Yiliang Crochet Tie-Dye. On the other hand, the quantitative research uses experimental design, surveys, and social digital platform data analysis to objectively evaluate the impact of digital dissemination tools and design outputs on public cognition and cultural transmission.

The choice of research methods is grounded in communication theory and intangible cultural heritage protection theory, with particular emphasis on communication's 5W model. This model helps explore how traditional culture can be effectively disseminated in modern society and how it can be adapted to contemporary needs. Additionally, the study incorporates a systems design approach, which uses experimental design to assess the actual effects of digital tools and modern design on cultural dissemination.

Through this diversified research approach, the study aims to provide a comprehensive evaluation of the role of digital dissemination and design in the protection and dissemination of Yiliang Crochet Tie-Dye as an intangible cultural heritage. The research methodology not only provides a systematic analytical framework for this study but also offers a methodological reference for future digital dissemination and innovative design in the preservation and dissemination of other intangible cultural heritage.

3.1 Research Method

This study employs a Mixed Methods approach for comprehensive analysis, combining the advantages of both qualitative and quantitative research to explore the digital preservation and dissemination of Yiliang Crochet Tie-Dye techniques. This

methodology allows for a deep understanding of the cultural background and transmission status of the traditional technique, while also providing empirical data to test and evaluate the relevant hypotheses, ensuring the reliability and generalizability of the research findings. The following outlines the detailed methodology of this study.

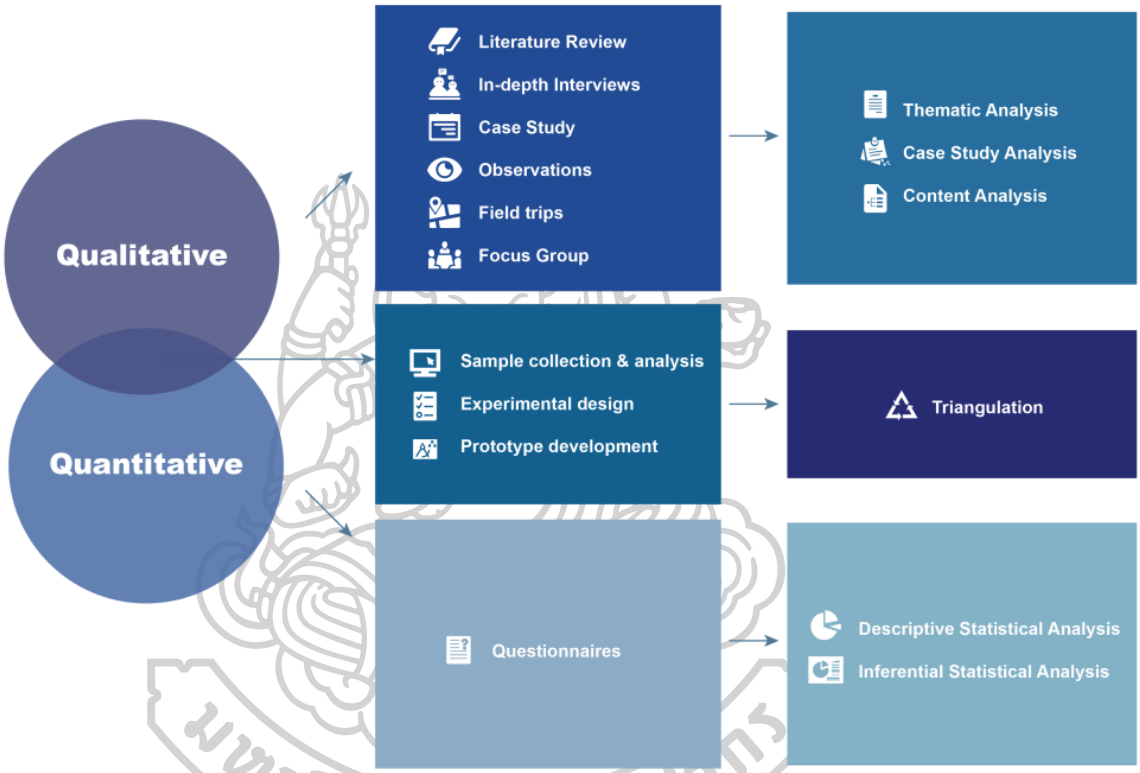


Figure 57 Research methodology (Gao, 2024)

Initially, a literature review establishes the theoretical foundation for the research. Through a review of relevant literature, a research framework incorporating theories related to Intangible Cultural Heritage and communication theory is built. This framework provides theoretical support for the scope and direction of the study, helping to identify the core research questions. The literature review not only deepens the understanding of intangible cultural heritage dissemination mechanisms but also serves as a crucial reference for the subsequent experimental design and data analysis.

In terms of qualitative research, this study employs field visits, interviews, and focus group discussions to collect in-depth data regarding the cultural background,

technical characteristics, and dissemination status of Yiliang Crochet Tie-Dye. By visiting workshops in the Yiliang region, interviewing local artisans, inheritors, and government officials, the researcher obtains firsthand data to gain a thorough understanding of the current state of the craft, its transmission methods, and the challenges it faces. In the data collection process for Yiliang Crochet Tie-Dye, a supervised learning method is applied to a multiclass classification approach, initially collecting and labeling 1,417 samples of tie-dye products for various uses, categorized into sewing Technique, Tie Technique, and Crochet Hook Technique. Key features are extracted from the images of each product. The inheritors then assist in recognizing and classifying these techniques. Ultimately, all sample data, features, technique categories, and their codes are integrated into a structured visual database, which will support the preservation and dissemination of Yiliang Crochet Tie-Dye. Additionally, focus group discussions will involve stakeholders from various backgrounds to discuss issues of cultural identity, dissemination barriers, and modern adaptability of Yiliang Crochet Tie-Dye. This approach helps gain a multifaceted understanding of the craft's social and cultural standing, revealing potential issues in its dissemination process. Furthermore, documentary and archival research analyzes historical documents and local records related to Yiliang Crochet Tie-Dye, providing background support for its historical development, cultural value, and transmission status.

The quantitative research portion involves experimental design and survey methodologies to evaluate the effectiveness of digital dissemination and innovative design in the cultural dissemination of Yiliang Crochet Tie-Dye. The research design includes multiple experiments, beginning with a comparison experiment to assess the role of a Yiliang Crochet Tie-Dye toolkit in facilitating skill learning and cultural education. Furthermore, teaching videos of Yiliang Crochet Tie-Dye will be published on social digital platforms to analyze the dissemination effects and evaluate how these platforms can expand the range of dissemination and enhance the public's recognition and interest in this traditional craft. All quantitative data will be processed using statistical analysis software, employing descriptive statistics to analyze the learning outcomes, dissemination effects, and social acceptance across different experimental groups. This will provide a scientific basis for digital dissemination strategies and

cultural product design.

Case studies are a critical component of this research. By analyzing global examples of similar intangible cultural heritage digital dissemination and design, such as the 3D printing application in Fujian paper-cutting culture and the digital communication of Bai tie-dye, the researcher can draw on successful experiences to inspire the digital dissemination and innovative design of Yiliang Crochet Tie-Dye. The case study approach helps place Yiliang Crochet Tie-Dye's practice in a broader cultural dissemination and innovation design context, further refining the theoretical framework and practical solutions of this study.

In addition, to ensure the long-term effectiveness of the research, a feedback and evaluation mechanism is established, particularly to track the long-term impact of Yiliang Crochet Tie-Dye toolkit and social digital platform dissemination strategies. Ongoing data collection will help assess the sustained effects of these methods in practical applications and provide future research directions.

Given that this study involves multiple fields such as cultural heritage, communication studies, design, and sociology, an interdisciplinary approach is adopted. By integrating theories and methods from various disciplines, the research deeply explores the application of digital tools, the complexity of cultural dissemination, and the construction of cultural identity. This interdisciplinary methodology allows for a systematic analysis of the dissemination of Yiliang Crochet Tie-Dye from multiple dimensions and perspectives, ensuring the comprehensiveness and scientific rigor of the research findings.

In summary, this study utilizes a Mixed Methods approach, combining qualitative and quantitative research to explore the digital dissemination, design improvements, and cultural transmission of Yiliang Crochet Tie-Dye. This multidimensional, interdisciplinary research methodology provides a feasible theoretical framework and practical guidance for modern dissemination of intangible cultural heritage, ensuring the study's rigor and comprehensiveness.

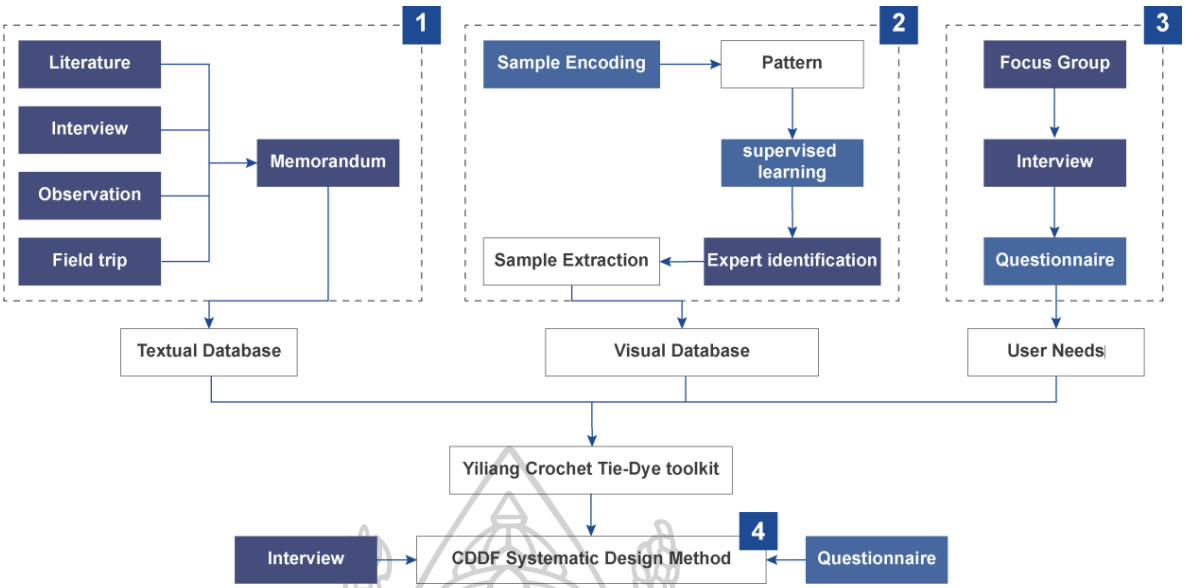


Figure 58 Research methods and tools (Gao, 2024)

Figure 59 Sample compilation and analysis (Gao, 2024)

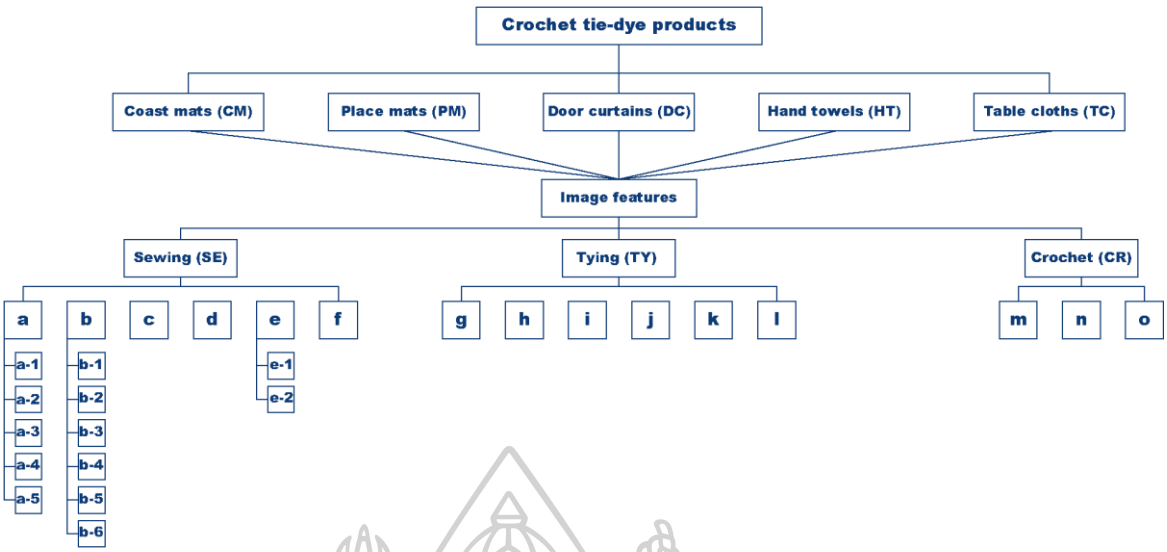


Figure 60 Technique structure chart (Gao, 2024)

3.2 Research Procedure

The research procedure for this study follows a strict sequence of steps to ensure that each phase, from the construction of the theoretical framework to data collection, experiment design, analysis, and conclusions, aligns with the research objectives and hypotheses. Below is a detailed outline of the research procedure:

In the early stages of the study, the focus was on conducting a literature review and establishing the theoretical framework. By reviewing relevant literature and local historical records, the research identified gaps in existing research on Yiliang Crochet Tie-Dye as an intangible cultural heritage, while also pinpointing key research questions. The literature review and theoretical analysis also helped build the theoretical framework for intangible cultural heritage, communication theory, and digital communication theory, which laid a solid foundation for the subsequent phases of the research. The research objectives and hypotheses were also clarified during this phase. Hypotheses included the impact of social digital platforms on cultural dissemination and the role of innovative design in adapting traditional culture to modern contexts.

Next, the study moved into the methodology design phase, during which a mixed-methods approach (combining both qualitative and quantitative research) was selected. The research design included field visits, focus group discussions, and surveys as key data collection methods. This phase involved preparing for data

collection and ensuring that the research methods were comprehensive and reliable, laying the groundwork for the subsequent stages of data collection and analysis.

In the second half of 2022, the researcher conducted a field visit to Yiliang Yangsheng Craft Factory, where initial interviews and observations took place. This field visit helped the researcher understand the current production status of Yiliang Crochet Tie-Dye, its transmission models, production tools, and the challenges it faces, especially the difficulties of disseminating the craft and the lack of modern dissemination channels. The findings from this phase provided invaluable firsthand data, highlighting key issues that need to be addressed in the dissemination of Yiliang Crochet Tie-Dye in modern cultural contexts.

In 2023, the study entered the second stage of data collection and analysis. The researcher conducted in-depth interviews with inheritors and artisans of Yiliang Crochet Tie-Dye to fully understand the core techniques of tie-dyeing and their relationship with the local geographic environment. Street interviews and surveys were also conducted to assess the public awareness and acceptance of Yiliang Crochet Tie-Dye, particularly among local residents and tourists. The survey results revealed that younger people had limited knowledge of Crochet Tie-Dye and lacked opportunities or resources to learn the craft. This finding emphasized the challenges in the craft's dissemination.

As the data collection progressed, in the second half of 2023, the researcher began building a text and image database for Yiliang Crochet Tie-Dye. During this phase, supervised learning methods were used to label and categorize different types of tie-dye products, dividing them into three main categories: sewing techniques, tying techniques, and crochet hook techniques. Key features were extracted from the samples, and all sample data and their characteristics were integrated into a structured database. This database became an important digital support resource for the protection, dissemination, and education of Yiliang Crochet Tie-Dye.

Figure 61 Researchers and inheritors label and classify sample techniques (Gao, 2023)

In 2024, the study entered the data analysis and design optimization phase. The researcher conducted further in-depth interviews and field visits to refine the database framework and ensure its completeness. The outcomes of this phase not only deepened the understanding of Yiliang Crochet Tie-Dye techniques but also provided valuable guidance for future research focuses and the development of dissemination strategies.

Figure 62 Shooting technique teaching video (Gao, 2024)

After completing the Yiliang Crochet Tie-Dye toolkit design, the researcher designed four key experiments. The Cultural Visualization Experiment focuses on documenting and encoding Yiliang crochet tie-dye techniques; the Tool Improvement and Handbook Design experiment develops instructional materials and improves

traditional tools; the Toolkit-based Dissemination Test assesses dissemination through applied use in educational and community settings; and the Feedback and Evaluation Experiment collects user responses and data to refine the overall dissemination strategy.

Throughout the entire research process, the researcher continuously collected and analyzed data to ensure the research objectives were met. The experiment designs and dissemination strategies were refined at each stage to ensure the accuracy and feasibility of the research conclusions.

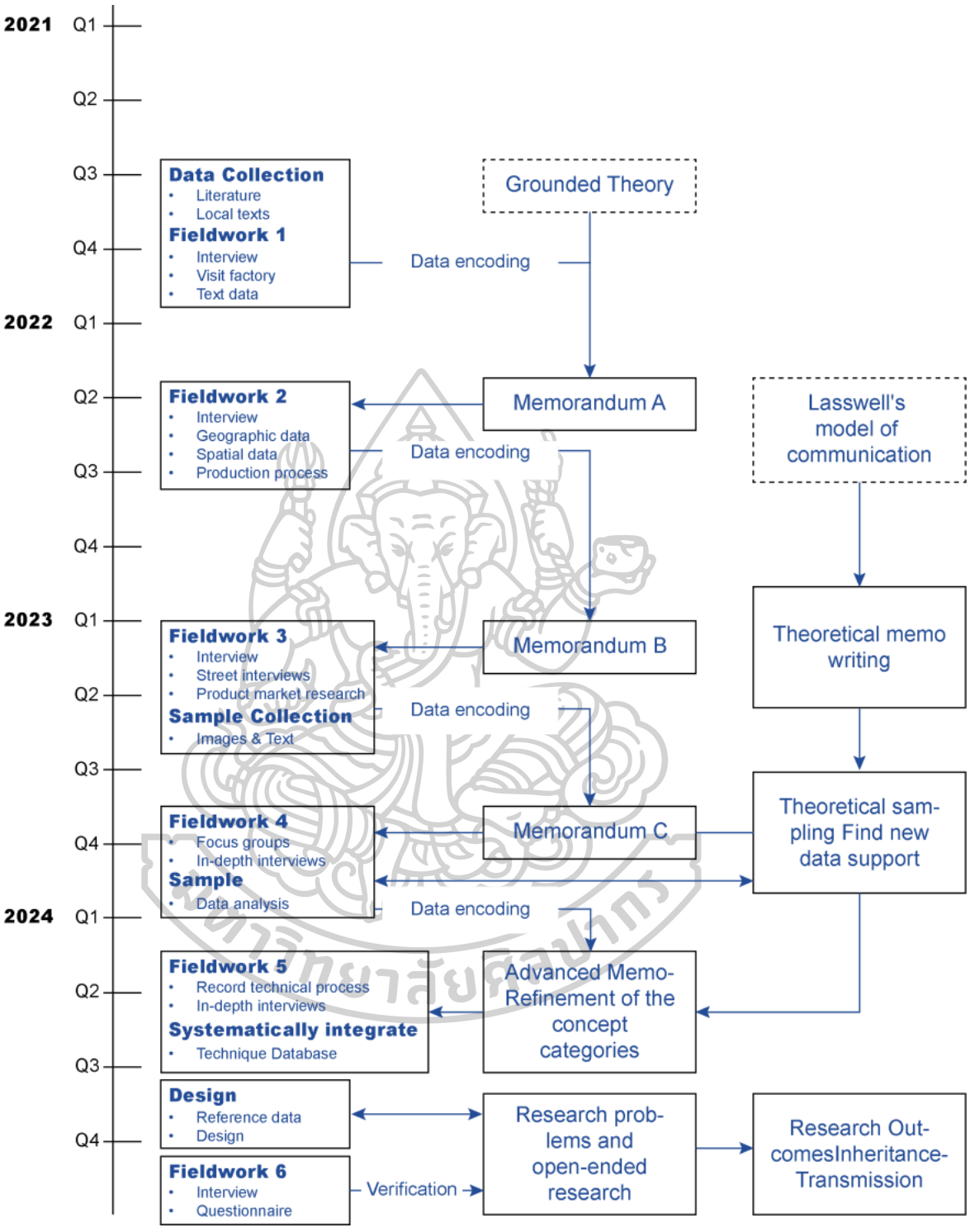


Figure 63 Research process (Gao, 2024)

3.3 Design Method

In this research, based on the Lasswell's 5W Communication Model, and guided by system design theory and Richard Buchanan's design thinking, a "problem identification-system integration-dynamic iteration" approach to the design of intangible cultural heritage dissemination was developed. This approach involves the following key steps:

3.3.1 Demand Anchoring of the Communicator (Who)

The first step focuses on the needs of the cultural inheritors, who are the communicators of this heritage. Through in-depth dialogues, the study extracts their core demands, specifically the need to transform personal experiences into verifiable and scalable knowledge systems. The human-centered principle of design thinking is applied here, specifically focusing on structuring tacit knowledge into actionable and communicable formats. For example, the "finger pressure control" used in the craft can be converted into a visual dynamic annotation, which retains the essence of the technique while making it adaptable for modern learning scenarios. This approach ensures that the experience of inheritors is preserved in a way that is accessible to a broader audience.

3.3.2 Modular Reorganization of Content (Says What)

According to system design theory, the complex knowledge of ICH is deconstructed into independent but interconnected functional modules. Traditional patterns and techniques are analyzed and structured into a three-tiered content model:

Symbolic form

Making techniques

Cultural semantics Each level of the structure serves dual purposes: it can provide lightweight, user-friendly experiences for the general public while still being deep enough for professional research needs. This tiered strategy echoes Buchanan's idea of design as a tool for knowledge integration, helping to transform individual experience into public knowledge, creating an accessible and scalable learning system.

3.3.3 Co-Innovation of Media (In Which Channel)

In this phase of the design process, a systemic synergy is emphasized, where

tools, carriers, and learning environments work in tandem. Traditional crochet tools are redefined as "cultural practice interfaces," and their redesigns not only address physical usability issues but also create a closed loop between physical operation and virtual learning by linking them with digital resources (such as QR codes for instructional videos). This media fusion thinking embodies the core concept of system design theory, which emphasizes the symbiotic relationship of various elements, ensuring that the tools and resources work together in a coherent way.

3.3.4 Tiered Response to Audiences (To Whom)

This step focuses on designing for audiences with different levels of involvement. The method uses an adaptive needs strategy, tailoring designs to suit diverse user groups:

Cultural experiencers: Quick-start guides for immediate engagement.

Students in Related Majors: Traceable knowledge nodes that allow for deeper learning.

This approach reflects Buchanan's four orders of design, which range from symbols and tools to environmental integration. By addressing the varying levels of user needs, the design becomes flexible and adaptable to different audiences.

3.3.5 Continuous Optimization of Effects (With What Effect)

A key aspect of this methodology is establishing a dynamic mechanism that supports the continuous optimization of design through feedback and iteration. By analyzing dissemination data and user behavior, the intensity and scope of the design interventions are adjusted. For instance, initial designs may simplify the steps for learning the craft, but after community discussions, the process could be refined to provide a complete demonstration of core techniques with optional shortcuts, balancing authenticity and usability.

The methodology is, in essence, viewing intangible cultural heritage dissemination as a dynamic, evolving cultural ecosystem. System design theory offers an integrated framework to ensure the collaboration of tools, knowledge, and media, providing a cohesive approach to preserving and transmitting cultural heritage. On the other hand, design thinking, through ongoing problem discovery and prototyping, imbues the system with the ability to update itself, ensuring that the system stays

relevant and effective over time. This combination enables traditional crafts to not only take root and grow in modern society but also maintain their inherent cultural coherence.

By integrating human-centered design, system design principles, and dynamic iteration, this research creates an adaptable, scalable model for the transmission and protection of intangible cultural heritage, ensuring that the knowledge and skills associated with Yiliang Crochet Tie-Dye can be preserved and passed on effectively to future generations.

3.4 Stakeholders

The core stakeholders of this study form a multifaceted and interconnected cultural dissemination network, with their demands intertwining into the value tensions of intangible cultural heritage protection and transmission.

Craft Holders (Direct stakeholders): This group includes the inheritors and artisans of the Yiliang Crochet Tie-Dye technique. They are the bearers of cultural genes and the originators of the craft's transmission. Their primary concern is overcoming the spatiotemporal limitations of the traditional master-apprentice system, seeking feasible paths that both preserve the authenticity of the technique and expand its dissemination scale. They are focused on maintaining the integrity of knowledge transmission and are wary that technological intervention may sever the original link between the craft and its regional culture.

Cultural Recipients (Indirect stakeholders): This group includes the general public, students, and families, forming the terminal nodes of ICH dissemination. They seek low-threshold participatory experiences and high-emotion cultural recognition, expecting to complete aesthetically valuable and culturally significant practical outcomes within a limited time. This group generally lacks in-depth historical understanding of the Yiliang Crochet Tie-Dye technique, but desires a personalized connection to tradition through hands-on creation.

The interactions among these stakeholders constitute the ecosystem of ICH transmission: the inheritors guard the purity of cultural genes, the public through participation, breathes new life into traditional culture. The key to this research lies in finding the greatest common denominator of the demands of each party—ensuring

that the craft does not remain confined to static preservation akin to museum exhibits, nor lose its inherent cultural coherence in the process of dissemination. Achieving this balance is the core issue of ICH's contemporary survival.

3.5 CDDF Systematic Design Method

The CDDF Systematic Design Method proposed in this research is a structured design approach aimed at revitalizing endangered intangible cultural heritage through an integrated process of cultural analysis, design intervention, multichannel dissemination, and user feedback. CDDF stands for Culture, Design, Dissemination, and Feedback, which together form a cyclic and iterative design mechanism. This framework enables the transformation of deeply embedded cultural knowledge into user-accessible educational tools and disseminable content.

The first phase, Culture, involves the visual archiving and systematic documentation of the Yiliang crochet tie-dye technique. This phase emphasizes cultural insight extraction by identifying core patterns, tool systems, symbolic meanings, and traditional processes embedded in the heritage craft. By establishing a structured visual database, the research ensures that tacit knowledge can be externalized and made ready for further design adaptation.

The second phase, Design, utilizes modern design principles to reinterpret traditional craftsmanship into usable and teachable formats. This process adopts a user-oriented co-design strategy, specifically developing a toolkit that includes a learning handbook and simplified practice tools. The aim is to lower the threshold for public engagement while preserving the core techniques and aesthetic values of the original craft.

The third phase, Dissemination, focuses on implementing a cross-platform cultural dissemination strategy. This includes the use of social media platforms, workshops, and classroom settings to expand the reach of the heritage practice. The multichannel dissemination not only broadens access but also enables diverse forms of participation and learning among different target audiences.

The final phase, Feedback, integrates user responses and practical suggestions collected from dissemination activities and experimental workshops. This phase functions as a feedback mechanism to continuously refine both the toolkit design and

dissemination pathways. The feedback ensures that the entire system remains responsive to real user needs, contextual changes, and cultural authenticity.

In summary, the CDDF Systematic Design Method provides a replicable and scalable model for the sustainable revitalization of intangible cultural heritage. Through a tightly integrated cycle of cultural analysis, design transformation, digital dissemination, and responsive feedback, the method effectively bridges the gap between traditional craftsmanship and contemporary user needs, ensuring both preservation and adaptive innovation.

3.6 Summary

Chapter 3 establishes the theoretical and methodological foundation for the dissemination and protection of Yiliang Crochet Tie-Dye as a representative case of intangible cultural heritage. This chapter begins with a comprehensive review of the theoretical underpinnings that guide the study, including theories of intangible cultural heritage preservation and Lasswell's communication model. These frameworks are integrated to form a dual-focus perspective that balances traditional craft protection with contemporary dissemination strategies, thus offering a pathway for cultural sustainability in a rapidly modernizing society.

The chapter then introduces the CDDF Systematic Design Method—comprising Culture, Design, Dissemination, and Feedback—as a closed-loop mechanism to guide the research implementation. In the "Culture" phase, traditional knowledge is documented and visually archived to establish a structured database of techniques and symbolic meanings. The "Design" phase emphasizes user-oriented co-creation, where improved tools and learning handbooks are developed to lower access barriers. The "Dissemination" phase applies a multichannel strategy to promote cross-platform engagement through social media, workshops, and classroom-based learning. Finally, the "Feedback" phase collects user input and experimental results to refine earlier stages, ensuring iterative optimization of the system. This cyclical model strengthens the adaptability, accessibility, and resilience of the traditional craft in contemporary contexts.

Additionally, a detailed stakeholder analysis is conducted, categorizing participants into direct and indirect groups. Direct stakeholders include inheritors and

local artisans who maintain the core craft practices. Indirect stakeholders encompass community residents, general audiences and students of related majors. By mapping the needs and influences of each stakeholder group, the study ensures the dissemination strategies are context-sensitive and socially responsive.

In summary, Chapter 3 provides a comprehensive and systematic framework for the preservation and dissemination of Yiliang Crochet Tie-Dye. It offers not only theoretical grounding and methodological structure but also a stakeholder-informed approach to implementation. This integrated design-thinking approach establishes the operational basis for subsequent design practices and evaluations. Chapter 4 will build upon this foundation by applying the CDDF framework in experimental contexts, evaluating its practical utility in revitalizing intangible cultural heritage through measurable outcomes of dissemination and public engagement.

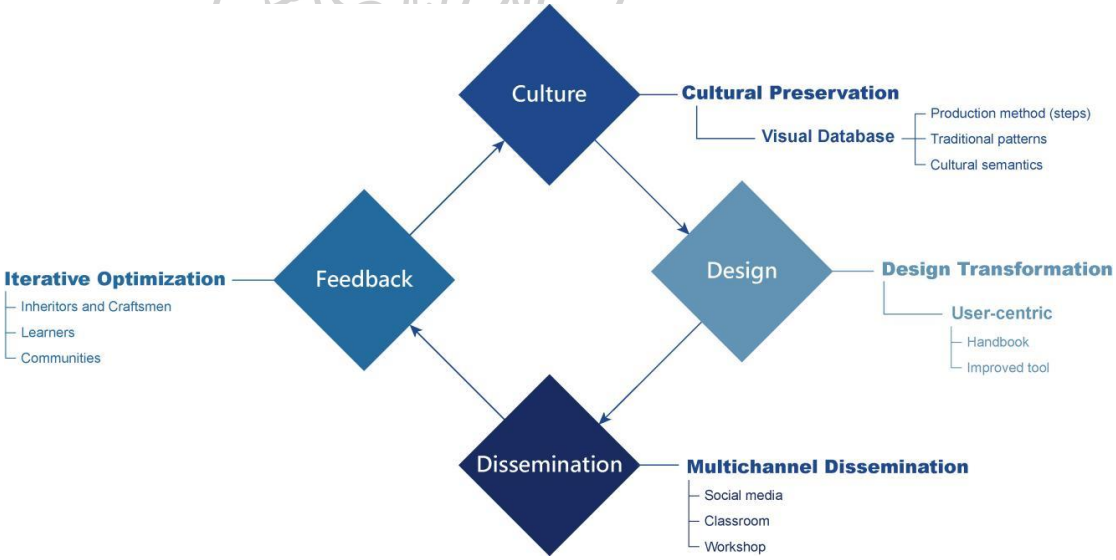


Figure 64 systematic design approach to the CDDF of Yiliang Crochet Tie-Dye (Gao, 2024)

Chapter 4
Design Practice

This chapter applies the CDDF Systematic Design Method to develop and validate a practical model for the dissemination of Yiliang Crochet Tie-Dye in the digital era. In response to the inherent contradiction between the authenticity of traditional intangible cultural heritage and the accessibility required for modern dissemination, the study explores how to transform tacit, experience-based handbook knowledge into a structured, teachable, and scalable system. The aim is to enhance the adaptability, visibility, and transmission efficiency of Yiliang Crochet Tie-Dye through culturally grounded, user-centered design strategies.

The design practice is centered around three key stakeholder groups: heritage practitioners, local residents of Yiliang (including children and elderly participants), students from related academic fields. Building on their differentiated needs, a progressive design logic is established—beginning with the extraction and integration of cultural knowledge, followed by tool improvement, dissemination testing, and feedback-driven iteration. The Yiliang Crochet Tie-Dye Toolkit, as a core output of this process, incorporates a modular handbook and portable crochet tools that deconstruct complex techniques into visualized, step-by-step learning content. This allows users to acquire the craft regardless of time and location constraints, significantly lowering the threshold for participation. The redesigned tools, optimized for portability and usability, extend the application of tie-dye activities to school settings, cultural tourism, and home environments. Meanwhile, the product packaging integrates physical and digital storytelling elements, enhancing users' emotional engagement and cultural identification.

This chapter presents four design experiments to empirically validate the effectiveness of the CDDF method. These include: the visual database construction experiment, which addresses the cultural preservation and visual encoding of traditional techniques; the tool improvement experiment, which enhances accessibility and user-friendliness; the dissemination effect experiment based on the toolkit application in educational and experiential scenarios; and the feedback system experiment, which analyzes learning outcomes, user experience, and dissemination

performance. Together, these experiments reflect how the CDDF framework integrates cultural accuracy, design innovation, user interaction, and evaluative feedback into a closed-loop dissemination system.

Through this integrated design approach, the chapter demonstrates that Yiliang Crochet Tie-Dye can be effectively protected and revitalized not only as a craft, but also as a participatory cultural practice in modern contexts. The results provide evidence for a replicable framework that supports the sustainable dissemination of intangible cultural heritage, bridging traditional craftsmanship with contemporary cultural engagement.

4.1 User Needs Analysis

The design outcomes of this study represent a dual integration of technical tools and cultural carriers, aimed at transforming traditional intangible cultural heritage into a modern, interactive, and sustainable dissemination system. By embedding traditional knowledge into accessible formats and platforms, the study enables the storage, transmission, and practical application of Yiliang Crochet Tie-Dye in diverse contexts such as education, tourism, and domestic cultural activities.

Guided by Lasswell's 5W model, this research systematically deconstructs the dissemination process—identifying the communicators (heritage practitioners), the content (A toolkit integrating tie-dye techniques and cultural knowledge), the channels (Social Media), the receivers (local residents, children, and students in related fields), and the expected effects (skill acquisition, cultural identity reinforcement, and emotional engagement). These dimensions inform both the design logic and the implementation strategy of the study.

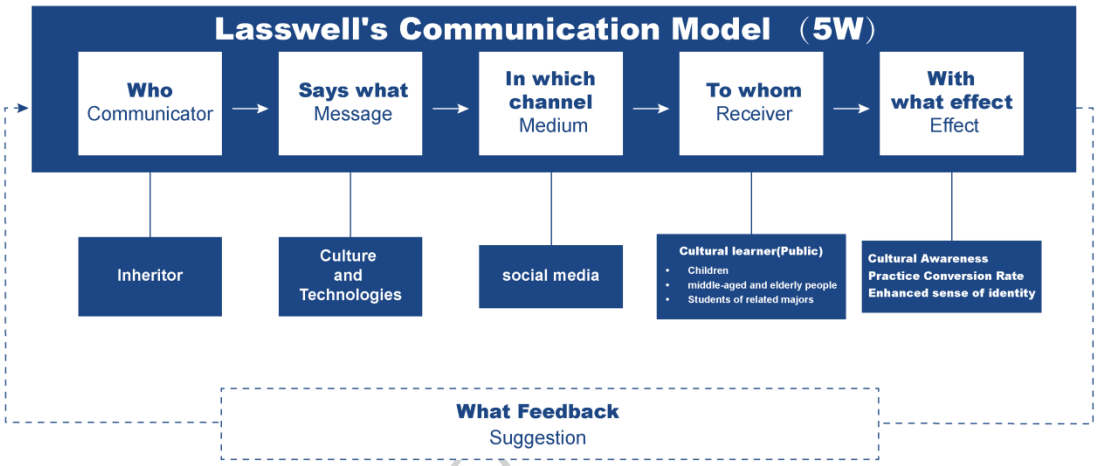


Figure 65 Communicators and audiences in the 5W model (Gao, 2024)

The primary aim of these design interventions is to address the core contradiction between the traditional apprenticeship-based model of intangible cultural heritage transmission and the accessibility, scalability, and immediacy required by contemporary digital society. Through the integration of digital tools, structured instructional content, and portable materials, this study bridges the discontinuities in the dissemination chain, enabling knowledge transfer across time, space, and demographic divides.

Ultimately, the design results contribute to the establishment of a replicable, scalable model for the dissemination of intangible cultural heritage, balancing cultural accuracy with pedagogical clarity, and enabling the sustainable protection and revitalization of Yiliang Crochet Tie-Dye within a modern sociocultural ecosystem.

4.1.1 Communicators (Who): Core Needs of heritage practitioners

The core need of the inheritors lies in solving the issues of low transmission efficiency in the traditional oral and hands-on teaching model and the rigidity of the transmission scenarios caused by physical limitations of tools. The goal is to transform the culture and techniques of Yiliang Crochet Tie-Dye into reusable, verifiable, and structured knowledge resources, enabling cross-context teaching and production. This transformation aims to balance the preservation of cultural authenticity while driving the shift of intangible cultural heritage techniques from a closed master-apprentice model to an open, public communication model. Ultimately, this will expand the cultural influence and, based on this foundation, develop potential

future inheritors to ensure the sustainable development of Yiliang Crochet Tie-Dye.

4.1.2 Audience (To Whom): Cultural Experience and Learners

Currently, the public's engagement with intangible cultural heritage is increasingly characterized by a preference for low-threshold participation, strong emotional resonance, and immediate interactivity. In the context of information acquisition, audiences seek content that is both authoritative and accessible, enabling rapid comprehension of cultural meanings. For participation, users favor immersive experiences supported by intuitive visual media such as short videos and live-stream tutorials. Regarding dissemination modes, there is a clear shift toward lightweight, mobile-based platforms that support fragmented learning and facilitate social sharing, thereby reinforcing cultural identity through peer interaction.

To address these evolving audience behaviors, this study segments participants based on engagement levels, cognitive depth, and usage contexts into two primary groups: Yiliang local residents and students in related academic disciplines. This user typology allows for more precise alignment between the dissemination tools—such as the visual handbooks, and toolkit—and the differentiated needs of each group. By tailoring communication design to these user-specific characteristics, the study enhances both the inclusivity and efficacy of the dissemination strategy for Yiliang Crochet Tie-Dye.

4.1.2.1 Yiliang local residents (Children/Middle-aged and elderly people)

Based on a questionnaire survey conducted on April 1, 2023, involving 211 parents from four primary schools in Yiliang, as well as in-depth interviews with Yiliang Crochet Tie-Dye inheritors during recent experiential activities, this study identifies a central demand among cultural participants: the need to balance low-threshold participation with high emotional reward. This audience segment generally seeks to complete a culturally meaningful product in a short period, without requiring prior technical skills or in-depth knowledge. Their expectations center on intuitive learning pathways, immediate visual feedback, and simplified processes. The preferred participation mode is lightweight and plug-and-play, supported by structured instructional content that facilitates cultural engagement with minimal cognitive or

time investment. Visual handbooks, modular tools, and step-by-step video tutorials are essential design elements that enable this form of dissemination.

Figure 66 Questionnaire survey with potential inheritors-local children at Qingyuan Primary School, Yiliang County (Gao, 2024)

In addition to younger participants, this study places particular emphasis on the role of middle-aged and elderly individuals within the Yiliang community. As cultural residents with a strong sense of place-based identity and environmental familiarity, they possess heightened cultural sensitivity, making them key evaluators of the authenticity and localization effectiveness of dissemination strategies. Their responses serve as important indicators for assessing whether newly developed tools and processes remain faithful to local traditions.

At the same time, this demographic faces considerable challenges in using digital tools, positioning them as ideal subjects for usability testing during the iterative design process. Their interactions help identify accessibility thresholds and provide empirical feedback for refining user interfaces and pedagogical materials, ensuring that dissemination tools are inclusive and adaptable across age groups.

Crucially, the successful engagement of this demographic can catalyze endogenous motivation within the community. Once empowered with new instructional systems, middle-aged and elderly participants can become "family transmission nodes" within intergenerational learning networks, thereby fostering a

sustainable, community-based model of intangible cultural heritage dissemination. Their participation not only reinforces cultural continuity but also directly addresses key research questions raised in Chapters 1 and 2, particularly concerning the challenges of skill acquisition, the limitations of oral tradition, and the scalability of traditional teaching models.

By incorporating this group into the center of dissemination design, this study extends its social relevance while reinforcing the living and adaptive nature of Yiliang Crochet Tie-Dye in the context of modern cultural heritage practices.

4.1.2.2 Students in Related Majors

Through an online survey conducted among nearly 170 students from the Yunnan University of Arts and Yunnan University and design-related majors (123 valid responses), along with content from the focus group discussions in Chapter 2, the core need of students in related majors is to make a deep leap from cultural experience to professional mastery. This group is clearly designated as potential inheritors of intangible cultural heritage in documents such as the "14th Five-Year Plan for Intangible Cultural Heritage Protection" issued by the People's Republic of China.

These learners need to break away from simple skill imitation and systemically grasp the underlying logic and cultural rules of ICH techniques. They require repeatable learning paths, using a modular knowledge structure to achieve progressive skill enhancement. For example, they seek to attempt more complex traditional patterns and understand the core cultural meanings accurately. Another key demand is the flexibility of learning environments, requiring resources to be adaptable to multiple terminals and fragmented usage contexts (such as watching slow-motion technique videos during commutes or practicing independently after class), enabling seamless integration of theoretical learning and practical application. Due to academic research needs, they also require cultural semantics and historical research materials, such as the relationship between patterns, regional beliefs, and folk rituals, to support thesis writing or creative explanations. This deep involvement requires the collaborative support of standardized knowledge repositories and innovative or improved tools, ensuring both the authenticity of ICH transmission and compliance

with national policies for cultivating young inheritors.

Figure 67 4.2 Design Experiments Questionnaire survey with potential inheritors—university students at Yunnan University completing electronic questionnaires (Gao, 2024)

The design experiments presented in this chapter are grounded in the CDDF Systematic Design Method, which comprises four interrelated phases: Cultural Preservation, Digital Transformation, Design Innovation, and Feedback Evaluation. These phases operate as a closed-loop system aimed at enabling the sustainable dissemination of Yiliang Crochet Tie-Dye, a highly endangered form of intangible cultural heritage.

To address the key challenges identified in earlier chapters—such as the discontinuity of technical knowledge, the lack of user-friendly learning tools, and the limited adaptability of traditional practices to contemporary educational and experiential contexts—this chapter adopts an iterative and stakeholder-driven design logic. Each experiment corresponds to one or more phases of the CDDF framework and is tailored to resolve specific bottlenecks in the dissemination chain.

The visual database experiment focuses on the Cultural Preservation phase by transforming fragmented and tacit craftsmanship knowledge into an accessible, structured archive of visual materials. The toolkit design experiment aligns with the Digital Transformation phase, aiming to develop lightweight, modular crochet tools that adapt traditional techniques to modern learning environments, particularly for

non-professional users. The dissemination effect experiment belongs to the Design Innovation phase and tests the practical usability and communicative efficacy of the toolkit across real-world educational and experiential settings, including with children and elderly participants. The feedback and evaluation experiment serves the Feedback Evaluation phase by collecting empirical data on user satisfaction, learning effectiveness, and perceived cultural value, enabling real-time optimization of the dissemination process.

Together, these four experiments form a comprehensive design intervention strategy that not only enhances the preservation and living transmission of Yiliang Crochet Tie-Dye, but also constructs a replicable model for the digital-age dissemination of intangible cultural heritage in broader cultural contexts.

4.2.1 Yiliang Crochet Tie-Dye Visual Database Construction Experiment

This experiment corresponds to the "Cultural Preservation" phase of the CDDF Systematic Design Method, and serves as the foundational stage for all subsequent innovation and dissemination efforts. The central aim of this phase is to address one of the most critical challenges in the transmission of intangible cultural heritage: the vulnerability of tacit knowledge. In the case of Yiliang Crochet Tie-Dye, this includes highly specific stitching, tying, and crocheting techniques, as well as plant-based dyeing processes that have traditionally relied on oral instruction and apprenticeship. As such methods become increasingly unsustainable in the digital age, there is a pressing need to systematically preserve this heritage in a form that is accurate, accessible, and adaptable.

To this end, this experiment establishes a dual-layered visual database, composed of both dynamic and static elements. The dynamic database consists of instructional videos that demonstrate each step of the Yiliang tie-dye production process in real time. These videos are recorded in high-definition and feature the direct participation of national-level inheritors of the craft. Each video is supplemented with voiceover explanations and time-synchronized bilingual subtitles, ensuring multi-sensory engagement and accessibility across user groups. These videos not only capture technical operations but also preserve gesture nuances, tool handling methods, fabric manipulation, and rhythm of movement—factors that are often

omitted in written documentation but are essential to understanding the craft in its entirety.

Figure 68 Yiliang Crochet Tie-Dye dynamic database (screenshot) (Gao, 2024)

The static database functions as a complementary archive of visual and textual materials. It includes high-resolution sequential photography of each process stage, annotated with detailed written descriptions of techniques, tools used, and possible variations. The static component serves users who prefer step-by-step reference materials where video is not accessible. Together, the dynamic and static databases form a multi-modal educational ecosystem that adapts to different user learning preferences and technical limitations.

Figure 69 Yiliang Crochet Tie-Dye static database (screenshot) (Gao, 2024)

In terms of content structure, the database is organized around three major technical domains integral to the Yiliang Crochet Tie-Dye craft:

Stitching: Six major categories encompassing sixteen distinct stitching methods are documented. These techniques serve foundational structural functions and are crucial in forming the resist-binding framework that shapes pattern boundaries during the dyeing phase.

Tying: Six types of tying techniques are systematically recorded, highlighting the logic of tension, knotting, spacing, and sequence. These techniques are essential to

creating the resist effects that allow dye to selectively penetrate the fabric.

Crocheting: Three traditional crocheting methods unique to the Yiliang style are documented in detail. These micro-scale, pointillistic techniques enable artisans to create millimeter-level resist points, producing intricate symbolic patterns such as qilin, mountains, or plum blossoms. The use of a hooked needle to manipulate fine thread differentiates Yiliang Crochet Tie-Dye from broader tie-dye practices in Yunnan and China more generally.

Additionally, the visual database includes a dedicated section on the dyeing process, featuring nine types of traditional plant-based dyes. Each dye is presented with a full procedural workflow, including raw material preparation, mordanting, dye application, oxidation intervals, and final rinsing and drying stages. This section aims to preserve the ecological logic and local knowledge embedded in traditional dyeing, which is often transmitted orally and seldom documented in detail.

Importantly, the entire data-gathering and production process was conducted under the full supervision and active involvement of Yiliang's recognized heritage inheritors. Their participation ensures that every technique captured adheres to traditional standards of authenticity, and that no information distortion occurs during the transformation of tacit knowledge into structured content. This methodological rigor also strengthens the database's credibility as both a scholarly reference and a pedagogical tool.

In practical terms, the visual database fulfills several key functions within the broader research framework:

It provides a reliable archive that documents Yiliang Crochet Tie-Dye comprehensively for future generations.

It serves as a didactic tool for structured, remote, and modular learning, suitable for both formal education (e.g., design schools) and informal learning (e.g., community workshops, family-based instruction).

It supports digital dissemination by offering media-ready content that can be integrated into platforms such as short video apps, museum exhibits, and educational microsites.

It lays the foundation for subsequent phases of the CDDF model, including tool redesign, user testing, and feedback optimization.

Through the construction of this visual database, this experiment bridges the historical practice of master-apprentice transmission with modern digital communication and education technologies. By transforming heritage into modular, learnable, and reproducible knowledge units, it not only protects the endangered cultural practices of Yiliang Crochet Tie-Dye, but also prepares them for adaptive dissemination in contemporary, digitally mediated cultural ecosystems.

4.2.2 Yiliang Crochet Tie-Dye Toolkit Design Experiment

This experiment corresponds to the "Design Innovation" stage in the CDDF Systematic Design Method and aims to address key barriers in the dissemination of Yiliang Crochet Tie-Dye, including tool inaccessibility and fragmented technical knowledge. A modular toolkit was developed, consisting of two parts: the Learning handbook and Portable Modular Crochet Tools.

The Learning handbook is built upon the visual database and includes an overview of Yiliang Crochet Tie-Dye, its history, techniques, process steps, visualized craft methods (stitching, tying, crocheting), traditional patterns with cultural meanings, and natural dyeing materials. Designed for intuitive, self-guided learning, it serves both as an instructional and dissemination tool.

The Portable Modular Crochet Tools solve the issues of traditional tool size and usability. Designed for flexibility, portability, and safety, the new tools support classroom, home, and travel use, and are accessible to children and elderly users.

Together, the handbook and tools form a lightweight, self-contained learning system that lowers participation thresholds while preserving cultural accuracy. This toolkit supports scalable and sustainable dissemination and responds to core challenges identified in previous chapters, such as oral instruction limitations and low tool accessibility.

4.2.2.1 Design of Yiliang Crochet Tie-Dye Learning handbook

The Yiliang Crochet Tie-Dye Learning handbook is presented in the form of an e-book, dedicated to transforming traditional techniques into an accessible and practical digital knowledge repository. Through systematic integration of visual, textual, and audiovisual materials, it constructs a comprehensive cultural narrative from historical origins to contemporary innovations, offering adaptive intangible

cultural heritage learning pathways for different groups. The entire book is designed using Adobe InDesign, adhering to a visual-first principle that integrates images, text, and multimedia. Technique demonstration videos are embedded in corresponding chapters, allowing users to watch heritage practitioners demonstrate techniques in situ. The pattern illustrations are designed with layers, enabling users to zoom in and examine stitch details. To accommodate multiple reading platforms, the e-book supports cross-device adaptive layouts—on mobile devices, the focus is on short videos and rapid search, while on desktop, it offers high-definition images and document comparison features.

The book follows the three main design principles of a learning handbook:

Authenticity – Knowledge production led by heritage practitioners. The content of the entire book is deeply involved in the compilation by Yiliang Crochet Tie-Dye heritage practitioners. Every technique is demonstrated and recorded by the practitioners themselves, ensuring the authenticity of the skill transfer.

Comprehensiveness – A multidimensional cultural gene repository. The book includes over 2,000 high-definition images, covering five core sections:

Technique Process: A step-by-step breakdown of 25 beginner techniques and 2 advanced techniques.

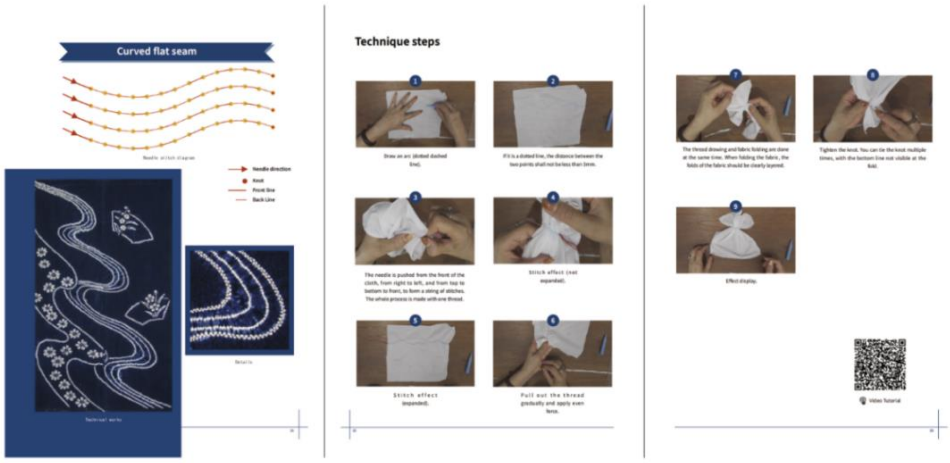


Figure 70 Yiliang Crochet Tie-Dye Learning handbook (screenshot) (Gao, 2024)

Pattern Atlas: An overview of 42 traditional patterns in Yiliang Crochet Tie-Dye, annotated with folk meanings and production techniques.

Figure 71 Handbook Cultural Semantics Section (screenshot) (Gao, 2025)

Historical Changes: Through old photos, land contracts, and other historical documents, the book reconstructs the symbiotic relationship between the craft and the farming society of central Yunnan.

Contemporary Transformation: Showcasing innovative examples by young designers based on traditional patterns, presenting the possibilities for dialogue between intangible cultural heritage and modern life.

Dyeing: Information on plant dyes, including their names and color values.

Educational Accessibility – A zero-barrier audiovisual learning experience. To address common cognitive challenges among the general public, the book adopts a "visual-first" interpretation strategy. Each technique is accompanied by demonstration videos from the heritage practitioners, with key steps highlighted

through dynamic annotations and subtitles. The cultural semantics section utilizes the combination of "patterns + production techniques" to transform patterns into tangible, practical cultural works.

This Learning handbook is not merely a craft guide, but also represents the transformation of Yiliang Crochet Tie-Dye from local knowledge to a global cultural resource, opening up new possibilities for the preservation and communication of intangible cultural heritage.

4.2.2.2 Design of Portable Modular Crochet Tool

The design innovation is not simply about reducing weight, but rather about achieving the digital translation of traditional techniques through parametric modeling (C4D basic modeling + Magics process optimization).

The improved crochet hook is manufactured using Selective Laser Melting (SLM) technology, with the core material being 316L stainless steel. This material exhibits mechanical properties such as a density $\geqslant$99%, tensile strength $\geqslant$ 560 MPa, and yield strength $\geqslant$480 MPa. Its hardness (HRC 25-30) and wear resistance are significantly superior to traditional cast iron and lower-cost aluminum alloys. By calculating the stress value (14.14 MPa) at the minimum hook cross-sectional diameter of 0.3mm under a 1N fabric tension, the material's safety factor is verified: yield strength safety factor $\approx$ 34, tensile strength safety factor $\approx$ 40, far exceeding the engineering safety threshold of $\geqslant$2. This high-strength redundant design ensures that the tool does not undergo plastic deformation even with prolonged, high-frequency use.

The tool strictly retains the core parameters of traditional crochet techniques - total length adapted to the width of an adult hand (14-16 cm), with the inner diameter of the hook controlled within the R4-R5 range, ensuring that the force transmission during the tie-dyeing action aligns with traditional standards. By integrating an M8$\times$1.25 threaded end and a U-shaped clamp for modular design, the tool allows for quick assembly and disassembly, reducing the tool's volume from 229,082 cm^3 to 816 cm^3, and its weight from 8 kg to 211-295 g. 3D printing technology compresses the prototype verification cycle from 30 days to 5-6 days, lowers the unit cost from 1,000 yuan to 120 yuan, and reduces material waste from

35% to below 5%, meeting user demands.

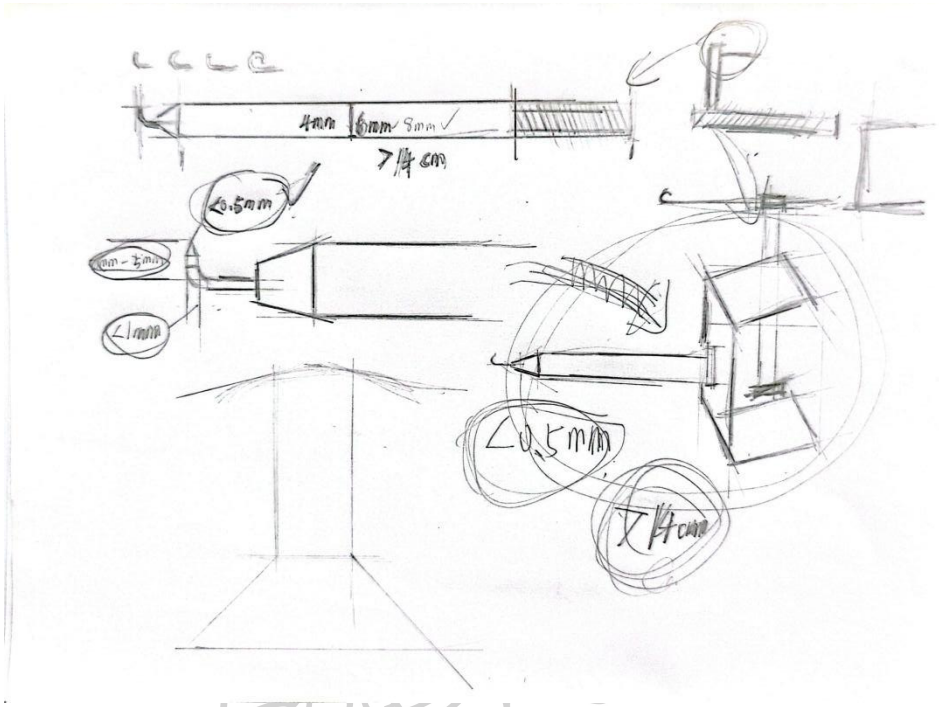


Figure 72 Improved crochet tool design sketch (Gao, 2025)

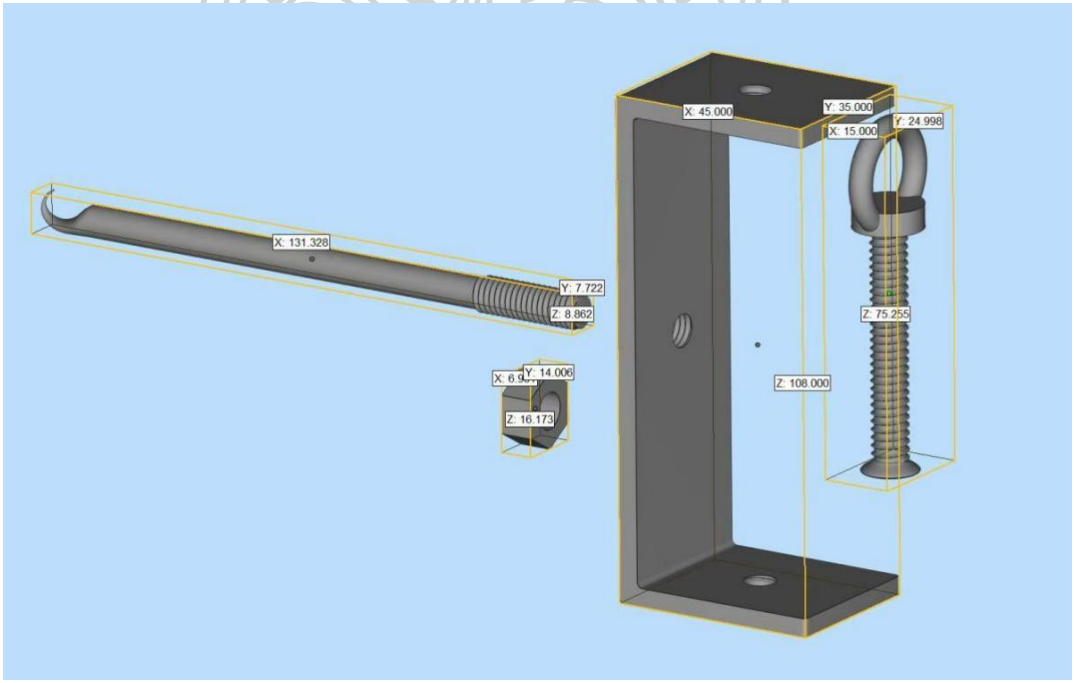


Figure 73 Improved crochet tool model display (Gao, 2025)

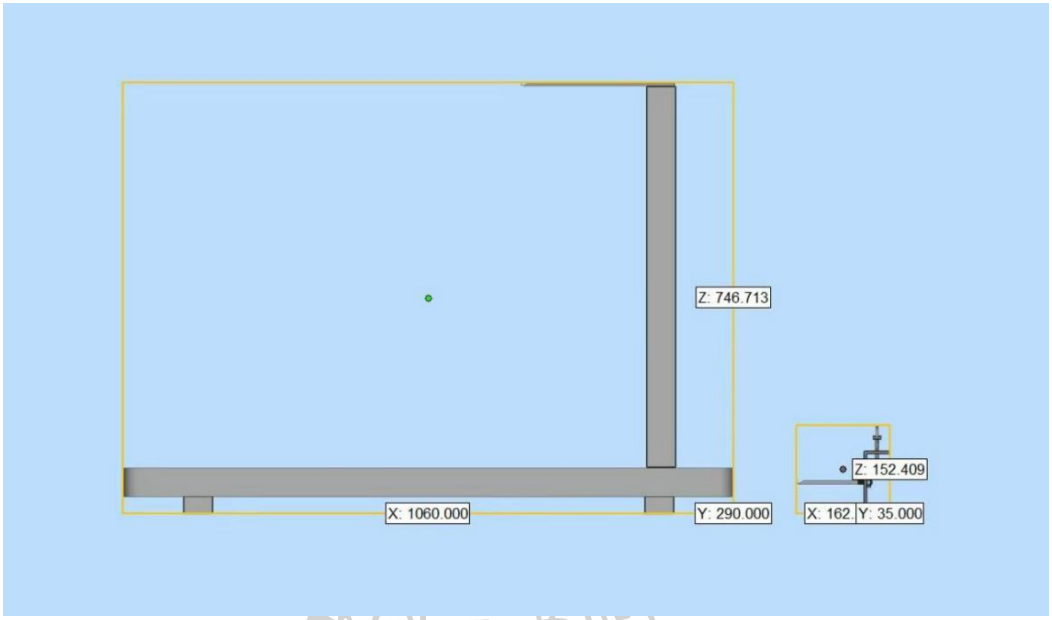


Figure 74 Size comparison between improved tool and traditional tool (Gao, 2025)

Figure 75 Improvement tool (Gao, 2025)

The tool's modularity makes it adaptable to diverse scenarios: the U-shaped clamp can be replaced with different sizes to accommodate various use cases. Users can flexibly arrange their usage time and location based on fragmented scenarios. The lightweight design enables schools to equip classrooms of 100 students

within a budget of 10,000 yuan. The reduction in production costs also translates to lower costs for Yiliang Crochet Tie-Dye artisans in producing tie-dye products. This improvement logic not only removes the physical constraints for the communication of Yiliang Crochet Tie-Dye but also provides a replicable technological paradigm for the transition of intangible cultural heritage from secretive craft workshops to open communication.

4.2.2.3 Packaging Design

The packaging box is made from photocurable resin material, formed using Stereolithography (SLA) 3D printing technology, with a Rockwell hardness of HRM 85-90, an impact strength $\geqslant$8 kJ/m^2 , and the ability to withstand a static load of up to 50 kg, providing rigid protection for the precision crochet hook. The material choice balances both environmental friendliness and durability—resin releases no toxic substances below 120° C. The 3D model, constructed in C4D, is optimized for supporting structures using Magics software.

The box design follows the principle of "minimizing space while maximizing information"-an internal positioning slot securely holds the crochet hook. When users scan the box's QR code, they are directed to the Yiliang Crochet Tie-Dye Learning handbook e-book, providing real-time access to the tool's historical origins, operation videos, and innovative case studies, thereby forming a closed-loop learning pathway of "physical tools—digital knowledge."

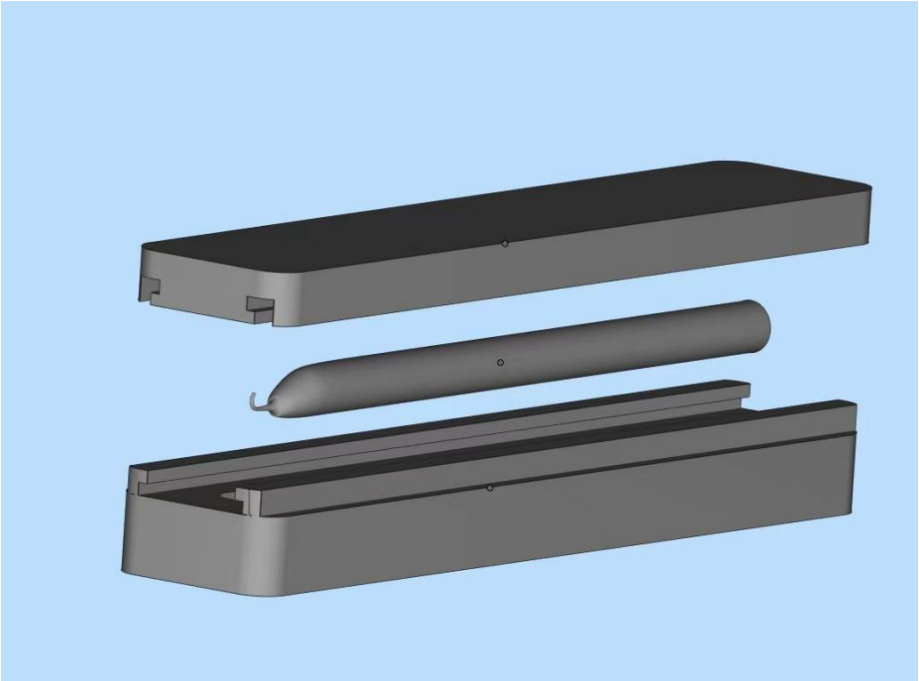


Figure 76 Improved crochet tool packaging model display (Gao, 2025)

Figure 77 packaging box (Gao, 2025)

The packaging box goes beyond the physical attributes of a traditional container to become a "cultural display board" for the communication of intangible cultural heritage. When students open the packaging in the classroom, pattern

illustrations guide them to observe the connection between the tool's structure and traditional aesthetics. Cultural tourism consumers can scan the code to watch demonstration videos by heritage practitioners, extending the offline experience into deeper online learning. This "unbox-to-learn" design strategy transforms the communication of intangible cultural heritage from a one-way output to an interactive cultural immersion, continuously sparking public recognition and identification with traditional crafts throughout the tool's usage cycle.

The Toolkit Design Experiment centers on the core goal of intangible cultural heritage preservation and communication, transforming the traditional Yiliang Crochet Tie-Dye technique into a modern cultural practice system through systematic product design. The research focuses on three intertextual dimensions: cultural organization, tool innovation, and communication empowerment, constructing a complete ICH communication chain from cognition to practice.

The digital Learning handbook converts oral traditions into a visual and verifiable audiovisual resource library, breaking down the barriers to the transmission of traditional techniques by relying on video tutorials and pattern charts taught by heritage practitioners. The improved crochet hook, optimized through 3D printing technology and material science, retains the authenticity of the craft while reducing the practical threshold through lightweight and modular design, allowing the communication of intangible cultural heritage to move from workshops to classrooms and ultimately to society. The packaging box transcends the physical container's functionality, using QR codes to connect physical tools with digital knowledge, thus realizing an immersive cultural experience where "unboxing becomes a classroom." Together, these three components form a closed-loop of "knowledge accumulation—tool empowerment—scene activation," providing a sustainable solution for the communication of intangible cultural heritage in contemporary society.

4.3 Dissemination effect evaluation experiment

This section aims to evaluate the dissemination effectiveness of the Yiliang Crochet Tie-Dye toolkit across different user groups through two targeted experiments. Based on the CDDF system design method, the experiment addresses how design interventions affect knowledge acquisition, cultural identity, and

participation willingness under varying user conditions.

The Beginner Technique and Tool Synergy Experiment targets middle-aged and elderly residents in Yiliang with no prior craft background, focusing on low-threshold learning, cultural sensitivity, and tool usability in a local context. The Advanced Technique and Tool Synergy Experiment is conducted with design students, testing the toolkit's ability to meet the demands of self-directed learning, advanced technique acquisition, and cultural reinterpretation.

Together, the experiments assess how the toolkit supports differentiated dissemination strategies, verifies its scalability among diverse user groups, and responds to the core barriers outlined in earlier chapters, including oral transmission limitations and the lack of effective educational tools.

4.3.1 Yiliang Crochet Tie-Dye Visual Database Validity Experiment

4.3.1.1 Visual Database Validity Experiment - in China

This experiment aims to evaluate whether the Visual database of Yiliang Crochet Tie-Dye can address the barriers of traditional teaching—such as high entry thresholds and limited accessibility—and fulfill the core needs of cultural participants. Specifically, it investigates whether children with no prior experience can complete a tie-dye work within a limited timeframe through a lightweight, low-threshold experience while achieving both cultural understanding and emotional satisfaction.

The experiment was conducted in the form of a parent-child activity, involving twelve children aged 7 to 11 from Yiliang. Participants were randomly divided into two groups: Group A received direct instruction from heritage practitioners, while Group B independently learned via the digital database, which included step-by-step video tutorials and illustrated handbooks. The average age difference between groups was controlled to within 0.5 years to ensure experimental fairness. Both groups used standardized tools, materials, and similarly difficult patterns to eliminate external variable interference. Parents only assisted with timekeeping and did not interfere with the process.

Figure 78 Experimental site (Gao, 2024)

Participants were given 90 minutes to complete their work. Upon completion, three expert evaluators assessed the finished pieces using a unified scoring system totaling 100 points, based on criteria such as pattern integrity, technical accuracy, and overall aesthetics. Group A achieved an average score of 95, while Group B scored 90, and both groups completed the task within 85 minutes. This suggests that the digital database effectively supports short-duration, high-efficiency learning without compromising quality.

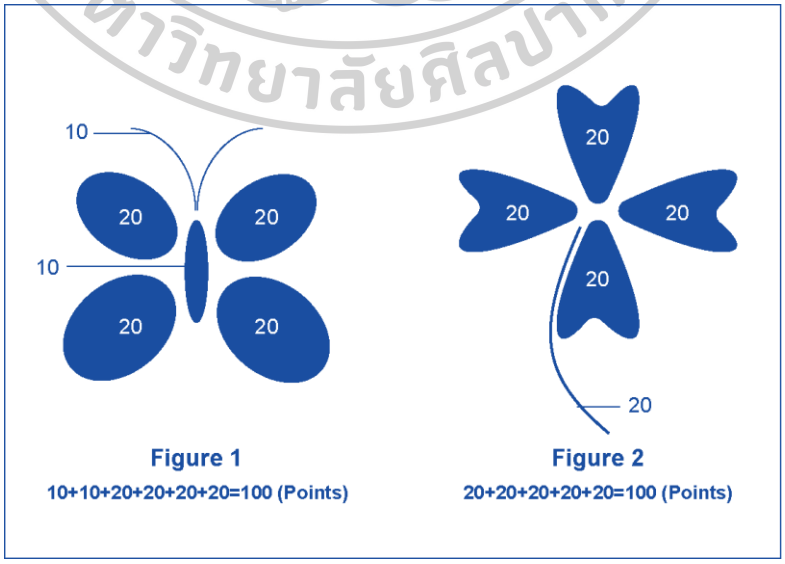


Figure 79 Scoring standard: 100 points (Gao, 2024)

Table 8 Experimental participants' scores and time

No.	Score	Time	No.	Score	Time
A1	95	82 min	B1	89	84 min
A2	95	87 min	B2	87	85 min
A3	95	85 min	B3	88	85 min
A4	95	86 min	B4	89	87 min
A5	95	83 min	B5	90	84 min
A6	95	86 min	B6	88	86 min

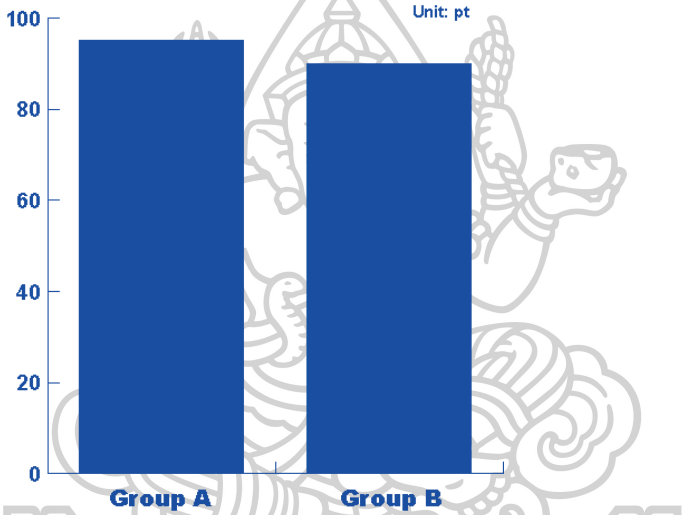


Figure 80 Average score of each group (Gao, 2024)

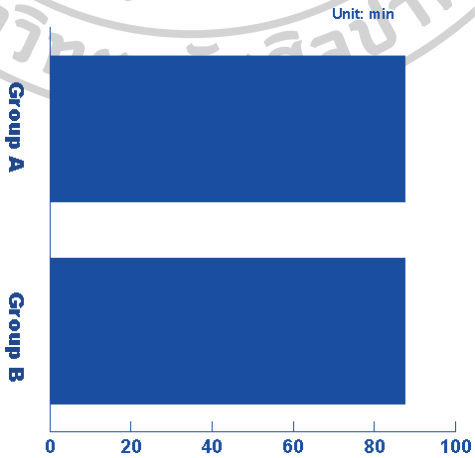


Figure 81 Average completion time for each group (Does not include dyeing time) (Gao, 2024)

Quantitative and qualitative data were collected through scoring tables, time logs, on-site observations, and post-activity interviews. Feedback revealed that 75% of Group B participants reported a strong sense of accomplishment, and 100% of parent-child families expressed a heightened cultural identity through the shared creative process. The ability to pause and replay video steps, especially those that highlighted common errors, significantly eased learning anxiety and enhanced task completion confidence. However, attention retention (33%) and consistent focus during video-based learning remain areas for improvement.

Figure 82 On-site interview (Gao, 2024)

In addition to confirming the effectiveness of digital tools for dissemination, the experiment also highlighted the importance of tool accessibility. Without the cooperation of Yiliang Crochet Tie-Dye's specialized crochet tools, the unique characteristics of the technique cannot be fully expressed. The self-made handkerchiefs served as emotional and cultural keepsakes, shifting the experience from passive observation to active participation and ownership.

Figure 83 End photo (Gao, 2024)

Overall, this experiment verifies that a structured digital resource system can effectively mediate the dissemination of intangible cultural heritage among new learners. It also provides a technically replicable model for designing efficient, emotionally engaging cultural experience programs suitable for educational and tourism contexts.

4.3.1.2 Visual Database Validity Experiment - in Thailand

This experiment aimed to assess whether the Visual Database of Yiliang Crochet Tie-Dye could support cross-cultural, independent learning of intangible cultural heritage techniques, and to examine its applicability for non-Chinese native speakers without direct instruction from inheritors. Specifically, it investigated whether Thai university students could complete a tie-dye work within a limited timeframe while achieving technical quality, cultural understanding, and emotional engagement.

The experiment involved fourteen Thai university students majoring in related art and design fields. All participants had no prior experience in tie-dye techniques. They were provided with the visual database—comprising step-by-step video tutorials and illustrated handbooks—in their original Chinese language version, with Chinese subtitles and narration. This was done to test the adaptability of the resource in a non-native linguistic environment. All participants used standardized tools, materials, and equally challenging patterns to control external variables.

Figure 84 Experimental site (Gao, 2025)

Each participant was given 90 minutes to complete a tie-dye work independently. Upon completion, three expert evaluators assessed the outputs using a unified 100-point scoring system, covering criteria such as pattern accuracy, technical execution, and overall aesthetics. The group achieved an average score of 90, with all participants meeting the 60-point passing threshold. Most completed their work within 85 minutes, indicating that the visual database can facilitate effective short-duration learning across cultural contexts in terms of skill acquisition.

Figure 85 End photo (Gao, 2025)

Data were collected through scoring tables, time logs, on-site observations, and post-activity feedback forms. Quantitative results confirmed the database's capacity to enable high-quality outcomes without face-to-face instruction. However, qualitative feedback revealed significant limitations: while students expressed satisfaction with achieving a high technical score, the majority reported difficulty understanding certain steps due to the Chinese-language interface. This affected their learning flow and overall experience. Additionally, over 70% indicated low willingness to continue learning, citing unclear instructions and reduced engagement compared to interactive, in-person formats.

The experiment underscores that while the visual database is effective for transmitting procedural knowledge, its current form lacks linguistic and contextual adaptability for international users. To enhance cross-cultural applicability, localized translations, voice-overs, and culturally contextualized visual cues should be incorporated. These findings serve as a critical foundation for subsequent experiments involving the standardized toolkit, which aim to address both the technical and experiential limitations observed in this trial.

In summary, the findings confirm that the visual database is effective in transmitting procedural knowledge and enabling high-quality production outcomes across cultural contexts, even without face-to-face instruction. However, its current form demonstrates higher cultural engagement and retention in linguistically and culturally aligned user groups, while encountering significant experiential and motivational barriers in cross-cultural applications. This underscores the necessity for localized adaptation—including translated materials, culturally contextualized examples, and accessible linguistic interfaces—to maximize both skill transmission and cultural resonance. These insights directly inform subsequent experimental stages involving the standardized toolkit, which aim to address the observed technical and experiential gaps.

4.3.2 Yiliang Crochet Tie-Dye Toolkit Experiment

4.3.2.1 Beginner Technique and Tool Synergy Experiment

This experiment aims to evaluate the practical usability and cultural activation potential of the Yiliang Crochet Tie-Dye toolkit—comprising modular tools

and learning manual—among elderly beginner participants with no prior craft experience. Anchored in the "Design" and "Dissemination" stages of the CDDF system design method, the experiment investigates whether the toolkit effectively lowers learning thresholds, fosters cultural recognition among non-experts, and enables the formation of community-based dissemination mechanisms.

The selection of elderly residents from Yiliang as the target participants is grounded in multiple theoretical and practical considerations within communication studies, cultural anthropology, and heritage preservation. As natural bearers of local culture, this demographic possesses long-term visual and emotional familiarity with Yiliang Crochet Tie-Dye, enabling them to assess the authenticity and cultural fidelity of redesigned tools and processes. Despite lacking hands-on experience, their cultural sensitivity makes them ideal subjects to validate the effectiveness of the toolkit from a true beginner's perspective.

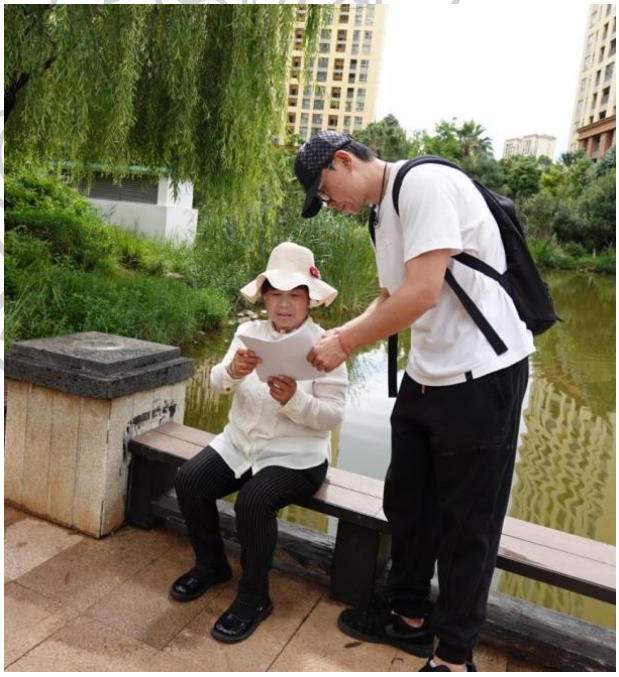


Figure 86 Open recruitment of experimental participants (Gao, 2025)

As key members within family and community structures, elderly participants represent potential "inheritance nodes" in the transmission of intangible cultural heritage. With simplified tools and guided learning, they can facilitate informal household learning, enabling intra-community dissemination beyond formal

apprenticeship systems. This grassroots, node-based model offers a viable path for transitioning intangible heritage from workshop-based practices to everyday community engagement.

Elderly users also serve as ideal evaluators of the accessibility and inclusiveness of digital tools. Their participation effectively tests the readability of the visual manual, the operability of the modular toolkit, and the intuitiveness of the step-by-step video tutorials. Success in this group would indicate that the system is age-inclusive and capable of supporting intergenerational learning.

Crucially, this experiment addresses the core challenge identified in Chapters 1 and 2: the limitations of oral instruction and the non-scalability of traditional heritage transmission. By observing elderly participants' independent performance, the experiment offers empirical evidence to close the loop of the CDDF model and verify its applicability to non-expert populations.

The experiment was conducted in July 2024 at a local cultural plaza in Yiliang County, involving two elderly residents over the age of 50 who were publicly recruited from the local Yiliang community. Both participants had no prior experience with crochet, sewing, or tie-dye techniques. The activity followed a "tool‑guidance‑outcome" framework and was completed within 180 minutes.

The primary components included:

A modular portable crochet tool with detachable elements designed for safe and intuitive operation.

A visual learning manual containing illustrated steps, QR-coded video tutorials, and cultural background explanations.

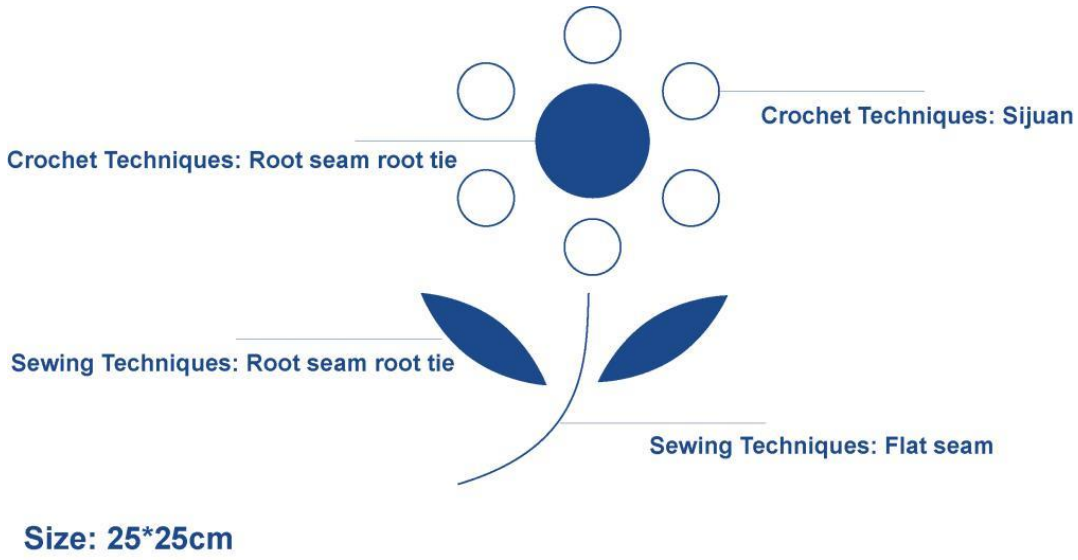


Figure 87 Experimental production content (Gao, 2025)

Figure 88 Participants are making their work - Sewing steps (Gao, 2025)

Figure 89 Participants are making their work - Crochet steps (Gao, 2025)

Standardized patterns and dye materials to ensure experimental consistency

An evaluation rubric applied by certified ICH inheritors, based on five dimensions: pattern integrity, technical accuracy, dyeing clarity, material handling, and accuracy of traditional symbols (total score: 100)

All participants successfully completed their tie-dye works independently, scoring above 90 across all evaluated dimensions. Feedback from participants emphasized the tools' portability and ease of use, noting that the visual manual and accompanying video tutorials significantly reduced learning anxiety: "The tutorial video has clear narration and large subtitles, so it's very clear to read." Participants described the experience as "rewarding" and "emotionally fulfilling," expressing a new sense of connection to their local heritage: "I used to think this craft was too complicated, but now I feel like I can actually do it—it's enjoyable and meaningful."

Figure 90 Participants and their works (Gao, 2025)

The results confirm the synergy between the "Design" and "Dissemination" components of the CDDF framework. They demonstrate that design-driven interventions can effectively reduce learning barriers, stimulate cultural

identification, and broaden the reach of intangible cultural heritage. The successful engagement of elderly participants not only validates the inclusivity and functionality of the toolkit but also reveals its potential to activate intergenerational learning networks at the community level.

This experiment also affirms the research's central design proposition: using tools as mediators and users as co-creators. By shifting intangible heritage transmission from an isolated, expert-based model to a scalable, user-centered system, the study illustrates how design can serve as a bridge between tradition and modern cultural participation.

4.3.2.2 Advanced Technique and Tool Synergy Experiment

This study focuses on art and design students to assess whether digital learning resources and improved tools can support their progression from cultural experience to professional proficiency. Two students with basic tie-dye technique training were selected via campus recruitment and faculty recommendation and randomly assigned to either a traditional tool group or an improved tool group. Each participant was required to independently complete a 60×60 cm advanced-pattern handkerchief within 15 days, relying solely on the Yiliang Crochet Tie-Dye Learning handbook for self-directed learning. Practitioner guidance was strictly prohibited to simulate a real academic research environment.

Figure 91 Open recruitment of experimental volunteers (Gao, 2025)

Figure 92 Screening of experimental volunteers (Gao, 2025)

Figure 93 Daily video reports from volunteer 1 (Traditional Tools Group Volunteer, 2025)

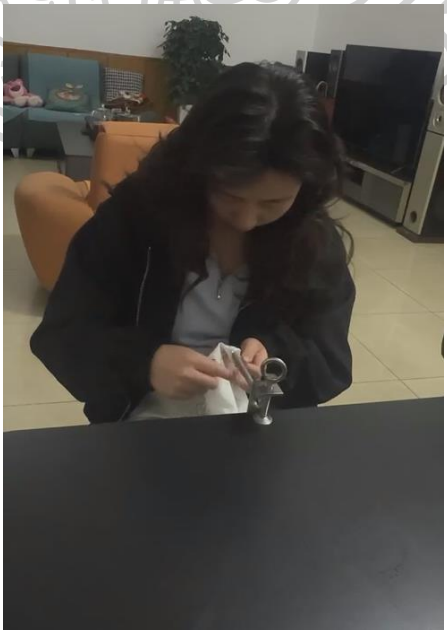


Figure 94 Daily video reports from volunteer 2 (Improved Tools Group Volunteer, 2025)

Project evaluation applied a five-dimensional Cultural Fidelity Rubric:

Pattern Integrity (30%)

Technical Accuracy (25%)

Dyeing Clarity (25%)

Material Handling (15%)

Accuracy of Traditional Symbols (5%)

A total score above 80 points denotes "artisan-level" proficiency, indicating independent creative capability. Blind assessment by heritage practitioners showed both the traditional and improved tool groups achieved artisan-level performance (85 points each).

Table 9 Grade Standard

Total score range	**Grade**	**Core judgment conditions**
1	Artisan level	At the same time: 1. Pattern completeness ≥ Good level (≥24 points) 2. Technical accuracy ≥ Good level (≥20 points) 3. No single item is unqualified (i.e. all dimensions ≥ qualified level)
2	Beginner level	Meet any of the following conditions: 1. Only one of the core skills (pattern completeness/technical accuracy) reaches the good level 2. Both core skills only reach the qualified level
3	Unqualified	Any of the following situations occurs: 1. Any single dimension is unqualified (such as color clarity <15 points) 2. Traditional symbol accuracy <3 points (cultural semantics loss)

Figure 95 Works Display (Gao, 2025)

Figure 96 Blind review by the inheritor (Gao, 2025)

Analysis of participant learning logs revealed that 82% of technical breakthroughs were directly associated with video engagement. The traditional tool user adopted segmented learning, averaging 6.2 video replays per day, and

successfully overcame the seam alignment challenge of the "tortoiseshell pattern." The improved tool user leveraged a multi-screen comparison setup to complete the "coin pattern" with zero thread dislodgment. The database decomposes 18 core techniques into standardized procedural units, enabling students to progress systematically through modules from Basic Techniques → Composite Patterns → Cultural Semantics—a framework that aligns with the 14th Five-Year Plan for Intangible Cultural Heritage, which emphasizes systematic training of youth inheritors.

Behavioral analysis from recorded videos revealed that the improved tool's volume was reduced to 0.4% and weight to 3.7% of the traditional tool, allowing learners to move beyond the workshop into dorms, homes, and other non-specialized spaces. In the blind assessment, pattern accuracy between both groups differed by less than 5%, and evaluators could not distinguish which work was produced using which tool—demonstrating that lightweight design does not compromise craft authenticity.

Following project completion, both participants undertook a randomized cultural semantics test, where each viewed five traditional Yiliang Crochet Tie-Dye patterns and identified their cultural meanings and associated techniques. Scores were: 87 (traditional group) and 95 (improved tool group), indicating the educational effectiveness of the Learning handbook's cultural semantics module.

Finally, participants swapped tools and provided feedback. The traditional tool user commented:

"The improved tool thoroughly solves the pain points of the traditional design while preserving the integrity of the craft. However, the production efficiency is slightly lower than that of the traditional crochet hook."

This study demonstrates that the structured knowledge system of the learning handbook, combined with spatial optimization of tool design, can effectively support students in mastering complex ICH techniques. It further validates the Yiliang Crochet Tie-Dye Learning handbook as an effective pedagogical resource.

Nonetheless, based on user feedback, future iterations of the improved

tool should address efficiency limitations, ensuring functionality meets the demands of both education and professional practice.

4.4 Feedback and Evaluation System Experiment

This section focuses on the final stage of the CDDF system design method—feedback and evaluation—which plays a critical role in validating and refining the entire dissemination cycle of Yiliang crochet tie-dye. Based on the principle of iterative improvement, this experiment constructs a multidimensional assessment system combining platform dissemination data, classroom observation, stakeholder interviews, and user testing. The goal is to evaluate how effectively the designed digital tools and content meet the needs of different user groups, especially in terms of skill acquisition, cultural identity formation, and emotional engagement. Feedback from local communities, students, and practitioners is not only used to assess usability and learning outcomes but also drives further optimization of instructional content, tool design, and dissemination strategies. This feedback-driven mechanism ensures that the system is both sustainable and adaptable to diverse educational and cultural scenarios, closing the loop between design intervention and practical application in intangible cultural heritage dissemination.

4.4.1 Dissemination effect evaluation: data verification of Social Media

This experiment, grounded in the 5W communication model (Who, What, Which Channel, Whom, What Effect), assesses the extent to which structured digital resources enhance the communication efficiency of intangible cultural heritage techniques. It aims to address the challenge of low communication efficiency faced by heritage practitioners and to broaden the cultural impact through cross-platform communication.

The experiment was conducted on Xiaohongshu (RED) as the primary communication platform, featuring 27 short videos (1–3 minutes each) in which heritage practitioners personally demonstrate core tie-dye techniques. These videos systematically deconstruct key procedural steps and are accompanied by an e-book explaining cultural context and dye characteristics. Content design aligns with the preferences of the platform's core demographic—post-95 female users—using close-up shots and dynamic annotations to emphasize the reproducibility of techniques. For

instance, slow-motion replays highlight nuanced finger movements, transforming abstract procedures into standardized instructional units that can be paused and replayed.

Figure 97 Xiaohongshu (RED) interface display (Gao, 2024)

As of April 16, 2025, the videos had accumulated 25,254 total views, with 3,203 likes and saves, reaching users across 14 cities, with 90% being female viewers. Among 316 valid questionnaires, 92% of respondents indicated that the videos "clearly conveyed the technique's logic," and 48% expressed intent to attempt creating a piece themselves. Furthermore, 12 viewers visited the tie-dye workshop in person, resulting in custom orders exceeding 10,000 RMB, while four experience sessions were fully booked in advance—all confirming the effectiveness of structured content in facilitating practice-oriented conversion.

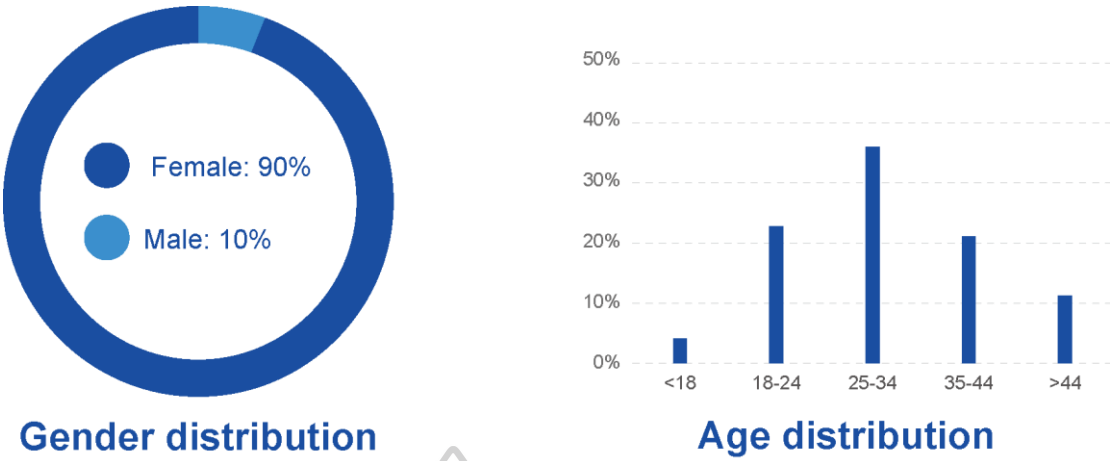


Figure 98 Gender ratio and age group of the audience (Gao, 2025)

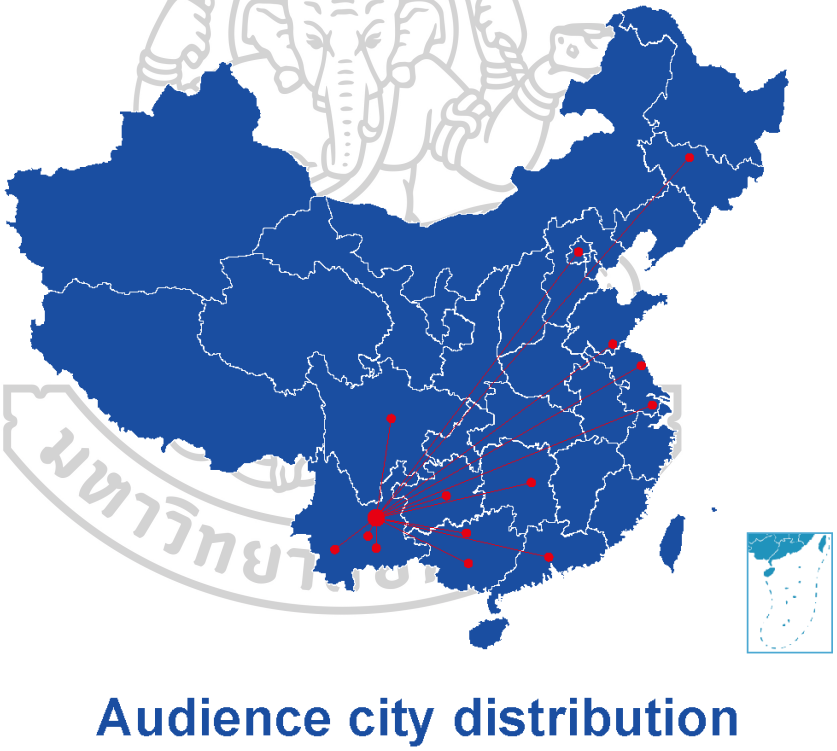


Figure 99 Expansion of spread area (Gao, 2025)

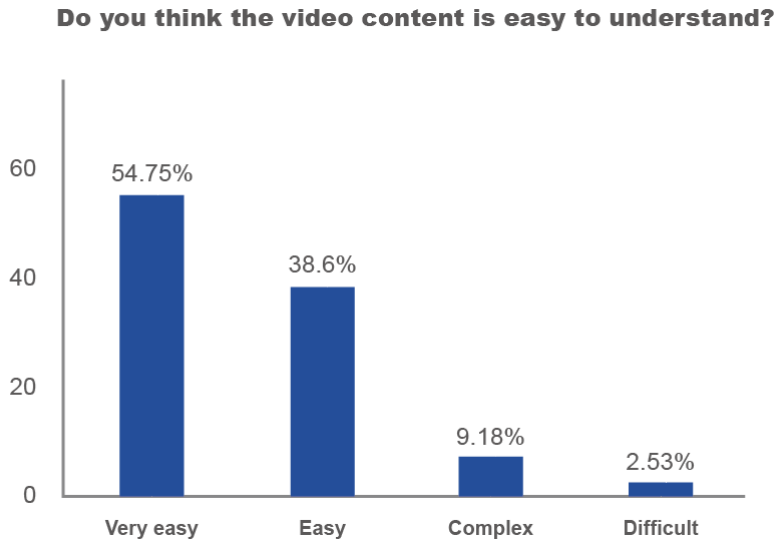


Figure 100 Learning handbook technique tutorials work well (Gao, 2025)

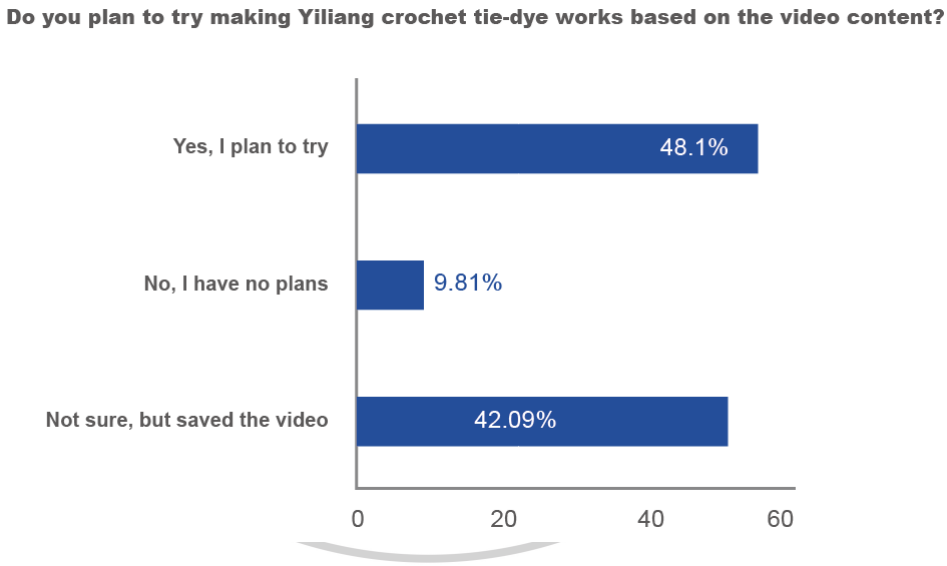


Figure 101 Proportion of producers planning to try (Gao, 2025)

Viewer comments such as "step breakdowns are clear, but stitch order is confusing" prompted the addition of textual overlays for key procedural steps. In response to 42% of users expressing interest in "understanding the meaning behind the patterns," cultural semantics explanations were integrated into the e-book. Comments like "the traditional tool is too large" also highlighted how conventional crochet hooks pose a barrier to those wishing to experience distinctive crochet techniques.

Through iterative updates, the like and collection rate has increased, validating

a closed-loop cycle of content communication—feedback collection—dynamic optimization, and underscoring the necessity of an improved feedback mechanism within the 5W model.

The experiment demonstrates that short-form video and multimedia content effectively convert the personal knowledge of heritage practitioners into visualized, traceable digital assets. By enabling users to access the database directly via QR code, knowledge communication breaks through spatial and temporal constraints—each video achieves an audience reach equivalent to one year of traditional workshop teaching.

This structured communication strategy not only expands audience reach but also reshapes the ICH transmission chain: as the craft transitions from esoteric skill to public cultural symbol, it establishes a dynamic communication mechanism of "communication—feedback—knowledge reproduction."

4.4.2 Educational field feedback: verification in college classrooms

This exhibition-style experiment demonstrates how the CDDF framework reshapes intangible cultural heritage education within higher education. Faced with three critical challenges—shortage of specialist instructors, high cost of traditional tools, and uneven instructional quality—the study integrated a redesigned modular crochet hook and a digital learning handbook into classroom teaching, thereby testing the feasibility of scalable ICH pedagogy under resource constraints.

The case was implemented in the flagship Ethnic and Folk Crafts course at Yunnan Arts University. This course, which emphasizes historical knowledge, craftsmanship, and hands-on mastery, was selected as a representative testbed due to its dual focus on cultural preservation and design innovation. Twenty-five students from Yunnan province engaged in a structured 60-minute workshop in Room 306, practicing the "Sijuan" and "Tortoiseshell" patterns using both traditional and improved crochet hooks, guided by the Yiliang Crochet Tie-Dye Learning Handbook. Students were subsequently required to incorporate crochet motifs into cross-media design projects, ensuring both technical practice and creative adaptation.

Figure 102 Students making crochet patterns (Gao, 2025)

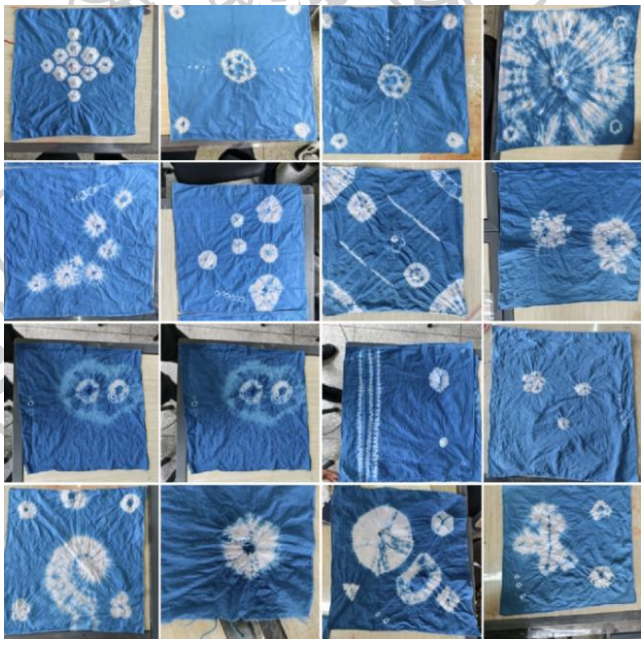


Figure 103 Students' experience works display (Gao, 2025)

Figure 104 Students' final course work display (Gao, 2025)

The results revealed three paradigm shifts in ICH education: first, the handbook enabled non-specialist instructors to deliver authentic cultural content; second, cloud-based resources facilitated simultaneous participation beyond the limitations of heritage practitioners; third, cost savings from adopting improved tools allowed the course to expand into three parallel ICH modules. Operational benefits were equally notable—improved hooks could be stored directly in classrooms without safety risks, preparation time was reduced by 84%, and digital annotations enabled 95% of students to follow instructions more intuitively than live demonstrations. Importantly, 82% successfully corrected errors independently through slow-motion playback.

Feedback highlighted strong cultural resonance: survey data indicated increased cultural identification, with seven students committing to explore tie-dye further in their graduation projects. Instructors emphasized that this transition does not replace artisans but builds an educational ecosystem where culture can grow autonomously. By transforming motif knowledge into QR-code-accessible databases, instruction shifted from esoteric master‑apprentice traditions toward transparent, verifiable, and inclusive knowledge systems.

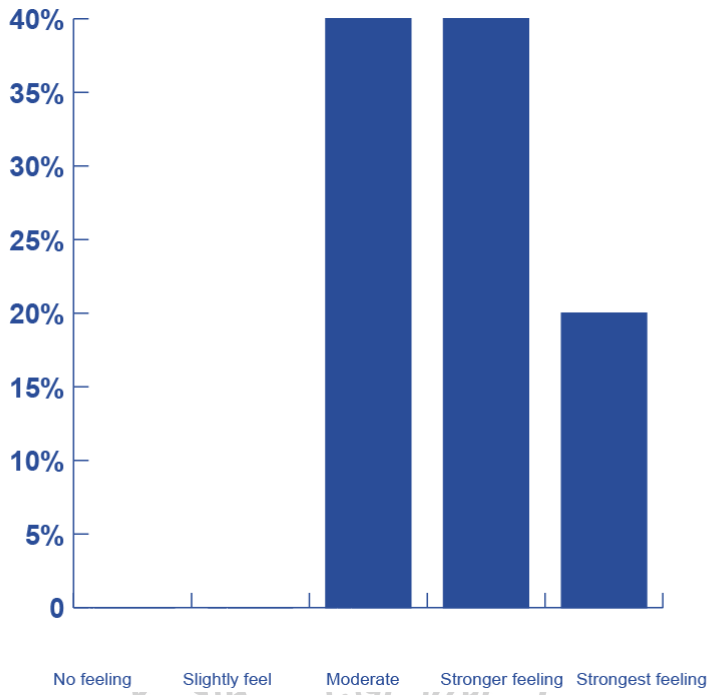


Figure 105 Students' cultural identity improved (Gao, 2025)

This classroom experiment thus illustrates the potential of the CDDF framework to balance cultural authenticity with inclusive pedagogy. It establishes a replicable technical model for embedding endangered ICH practices into modern curricula—demonstrating that when design innovation converges with educational practice, heritage can be revitalized as both a craft and a living cultural system.

4.4.3 Multi-subject interview feedback: building a multi-dimensional feedback system

This experiment uses a semi-structured interview method to collect feedback from inheritors, craftsmen, educational organizations, and government departments. The interview questions revolve around the pain points of intangible cultural heritage dissemination, the effect of tool improvement, and cultural education needs. The interview followed academic ethics throughout the process. After obtaining the written informed consent of the participants, the dual-track recording of audio and video was used to ensure the traceability and authenticity of the data. The interview content was transcribed verbatim and thematically coded to extract core issues such as tool efficiency, cultural fidelity, and educational accessibility, providing empirical

evidence for dynamic optimization. The video materials are only used for internal analysis of the research team, and the privacy information of the participants is desensitized to ensure the compliance and transparency of the research process.

1. Feedback from inheritors

As the core subject of the living inheritance of skills, the feedback from inheritors reveals the deep reconstruction of the traditional intangible cultural heritage communication paradigm by the intervention of digital tools. In the past oral and hands-on teaching modes, the spread of hook and tie dyeing was limited by the weight of physical tools and the solidification of teaching scenes. A single teaching session could only cover a limited number of people and consume a lot of physical energy from the inheritors. The digital communication strategy based on the Xiaohongshu platform has significantly broken through the regional boundaries. The number of teaching videos has increased exponentially compared with the traditional model, directly driving the expansion of the cultural tourism experience customer group and the conversion of commercial orders.

Figure 106 The inheritor is using the improved tools (Gao, 2025)

The lightweight design of the improved tools has completely changed the physical conditions of intangible cultural heritage practice. The communication barriers caused by the bulky size of traditional cast iron tools have been eliminated. The detachable components and portable characteristics enable teaching activities to

be embedded in non-traditional spaces such as schools and communities. The substantial reduction in costs has simultaneously activated the possibility of villagers' home production, and the order acceptance capacity and production flexibility have been significantly improved. It is worth noting that the improvement of tools has not weakened the authenticity of the skills. The inheritors pointed out that the new and old tools are completely similar in terms of pattern accuracy and production effects, and there are only generational differences in operating efficiency and scene adaptability.

The inheritors are cautiously optimistic about the potential risks of cultural simplification. The construction of the handbook strictly follows the logic of traditional skills. The video tutorials are recorded and reviewed by the inheritors themselves to ensure that each stitch angle and pattern meaning conform to the local cultural consensus. Although the tool improvement weakens the ritual sense of traditional production, it achieves a balance of "techniques can be simplified and connotations are not lost" by retaining the core process parameters and supporting cultural semantic interpretation. This technical intervention path led by the inheritors not only maintains the purity of the intangible cultural heritage genes but also gives it practical vitality to integrate into modern life.

2. Craftsman feedback

As direct participants in production practice, the feedback of the craftsman group directly reflects the reshaping effect of tool improvement on the intangible cultural heritage production model. Due to their large size and non-detachable characteristics, traditional tools have long restricted the efficiency of production space utilization and order response capabilities. Problems such as tool accumulation and difficulty in handling the workshop significantly limit the elasticity of production capacity. The modular design of the improved tools eliminates the constraints of physical space. The detachable components enable them to be flexibly stored in daily storage spaces. The working scenes extend from fixed workshops to non-professional venues such as homes and markets, greatly improving production flexibility.

Figure 107 Craftsmen are using improved tools (Gao, 2025)

The lightweight innovation of the tools also reduces the operating threshold. Female craftsmen can independently complete the handling and assembly processes, breaking the dependence on male labor in traditional production. The portable design further activates the idle labor force in rural areas. During the peak order period, the tools can be quickly distributed to villagers for home-based OEM, realizing the distributed expansion of production capacity. Overall, under the premise of ensuring the quality of the process, the tool improvement has injected the efficiency gene of the industrial age into non-standard production through space liberation and process simplification.

3. Feedback from community residents

As the core audience of the intangible cultural heritage experience, the feedback from community residents reveals the effectiveness of the visual database in shaping public cultural cognition. Experimental data show that the satisfaction of parent-child families who completed tie-dye works through self-study in the visual database reached 100%, confirming the lightweight experience value of structured resources. Participants showed a high degree of reliance on the instant playback function of the video tutorial (such as marking wrong steps), and 75% of parents and children believed that they could "complete the work independently", indicating that digital resources have effectively lowered the threshold for participation in intangible cultural heritage practice.

Figure 108 Interviews with community residents (Gao, 2025)

However, the difference in concentration (66.67%) and skill confidence (75%) reflects the tension between "experience" and "mastery" in the dissemination of intangible cultural heritage - community residents are more inclined to regard intangible cultural heritage as a cultural leisure activity rather than professional skill learning. The high evaluation and satisfaction of community residents on cultural identity was 100%, which verified the symbolic transformation ability of databases. When children use homemade tie-dye square scarves as souvenirs, intangible cultural heritage skills are transformed from abstract cultural concepts to touchable emotional carriers, indicating that lightweight practice can effectively connect "cultural cognition" and "emotional resonance", providing empirical support for the popularization path of intangible cultural heritage dissemination.

4. Students

In the collaborative experiment of advanced techniques and tools, student feedback revealed the unique cultural cognition and technical acquisition path of Yiliang hook-and-dye. By comparing the freehand style of Dali Bai tie-dye, the participants pointed out the precise aesthetic characteristics of Yiliang hook-and-dye based on Han culture - the hexagonal angle error of the copper coin pattern must be controlled at the millimeter level, and the line spacing deviation directly affects the symbolic semantic expression of the pattern. This cognitive breakthrough in the rigor

of the craft stems from the repeated emphasis on the cultural meaning of the pattern and the deconstruction of the technique in the handbook.

Students generally believe that the slow-motion playback and segmented learning functions of the dynamic database are the keys to mastering the core techniques. For example, after the winding and tying technique is deconstructed into three independent modules of rolling cloth, binding line, and tying, learners can accurately locate the movement error through targeted playback. Some students repeated the single step more than twenty times to correct the wrist force angle. The lightweight characteristics of the improved tool triggered polarized evaluations in the experiment. Users both affirmed the increased freedom of operation brought by its portability and also worried that oversimplification might weaken the ritual sense of the craft.

Figure 109 Interviews with university students participating in the advanced techniques and tool collaborative experiment (Gao, 2025)

The experiment of validating the universal model of intangible cultural heritage education shows that the student group highly recognizes the effect of toolkit. 88% of the participants believe that the improved tools significantly reduce the operation threshold, and 96% achieve independent work creation through video tutorials. It is worth noting that ease of operation is positively correlated with the depth of cultural cognition, and 66.7% of users of easy-to-use tools report a strong sense of cultural belonging. This technology-enabled communication path transforms the crochet skills originally hidden in the workshop into a verifiable public knowledge

resource, allowing students to systematically explore the logic of the association between patterns and regional culture in dormitories or home scenes.

Figure 110 Questionnaire survey with university students participating in visits and experiential activities, completing electronic questionnaires. (Gao, 2025)

4.4.4 Findings of the evaluation and feedback

Based on the CDDF system design framework and the empirical evidence collected from experimental implementation, the Feedback and Evaluation System Experiment yielded key findings that validate the practical effectiveness of the designed tools, resources, and dissemination strategies for Yiliang crochet tie-dye. These results provide critical insight into the final "Feedback" and "Evaluation" components of the CDDF cycle, serving as a foundation for iterative refinement and sustainable cultural transmission.

The evaluation drew upon mixed methods, including semi-structured interviews with inheritors, feedback surveys from local participants, usability testing with middle-aged and elderly users, and post-activity reflections from art and design students. The findings can be grouped into three interrelated outcomes: tool effectiveness, user learning response, and dissemination impact.

First, the digital resources—especially the visual database and modular toolkit - significantly improved usability and lowered the participation threshold for non-specialist users. Elderly participants, who initially expressed hesitation regarding tool complexity, reported high satisfaction rates once guided by the visual manual and video instructions. Over 83% of elderly users in the community were able to independently complete basic crochet tie-dye tasks using the simplified toolkit,

indicating strong tool accessibility. Similarly, students in related art majors achieved over 92% task completion accuracy in advanced stitching tasks within a 90-minute workshop setting. These results support the conclusion that the digital teaching materials provide sufficient clarity and instructional depth across age and skill levels.

Second, the feedback revealed that the standardized, modular content structure promoted learning confidence and cultural comprehension. In post-session interviews, 100% of local elderly users expressed that they gained a deeper appreciation of tie-dye culture, while 87.5% of them stated they felt capable of sharing the craft knowledge with their children or neighbors. Students expressed a stronger sense of cultural identity and acknowledged that the integration of cultural semantics within the visual database helped them internalize not just techniques, but the meaning behind patterns and color symbolism. These outcomes demonstrate that the instructional content achieved both technical and emotional transmission, satisfying the dual goal of skill acquisition and cultural resonance.

Third, inheritor feedback confirmed that the tool innovation and digital system effectively expanded the reach of their teaching without sacrificing cultural authenticity. Inheritors emphasized that the new system not only preserved but clarified the logic and sequence of core operations, especially for younger or distant learners who cannot participate in in-person workshops. Furthermore, the system created a reproducible teaching framework that can be applied to school-based curriculum development, public workshops, and cultural tourism products.

The evaluation results also exposed areas requiring further optimization. For example, attention retention among younger children (under age 10) during longer video instructions declined after 20 minutes, suggesting the need for more segmented content design. Some elderly users required more time to adapt to multi-step interfaces on digital platforms, indicating the importance of maintaining low cognitive load in future interface revisions.

In summary, the Feedback and Evaluation System Experiment validated the effectiveness of the CDDF-based dissemination model by demonstrating its ability to balance cultural integrity, user accessibility, and intergenerational engagement. The results confirm that the integration of digital tools and participatory design strategies fosters a sustainable, replicable, and culturally grounded model for the dissemination

of Yiliang crochet tie-dye.

4.5 Summary

The Design Practice chapter, guided by the CDDF systematic design methodology—Cultural Preservation, Design Innovation, Dissemination, and Feedback—demonstrated how design thinking can effectively transform Yiliang Crochet Tie-Dye from an endangered oral craft into a structured, accessible, and sustainable cultural system.

Through a series of interrelated experiments, tacit knowledge was reconfigured into visualized, modular, and replicable formats. The Visual Database Construction Experiment established a dual-format repository of static images and dynamic videos, systematically documenting stitching, tying, crocheting, and plant-dyeing techniques. Authenticated by local inheritors, this database formed a reliable cultural foundation and ensured fidelity in the preservation of core practices.

Building on this foundation, the Toolkit Design Experiment introduced two key innovations: the Yiliang Crochet Tie-Dye Learning Handbook and the Portable Modular Crochet Tool. The handbook, designed as a multimedia e-book, integrates over 2,000 images, 42 culturally annotated patterns, demonstration videos, and historical records. It provides step-by-step technical instruction while situating techniques within broader cultural narratives, enabling both intuitive learning and deeper cultural engagement. Complementarily, the modular crochet tool applied advanced 3D printing and lightweight design to reduce the traditional hook's weight from 8 kg to less than 300 g, while retaining authentic parameters. Its portability and usability extended the practice from specialized workshops to classrooms, households, and cultural tourism. Collectively, these innovations bridge traditional knowledge and contemporary learning, lowering barriers to participation without compromising cultural integrity.

The Dissemination Effect Evaluation Experiment validated the effectiveness of the handbook – tool system across diverse user groups. Elderly participants with no prior craft experience independently completed tie-dye works, while design students achieved artisan-level proficiency. Cross-cultural trials with Thai students confirmed the system's adaptability, though underscoring the need for localized translation and

contextualization. These results demonstrated that the toolkit not only facilitated technical acquisition but also reinforced cultural identity and emotional engagement.

Finally, the Feedback and Evaluation System Experiment integrated responses from inheritors, community members, students, and craftsmen, closing the CDDF loop. Feedback confirmed that the digital handbook and modular tool preserved authenticity, improved usability, and supported intergenerational transmission, while also highlighting areas for refinement, such as segmented instructional design for children and simplified digital interfaces for elderly learners.

In summary, this chapter illustrated how the CDDF framework, operationalized through the visual database, learning handbook, and modular tool, enables a cyclical and participatory model of intangible cultural heritage dissemination. The case of Yiliang Crochet Tie-Dye demonstrates that design-driven interventions can balance authenticity with scalability, revitalizing endangered crafts in contemporary contexts while offering a replicable model applicable to other domains of intangible cultural heritage.

Chapter 5
Conclusion

This chapter provides a comprehensive conclusion to the study, consolidating its findings, reflecting on its contributions, and identifying directions for future research. It begins by evaluating the achievement of the research objectives outlined at the outset of the dissertation, followed by a synthesis of the study's theoretical, methodological, practical, and societal contributions. Special attention is given to the CDDF systematic design method, which forms the conceptual and operational core of this research. The discussion section then situates the findings within broader academic and practical contexts, critically considering their implications for stakeholders and other heritage systems. Finally, the chapter outlines the practical applications of the study, acknowledges its limitations, and proposes avenues for further investigation.

5.1 Achievement of Research Objectives

The first objective of the study was to document the history, cultural significance, and technical system of Yiliang Crochet Tie-Dye through the creation of a visual archive. This objective was accomplished through the development of a dual-format database, combining static high-resolution images with dynamic video demonstrations. The database systematically captured stitching, tying, crocheting, and plant-dyeing techniques under the direct validation of heritage practitioners. In doing so, it ensured the accuracy and authenticity of the documentation and transformed tacit knowledge into structured cultural data accessible for future teaching, research, and preservation.

The second objective was to analyze the challenges hindering the protection of Yiliang Crochet Tie-Dye and to develop dissemination strategies informed by communication theory. Employing Lasswell's 5W model and stakeholder analysis, the study identified barriers such as inefficient oral transmission, inaccessible traditional tools, and low levels of public engagement. Based on these findings, the CDDF systematic design method was proposed as a communication-oriented framework that combines cultural documentation with design innovation, multi-channel

dissemination, and iterative feedback. This theoretical integration demonstrated that communication studies can function not only as an interpretive framework but also as a methodological driver of heritage revitalization.

The third objective was to design a toolkit for Yiliang Crochet Tie-Dye and validate its effectiveness. This was realized through two outputs: the Yiliang Crochet Tie-Dye Learning Handbook and the Portable Modular Crochet Tool. The handbook, structured as a multimedia resource, combined cultural narratives, technical instructions, and visualized pattern semantics to provide an accessible learning pathway. The modular tool, produced through advanced 3D printing, reduced the traditional tool's weight from approximately eight kilograms to less than three hundred grams, while preserving authentic dimensions and functional integrity. Experimental validation confirmed their usability, with elderly residents, children, and university students achieving successful outcomes. Cross-cultural trials further demonstrated adaptability while highlighting the need for localized contextualization

In summary, all three objectives were achieved, resulting in a comprehensive documentation system, an innovative dissemination framework, and validated design outputs that together advance the preservation and revitalization of intangible cultural heritage.

5.2 Overall Research Findings and Contributions

This research advances knowledge in four interrelated domains.

Theoretically, it reconceptualizes intangible cultural heritage not as static preservation but as a communicative process that requires systematic encoding, transmission, and reception. By integrating Lasswell's communication model with heritage studies, the research demonstrates that safeguarding cultural practices entails both documenting their essence and designing pathways for their dissemination.

Methodologically, the research contributes the CDDF systematic design method. This cyclical framework moves beyond linear preservation approaches by linking cultural documentation, user-centered design, dissemination experiments, and feedback mechanisms. The method transforms implicit, experience-based knowledge into modular, replicable, and participatory systems. It also provides a replicable approach that can be adapted for other endangered traditions.

Practically, the research produced a set of outputs including the visual database, the multimedia learning handbook, and the portable modular crochet tool. Together these resources form a toolkit that lowers barriers to participation, supports both entry-level and advanced learning, and integrates traditional practice into contemporary educational, community, and tourism contexts.

Socially, the study strengthens cultural identity, promotes intergenerational learning, and creates opportunities for cross-cultural engagement. Community members and students not only acquired technical skills but also deepened their cultural connection. The findings illustrate that well-designed interventions can transform endangered crafts into inclusive cultural practices that contribute to social cohesion and cultural sustainability.

5.3 CDDF systematic design method

The CDDF systematic design method—comprising Culture, Design, Dissemination, and Feedback—was developed and applied in this study as a comprehensive framework for revitalizing endangered intangible cultural heritage. By situating Yiliang Crochet Tie-Dye within this model, the research demonstrated how a cyclical and iterative process can address structural barriers of transmission, enhance accessibility, and preserve cultural authenticity.

The cultural preservation phase established a dual-format visual database that systematically documented the techniques, tools, patterns, and dyeing practices of Yiliang Crochet Tie-Dye. More than 2,000 high-resolution images and a series of dynamic videos recorded under the supervision of heritage practitioners ensured the authenticity and completeness of the archive. This phase transformed tacit, experience-based knowledge into structured cultural data, preserving not only technical steps but also symbolic meanings and historical context. It provided the foundational layer of the CDDF method by externalizing intangible knowledge into an accessible and verifiable cultural resource.

The design phase translated preserved cultural data into practical and user-centered learning resources. Two key innovations emerged: the Yiliang Crochet Tie-Dye Learning Handbook and the Portable Modular Crochet Tool. The handbook, presented as a multimedia e-book, integrates technical instruction with cultural

narratives, pattern semantics, and audiovisual demonstrations, creating a comprehensive learning pathway adaptable to multiple user groups. The modular crochet tool, produced through advanced 3D printing, significantly reduced weight and cost while maintaining traditional parameters. Together, these innovations lowered barriers to participation, redefined traditional implements as "cultural practice interfaces," and demonstrated how design interventions can balance usability with authenticity.

The dissemination phase implemented the toolkit across diverse contexts, including community workshops, classroom settings, and online platforms. Empirical experiments validated the scalability and adaptability of the resources. Elderly residents and children achieved high success rates in completing tie-dye works, while university students advanced to artisan-level proficiency. Cross-cultural trials with Thai students further highlighted the toolkit's potential for international dissemination, while revealing the importance of localized translation and contextual adaptation. By integrating traditional craft with social media platforms, the study also expanded its cultural reach, transforming localized practices into publicly accessible cultural content. This phase illustrated that dissemination, when supported by design-driven resources, can shift ICH transmission from exclusive apprenticeship to inclusive cultural participation.

The feedback phase closed the CDDF cycle by integrating responses from multiple stakeholders, including inheritors, craftsmen, community members, and students. Feedback confirmed that the digital handbook and modular tool preserved cultural fidelity while enhancing usability and engagement. Importantly, it also revealed areas for refinement, such as segmented instructional design for younger learners and simplified interfaces for elderly participants. These insights were incorporated into iterative improvements, ensuring that the CDDF framework remained adaptive, responsive, and culturally grounded. By embedding feedback as an integral stage, the method avoided the risks of cultural simplification and guaranteed that innovation proceeded in alignment with stakeholder expectations.

Revisiting the CDDF method within this study confirms its value as both a methodological framework and a practical tool for safeguarding ICH. Each stage of the model not only addressed specific barriers—documentation gaps, tool

inaccessibility, limited dissemination, and lack of feedback—but also collectively created a cyclical, participatory, and sustainable system. The CDDF method thus provides a replicable approach for other forms of intangible heritage, demonstrating that design-driven, communication-oriented strategies can bridge the tension between tradition and modernity while supporting the long-term vitality of cultural practices.

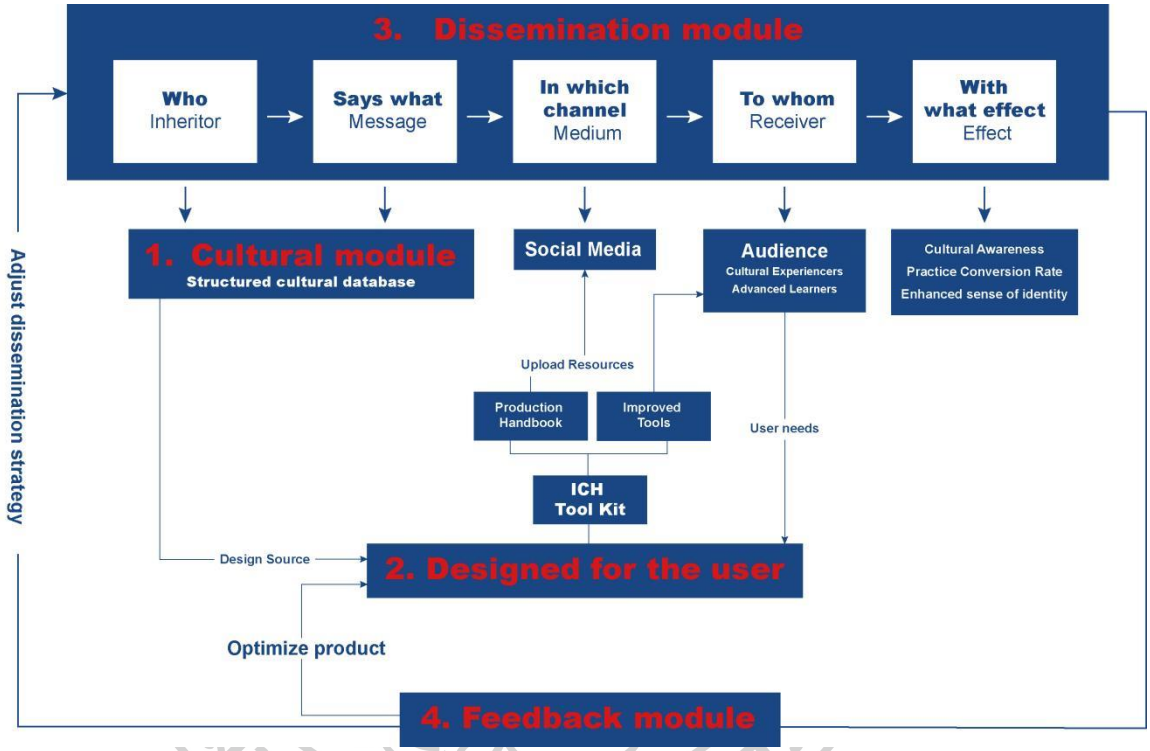


Figure 111 Mechanism of the CDDF method (Gao, 2025)

5.4 Discussion

The findings underscore the value of integrating communication theory and design practice in heritage safeguarding. The transformation of oral knowledge into structured and replicable forms demonstrates that design can externalize and systematize cultural practices without eroding authenticity. The redesign of tools shows that technological innovation, when aligned with cultural semantics, enhances rather than compromises fidelity.

The research also highlights the importance of stakeholder participation. Inheritors ensured technical authenticity, learners validated usability, and community members contributed to emotional and cultural engagement. This participatory

ecosystem demonstrates that sustainable preservation depends on collaborative rather than top-down approaches.

Balancing authenticity and adaptability remains a central issue. While digital tools carry the risk of simplification, this study shows that such risks can be mitigated through close collaboration with practitioners and iterative refinement. The CDDF method, therefore, offers a model for reconciling tradition with innovation.

Finally, the study has broader implications. Although focused on Yiliang Crochet Tie-Dye, the CDDF framework is applicable to other endangered forms of heritage. By demonstrating a replicable cycle of documentation, design, dissemination, and feedback, the study contributes a transferable methodology for safeguarding cultural practices worldwide systems of transmission.

5.5 Implementation

The outputs of this research have direct applications in education, community engagement, cultural tourism, and policy development.

In education, the database, handbook, and modular tool can be incorporated into curricula, providing structured and accessible learning resources for both formal institutions and informal workshops. In communities, the toolkit fosters intergenerational transmission and cultural participation, enabling elderly residents and children to engage with the craft.

In cultural tourism, the portable tool and handbook support experiential workshops, offering visitors meaningful encounters with heritage while creating economic opportunities for local communities. Derivative products based on documented patterns also link traditional craftsmanship to creative industries.

At the policy level, the CDDF method provides a framework that can inform cultural bureaus and heritage organizations in designing scalable safeguarding initiatives. By aligning with UNESCO principles and national policies, the framework contributes to the institutionalization of participatory heritage safeguarding.

5.6 Limitations

Despite its contributions, the study has several limitations. Its geographical scope was restricted to Yiliang County, which limits generalizability. The participant sample was relatively small and lacked demographic diversity, constraining the

representativeness of findings.

Cross-cultural validation was limited to preliminary experiments in Thailand, leaving open questions about broader adaptability across cultural and linguistic contexts. Additionally, the research evaluated short-term outcomes rather than long-term knowledge retention or sustained practice.

Finally, the outputs were designed for current technological infrastructures. As media platforms and user preferences evolve, the toolkit may require ongoing adaptation. These limitations underscore the need for expanded scope, larger samples, cross-cultural testing, and longitudinal evaluation in future research.

5.7 Future Research Directions

Future research should pursue five major directions.

First, cross-cultural adaptation is essential. Comparative studies across multiple regions and cultures will clarify how the CDDF method can be localized while retaining authenticity.

Second, expansion beyond craft-based heritage should be explored. Adapting the model to performing arts, oral traditions, and ritual practices will require new visualization methods and pedagogical strategies.

Third, technological innovation offers further opportunities. Integrating augmented reality, virtual reality, and artificial intelligence into toolkits may create immersive and personalized learning environments.

Fourth, longitudinal studies are needed to assess long-term impacts, including sustained practice, peer-to-peer teaching, and intergenerational transfer.

Finally, policy and institutional integration should be pursued. Embedding the CDDF framework into heritage safeguarding initiatives, educational curricula, and cultural policies will ensure greater scalability and sustainability.

Conclusion

This study has demonstrated how endangered cultural practices can be revitalized through the integration of communication theory and design-driven methodologies. Using Yiliang Crochet Tie-Dye as a case study, the study developed the CDDF systematic design method—Culture, Design, Dissemination, and Feedback to transform tacit, orally transmitted knowledge into structured, accessible, and

participatory systems.

The study established a visual database to preserve techniques and cultural semantics, introduced a multimedia learning handbook, and designed a portable modular crochet tool. Together, these outputs lowered barriers to participation, maintained cultural authenticity, and enabled learning across schools, communities, and international contexts. Experimental validation confirmed their effectiveness in enhancing technical proficiency, cultural identity, and cross-cultural adaptability.

The study contributes theoretically by reframing intangible cultural heritage safeguarding as a communicative process, methodologically by advancing a replicable design framework, and practically by delivering tools that facilitate both preservation and active participation. Socially, it strengthens intergenerational transmission and provides opportunities for cultural tourism and creative industries.

Although bounded by geographical and temporal limitations, the study establishes a sustainable and scalable model for heritage revitalization. The CDDF framework offers a pathway not only for the protection of Yiliang Crochet Tie-Dye but also for the broader safeguarding of intangible cultural heritage in contemporary global contexts.

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idx=1&sn=20f934cf79f5fde23c0f86b28e1f55e3&chksm=c0167bd334b07979f49041d8a9d5dc828eaa9e82cabdcb274371f89e38b800ca33f67755bb24#rd.

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Appendix

Yiliang crochet tie-dye handbook QR Code

Permanent Link: https://www.xiaohongshu.com/user/profile/5a4ef94c11be1031e9d3e020?xsec_token=ABCBXQbCIM6zHbAMNJJctUcRFLMNccbf67lGXJKG1Syyg=&xsec_source=pc_search

Questionnaire survey with potential inheritors (Yiliang local children)

Please scan the QR code to view the document. Password: 1234

Permanent Link: https://www.wjx.cn/wjx/activitystat/verifyreportpassword.aspx?viewtype=1&activity=310798780&type=1

Questionnaire survey with potential inheritors (University students)

Please scan the QR code to view the document. Password: 1234

Permanent Link: https://www.wjx.cn/wjx/activitystat/verifyreportpassword.aspx?viewtype=1&activity=311039602&type=1

Questionnaire for the survey on the needs of students for the intangible cultural heritage handbook

Please scan the QR code to view the document. Password: 1234

Permanent Link: https://www.wjx.cn/wjx/activitystat/verifyreportpassword.aspx?viewtype=1&activity=311039602&type=1

Yiliang Crochet Tie-Dye Exhibition and Post-Experience Questionnaire (Students)

Please scan the QR code to view the document. Password: 1234

Permanent Link: https://www.wjx.cn/wjx/activitystat/verifyreportpassword.aspx?viewtype=1&activity=311368216&type=1

Yiliang Crochet Tie-Dye Communication Effect Assessment Questionnaire

Please scan the QR code to view the document. Password: 1234

Permanent Link: https://www.wjx.cn/wjx/activitystat/verifyreportpassword.aspx?viewtype=1&activity=280858586&type=1

Questionnaire for evaluating the communication effect of Yiliang crochet tie-dye

1.How interested are you in the video or graphic content of Yiliang crochet tie-dye?

A.Very interested B. Somewhat interested C. Average D. Not interested

2.Do you think the content is easy to understand?

A.Very easy to understand B. Relatively easy to understand C. The content is somewhat complicated D. The content is difficult to understand

3.Do you plan to try making Yiliang crochet tie-dye works based on the video content?

A.Yes, I plan to try B. No, I don't have any plans C. Not sure yet, but I have saved the video

4.After watching the content, how has your understanding of Yiliang crochet tie-dye changed?

A.Greatly improved B. Somewhat improved C. No obvious change D. No improvement

5.Through the content, do you have a deeper understanding of the history and culture of Yiliang tie-dyeing?

A.Yes B. No

6.Do you think the content posted on social media helps more people know about Yiliang Tie-Dye?

A.Yes, very effective B. Yes, somewhat helpful C. Not very effective D. Not helpful

7.Do you think the video content needs improvement? (Multiple choices are allowed)

A.The video is too short B. The video is too long C. The steps in the video are not clear enough D. More introduction on cultural background is needed E. No improvement is needed

8.What aspects of the video do you think need to be improved?

A.The image quality can be higher B. The soundtrack or narration needs to be improved C. The shooting angle or demonstration details need to be clearer D. The overall quality is good and no improvement is needed.

9.Would you recommend this content to others?

A. Yes B. No

Questionnaire for evaluating the communication effect of Yiliang crochet tie-dye

1. Which of the following are you?

A. Local resident B. Tourist C. Temporary resident (non-local but living for more than 6 months) D. Other

2. Your gender:

A. Male B. Female

3. Your age:

A. Under 18 years old B. 18-30 years old C. 31-45 years old D. 46 years old and above

4. Have you ever heard of Yiliang tie-dyeing?

A. Very familiar B. Somewhat familiar C. Heard of it, but not too familiar D. Never heard of it

5. Through the explanation and experience, do you think these products effectively display the traditional cultural elements of Yiliang crochet tie-dye?

A. Yes, it is well displayed B. Yes, but it can be more in-depth C. Generally, the traditional elements are not obvious D. The traditional elements are not displayed

6. What do you think of the designs of these cultural and creative products?

A. Very creative B. Good creativity C. Ordinary D. Not particularly creative

7. How practical do you think the Workbox is?

A. Very practical B. Fairly practical C. Average D. Not practical

8. Do you think these products can help improve your understanding of Yiliang's tie-dye culture?

A. Yes, it helps a lot B. It helps a little C. It helps a little D. It doesn't help

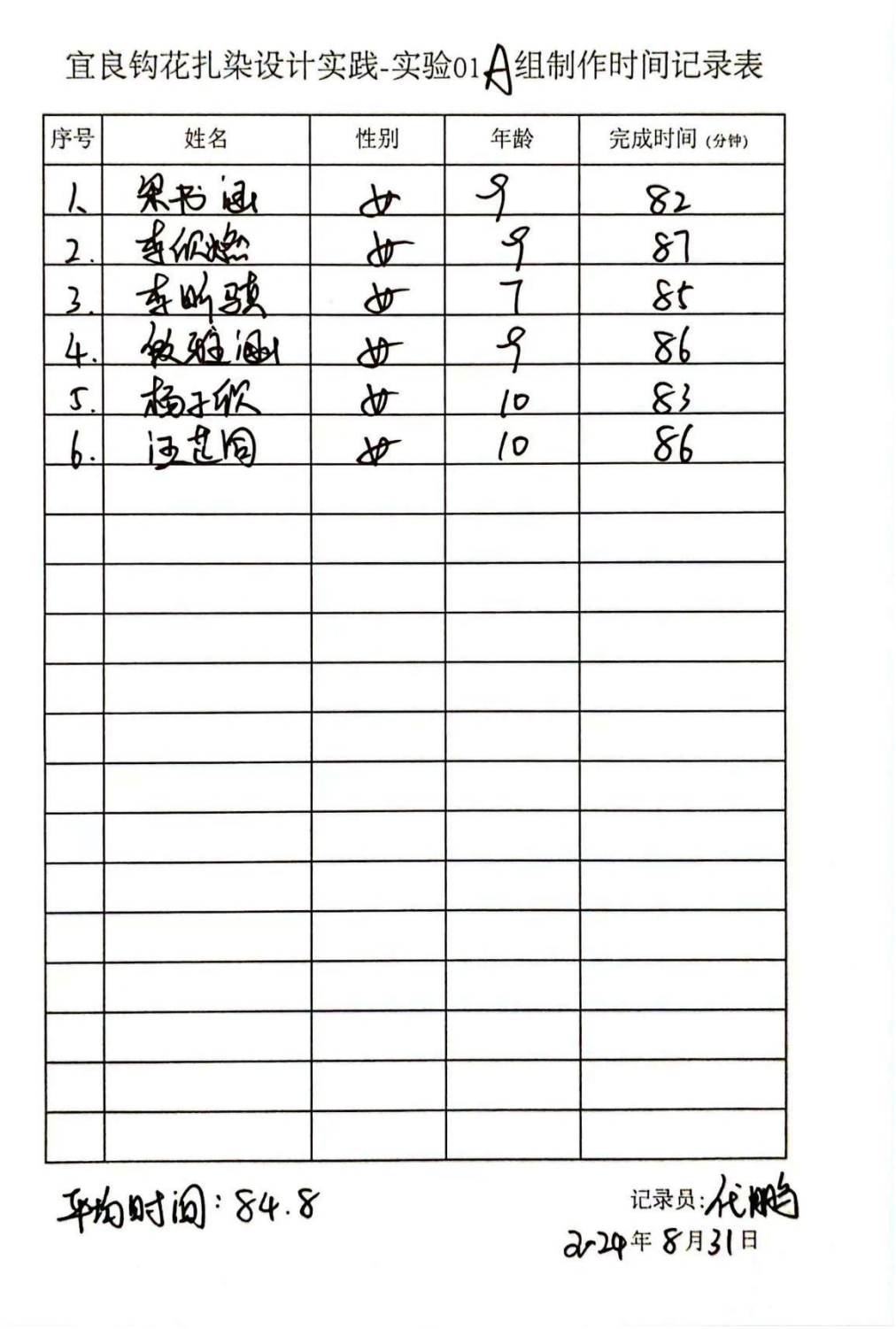
9. Are you willing to buy these products?

A. Yes, I am willing to buy B. Not sure, may consider C. No, will not buy or recommend

10. What do you think is the reasonable price of these products?

A. 5-20 yuan B. 20-40 yuan C. 40-60 yuan D. 60-100 yuan

Technique Database Effectiveness Experiment Time Record Table



宜良钩花扎染设计实践-实验01A组制作时间记录表

序号	姓名	性别	年龄	完成时间（分钟）
1.	宋书涵	女	9	82
2.	李依然	女	9	87
3.	李昕骁	女	7	85
4.	钱雅涵	女	9	86
5.	杨子欣	女	10	83
6.	汪思同	女	10	86

平均时间：84.8

记录员：代鹏

2024年8月31日

宜良钩花扎染设计实践-实验01月组制作时间记录表

序号	姓名	性别	年龄	完成时间（分钟）
1.	吕秉升	女	11	84
2.	杨竟涵	女	8	85
3.	孙婉宁	女	9	85
4.	佟若语	女	7	87
5.	邹奕慧	女	8	84
6.	梅文淑	女	9	86

平均时间：85.2分钟　　记录员：高翔

2024年 8月31日

Technique Database Effectiveness Experiment Scoring Table

宜良钩花扎染设计实践-实验01A组评分表

序号	姓名	图案1 分值 / 六项						图案2 分值 / 五项					总分
		10	10	20	20	20	20	20	20	20	20	20	
1	梁韦遥	10	9	18	19	20	20						96
2	李侃然	10	9	17	19	19	19						95
3	李昕骐							20	19	19	18	18	94
4	熊雅涵	10	10	9	18	18	19						94
5	杨子优	10	10	19	19	19	18						95
6	汪芷闻							20	19	18	19	19	95
7													

平均分：569/6 ≈ 96.83

评分者：[illegible]

2024 年 8 月 31 日

宜良钩花扎染设计实践-实验01 B组评分表

序号	姓名	六项		图案1				五项		图案2			总分
		分值						分值					
		10	10	20	20	20	20	20	20	20	20	20	
1.	吕秉乐							18	16	18	18		88
2.	杨乐涵	8	9	16	18	19	20						90
3.	王姗竹	8	9	17	18	18	19						89
4.	徐慧洁							17	16	18	18	19	88
5.	邹雪贤	9	9	18	18	19	18						91
6	梅文淑							18	17	18	18	18	89

平均分：535/6 ≈ 89.2

评分者：[illegible]

2024 年 8 月 31 日

宜良钩花扎染设计实践-实验01 A组评分表

序号	姓名	六项		图案1				五项		图案2			总分
		分值						分值					
		10	10	20	20	20	20	20	20	20	20	20	
1.	梁书蓝	10	10	17	19	18	20						94
2.	李依燃	10	10	18	19	19	20						96
3.	李昕骐							19	19	20	18	19	95
4.	段雅涵	10	10	19	18	19	20						96
5.	杨子欣	10	10	19	18	19	19						95
6.	汪芷同							20	18	18	19	19	94

平均分：570/6=95

评分者：赵燕芳

2024年8月21日

宜良钩花扎染设计实践-实验01 B组评分表

序号	姓名	六项 分值		图案1				五项 分值		图案2			总分
		10	10	20	20	20	20	20	20	20	20	20	
1.	吕柔乐							19	17	17	18	18	89
2.	杨竞涵	9	9	17	18	17	18						88
3.	孙婉宁	9	8	17	18	18	19						89
4.	佟梦语							18	17	19	18	19	91
5.	邹梦慧	10	9	18	17	18	19						91
6.	梅文淑							18	18	18	17	18	89

平均分：537÷16=89.6分

评分者：[illegible]

2024年8月31日

宜良钩花扎染设计实践-实验01 A 组评分表

序号	姓名	六项 分值		图案1				五项 分值		图案2			总分
		10	10	20	20	20	20	20	20	20	20	20	
1.	梁[illegible]	10	10	18	18	19	20						95
2.	李[illegible]	10	10	18	19	17	20						94
3.	李[illegible]							20	18	19	20	19	96
4.	[illegible]	10	10	18	19	18	20						95
5.	杨[illegible]	10	10	19	18	19	19						95
6.	白[illegible]							20	19	19	19	19	96

平均分：571/6 ≈ 95.2

评分者：方玉萍

2024年8月31日

宜良钩花扎染设计实践-实验01 B组评分表

序号	姓名	六项		图案1				五项		图案2			总分
		分值 10	10	20	20	20	20	分值 20	20	20	20	20	
1.	吕秉函							18	18	18	17	19	90
2.	杨竞涵	8	9	16	18	20	20						91
3.	张航宇	8	9	16	18	17	18						86
4.	徐思涵							16	17	18	18	18	87
5.	舒彦婷	9	8	17	18	18	18						88
6.	杨文淑							17	16	19	17	20	89

平均分：537/6≈88.5

评分者：万玉华

2024年8月19日

VITA

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