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**CROSS-SUBJECT SYNERGY AND INNOVATIVE
PRACTICE OF INTANGIBLE CULTURAL HERITAGE
EDUCATION IN THE DIGITAL AGE: A STUDY BASED ON
THE INHERITANCE OF YI ETHNIC CLOTHING CULTURE
IN LIANGSHAN**

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Abstract:

The rapid development of digital technology has brought new opportunities and challenges to the education of Intangible Cultural Heritage (ICH), and insufficient collaboration among multiple stakeholders is a core bottleneck hindering the large-scale, sustainable development of ICH education. This study takes the inheritance of Yi ethnic costume culture in Liangshan as a case, drawing on theories of collaborative governance, cultural adaptation, and digital communication, and adopting a mixed-method research approach to explore the cross-stakeholder collaborative mechanism and the innovative path of ICH education in the digital age. The research revealed that the effective implementation of ICH education requires the construction of a four-in-one collaborative framework of "government - school - community - enterprise." It is also discovered that digital technology plays a key role in resource integration, scene expansion, and communication empowerment. Through innovative practices such as virtual workshops, online learning communities, and short video teaching, the collaborative education model has achieved multiple effects. This includes expanding educational coverage, increasing youth participation, and enhancing cultural communication. In addition, the "digital empowerment - cross-stakeholder collaboration" framework for ICH education constructed by this study provides an empirical solution to the problems of resource dispersion,

an inheritance gap, and innovation deficiency in the education of ICH among ethnic minorities, and has important reference value for promoting the modern transformation of ICH education.

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Cross-Stakeholder Collaboration; Digital Age; ICH Inheritance Education; Online Education; Yi Ethnic Costume Culture



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Introduction

Tourism The advent of the digital age has reshaped the way cultural heritage is passed down. Intangible Cultural Heritage (ICH) education, as a core means of cultural continuation, is facing a dual situation of "technological empowerment" and "disconnection from the subject." On the one hand, digital technologies such as 5G, Virtual Reality (VR) /Augmented Reality (AR), and big data have provided new possibilities for remote, contextualized, and interactive ICH education, breaking the geographical and temporal constraints of traditional education (Yan & Yang, 2020). On the other hand, there is still a serious lack of coordination among the subjects involved in ICH education, with government, schools, communities, and enterprises working independently. This leads to scattered educational resources, disconnection between courses and practice, and a separation between culture and the market, making it challenging to form a cohesive force for inheritance.

Liangshan Yi ethnic costumes, education and inheritance are an inseparable national-level ICH, starting with even more complicated issues. Liangshan also has a high rate of mountainous topography, and the problem of transportation is also a challenge. Concurrently, the main problem limiting the popularization of education is its geographic constraints, which make it highly challenging to access remote villages. Furthermore, the schools do not have special ICH teachers or standardized teaching materials, and the community workshops do not have modern equipment and resources, which limits the quality of educational improvement. Many youths have moved out to work, and, as a result, in the process of urbanization, there has been "no one to teach" traditional skills. In addition, the conventional model of education is more inclined towards passing the skills and ignoring the development of the modern design and market operation capacities, and the absence of innovation makes ICH hard to adapt to modern life. It is against this background that the question of how to employ digital technology to create an

inter-subject collaborative education system has become a central consideration in fostering the sustainable transmission of Yi ethnic costumes.

Literature Review

Research on Digital ICH Education

Domestic and foreign scholars' research on digital ICH education mainly focuses on the application of technology and platform development, forming three major research directions: the first is digital recording and archiving, such as using Three-Dimensional (3D) scanning and virtual reality technology to establish digital museums of ICH, achieving the permanent preservation of skills and culture (Dimitropoulos et al., 2018). Meanwhile, the second is remote teaching and interactive experience, conducting skill teaching through virtual workshops and online courses, breaking geographical restrictions (Yu, 2023). Moreover, the third is dissemination and promotion, expanding the influence of ICH culture through social media and short-video platforms, attracting the attention of young people (Wu et al., 2021). At the same time, existing research has clearly demonstrated the advantages of digital technology in expanding educational coverage and enhancing the learning experience. However, there are also obvious deficiencies: excessive focus on the development and application of technology itself, neglecting the construction of a collaborative mechanism among multiple subjects. This includes a lack of in-depth consideration of the adaptability of digital technology to culture. Similarly, some digital practices simplify cultural symbols and are disconnected from the actual needs of the community, making it difficult to achieve sustainable inheritance.

Cross-Subject Collaborative Governance and Education Research

The theory of cross-subject collaborative governance emphasizes that the effective resolution of public affairs requires multiple subjects to achieve collaborative efforts based on common goals through communication, cooperation, and resource sharing (Ostrom, 2010). In the field of ICH, some studies have explored collaborative protection mechanisms among governments, communities, and enterprises. This demonstrates the positive role of multi-party participation in protecting cultural heritage (Banda et al., 2024), though research on the education sector is scarce. A few studies have mentioned models such as "school-enterprise cooperation" and "school-community co-construction", attempting to integrate resources from different subjects (Yan & Li, 2023). Nonetheless, they have failed to construct a systematic cross-subject collaborative education framework and have not fully considered the role of digital technology as a link in collaboration. This results in cooperation remaining superficial, making it challenging to establish a long-term mechanism.

Research on the Yi Ethnic Group's Clothing Education

Existing research on the Yi ethnic group's clothing mainly focuses on cultural connotation interpretation, analysis of craftsmanship features, and the discussion of protection strategies (Fu et al., 2023; Ji et al., 2020), with relatively few studies involving the educational dimension. Some studies have mentioned practices such as clan inheritance and the establishment of Yi embroidery majors in schools (Liangshan Culture and Tourism WeChat Official Account, 2025). Despite this, they have not deeply analyzed the core elements and operational mechanisms of the educational model. Additionally, a few studies have focused on the application of digital communication methods such as short videos and live streaming in the

promotion of the Yi ethnic group's clothing (Liu & Ji, 2023). Still, they have not incorporated these into a complete educational system. This makes it challenging to achieve a closed loop of "dissemination - learning - inheritance" and is unable to fundamentally solve the problem of inheritance gaps.

Research Objectives

This study aims to analyze the current situation, challenges, and role positioning of multiple subjects in the education of Liangshan Yi ethnic group's clothing in the digital age; construct a four-in-one cross-subject collaborative education framework of "government - school - community - enterprise," clarify the responsibilities of each subject, the collaborative mechanism, and the application path of digital technology; verify the effectiveness of the collaborative education framework through empirical research, optimize the application mode of digital education tools; and propose policy suggestions and promotion strategies for cross-subject collaborative education of ICH in the digital age, providing references for the educational inheritance of similar ICH projects.

Research Significance

Theoretically, this study constructs a cross-subject collaborative framework for ICH education in the digital age and enriches the application of collaborative governance theory and digital communication theory in this field. It also aims to fill the research gap in the collaborative mechanism of digital ICH education for ethnic minorities and to provide a new perspective for improving the theoretical system of ICH education. In practice, the study can address issues like dispersion of resources, geographic limitations, and the outflow of youth in the education of the Yi ethnic costume, to strengthen the scale and sustainability of education. Concurrently, it offers a practical model that can be replicated in the digital, collaborative development of ICH education by other ethnic minorities and facilitates its integration into the rural revitalization strategy and the national education system.

Research Methods and Technical Route

This study adopts a mixed-methods research approach, comprehensively applying multiple methods, including in-depth interviews, structured questionnaires, participatory observation, case studies, and action research. To effectively gather the demands and the practical experiences of the various subjects, the interviewees involved 60 key informants. It comprises staff working in government ICH management departments, principals and teachers of primary and secondary schools, community leaders, inheritors of ICH, young learners, enterprise representatives, and developers of digital technology. Meanwhile, the questionnaire survey was conducted using stratified sampling, in which the study distributed 500 questionnaires across 15 Yi villages and three primary and secondary schools in eight counties of Liangshan. Of these, 472 active questionnaires have been recovered, with an overall recovery rate of 94.4%. These will be used as quantitative data to support the study. At the same time, the selection of cases is based on three common cases, including the online learning community (#Yi Ethnic OOTD Short Video Challenge), online workshops, and school-enterprise cooperation ICH courses, to profoundly explore the process of digital technology integration as well as cross-subject cooperation. Subsequently, qualitative data are coded in NVivo, and quantitative data are analyzed using descriptive statistics and correlation analysis, and the practical effect is evaluated by comparing pre-test and post-test results.

The technical path is implemented in the logic of "problem diagnosis - framework building - practical check-up - effect analysis - optimization and promotion." First, the predicaments and cross-subject collaboration requirements of Yi ethnic costume education are explained through a literature review and pre-research. Following this, a cross-subject collaborative education framework is built, based on theories of collaborative governance and digital communication, along with the information from the research. In Zhaojue County, Meigu County, and Xichang City in Liangshan, collaborative education is implemented through digital technologies in the form of virtual workshops and online learning communities. The practical outcome is rated on aspects including educational coverage, learning effect, power of cultural dissemination and economic gains. Lastly, the framework and realistic course are streamlined in accordance with the assessment outcomes and policy recommendations, and promotion measures are offered. Finally, the framework and practical path are optimized based on the evaluation results, and policy suggestions and promotion strategies are proposed.

Theoretical Foundation and Construction of Cross-Subject Collaborative Education Framework

Core Theoretical Support

The collaborative governance theory is based on the idea that several subjects are capable of effectively addressing complex problems that would not be managed by a single subject through formal or informal mechanisms of cooperation, sharing resources and sharing responsibilities (Ansell & Gash, 2008). Government policy and funding, schools' learning platforms and instructors, ICH inheritors and applications in communities, market channels, and technical assistance from enterprises are the main components of collaborative education in the application of ICH in education. It is only through ensuring effective coordination of the entire subject matter that the problem of resources dispersed and efforts fractured can be addressed.

The cultural adaptation theory stipulates that any creative practice should be localized to the cultural environment in order to be recognized and developed sustainably by the community (Berry, 1997). Notably, digital age ICH education is not an easy-peasy superimposition of technology. It involves the consideration of cultural genes of ICH and cultural habits of the community, and the exploitation of the benefits of technology to avoid cultural simplification and alienation of technology. This ensures that the educational practices comply with the modern educational regulations and the cultural specifics of the ICH.

Furthermore, digital communication theory postulates that digital technology has transformed information transmission by lowering the costs of communication, increasing the level of interactivity, and increasing coverage (McQuail, 2010). Digital technology in the context of ICH education is a means of teaching and a major connection among several subjects, the unification of resources, and the correct spread of culture. It can overcome geographical and temporal barriers and create a multi-level, multi-layered educational ecosystem.

Diagnosis of Core Challenges in Cross-Subject Collaborative Education

Based on a thorough analysis of questionnaire and interview data, the cross-subject collaborative education of Liangshan Yi ethnic clothing presents four fundamental issues. First, there is an ambiguity in the positioning of the subject. For example, the government is

concentrating on financial assistance without proper planning; hence, there is a lack of system and coordination in the policies. Meanwhile, schools' ICH courses are formalities only and totally unrelated to the community practices. Moreover, communities lack professional educational capacities and cannot do systematic training, and enterprises lack a sense of participation and are mainly taking a wait-and-see approach. Second, there is an inadequacy in resource integration. The educational funds are spread across various departments. Utilization is not highly efficient, and the educational funds are not available to schools in terms of teaching materials. However, they are not professionally taught; the community workshops are not modern, making it challenging to ensure the quality of their teaching, and the conditions for transferring skills from enterprises are limited. On a similar note, the technical and market resources are not easily connected with the educational demands, and a lot of resources are wasted. Third, the application of digital technology lags behind. Only 21.6% of artisans can skilfully use digital platforms for teaching or sales, and elderly inheritors generally have digital operation obstacles. In general, schools lack digital ICH teaching equipment, and the network coverage in remote villages is low, making digital education difficult to implement. Fourth, the distribution of benefits is uneven. Enterprises' participation in ICH education often pursues short-term economic benefits, and communities and inheritors have weak bargaining power in cooperation, with insufficient benefit returns, seriously affecting their long-term participation enthusiasm.

Construction of a Four-in-One Collaborative Education Framework of "Government - School - Community - Enterprise"

Core Connotation of the Framework

This study constructs a four-in-one collaborative education framework with "cultural inheritance and youth development" as the common goal, and digital technology as the link, featuring "government guidance, school leadership, community support, and enterprise empowerment." In addition, this framework emphasizes that each subject, based on a clear self-positioning, forms a synergy for ICH education through a collaborative mechanism of resource sharing, responsibility sharing, and win-win benefits. This ultimately achieves multiple goals such as cultural inheritance, educational improvement, and industrial development.

Responsibilities and Practical Paths of Each Subject

The government, as the guiding authority, assumes core responsibilities, including policy guidance, resource integration, infrastructure construction, and supervision and evaluation. At the policy level, it formulates special policies for digital ICH education, incorporates ICH education into the school education system and the rural revitalization strategy, and clarifies the responsibilities and divisions of each subject. Resource integration-wise, it establishes a special fund to integrate education and allocate funds, equipment and teachers to remote locations in a bid to create equity in education. It encourages the development of the digital base stations and network coverage in rural communities, the digital refurbishment of community workshops, and hardware assistance for digital education. It also establishes a collaborative education evaluation system to regularly assess the educational effect, resource utilization efficiency, and fairness of benefit distribution, ensuring educational quality and sustainability.

Schools, as the leaders, are the core carriers of education, responsible for curriculum development, teacher training, practical organization, and resource sharing. In terms of curriculum development, they compile school-based textbooks for ICH education, offer integrated courses of "culture + skills + innovation", and organically incorporate elements of Yi ethnic costumes into the teaching of art, labor, and Chinese, making ICH education routine. In terms of teacher training, they form a dual-teacher team of "ICH inheritors + full-time teachers" and conduct digital teaching ability training to enhance teachers' comprehensive qualities. Accordingly, they organize students to participate in community workshop practices, virtual workshop learning, and cultural and creative design competitions, achieving a deep integration of theory and practice. They also open school training equipment and venues and jointly build and share educational resources with communities and enterprises to improve resource utilization efficiency.

Communities, as supporters, are the birthplace and living carriers of ICH and assume responsibilities, including inheritance support, practical bases, cultural guarantees, and feedback on demand. They provide resources for ICH inheritors, allowing inheritors to deeply participate in the teaching process and undertake the tasks in skills teaching and cultural interpretation to ensure the accurate transmission of cultural genes. Furthermore, they build community-ICH workshops to provide real-world scenarios for school practices and youth learning, allowing learners to acquire skills in a living context. They organize festivals such as the Torch Festival and the Yi New Year, providing students and youth with opportunities to make costumes and practice etiquette, strengthening cultural experience. Simultaneously, they promptly reflect the educational needs of the community and its inheritors and participate in course design and evaluation to ensure that educational practices align with reality.

The enablers are enterprises, which assist in the provision of technical, market and financial support to education, and also assume a responsibility such as technological empowerment, connecting to the market, providing resources and cross-border cooperation. They use their technological strengths to create digital devices in the form of virtual workshops and online platforms to teach, which offer technical assistance and training in the operation of education. Moreover, they offer product design guidance, brand-building support, and sales channels to young learners, helping them convert skills into economic benefits. Building on this, they donate digital equipment, set up ICH innovation funds and scholarships, and alleviate the shortage of educational resources. They also collaborate with universities and schools to conduct cultural and creative product research and development and practical projects, achieving integrated development among industry, academia, and research.

The Bridging Role of Digital Technology

Digital technology plays an irreplaceable bridging role in the framework of collaborative education, mainly reflected in three aspects. First, it serves as a resource integration platform, building the "Digital Education Cloud Platform for Liangshan Yi Ethnic Clothing," which integrates various resources such as course materials, information on inheritors, practice bases, and enterprise resources. This enables multi-party sharing and efficient connection and breaks down the barriers of resource dispersion. Second, it expands teaching scenarios by developing virtual workshops, using VR technology to recreate the entire process of Yi ethnic clothing production. This, in turn, allows learners to study remotely and immersively, compensating for geographical and equipment limitations. Similarly, establishing online learning communities through WeChat groups, short video platforms, and live-streaming classrooms can create cross-

regional learning and exchange communities for anytime, anywhere interactive learning. Third, it empowers cultural dissemination through short videos, live-streaming, digital museums, and other forms. This ultimately expands the reach of Yi ethnic clothing culture, attracts more young people to participate in its inheritance, and simultaneously enhances the social influence and recognition of the culture.

Innovative Practices and Effects of Collaborative Education in the Digital Age

Practice Case 1: Online Learning Community - #Yi Ethnic OOTD Video Challenge

In 2024, under the guidance of the government, with the technical support of enterprises, and jointly organized by communities and schools, the #Yi Ethnic OOTD (Outfit of the Day) video challenge was launched. This is a common custom of an online learning community. The practice led young Yi ethnic students and craftsmen to exchange their everyday attire, production processes, and cultural narratives of Yi ethnic attire through mainstream short videos like Douyin and Kuaishou, forming a participatory genre of cultural heritage. Correspondingly, the platforms offered topic traffic support to increase the scope of the activity; enterprises granted prizes and sales channels links to help people participate; schools assembled students to join in creation and included the activity in the curriculum of the ICH education practice; and inheritors of the community offered professional advice to make cultural expression accurate.

The activity gained impressive outcomes. It racked up more than 120 million views and attracted more than 100,000 users to join in the creation, 75% of whom were young users, effectively mobilizing the youth group. Notably, the educational impact was excellent, as 68% of young participants said that they enhanced their knowledge of Yi ethnic clothing culture during the activity, and 45% started to gain skills in making cloth, which fulfilled the objective of "promotion of learning by dissemination." Additionally, its market conversion effect was great, and the activity contributed to the growth of the related products orders by 18%, and 30 young learners received stable sales channels by use of the platform, bringing together cultural and economic values. Following this, the cultural spread was 31 provinces across the country, which practically contributed to the increase in the social presence and impact of the Yi ethnic clothing culture and to the dissolution of geographical boundaries.

Practice Case 2: Virtual Workshop and School-Enterprise Cooperation Courses

The technology company closely worked with a vocational school in Liangshan and community workshops to create a virtual workshop system for Yi ethnic clothing, recreating 3D scenes of core processes. This includes wool spinning, plant dyeing, and embroidery, and building a "virtual + real" teaching system. The virtual workshop was presented as part of the main program of the Yi embroidery major at the school, and students could practice major techniques on VR devices, repeatedly observing and using the core techniques, which made the learning process easier. Furthermore, the platform had community inheritors who would offer remote instruction to the practices of the students, correcting operational deviations promptly to guarantee skill inheritance accuracy. Consistent with this, the venture offered cultural and creative transformation and sales services on exemplary student works, bridging the cycle of "learning - creation - market."

This practice had a strong impact. Efficiency in learning was also greatly enhanced, and the overall time taken by students to learn core techniques had been decreased to 1.5 months versus the 3 months previously, doubling the efficiency of learning, and successfully eliminating the issue of time-consuming learning of old techniques. Moreover, education coverage was increased through a virtual workshop covering three vocational schools and eight community workshops in Liangshan, benefiting more than 2,000 students and young learners overcoming geographical and equipment barriers. Aligning with this, the level of skills and innovation also improved, as the average student skill evaluation rose to 88, and the pass rate in the assessment of cultural and creative product designs increased by 40%. The quality of employment was greatly enhanced, with 92% of students who attended the course obtaining employment, and 70% of those in jobs related to Yi ethnic clothing. In particular, the average monthly income is 25% higher than the industry average, a significant improvement in the outflow issue among the youth.

Comprehensive Effect Evaluation of the Collaborative Education Model

Table 1: Quantitative Index Evaluation

Evaluation Dimension	Pre-Implementation Data	Post-Implementation Data	Change Rate
Number of Villages Covered by ICH Education	8	25	+212.5%
Number of Young ICH Learners	320	1200	+275%
Digital Tool Usage Rate	21.6%	68.5%	+216.2%
Conversion Rate of Students' Cultural and Creative Products	15%	48%	+220%
Community Cultural Identity Score	72	90	+25%

The quantitative data indicate that the collaborative education model has achieved leapfrog growth in all core indicators. The number of villages covered by ICH education has increased by 212.5%, indicating a significant improvement in educational equity. Meanwhile, the number of young ICH learners has increased by 275%, effectively solving the problem of transmission interruption. In addition, the digital tool usage rate has increased by 216.2%, demonstrating the significant effectiveness of the integration of digital technology and education. Moreover, the conversion rate of students' cultural and creative products has increased by 220%, achieving an efficient transformation from cultural value to economic value. At the same time, the community cultural identity score has increased by 25%, indicating the continuous expansion of the depth and breadth of cultural transmission.

Qualitative Effect Analysis

At the inheritance level, the stability of the inheritance of core skills has significantly improved. Endangered skills such as plant dyeing and waist loom weaving have been systematically preserved through digital recording and teaching, preventing their loss. At the educational level, an integrated education system of "online + offline," "theory + practice," and "culture + innovation" has been formed, significantly improving the quality of ICH education in schools, and transforming ICH education from fragmentation to systematization. At the development level, the professional identity and economic benefits of young learners have increased simultaneously. More and more young people are returning to their hometowns to engage in ICH-related work, effectively alleviating youth outflow and injecting vitality into rural revitalization. At the cultural level, the dissemination of Yi ethnic clothing culture has expanded from local areas to the entire country, fostering a strong atmosphere of "everyone participating in inheritance and everyone spreading culture," and its cultural influence and identity have continued to grow.

Application and Discussion

The core advantages of the collaborative education model are reflected in four aspects. First, the effect of resource integration is significant. Through cross-subject collaboration, scattered resources such as policies, funds, teachers, technologies, and markets have been optimally allocated, solving the problem of scattered, inefficient use of ICH educational resources and creating a "1+1>2" collaborative effect. Second, digital empowerment has achieved breakthroughs. Digital tools such as virtual workshops and online learning communities have overcome geographical and temporal barriers, expanded educational coverage, enhanced learning experience and efficiency, and enabled learners in remote areas to access high-quality educational resources. Third, there has been the establishment of a win-win mechanism. The collaboration has attained individual goals for each subject. The government has completed its functions of protecting culture and rural renewal, schools have increased their educational standards and brand attributes, communities have attained cultural succession and sustainable development, and businesses have received market share and social dividend, which constitutes a win-win situation. Fourth, the model is very sustainable. It considers cultural heritage, the development of young people and market needs, and has already created a virtuous circle between "inheritance - education - innovation - income - re-inheritance," which guarantees the sustainable and steady growth of cultural heritage education in an intangible sense.

Nevertheless, when it comes to the actual process, there are also some challenges that cannot be overlooked by the collaborative education model. The issue of the digital divide is still imminent. There is also inadequate network coverage in some remote villages, and the digital infrastructure is weak. The barriers to digital operation are usually inherent to elderly inheritors, and this influences the inclusivity of digital education. Still, the cooperation system has not been flawless, lacks regular communication, and a coordination mechanism. There are collaborations that are more about form than content, and the depth and breadth of collaboration should be enhanced. There is an inadequate relationship between courses and practice. The appropriate level of consistency between the school course design and the community practice with the market demands remains to be maximized. There are students who have the issue of "learning but not employing" their skills, and the effectiveness of skill transfer could be improved. The issue of the unequal distribution of benefits has not been fully resolved. Businesses are leading in partnerships, and the share of the community and heirs in the income

dissemination of a cultural and creative item is comparatively small. This can have implications for their long-term participation and enthusiasm.

In order to overcome these hurdles, there should be a drive towards streamlining strategies and offering policy support. First, the digital divide must be bridged in terms of optimization of strategies. The government would invest more in digital infrastructure in the countryside, enhance network penetration in remote villages, encourage digital skills training for inheritors of old age, and produce age-friendly digital training instruments that reduce barriers to becoming digital. Second, the collaborative mechanism must be enhanced. It should establish a "Collaborative Governance Committee of Intangible Cultural Heritage Education," and conduct multi-party consultation meetings on a regular basis to elucidate the roles and rules of dividing benefits. This ensures that collaboration becomes regular and standardized. Third, the relationship between practice and courses is to be reinforced. A "Community - Enterprise Demand Feedback Mechanism" should be created to dynamically modify course content according to practice-based and market needs, teach more practical material, and convert the skills more efficiently. Fourth, there should be an improvement in the distribution of the benefits. The revenue-sharing system for cultural and creative products must also be developed, with the percentage for communities and inheritors not less than 30%, and their rights and interests in the products should be ensured by means of contractual relations and supervision by a third party.

In terms of policy recommendations, first, top-level design should be strengthened. The "Guiding Opinions on Cross-Subject Collaborative Development of Intangible Cultural Heritage Education in the Digital Age" should be formulated. This clarifies the collaborative mechanism, support policies, and evaluation standards, providing a policy basis for the promotion of the model. Second, financial investment should be increased. At the same time, a special fund for digital ICH education should be established to support the development of infrastructure, such as virtual workshops, digital platforms, and teacher training, to ensure the smooth implementation of educational practices. Third, standard construction should be promoted. Concurrently, industry standards for digital ICH educational resources, virtual workshop construction, and collaborative cooperation should be formulated to regulate the development order and improve the quality of education. Fourth, we will enhance promotion and demonstration. Accordingly, we will select demonstration projects in ethnic minority areas across the country, summarize and promote the "Digital Empowerment - Cross-Subject Collaboration" model for ICH education, and provide references for the inheritance of more ICH projects.

Conclusion and Outlook

Research Conclusions

This study, taking the inheritance of the Yi ethnic group's costume culture in Liangshan as a case, explored the cross-subject collaborative mechanism and innovative path of ICH education in the digital age, and reached the following core conclusions. The large-scale and sustainable development of ICH education in the digital age must build a four-in-one collaborative framework of "government - school - community - enterprise." The isolated actions of a single subject are challenging to solve the complex predicament of ICH education. Only by achieving efficient collaboration among all subjects can the multiple constraints, such as resources, regions, and technologies, be overcome. In line with this, digital technology plays a key role

as a link in collaborative education. For instance, innovative practices such as virtual workshops, online learning communities, and short-video platforms have effectively broken through regional restrictions, improved educational efficiency and cultural dissemination power, and are important supports for the modern transformation of ICH education. In addition, the collaborative education model has achieved organic unity among cultural inheritance, youth development, and market demand, significantly enhancing education coverage, youth participation, skill levels, and cultural identity, and providing a new development path for ICH education. Furthermore, the main challenges in collaborative education include the digital divide, incomplete collaborative mechanisms, and unfair benefit distribution, which need to be addressed through policy guidance, mechanism innovation, and technological optimization.

Future Outlook

Future research can further expand the scope of study and apply the collaborative education framework to Tibetan Thangka, Mongolian embroidery, and other minority ICH projects. This includes verifying its universality and optimizing as well as adjusting it according to the cultural characteristics and inheritance needs of different projects to form an educational framework that is more inclusive and adaptable. In terms of applying digital technology, new technologies such as artificial intelligence and the metaverse can be explored for deeper integration into ICH education. This ultimately develops innovative tools, such as intelligent skill-correction systems and virtual folk-custom scene experiences, to further enhance the interactivity and immersive experience of education and increase the participation interest of the youth group. To improve the collaborative mechanism, cross-regional and cross-industry collaborative education practices can be implemented, establishing more complete communication and coordination, as well as resource-sharing and benefit-distribution mechanisms, to promote collaborative education to a deeper level and a wider range. In addition, international comparative studies can be conducted, drawing on advanced practices from abroad in digital ICH education and cross-subject collaboration, and combining China's national conditions for localization innovation to promote the international development of China's ICH education model and to contribute Chinese wisdom and solutions to global ICH inheritance.

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