

Communicating Cultural Heritage: A Literature Review on Game Edutainment and Archiving Strategies Exploration

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ABSTRACT

The preservation of intangible cultural heritage (ICH) is challenging because of its participatory and dynamic nature, which requires more than passive documentation. A systematic review examined comparative research on the effectiveness of game-based edutainment and traditional archiving in the preservation and transmission of ICH. Articles to be included in this review were discovered with Elicit AI, an automated literature review assistant that queries the Semantic Scholar corpus and ranks articles using relevance to the semantic query to the research question. Ten studies were included in the analysis. A large language model (LLM) was used to extract data to ensure consistency, and all results were heavily validated by humans. The results demonstrate that game edutainment formats and related programs, such as digital games, virtual reality (VR), and interactive storytelling, are especially efficient in promoting a high level of user engagement, experiential learning, and cultural regeneration, particularly among younger age groups. By contrast, conventional archival practices are more effective for high-fidelity reporting and the orderly maintenance of multifaceted cultural information, thus guaranteeing the long-term integrity of scholarly information. Neither approach is universally better, as each has its own merits that can be applied to particular preservation objectives. The hybrid solution, which combines the dynamic flexibility that comes with game edutainment with the detailed preservation provisions of conventional archival practices, is deemed the most promising gateway for the long-term sustainability of ICH.

Keywords: intangible cultural heritage, game edutainment, traditional archiving, cultural transmission, digital preservation

INTRODUCTION

Intangible cultural heritage (ICH) refers to practices, representations, expressions, knowledge, skills, and the instruments, objects, artefacts, and cultural spaces related to the same that communities, groups, and, in some cases, individuals identify as their cultural heritage. ICH is passed across generations, and communities and groups create in response to their environment, their conjunctive interaction with nature, and their history gives them a sense of identity and continuity [1]. The inability to preserve this non-material, lived heritage is intrinsically complicated owing to its temporal nature; nevertheless, this dynamism is the key to this heritage as compared to physical artefacts [2]. Its survival is based on vigorous intergenerational transmission; therefore, preservation is an active and continuous challenge among cultural practitioners and policymakers.

To address these issues, two major preservation methods have been developed: traditional archiving, based on the systematic documentation of data, and game-based edutainment, which takes advantage of the opportunities for digital interactive interaction as a way of a cultural experience [3, 4]. Archived documents, digital archives, and audiovisual recordings are all traditional archival practices that provide systematic and high-fidelity records of the performance and cultural knowledge of experts. Nevertheless, such methods are rather passive and fail to facilitate intensive engagement and active cultural knowledge transfer, especially for younger viewers [5]. Conversely, technologies of game edutainment, which include digital games, VR, motion capture, and interactive storytelling, have been proven to be uniformly effective in contributing to user engagement,

motivation, and experiential learning in a variety of cultures [6, 7]. These are dynamic and participatory experiences that are deemed vital in the regeneration and sustenance of ICH.

Cultural learning has been digitised, and as a result, heritage transmission has moved beyond mere documentation to include the transfer, renewal, and intergenerational exchange of cultural knowledge [8]. This shift acknowledges that intangible heritage possesses a participatory and experience-oriented nature that is not necessarily realised with traditional archival practices [2, 9]. Although both archival and game edutainment methods have proven individually effective, no evidence synthesis has been created to present a systematic overview of their strengths and weaknesses in comparison with each other. Therefore, this review examines the following question: To what extent do game edutainment strategies play a role in the preservation and communication of ICH as opposed to traditional archival practices?

This comparison has great practical relevance for heritage practitioners, policy makers, and cultural custodians in modern heritage management settings. This systematic review will offer evidence to guide the design of more effective ICH preservation programmes by analysing the complementary potential of game edutainment in enhancing the intergenerational relationship as well as active cultural learning.

METHODS

A systematic literature review approach was employed to deliver a thorough and rigorous synthesis of available empirical data on game edutainment and the traditional archival practice of preserving ICH. The review process included a systematic database search, a multistage screening measure, and a systematic data extraction process.

Search Strategy

The search was guided by the following research question: In what ways can game edutainment strategies be compared with traditional archival approaches to the preservation and transmission of intangible cultural heritage? It was conducted using Elicit AI, an AI-based literature review helper that programmatically queries the Semantic Scholar corpus and retrieves articles ranked by semantic relevance to the given question. As Elicit derives its indexing technology (Semantic Scholar) from over 126 million scholarly papers in the humanities and social sciences, as well as computer science, it is well suited to this interdisciplinary research. Nevertheless, due to the fact that the search was conducted using only one tool and corpus, other studies might have been missed because they were indexed only in other databases. The initial search yielded 50 potentially relevant studies.

Screening Process

The predefined inclusion criteria were used to screen the initial search results through a two-stage process to detect studies that fit the predefined criteria. The papers were graded on a holistic basis according to the following criteria:

1. **Game-Based Approach:** This research will analyse digital game-based or interactive edutainment methods in the context of cultural heritage conservation.
2. **Heritage Type:** The research must concentrate on intangible cultural heritage (ICH), such as performing arts, oral traditions, social practices, rituals, and festive events.
3. **Comparative Analysis:** This research should also cover the use of game-based and traditional archival techniques and compare the results implicitly or explicitly.
4. **Study Design:** The studies should be either quantitative, qualitative, or mixed methods, with a systematic analysis of the results.
5. **Outcome Measures:** Studies should have at least one outcome measure of preservation effectiveness, levels of engagement, or knowledge transfer.

6. **Data Quality:** The data should be original empirical data (not theoretical pieces, opinion articles, or unsystematic case reports).
7. **Study Focus:** It should focus mostly on preservation or educational results and not only on technical or digitisation procedures.

Figure 1 illustrates the systematic review process from the initial search to final data extraction.

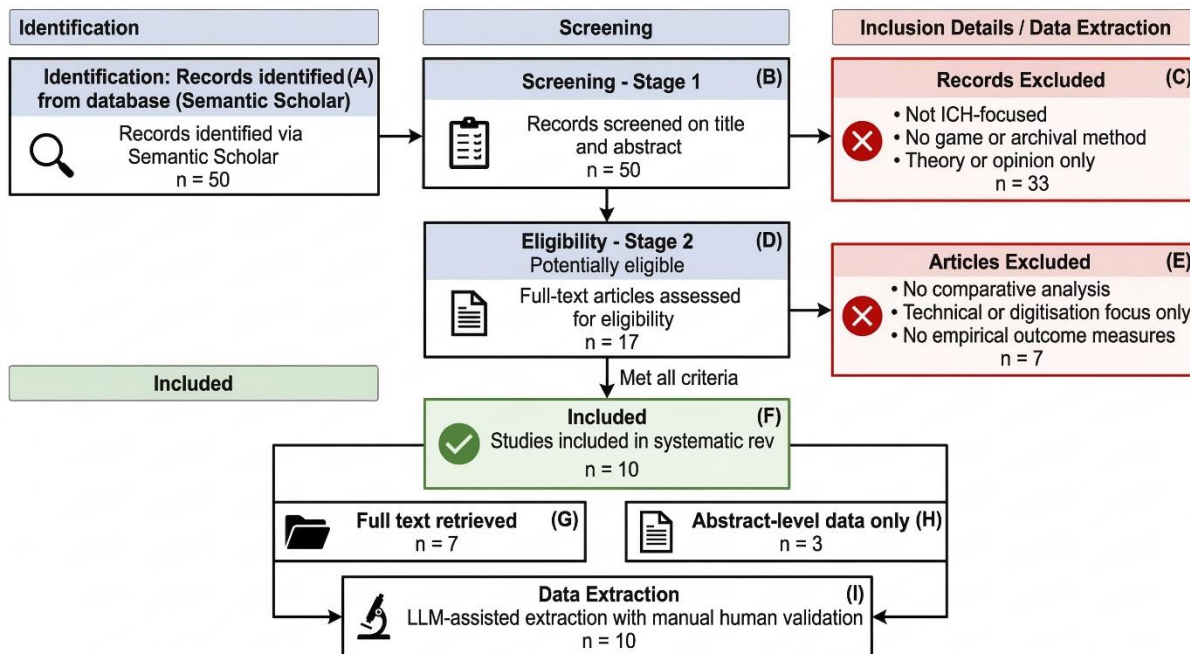


Figure 1. PRISMA-style flowchart illustrating the systematic literature review process from the initial search (n = 50) to the final included studies (n = 10). The flowchart demonstrates the transparency and replicability of the screening methodology.

Data Extraction

A large language model (LLM) was used to ensure the efficiency and consistency of extracting data from the included studies. The use of artificial intelligence to aid natural language processing and data synthesis is a developing trend in systematic review methodology [10]. Although the extraction with the help of LLM can significantly increase the speed of the review process, all outputs extracted by it were thoroughly checked by a person to promote accuracy and contextual fitness. Each data extraction column is detailed as follows:

Type of study design: This refers to the research design (e.g., case study, ethnographic study, experimental design, qualitative research, mixed methods, or action research) mentioned in the methods or introduction sections. The key approaches are captured where there are two or more.

Cultural Heritage Representation Method: The identified method was game edutainment/virtual reality/interactive storytelling/game jam, or some other digital preservation technique, and was coded in the Methods and Results sections. In cases where several methods were employed, they are all enumerated in descending order of importance.

Participant Characteristics: The Methods section included information on cultural groups, number of participants, age range, and role in cultural heritage preservation, which were used as necessary data. The community situation was outlined in the case of community-based studies.

Technology and Interaction Modalities: The technologies (e.g. VR, mobile devices) and interaction modalities (e.g. game mechanisms, storytelling modalities, user engagement modalities) were mined out of methods, technology descriptions or result sections.

Cultural Heritage Preservation Outcomes: The results, discussion, and conclusion sections were analysed to retrieve outcomes related to cultural aspects that were preserved, knowledge transmission methods, feedback from the participants or community involved, and perceived effectiveness. Quantitative measures were summarised, and qualitative measures were documented where possible.

RESULTS

This section summarises the results gathered from the ten studies used in this review. Table 1 summarises the design, cultural domain, preservation method, and important findings of each study.

Characteristics of Included Studies

The ten articles under consideration provide insights into game edutainment and traditional archiving in the field of ICH, despite being based on various disciplinary backgrounds and methodological levels. A summary of the focus, area of cultural study, preservation technique, major findings, and access to full text is presented in Table 1.

Study	Study Focus	Cultural Domain	Preservation Method	Key Outcomes
Zhu et al. [11]	Development and evaluation of an educational game for handicraft ICH	Chinese handicraft (Cloth Tiger)	Game edutainment (Embodied Experience Educational Game Model)	No explicit outcome measurement reported
Mortara & Bellotti [12]	Overview of serious games for cultural heritage; multiple case studies	Art history, museum curation, tribal customs	Game edutainment, interactive storytelling	No explicit outcome measurement reported
Selmanovic et al. [13]	VR and interactive storytelling for bridge diving tradition	Bridge diving (Mostar, Bosnia)	Virtual reality, interactive storytelling, simulation	Positive participant feedback; reported success in preservation and communication
Pang et al. [14]	Serious game for learning Cantonese opera movements	Cantonese opera	Game edutainment (motion-sensing camera)	Positive performer feedback; reported feasibility for ICH preservation
Selmanovic et al. [15]	VR video storytelling for Mostar bridge diving	Bridge diving (Mostar, Bosnia)	Virtual reality, interactive storytelling, game edutainment	Positive feedback; VR reported as superior to traditional methods
Laiti et al. [9]	Game jam for Sámi cultural revitalisation	Sámi Indigenous culture	Game jam, interactive storytelling, game edutainment	Game jamming reported as a potent tool for revitalisation; promotes holistic learning
Kitsikidis et al. [16]	3D game for Greek dance learning using motion capture	Greek traditional dance (Tsamiko)	Game edutainment, 3D game, motion capture	Preliminary experiments show reported potential
Rattananrungsri et al. [17]	Mobile RPG for Manora dance	Southern Thai dance-drama (Manora)	Game edutainment, interactive storytelling	Significant increase in interest ($t(54) = 5.69, p <$

				.001); positive recognition reported
Stavrakis et al. [18]	Digital archive and 3D game for Cypriot folk dances	Cypriot folk dance	Digital archive, motion capture, game edutainment	No outcomes mentioned in abstract
O'Connor et al. [19]	Interactive games for traditional sports and games	Traditional sports (various)	Game edutainment, virtual reality	Positive feedback from children and teens; reported effective engagement

Table 1. Summary of included studies (n = 10): study focus, cultural domain, preservation method, and key outcomes.

Note: ICH = intangible cultural heritage; VR = virtual reality; RPG = role-playing game; 3D = three-dimensional.

Summary of Cultural Domains Addressed

The analysed studies cover a wide spectrum of ICH domains, as demonstrated in Table 1. The domain of dance was reviewed the most often; three studies on Greek, Thai, and Cypriot dance traditions were identified. The other literature touched on bridge diving customs (2 studies), Chinese handicrafts, Cantonese opera, Sami Indigenous culture, art history and museum/tribal customs, and traditional sports. This heterogeneity suggests that game edutainment approaches can be implemented in a broad range of ICH types.

Summary of Preservation Methods Used

The preservation strategy analysis indicates that there is a strong focus on game-based and interactive strategies. The most common approach was game edutainment, as it was mentioned in nine out of ten studies. Five studies used interactive storytelling, three used virtual reality, and two used motion capture. Other strategies, such as game jams, three-dimensional games, digital archives, simulations, and motion-sensing cameras, were presented in one study each. Notably, the number of methodologies used in studies is often noticeable in the context of a multimodal perspective on ICH representation.

The significant difference between game edutainment (nine studies) and traditional archival approaches (the latter was represented in only one study but also included elements of game edutainment) indicates a solid tendency in the current body of literature. This trend implies that academia is focusing heavily on the validation of interactive digital technologies in cultural heritage projects. This focus could be due to the acknowledgement that game edutainment provides higher levels of innovation and dynamism with regard to re-energising intangible cultural content, or a belief that conventional archiving is constrained with regard to encouraging active engagement and the transfer of culture. The biased representation of the evidence base in favour of technology-based solutions must be noted as a possible effect on the relative situation of this review.

Summary of Key Outcomes Reported

Most of the results presented in the studies comprised it were positive regarding interactive and game-based methods. Five studies indicated a positive reaction to cultural interactive experiences by the participants or users. Other outcomes included increased interest or recognition (one study), feasibility in terms of ICH preservation (one study), and success in terms of preservation and communication (one study). One study identified VR as more effective than traditional methods, whereas another chose game jams as a method that proved effective in promoting a holistic approach to learning. One study found early potential and effective interactions among children and teenagers. Interestingly, three studies did not indicate explicit outcome measures in their abstracts, which could indicate a larger problem of inconsistent empirical reporting in this area.

DISCUSSION

This discussion summarises the results of the studies included in it with the help of a thematic analysis of preservation effectiveness, communication and engagement, and implementation challenges, and a comparative analysis of game edutainment and traditional archival approaches is conducted, as well as theoretical and practical implications are considered.

Thematic Analysis of Findings

Preservation Effectiveness

Most studies used digital games, virtual reality, or motion capture as the main tools for ICH representation, with a strong focus on high-fidelity digital representation. Kitsikidis et al. [16] and Stavarakis et al. [18] used motion capture and three-dimensional game technologies to document and teach traditional dances by attempting to make the dances authentic through detailed digital recreation. Selmanovic et al. [13, 15] also used virtual reality and 360-degree video to offer the user an experience of the tradition of diving into the Mostar bridge and reported increased presence and perceived realism of the experience. In addition to the static digital modelling of objects, Laiti et al. [9] revealed that game jams may be used as dynamic community development spaces that can produce playable artefacts that reflect living cultural themes and highlight both the creative process and the cultural artefact.

One of the most difficult issues in the literature is the extent to which digital representations can adequately reflect the complexity, levels of meaning, and contextual nuances of ICH, especially knowledge that is tacit or embodied in nature [20]. Although documentation was ranked low in relation to experiential learning and engagement in most research, few studies incorporated or directly compared traditional and interactive modes of learning within the same research design. This is a major gap in the literature. Further research should be devoted to the creation of new hybrid models that combine the benefits of engagement provided by game edutainment with the capacity of recording the necessary information, which is a feature of traditional archives.

Communication and Engagement

The level of user interaction and learning was positive throughout the studies included. Rattanarangrot et al. [17] presented quantitative data indicating that interest in Manora dance increased significantly after the gameplay ($t(54) = 5.69, p < .001$). The studies by Kitsikidis et al. and Pang et al. also presented positive feedback from learners and cultural experts regarding the educational affordance of their game-based interventions [16] and [14], respectively. Despite these promising results, one of the main limitations in the available studies is the lack of universal models for measuring knowledge transfer, which limits the comparison of learning outcome results.

The metrics of user engagement were also high, and the respondents often noted that they enjoyed the experience, became immersed, and felt a significant level of connection to the cultural material. Virtual reality and interactive storytelling were specifically mentioned to allow the development of presence and empathy, as well as allowing users to immerse themselves in cultural practices. There was also a high potential for accessibility of the digital and game-based approaches through distribution via mobile devices and the web, especially for younger individuals. Nevertheless, the availability of high-technology devices, including VR headsets and motion capture opportunities, is not evenly distributed across various environments, which could restrict the quality and accessibility of these interventions in low-resource environments [3, 21].

Implementation Challenges and Solutions

The installation of game edutainment in maintaining ICH often involves many technical specifications, such as specialised hardware in the form of VR headsets, motion sensors, and customised controllers and software applications, such as the Unity game engine and custom motion capture systems [17]. Such demands may prove to be very restrictive in low-resource settings where technology and technical skills accessibility are constrained. To achieve cultural accuracy in game-based representations, close and prolonged work with community

members and cultural professionals is required. Game jams have been considered an effective strategy to incorporate real cultural stories and make digital content appropriate and dignified [9].

One of the inherent contradictions arising from these results is that the same features that drive game edutainment to its most powerful form—immersion and dependence on advanced technology—are the greatest obstacles to its mainstream adoption. A high level of engagement and knowledge transfer through experience is often linked to high resources and specific hardware necessities. This implies that the most effective interventions could also be the least accessible to the neediest groups, especially those living in communities where preservation measures are most required. Next-generation projects must strike a delicate balance between technology and accessibility.

Comparative Analysis

Comparison Dimension	Game Edutainment Methods (Digital games, VR, motion capture, interactive storytelling)	Traditional Archival Methods (Digital archives, video documentation, high-fidelity recording)
Strengths	High user engagement and participation Interactive and experiential learning Wide dissemination via digital platforms Supports embodied knowledge transmission Appeals to younger audiences Facilitates cultural revitalisation	High-fidelity documentation Detailed capture of expert performance Accessible for scholarly research Long-term stability and reliability Systematic cataloguing Preserves nuanced cultural data
Limitations	Resource-intensive development Requires technical infrastructure May not capture tacit knowledge Limited long-term outcome data Technological access barriers Risk of cultural oversimplification	Passive engagement Limited interactivity Less appealing to younger audiences Limited dynamic transmission Static nature Reduced community participation
Cultural Impact	Increases interest and motivation Enhances perceived learning Potential for cultural revitalisation Facilitates intergenerational transfer Fosters cultural identity Promotes community engagement	Preserves knowledge for future generations Maintains historical record Supports academic research Less effective for active transmission Limited revitalisation impact Reduced community engagement
Primary Application Context	Cultural education and outreach Community engagement Youth-focused transmission Interactive museum experiences Cultural revitalisation projects	Scholarly research Long-term preservation Reference and consultation Legal and policy documentation Foundational record-keeping

Table 2. Comparative analysis of game edutainment versus traditional archival methods across four dimensions

A direct comparison of game-based edutainment strategies with traditional archival approaches, as presented in Table 2, highlights the distinctive strengths, limitations, and cultural impact of each method.

Synthesis of Comparative Findings

Game edutainment techniques exhibit unquestionable advantages in providing high levels of user engagement, interactive and experiential learning, and using digital channels to disseminate them, as well as embodied knowledge as a tool to learn. Such attributes ensure their high suitability for dynamic cultural communication and youth-oriented transmission. In contrast, traditional archiving processes are the best option when documentation is of high fidelity and expert performance is to be captured in detail so that finer cultural knowledge can be stored in a format that can be used to conduct scholarly research and also act as a reference over a long period.

Both methods have drawbacks. Game edutainment involves large resource usage, a specialised technical infrastructure, and has a poor ability to capture tacit or contextual aspects of ICH. Scientific support for long-term preservation results is low. Conventional archival practices, in turn, are more likely to be relatively passive and less engaging to younger audiences and have limited ability to transmit culture dynamically or provide community renewal. Game edutainment has shown better results in terms of cultural impact in active participation, motivation, and intergenerational transmission, whereas traditional archival methods play a supplementary role in knowledge preservation for future generations and serve as a reference in academic and policy matters. In summary, the evidence indicates that both methods may not necessarily be better than each other; however, the available strengths of each method are complementary and relevant to the choice of an adequate strategy; the selection of a proper strategy must be determined by the preservation objectives, available resources, and the targeted audience.

Theoretical Implications

This review results add to the increasing theoretical research on digital heritage preservation as they confirm that ICH transmission should be documented and engaged. The reviewed literature attests to the opinion that ICH is fundamentally participatory, and that preservation strategies should be deprived of this lived, dynamic nature. Such a persistent positive effect of game edutainment indicates that interactive technologies are not peripheral resources but are becoming the heart of effective ICH communication. This conforms to theoretical frameworks that have placed experiential learning and community participation at the centre of intangible heritage sustainability [8, 22].

Simultaneously, the evidence base creates a gap in terms of theory: the circumstances under which game edutainment and traditional archival techniques should be combined have not been thoroughly researched. A stronger theoretical framework that considers preservation objectives, the availability of resources, the demographics of the target audience, and cultural sensitivity would be useful to researchers and professionals in their work. As Figure 2 shows, the conceptual model can demonstrate the complementary relationship between these two methods to achieve total ICH protection.

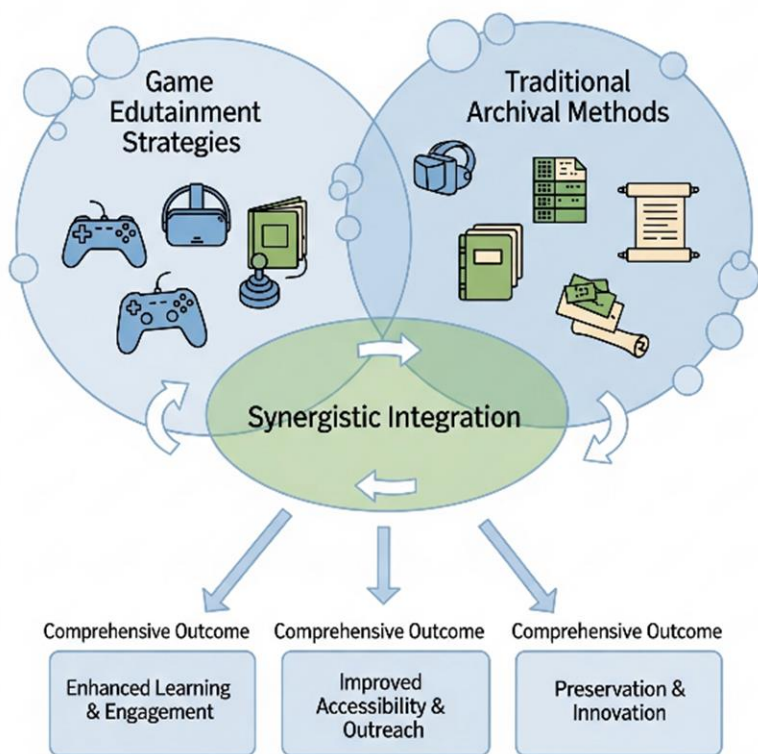


Figure 2. Conceptual model of hybrid ICH preservation, illustrating the complementary relationship between game edutainment (dynamic engagement and cultural transmission) and traditional archival methods (high-fidelity documentation and long-term stability), converging toward integrated ICH preservation.

Practical Implications

The results of this review have several implications for practitioners in the field of heritage, cultural institutions, and policymakers. First, game edutainment, especially via mobile applications and web-based distribution, provides a channel of accessibility and scalability for young and digitally inclined audiences to ICH. Mobile game-based strategies can be seen as one of the more realistic ways of entering, which could make mobile game development a relatively lower barrier to entry than VR or motion capture systems.

Second, the specified conflict between the level of technological advancement and equal opportunity highlights the necessity of gradual implementation measures. Resource-constrained institutions can focus on less technologically advanced edutainment technologies, such as interactive web storeys or mobile apps, and use more expensive VR and motion capture solutions as flagships with sufficient funds and infrastructure availability. Third, the regular focus on the role of community involvement in the studies under inclusion demonstrates the vital role of including cultural knowledge holders in the design and development processes. Hybrid models integrating game edutainment with rigorous archival documentation must be prioritised to guarantee accessibility and academic integrity.

Limitations of the Review

This review has several limitations. First, the search was limited to one tool (Elicit AI) and corpus under it (Semantic Scholar). Although this corpus is interdisciplinary and wide-ranging, there is a risk that some potential studies were not recognised because not all relevant publications were covered. A multi-database approach, which incorporates databases such as Scopus, Web of Science, or subject-specific heritage indexes, should be used in future reviews to increase coverage and decrease the chance of bias due to the database. Despite the interdisciplinary and broad nature of this corpus, it might not cover all relevant publications in specialised journals in heritage or cultural studies, which leads to the risk that the correct studies were not found. Further investigations should consider a multi-database search to expand coverage. Second, the data extraction strategy based on an LLM was validated via a manual review of the data; thus, the possibility of inconsistency in the interpretation of ambiguous or incomplete abstracts can be identified. Third, the high focus on game edutainment methods in the current body of literature, in which traditional archival methodology is covered in a single study, constrained the possibility of a direct comparison and could be viewed as a publishing bias toward newer technology-based interventions. Lastly, the incompleteness of reporting the outcomes of three studies due to the reliance on abstract-level information when there was no access to the full text of the studies can be seen as a reason.

CONCLUSION

This systematic review has assessed the comparative effectiveness of game edutainment approaches and conventional archival practices in the preservation and communication of intangible cultural heritage. The conclusions drawn from ten studies are consistent and indicate that game edutainment methods that involve digital games, VR, motion capture, and interactive storytelling are very effective in promoting user engagement, motivation, and experiential cultural learning, particularly among younger generations. Although not as efficient at active interaction and cultural regeneration, traditional archival techniques are essential for the high-fidelity capture of information and the long-term storage of subtle cultural information.

Both methods are not universal. It can be concluded with great confidence that hybrid models of preservation need to be developed that will combine the interactive nature of game edutainment and the overall archiving documentation powers of conventional archiving. These hybrid models have the greatest potential for sustainable, equal, and culturally sensitive conservation of ICH. Future studies should focus on empirical research comparing or combining both methods within a single study, using standard measures of learning outcomes, and considering the limitations of technology access in resource-constrained heritage settings. The creation of a hybrid framework for ICH preservation based on cultural theory and empirical evidence is a highly urgent and fruitful step toward the discipline. Methodologically, future studies should recreate the same review with more databases and manual citation chaining to confirm the current results and reduce the possibility of potential search bias by using a single corpus.

Ethical Considerations

The systematic literature review was performed based only on available publicly available published academic research and did not entail direct human subjects, gathering of personal information, or contact with living populations. In this regard, official institutional ethical consent was not required. Data extraction via a large language model (LLM) was performed under strict human supervision, with all results manually checked by humans to prevent inaccuracy, inappropriateness with the context, and irrelevance to the original source materials.

Conflict Of Interest

The authors declare no conflicts of interest regarding the research, authorship, or publication of this article.

Data Availability

The data extraction table and the complete list of screened studies are available from the corresponding author upon reasonable request. A systematic search was conducted using the Semantic Scholar database.

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