

Study on the Innovative Mechanism of Gamification in Intangible Cultural Heritage Education: a Paradigm of Educational Resource Development in the Field of Short Videos

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ABSTRACT

With the iterative development of digital media technology, the legacy of Intangible cultural heritage (ICH) arts and crafts is facing a paradigm shift from static protection to living communication. This study focuses on the innovative mechanism of gamification in Intangible cultural heritage (ICH) education in the field of film and television, aiming to solve the three main problems of traditional Intangible cultural heritage (ICH) teaching, namely the attenuation of participation, the lack of contextualization, and the defect of intergenerational dissemination. Through case study and design-based research methods, we have constructed a three-in-one teaching resource development model: narrative-interaction-enablement-community creation. The study finds that the fragmented nature of short videos is highly coupled with gamification mechanisms, which can improve knowledge retention through role-playing and instant feedback; moreover, the combination of user-generated content and augmented reality can improve the efficiency of non-inherited skill acquisition. The study not only provides a theoretical framework for cross-media educational design in the field of digital humanities, but also verifies the path of enhancing the reproduction of artistic content in cultural heritage through practice and establishes a standard replicable paradigm for the digital transformation of Intangible cultural heritage (ICH) education.

1. Introduction

With the rapid development of digital technology, living transmission and educational innovation of intangible cultural heritage (ICH) have become the focus of interdisciplinary research. In the digital age, intangible heritage legacy and education are facing unprecedented challenges

and opportunities. The rise of short video platforms, with its unique characteristics of fragmented dissemination and strong interactivity, provides a new path for the development of educational resources for intangible cultural heritage. However, how to achieve a dynamic balance between technological logic, educational goals and cultural values

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has become an urgent problem to be solved.

This study aims to explore how to build a value symbiosis model for the development of educational resources for Intangible cultural heritage (ICH) gamification in the context of short videos in order to achieve a synergistic evolution between technological enhancement, educational goals, and cultural heritage. Specifically, this paper will answer the following main questions: how can the gamification design of short videos establish a dynamic balance between traffic logic and cultural authenticity? How can embodied knowledge and tacit experience of ICH skills be preserved through interaction with short videos? How can the development of micro educational resources resonate with regional cultural policies and community heritage networks?

This study will make the following contributions to the existing body of knowledge: provide a new theoretical basis for gamification innovation in ICH education by introducing action learning theory and the perspective of new quality productivity; provide specific design principles and implementation strategies for the development of educational resources for ICH, to help educators achieve a balance between technological empowerment and cultural heritage in practice; and provide references for the formulation of regional cultural policies and the construction of community heritage networks, to promote sustainable ICH development.

2. Elements of gamification

The technology-driven school believes that technologies such as algorithmic recommendation of short videos and AR/VR interaction can directly improve the coverage of ICH outreach. For example, some scholars point out that cloud game technology can overcome the limitations of time and space and realize the “immersive reproduction” of NRS^[1]; Xu et al. (2024) verified the visual enhancement effect of mixed reality technology on the Yueju Opera legacy through the LanternOperAR project; and Cao Shule et al. (2024), from the perspective of cross-media storytelling, argued that the potential of Black Myth: Wukong for the modern transformation of traditional mythological symbols from a cross-media narrative perspective. Critical revisionists, on the other hand, are concerned with the side effects of technology application, such as Malegiannaki (2021), who found that gamification design can lead to the dissolution of ICH connotations through entertainment; and Xu et al. (2024), whose empirical data showed that older users’ participation in AR interactions was significantly lower than that of the younger group, revealing the intergenerational inequality of technological empowerment.

The consensus between the two types of views is that technology is an irreversible transformative force for NHM, but its effectiveness is limited by cultural appropriateness.

In the practice of gamification design for the reproduction of artistic content in the Ancient City of Yong Ning, one of the ICH scenarios of the Great Wall Cultural Belt, learning motivation and engagement increased significantly through the intelligent incorporation of elements such as tasks, rewards and competition. However, gamification design also has a potential impact on cultural authenticity. For example, although the point reward mechanism may enhance knowledge retention, it may inadvertently simplify the rich cultural connotations underlying ICH. Therefore, special care must be taken when designing gamification elements to ensure that the depth and breadth of culture is fully preserved while stimulating learning.

In particular, while filming documentation of ICH in the ancient city of Yong Ning, such as the artisans who make tofu, baklava and hawthorn cake according to the ancient method, as well as the artists of the bamboo horse, stilt walker and bamboo horse opera, we found that ICH are often marginalized in terms of multidimensional experiences such as sound and tactile sensations. Simply relying on motion capture technology to record the process of heir abilities is obviously not enough to fully convey the essence of ICH. In the future, we will need to further optimize the game design to encourage more subjects to actively participate in ICH inheritance to ensure that the multidimensional experience of ICH can be fully demonstrated. At the same time, the concept of integrating film and game should be carried forward throughout to avoid the problem of “fragmented performance” caused by the “immediacy” of short videos, so as to realize the systematic and holistic legacy of the ICH.

3. Gamification in educational programs

The constructivist orientation advocates learner-centered knowledge construction, such as the “context creation-collaborative learning” model proposed by Hockney (1997); the behaviorist orientation focuses on the design of quantitative evaluations and incentives, as shown by Erna Wahyuni et al. (2023), through Indonesian educational game experiments, who demonstrated that rewarding students with points can improve the retention rate of non-hereditary knowledge; the critical pedagogical orientation is wary of the impact of gamification on cultural memory. Erna Wahyuni et al. (2023) showed through an Indonesian educational game experiment that point rewards can increase the retention rate of students’ ICH knowledge; the critical pedagogical orientation distrusts

the dilution of cultural depth by gamification, and Aalto (2017) pointed out that the “mission pass” model in trans-cultural serious games can simplify the story of community resistance underlying ICH.

The application of gamification in ICH education has given rise to three theoretical orientations: constructivism emphasizes context creation and collaborative learning, behaviorism focuses on quantitative evaluation and incentives, and critical pedagogy is wary of diluting the cultural depth of gamification.

In the practical application of the innovation of the educational model and the reconstruction of the learning mechanism, for example, in the course of writing a script, through collaboration with the ICH, the ICH is integrated into the curriculum design, so that students can understand and transmit the ICH in practice. This model not only increases students’ motivation to learn, but also promotes the living transmission of ICH.

The main objective of this study is to move beyond the “instrumental rationality-driven” digital paradigm of the NHM and provide a critical practice framework for cultural heritage in the age of short videos. Specific objectives include: developing a value symbiosis model that integrates technology, education, and cultural policy to achieve an organic combination of technological enhancement and cultural heritage; exploring the pathway of preservation of embodied knowledge and tacit experience in NH skills through innovative interactive design; and studying the mechanism for linking micro-educational resource development, regional cultural policy, and the community heritage network to achieve broader cultural heritage.

4. Development of educational resources for Intangible cultural heritage (ICH) gamification

The development of game-based educational resources for Intangible cultural heritage (ICH) education is essentially a paradigmatic reconstruction of the mechanism of cultural inheritance in the age of digital media. Technological ecology theory advocates the construction of a digital ICH ecosystem (Lei Wenxuan et al., 2023), whose five directions digital intelligence tested the synergistic effect technological innovation and cultural capital through the index of new qualitative productivity (Han Wenlong et al, 2024); while community participation theory emphasizes that digital media must be embedded in the local cultural network (Zhao Lingyi, Zhu Shiyuan, 2022), as confirmed by Jiangyong’s “rhizomatic transmission” model of women’s writing. The “rhizomatic transmission” model confirms the anchoring mechanism cultural. However, the

algorithmic push paradox revealed by Mitsche (2016)-the cultural dislocation caused by the forced injection of ICH content into the consumption scenarios of urban youth-exposes the limitations of superficial gamification: while short video platforms increase the efficiency of dissemination, they reduce ICH to a visual spectacle. Although short video platforms dissemination efficiency, they reduce ICHs to a visual spectacle, resulting in the loss aura in the process of technological substitution, such as 3D printing(Gu Shuzong et al., 2013).

This study goes beyond the traditional paradigm of instrumental rationality and builds a three-stage development model of “decoding cultural genes, transforming game mechanisms, and integrating virtual and real scenes” in the field of short videos, based on Andrei Marchevsky’s hierarchy theory of gamification and Ivan’s definition of deep gamification:

In the curricular practice of the Yong Ning Bamboo Horse Opera, we seek to transform the physical knowledge of rhythm and balance of the Bamboo Horse Opera’s stilts into programmable data units through motion capture and breath sensing technologies, so as to establish the digital genetic map of non-inherited abilities.

The interactive task “Ruban Lock Puzzle Solving” is designed to require students to complete digital translation of traditional skills, game rule design and virtual community outreach in a virtual scene. With the help of the filter of augmented reality and the mechanism of user-generated content (UGC), Intangible cultural heritage (ICH) teaching overcomes the limitation of the 15-second cognitive fragmentation of short videos and achieves the dual goal of the preservation rate cultural authenticity and the multiplication of dissemination efficiency in the overlapping virtual and real scenarios.

To verify the key role of the role-playing mechanism in the development of educational resources, we sought to construct the virtual identity of “bamboo horse craftsmen,” and students experienced the identity transition from technical manipulators to cultural interpreters in the practice of gamification, hoping to improve the accuracy of their skill reproduction and the depth of their interpretation of cultural meaning. This in-depth gamification path can avoid the risk of cultural dilution caused by superficial point incentives shift non-patrimonial education from “instrumental enhancement” to “value symbiosis.” Current bottlenecks reveal the direction of optimizing the development of teaching resources: at least one-third of students experience an “interactive cognitive gap” in the transition between real and virtual scenarios (completion of the game task is negatively correlated with understanding the meaning of ICH). This calls for the development of

a graded teaching system that can be adapted to different cognitive styles, such as incorporating somatosensory interaction in the primary level: incorporate somatosensory interaction modules (e.g., balance simulators on stilts) into the elementary levels to strengthen the neural coupling between muscle memory and cultural perception; Introduce dynamic value assessment indicators in advanced tasks to quantify the mapping relationship between “cultural capital - game mechanism learning effectiveness.” Just as the Ant Forest reconstructs the logic of environmental protection practice through carbon credits, noncapital education urgently needs to build a cultural value circulation model based on blockchain technology so that Benjamin’s “spiritual charm” can be reborn in the digital twin.

At the same time, it is necessary to strengthen “story-driven” teaching strategy, transform Benjamin’s “aura,” which has disappeared in the era of mechanical reproduction, into programmable digital narrative assets, ensure the uniqueness of cultural symbols, and reconstruct the scene of non-genetic inheritance with a sense of spatial and temporal immersion by using digital twin technology to ultimately form the benign closed ecological circle of “cultural value capture-enhanced technology increase value-added-rebate educational effectiveness.”

5. Discussion on practical solutions for the integration of cinema and tourism

The technical features of short video platforms, such as algorithmic recommendation and AR/VR interaction, offer new opportunities for the dissemination of Intangible cultural heritage (ICH). For example, in the scriptwriting course, through cross-media narrative research, game planning and plot expansion were carried out based on the original Intangible cultural heritage (ICH) light comedy “Bamboo Horse and Green Plum.” This not only overcomes the limitations of traditional performances, but also brings a new form of legacy and means of dissemination for ICH art. However, the traffic logic of short video platforms may conflict with the slow cultural characteristics of Intangible cultural heritage (ICH) themed plays, and a balance must be struck between technological enhancement and heritage through innovative design.

An experimental film showing how the future gamified living heritage can present such a scene is currently being planned. Under the background of big data, this kind of “meaningful leisure” game is developed in the direction of the boutique cloud game, organizing positive punch card tasks among players. For example, the story is set in an ancient city of Yong Ning rich in historical relics, where cultural heritage faces the impact and challenges of modernization. Through temporal and spatial immersive

technology, players can experience the ancient bazaar and important historical events in the ancient city. At the same time, as part historical education, players are encouraged to deepen their historical knowledge of aspects of the cultural heritage of the ancient city of Yong Ning online purchase of cultural souvenirs, famous physical snacks, listening to operas and watching performances.

This study adopts a mixed research method. An empirical study was conducted to assess the impact of gamified teaching resources on students’ memory retention and cultural identity. At the same time, case studies and participatory observations were used to explore in-depth value conflict negotiation, embodied cognitive transfer, and multi-scale ecological linkage mechanisms in the development of ICH gamified instructional resources.

6. Search

6.1 Learning outcomes

Through the practice of the screenwriting program, students achieved significant results in knowledge absorption, knowledge translation and knowledge dissemination. For example, after thoroughly analyzing the integration of The Hunger Games and reality television games in 2024 and the combination of The Millionaire and the game show in 2019, students actively created the film and television work Reasoning Fiction, which integrates the elements of the game killing scripts, and won the school-wide image award. These achievements not only demonstrate students’ deep understanding of theoretical knowledge, but also reflect their ability apply innovation in real projects.

6.2 Motivational aspect

Teaching gamification not only allows students to apply their knowledge of film, television and games to hands-on projects, but also effectively stimulates student motivation through the introduction of tasks, rewards and other elements. For example, in the screenwriting course, students had positive learning experiences and timely feedback by playing roles and participating in project development, which increased their interest and engagement in learning. This engaging learning approach not only increases students’ motivation to learn, but also develops their teamwork and problem-solving skills.

7. Conclusions

This study explored a new path for the cultivation of artistic innovation and practical skill of outstanding cultural heritage technicians through the

practice of playwriting course. It found that the playwriting course, guided action learning theory, effectively enhanced students' innovative thinking and practical skill through pre-planning, social organization and institutionalizing functions of play, as well as the application of artistic and design skills. The study sheds light on the potential of teaching gamification in Intangible cultural heritage (ICH) education and proposes directions for future research, including how to further optimize gamification design achieve synergistic evolution between technological enhancement, educational goals, and cultural heritage.

Future research can focus on the following directions: first, optimization of the value conflict negotiation mechanism, exploring more effective ways to balance flow logic and cultural originality.

Second, the innovation of the transfer path of embodied cognition, preserving the embodied knowledge and tacit experience of Intangible cultural heritage (ICH) skills through advanced technological means. Third, the construction of a multi-scale ecological linkage mechanism to promote the deep integration of micro-didactic resource development with regional cultural policies and community heritage networks. Through these research directions, it is expected to provide more comprehensive and in-depth solutions for the living heritage of the ICHN.

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