

AI-Assisted Co-creation and Youth Engagement in Intangible Cultural Heritage: A Systematic Literature Review

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Abstract. Transmission of intangible cultural heritage (ICH) is facing a serious challenge, as youth participation is declining globally. Digital technologies have been widely used to preserve ICH, but most efforts are largely confined to documentation and display, with limited success in engaging younger generations. The rapid development of artificial intelligence (AI) offers new opportunities to revitalise ICH through more interactive and creative approaches. This study presents a systematic literature review exploring how AI technologies are currently applied in the ICH field and their influence on youth participation, drawing on literature published between 2010 and 2025. The review identifies three primary categories of AI applications: digital documentation and preservation, interactive dissemination, and public co-creation. The findings indicate that AI research in ICH has shifted from a technology-driven focus to user-centered approaches; however, empirical evidence regarding whether these applications effectively enhance youth participation remains scarce, and theoretical underpinnings remain underdeveloped. This review proposes an integrated framework for understanding AI's role in this domain and identifies future research directions, particularly the need for youth-focused empirical studies and greater attention to risks to cultural authenticity.

Keywords: AI, Intangible cultural heritage, Youth participation, Co-creation

1. Introduction

Intangible cultural heritage (ICH) represents the living heritage of human civilisation, including oral traditions, performing arts, social practices, traditional craftsmanship, and knowledge of nature. However, ICH faces a profound intergenerational transmission crisis. Globally, young people demonstrate declining interest in and participation in traditional cultural practices; this raises urgent concerns about the survival of many ICH forms [1]. The rapid development of artificial intelligence technologies presents new possibilities for revitalising ICH transmission by creating interactive, accessible, and engaging experiences that may resonate with younger generations [2, 3].

Research on artificial intelligence (AI) applications in the ICH domain has grown rapidly. AI applications have evolved from "digital storage" to "generative" innovation. These applications have yielded notable outcomes in restoration, design, copyright protection, and education [2]. Researchers have reported that generative AI has been applied to traditional handicraft design, production, trade, and digital transformation [4]. Large-scale AI models redefine public perception of ICH. These

models leverage mechanisms such as "decoupling of digital memes" and "intelligent embodied cognition" [5]. Previous reviews have demonstrated that digital technologies support ICH safeguarding through documentation, dissemination and education [1]. However, the mere existence of digital documentation does not guarantee meaningful transmission. Empirical studies on specific ICH practices reveal that craft transmission faces acute challenges: strict family-based transmission rules, high technical skill barriers, and a prolonged learning curve have resulted in alarmingly low participation among younger generations, with skilled practitioners rarely under forty [6]. This case exemplifies a broader pattern of generational disengagement that archival digital approaches alone fail to address, thereby reinforcing the need for more interactive and co-creative AI applications.

Existing research on AI in the ICH domain has notable limitations, including a lack of user-centered perspectives, particularly concerning young participants, and underdeveloped theoretical frameworks. Most studies focus on AI's capabilities rather than its impact on users. Additionally, risks to cultural authenticity are inadequately addressed. Young people are often grouped with general audiences without specific analysis of their digital native traits and engagement with AI-mediated content. These gaps underline the necessity for a systematic review to synthesize evidence and promote youth-centered research [7, 8].

This study adopts the method of literature review to explore the types of AI applications in the ICH domain, analyzes the influence of these applications on youth participation, and discusses the theoretical gaps and empirical shortcomings in current research. It integrates literature and identifies scholarly gaps, providing a foundation for theoretical development.

2. Classification of AI applications in intangible cultural heritage

2.1. Digital documentation and preservation

Understanding how AI is applied in the ICH domain is the first step toward assessing its impact on youth participation. The following sections analyze three types of AI applications. These types are arranged in order of increasing user engagement, from passive documentation to active co-creation.

The earliest AI applications in ICH involve digital documentation and preservation. AI technologies have been applied to 3D reconstruction of cultural artefact. They are also employed in digital archiving of ICH elements. They facilitate the construction of knowledge graphs that map relationships within ICH systems [2, 9]. In this category, AI functions mainly as a recording and preservation tool. In the field of AI-driven digital preservation of intangible cultural heritage, these technologies are praised for their unprecedented documentation capabilities. However, they often fail to meaningfully engage youth. In these digital practices, participants are relegated to a largely passive role: rather than acting as active agents in cultural practice, they become passive consumers of digital representations [9]. AI-powered 3D scanning, for example, can accurately document endangered heritage sites, protecting them from material decay, yet it also risks shifting the public—and young people in particular—away from active cultural practitioners toward mere recipients of digital information, thereby weakening their direct, embodied connection to the heritage itself. The fundamental limitation of this approach lies in its unidirectional transmission model: while cultural knowledge is recorded and stored, the interactive and experiential dimensions—which are crucial for engaging youth—remain largely absent [1].

This type of application dominates current ICH digitalization efforts. However, its effectiveness in attracting youth is limited. Young people expect interaction and participation. Passive viewing does not match their digital habits. This explains why documentation alone cannot address the challenge of youth engagement.

2.2. Interactive experience and dissemination

The second type of AI application moves beyond passive documentation. It focuses on interactive experiences. This category combines AI with virtual reality (VR) and augmented reality (AR), which create immersive cultural experiences. They also enable intelligent tour guidance systems. They also employ personalized recommendation algorithms, suggesting ICH content based on user preferences. Among these, users participate as viewers or experiential participants. They engage with ICH content through interactive interfaces. AI-driven platforms drive the digital communication of ICH; their immersive experiences can capture the attention of the youth. It enables cultural content to be more visually appealing and accessible [10]. AI can also revive craft traditions, producing interactive platforms that allow users to explore traditional techniques in virtual environments [3]. This type achieves higher engagement than pure documentation. However, participation remains largely at the level of consumption. Users experiencing ICH content do not contribute to its creation or reinterpretation [5]. Interactive experiences represent an improvement over documentation. Yet they still position users as consumers. The cultural content is presented to them. They do not produce or transform it. This limits their sense of ownership and connection. True engagement requires moving beyond consumption.

2.3. Collaborative co-creation and public participation

The third type of AI application represents a paradigm shift: a transition from consumption to production. Users transition from "viewers" to "creators." Generative AI technologies enable this shift. These include large language models and diffusion models. Users can engage in pattern design, style transfer, and user-generated content creation related to ICH [2, 4, 7]. Research shows that students who actively use AI tools for design and creation demonstrate improved learning outcomes. Their sense of cultural identity is also strengthened [11]. The potential of digital tools to empower youth engagement in ICH is particularly evident in comparison with the challenges facing traditional craft transmission. Field research reveals that the craft's demanding technical requirements, prolonged apprenticeship, and limited economic returns have deterred younger generations from craft practice—skilled practitioners are rarely under forty, and most local young people opt for formal education or urban employment instead of inheriting the family skill [6]. This transmission dilemma underscores the urgent need for accessible entry points. In response, recent research indicates that interactive multimodal mobile interfaces can improve engagement and knowledge retention among youth in cultural heritage contexts, suggesting that AI-enhanced co-creation promotes deeper cultural learning through hands-on experiences [12].

Table 1. Typology of AI applications in intangible cultural heritage

Type	Core Function	User Role	Young Engagement Level	Key Limitation
Digital Documentation & Preservation	3D reconstruction, digital archiving, knowledge graph	Passive receiver	Low	One-directional, lacks interactivity
Interactive Experience & Dissemination	VR/AR immersion, intelligent guidance, personalized recommendation	Viewer/Experiencer	Medium	Consumptive, not productive
Collaborative Co-Creation & Public participation	Pattern design, style transfer, user-generated content	Active Creator	High	Cultural authenticity risks

Table 1 summarizes the three types of AI applications identified in this review. These types constitute a continuum from low to high youth engagement. Co-creative applications position young users as active creators rather than passive recipients.

3. Mechanisms of AI promoting youth participation in intangible cultural heritage

3.1. Youth as "digital natives": technological acceptance and adaptability

Youth in this review refers to individuals aged 16 to 35. This age group is commonly defined as "youth" in the cultural participation studies. They are digital natives who have grown up with the Internet, social media, and mobile devices. Their relationship with technology differs significantly from that of older generations.

Young people are "digital natives." They have inherent advantages in their acceptance and adaptation to AI technologies, having grown up with digital devices and platforms. Youth demonstrate greater technological fluency. They have lower barriers to adopting new tools and show higher tolerance of technological experimentation [8]. This generational characteristic significantly influences AI-mediated ICH participation. Studies have demonstrated that when delivered via AI-powered platforms, ICH content encounters substantially reduced initial resistance to engagement with traditional cultural practices. These platforms align with youth's digital habits [10]. The integration of AI with familiar social media interfaces and mobile applications creates a low-threshold entry point, thereby preventing youth from perceiving ICH as distant or irrelevant to their lives [5].

However, the absence of such technological mediation often leaves traditional crafts unable to attract young learners. A case study of Guizhou's Buyi Fengxiang dyeing—a nationally recognised ICH practice—reveals that the craft's demanding technical requirements, prolonged apprenticeship, and limited economic returns have deterred younger generations from craft practice. Skilled practitioners are rarely under forty, and most local young people pursue formal education or urban employment instead of inheriting the family skill [6]. This example illustrates that without interactive and accessible entry points, even culturally significant practices risk intergenerational discontinuity. This underscores the potential value of AI-mediated platforms in lowering participation thresholds—not by replacing traditional craftsmanship, but by offering young digital natives a familiar, low-barrier gateway into cultural learning. However, current literature has not adequately examined the relationship between technological acceptance and sustained cultural engagement. Whether initial attraction translates into long-term commitment remains an open question.

3.2. AI co-creation as a facilitator of cultural learning

The co-creative application of AI shows considerable promise for facilitating youth cultural learning. It operates through "learning by doing" mechanisms. Young users actively employ generative AI tools, create ICH-inspired designs, and then reinterpret traditional motifs. They develop cultural content while engaging in experiential learning. This combines cultural knowledge acquisition with creative expression [13]. This process induces deeper cognitive processing than passive consumption. Users must not only understand cultural elements sufficiently but also manipulate and recontextualise them through AI tools. In university ICH courses, students using generative AI tools demonstrated enhanced understanding of traditional craftsmanship principles. The act of creating required them to engage with cultural knowledge at a structural level [8].

Empirical evidence substantiates the positive impact of digital co-creation on youth engagement with ICH. For instance, research on a human-GenAI co-creation system for Canton Porcelain demonstrated that such an approach not only simplifies the participation process but also enhances creative engagement and user experience among young novices, effectively balancing technological assistance with the preservation of cultural authenticity [13]. Similarly, field tests of multimodal mobile interfaces in cultural heritage contexts revealed that young users exhibit high levels of interaction, emotional expression, and knowledge retention, which suggests that well-designed interactive systems can foster a deeper sense of connection [12]. This potential for digital tools to cultivate ownership and engagement is particularly significant given the documented challenges of intergenerational transmission in traditional craft practices, where the absence of such interactive entry points has historically contributed to a steady decline in youth participation [6].

Co-creation and interactive experiences are not mutually exclusive; rather, they can synergistically enhance youth engagement. Interactive platforms draw youth in, while co-creative features sustain their engagement. Consequently, the combination of both approaches may yield the strongest effects.

3.3. Interactive experiences and stimulating willingness to participate

Beyond co-creation, AI-powered interactive experiences stimulate willingness to participate. They lower barriers to entry while enhancing sustained engagement. The gamification of ICH content through AI-driven interactive platforms creates engagement loops. Personalised recommendation systems adapt to individual user preferences. These loops can maintain youth interest over time [11].

Large-scale AI models reshape public cognition of ICH. They make cultural content more accessible and relatable to contemporary audiences [5]. However, the sustainability of this engagement remains questionable. Initial attraction through interactive interfaces is extensively documented. Yet, the transition from curiosity-driven engagement to meaningful cultural commitment requires additional factors. Current AI applications may not address these factors [8].



Figure 1. Conceptual framework of AI-mediated youth participation in ICH

Figure 1 illustrates the conceptual framework of AI-mediated youth participation in ICH. The framework depicts the logical flow of this review. AI application types influence youth engagement through pathways shaped by youth characteristics. This yields participation outcomes. The review also identifies persistent research gaps that need to be addressed in future studies.

4. Conclusion

This systematic literature review examines the intersection of AI and ICH, with a particular focus on youth participation. The analysis demonstrates that AI applications in the ICH domain can be categorized into three types, namely digital documentation and preservation, interactive experience and dissemination, and collaborative co-creation and public participation. These types represent a progression from passive consumption to active production. Each type affords different degrees and qualities of youth engagement. The review reveals that research in this field is shifting from a technology-centered orientation toward user-centered concerns. However, significant gaps persist. The review identifies three critical gaps. First, a user-centered perspective remains lacking. Second, theoretical frameworks are underdeveloped. Third, risks to cultural authenticity remain insufficiently addressed. These gaps highlight the need for future research to move beyond technology-driven inquiries and toward youth-centered empirical investigations.

This review has several limitations. The literature search was limited to three databases. The search was restricted to Chinese and English publications. This may have excluded relevant studies in other languages. Additionally, as a review paper, this study lacks primary empirical data. Such data would provide direct evidence of causal relationships between AI applications and youth participation outcomes. Future research should employ quantitative, qualitative, or mixed methods, thereby providing robust evidence on the effectiveness of AI applications for youth ICH engagement. Moreover, theoretical models should integrate cultural heritage studies, technology acceptance, and youth development frameworks, thereby enhancing explanatory power for understanding AI's role in cultural transmission.

Moving forward, generative AI technologies will continue to advance, and the integration of AI and ICH will deepen. The value of AI lies not in replacing human cultural transmission, but in creating opportunities for young people to encounter, engage with, and co-create traditional culture.

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