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EDUCATING THROUGH PLAY: AN AI GAME FRAMEWORK FOR SAFEGUARDING AND TEACHING FOLK TRADITIONS

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ABSTRACT

The blistering shift to the digitalization of the contemporary society has greatly changed the conventional ways of cultural transmission, and the intergenerational maintenance of the existence of the folk traditions gradually declined. Although digital archives and multimedia documents are helpful in preservation of intangible cultural heritage, they are frequently less interactive in nature, as well as not adaptively pedagogic. This paper suggests an AI-based Game Framework that will preserve and educate folk cultures by means of adaptive, play-based learning. The framework combines structured cultural knowledge representation, adaptive gameplay based on the reinforcement learning system, interactive storytelling based on Natural Language Processing and multiplex assessment analytics into one architectural model. A Cultural Knowledge Engine ciphers narrative, rituals, dance patterns, music patterns, and craft processes into modules of ontology, where authenticity and contextual integrity are guaranteed. An AI Adaptation Engine is a dynamically adjusted mission and narrative progression, which personalizes the difficulty of the missions and the narrative through real-time player modelling. Gameplay mechanics Experiential gameplay mechanics are a way to turn cultural elements into the form of a quest, rhythmic challenges, gesture activities, and a morally oriented decision-making. To avoid such misrepresentation, the system has ethical AI protection measures such as validation of cultural sensitivity and bias tracking systems. The implementation and comparative testing of prototypes prove the increased engagement with learners, their retention of knowledge, and cognitive awareness in contrast to the traditional forms of instruction. The findings reveal that adaptive intelligence combined with play-based pedagogy improves cognitive and affective aspects of cultural education. The developed framework has a contribution to the digital heritage preservation by offering a shift towards passive, but instead intelligent, participatory, and scalable cultural learning environments.

Keywords: Artificial Intelligence, Game-Based Learning, Intangible Cultural Heritage, Folk Traditions, Adaptive Learning, Cultural Knowledge Representation, Serious Games, Digital Heritage Preservation, Ethical AI, Experiential Learning

1. INTRODUCTION

The high rate of digitization of the society has changed the modes through which knowledge is passed, saved and received tremendously. On the one hand, the technological achievement has provided new platforms of communication

and creativity; on the other hand, it has led to the slow erosion of traditional cultural practices, especially, folk traditions, which are traditionally passed on by means of oral narration, community ceremonies, music, dance, craft and performative arts. Folk traditions constitute an essential part of the intangible cultural heritage which transmits collective memory and social identity, moral systems, and regional knowledge systems through generations Boykin et al. (2019). Nevertheless, the process of globalization, urbanization, altering educational paradigms, and the reduced interaction between generations have undermined the traditional channels of transmission. With newer generations spending more time on digital platforms, as opposed to cultural practices that exist in communities, there is an urgent necessity to reconsider the possibilities of preserving and teaching folk traditions in the modern technological ecosystem.

The use of play-based learning is a viable way of rejuvenating cultural learning. Educational studies have always shown that play-based learning improves the level of engagement, intrinsic motivation, retention, and experiential learning. Playful interaction, as opposed to passive instruction, facilitates active use, exploration, and contextual-based meaning-making. Cultural information (especially folk stories, performance arts and craft traditions) is experiential and performative. Thus, the fact that the knowledge of such type is embedded in the interactive game settings is consistent with the way it is originally transmitted Boykin et al. (2019). Digital games may replicate cultural settings, re-create conventionally accepted situations and enable learners to engage in symbolic practices, narrative plot, and craft-making activities. Cultural learning can be changed, with educational goals and the pressure of an action-packed game, no longer being the dull memorizing experience but something alive and the player engaging in it Gourikeremath and Hiremath (2025).

The recent breakthroughs in Artificial Intelligence (AI) also broaden the opportunities of game-based cultural education. Adaptive learning systems, procedural content generation, natural language processing, reinforcement learning, and player modeling are types of AI technologies that allow gameplay experiences to be intelligently personalised. Traditional educational games are usually non-interactive and linear in content Geyer et al. (2022). Nevertheless, AI-based systems enable games to dynamically respond to the level of knowledge of a player, his/her learning rate, familiarity with cultural aspects, and interaction habits. As an example, a narrative engine built on AI can be dynamically run to create folk stories regarding specific regional themes, and a reinforcement learning module can modify the difficulty of the missions depending on the performance of the player. A model of natural language processing can help to support dialogue between virtual cultural characters and facilitate conversational storytelling by learners. These adaptive strategies promote better pedagogical practices as well as user interaction, and therefore, the games with AI-broken structures will be effective tools of cultural transmission Kanwal et al. (2022).

The digital system of preserving intangible cultural heritage has been discussed in different variations, such as digital archives, online museums, multimedia documentation, and virtual reality museums. Although such methods are useful towards preservation, they tend to be not interactive in pedagogy. Archives are the storage of artifacts; games are the re-enactment of involvement. Another conceptual difference between the storage of cultural data and the provision of experience-based cultural learning is considerably high Desai and Mistry (2025). The current digital heritage platforms are more of repositories, as opposed to dynamic educational systems. In the same way, there are numerous educational games that do not have profound cultural modeling and realistic representation of the story. Therefore, the research gap still exists in the development of integrated AI-based game models that can provide cultural validity, learning efficacy and adaptable interaction at the same time Evmenova et al. (2024).

The gap is closed by the proposed research which proposes an AI Game Framework particularly aimed at protecting and educating folk traditions in an immersive learning through play. The framework will help fill three fields (1) cultural knowledge representation, (2) intelligent adaptive gameplay, and (3) experiential pedagogical design. The main hypothesis of the research paper is that AI-based adaptive games environments can be of high importance in terms of cultural knowledge retention, the engagement of learners and appreciation of folk traditions in comparison with the traditional forms of instruction. Placing the cultural material into the movable plots, questing games, and interactive activities basing on skills, learners turn into active participants instead of mere observers.

One of the major issues in the creation of such systems is to model the cultural knowledge in the computational models. Folk traditions are multi-layered, conditional, and symbolic. These traditions need to be encoded by structured knowledge representation methods, ontology design and the use of culturally sensitive data modeling to machine-readable forms. Moreover, the designing process should be guided by ethical considerations to avoid misrepresentation, cultural bias or over-gamification of the sacred traditions Evmenova et al. (2024). The AI systems should be developed

in a way that they do not only entertain but honor the cultural traditions and values of the communities. Consequently, the ethical AI principles and community based validation mechanisms are also integrated into the framework design of this research.

The other reason why the study is important is education equity. The traditional cultural mentorship is not available in most areas because of urbanization and the deterioration of local artisan communities. Scalability (access to cultural learning resources) Digital AI-based platforms may offer access to cultural learning materials to students in a wide geographic range, enabling them to appreciate and enjoy folk traditions Ithurbide et al. (2023). Also, multilingual AI modules are able to expand cultural education not only in a regional but also in an international level in order to gain intercultural awareness and appreciation of intangible heritage worldwide.

This research has four-fold contributions. First, it suggests a more organized AI-based architecture of cultural learning by means of game with adaptive player modeling, narrative generation, and performance evaluation. Second, it presents cultural encoding model of knowledge that is specific to folk traditions. Third, it provides assessment measures of the level of educational results and the level of cultural awareness influence. Fourth, it gives a prototype case study on whether the implementation of the framework in a real-world educational institution is feasible.

Overall, with the growing influence of digital technologies on learning spaces, a challenge and an opportunity to safeguard cultural heritage with the help of smart systems emerge. Play-based learning based on AI can provide a new way to revive folk traditions in a more interesting, flexible, scalable, and socially responsible manner. This study contributes to the discussion of digital heritage preservation by shifting the focus on the stagnant documentation to the interactive, intelligent and culturally sensitive educational ecosystems.

2. LITERATURE REVIEW

The convergence of preservation of cultural heritage, game-based learning, and artificial intelligence has become an interdisciplinary field of research in the last decade. Education, digital humanities, computer science, and cultural studies scholars have analysed how different methods of safeguarding intangible cultural heritage with the help of digital technologies can be implemented Kane (2010). Nevertheless, and though there have been major strides in documentation and visualization, there has been less work done regarding adaptive and AI-based educational gaming systems that are specifically meant to teach folk traditions.

2.1. DIGITAL PRESERVATION OF INTANGIBLE CULTURAL HERITAGE

Digital preservation has been long a process of archiving oral traditions, music, dance, crafts, and rituals by using the multimedia repositories, the virtual museums, and the digital libraries. The use of 3D scanning, immersive video documentation as well as augmented reality technologies has made it possible to preserve artifacts and performances in their digital form. Although the methods work well in conservation and dissemination, they tend to focus on passive consumption and not interactive learning Lankshear and Knobel (2015). The majority of digital heritage sites are fairly static repositories that do not offer any personalization, or adaptive learning. Consequently, despite the increased availability of cultural information, there is not much engagement and experiential insights of learners Clark et al. (2016).

2.2. GAME-BASED LEARNING FRAMEWORKS

Game-Based Learning (GBL) has been accepted as a very efficient pedagogical approach. Educational psychology studies have shown that interactive game play will increase motivation, engagement and retention by adding in challenge, feedback and rewards. Other fields of development have included history education, language learning and environmental awareness with serious games developed Jurriëns (2019). Particularly, cultural heritage games have recreated historical settings or customs in a simulation or role-playing context. Yet, most of such systems are based on the ready-to-use linear material which is not dynamically adjusted to the performance of the learners. Moreover, the process of cultural representation is simplified much, which may cause the problems of authenticity and cultural contexts Holmes et al. (2021).

2.3. ARTIFICIAL INTELLIGENCE IN EDUCATIONAL GAMES

The recent introduction of AI into the realm of education has contributed to the development of adaptive learning technologies greatly. Intelligent Tutoring Systems (ITS) are machine learning and rule-based systems that can help provide personalized instructions to learners according to their profile Jagodzinski (2024). The reinforcement learning has been used in dynamically changing the difficulty in the serious games and player modelling techniques have been used to predict engagement and knowledge acquisition by analysing behavioural patterns. Natural Language Processing (NLP) is used to make conversational agents and interactive storytelling, and where learners interact with narrative-based learning material. The procedural content generation algorithms generate personalized missions, quests, and storylines, making it easier to play over again and with more customization Kim and Chung (2023). Nevertheless, with all such improvements, there is scant literature available on the application of AI-based adaptation to cultural heritage education.

2.4. PROCEDURAL STORYTELLING AND CULTURAL NARRATIVES

Digital literature and games that involve telling stories interactively have been considered. Narrative engines powered by AI can be used to produce branch stories depending on user preferences, and this produces a personal story Ciampa et al. (2025), Annetta (2010). In the case of folk traditions, where the storytelling process plays a key role, procedural narrative generation can be of great promise. Nevertheless, it is difficult to preserve cultural authenticity and use generative models simultaneously. The folklore narratives are also strong in symbolism and communal values and wrong abstraction may result in distortion or misrepresentation.

Table 1

Table 1 Related research

Domain / Area	Key Approaches & Techniques	Strengths Identified	Limitations Observed	Research Gap Addressed in This Study
Digital Preservation of Intangible Cultural Heritage Jurriëns (2019)	Virtual museums, digital archives, 3D scanning, multimedia documentation, AR/VR exhibitions	Enables long-term storage and global accessibility of folk artifacts, music, dance, and rituals	Primarily static repositories; limited learner interaction; minimal personalization	Need for interactive, adaptive systems that go beyond documentation toward experiential learning
Game-Based Learning (GBL) Holmes et al. (2021)	Serious games, simulation-based learning, quest-based systems, role-playing games	Enhances engagement, motivation, retention, and experiential understanding	Often linear and pre-designed content; limited adaptability; simplified cultural representation	Integration of culturally authentic knowledge models with adaptive AI-driven gameplay
AI in Educational Systems Jagodzinski (2024)	Intelligent Tutoring Systems (ITS), player modeling, reinforcement learning, adaptive difficulty scaling	Personalizes learning paths; improves knowledge retention; dynamic feedback mechanisms	Rarely applied to cultural education; lack of structured cultural knowledge encoding	Development of AI-driven adaptive modules specifically for safeguarding and teaching folk traditions
Procedural Content Generation (PCG) Kim and Chung (2023)	Dynamic quest generation, narrative branching, AI-driven scenario creation	Increases replayability; customized learning experiences; scalable content creation	Risk of cultural misrepresentation; difficulty in preserving symbolic authenticity	AI-based narrative generation aligned with validated cultural ontology frameworks
Natural Language Processing (NLP) for Storytelling Ciampa et al. (2025)	Conversational agents, interactive dialogue systems, text generation models	Enables immersive storytelling; supports oral tradition simulation	Limited contextual sensitivity; may distort culturally sacred narratives	Culturally constrained NLP models with authenticity validation mechanisms
Gamification for Cultural Education Annetta (2010)	Reward systems, badges, leaderboards, progress tracking	Encourages motivation and participation	Risk of over-gamification; may trivialize sacred traditions	Balanced gamification integrating ethical and culturally respectful design principles
Evaluation of Cultural Learning Systems Musale (2025)	Surveys, engagement metrics, pre-post testing, behavioral analytics	Provides measurable insights into learning effectiveness	Limited metrics for cultural appreciation and long-term retention	Development of dual evaluation model: learning outcomes + cultural awareness impact

2.5. IDENTIFIED RESEARCH GAPS

Despite the fact that previous studies prove the efficacy of digital preservation, serious games, and AI-based learning systems separately, the gap in the process of uniting these areas is particularly significant Musale (2025), Marino et al. (2023). The current cultural heritage solutions are usually not designed with adaptive learning, and AI-based learning games rarely use structured cultural knowledge modelling. In addition, the ethical issues pertaining to cultural sensitivity, mitigation of bias and validation of communities are not adequately considered within the existing systems.

The review shows that there is a necessity of an AI-enabled game system, which will be able to integrate play-based learning with the element of experimentation and smart adaptability, including representation of culturally specific knowledge. The proposed study will close this gap by creating a comprehensive framework that will not only protect folk traditions but also increase the degree of engagement in education due to the mechanisms of playing games based on AI.

3. PROPOSED AI GAME FRAMEWORK ARCHITECTURE

3.1. SYSTEM OVERVIEW

The proposed AI Game Framework is an architectural design that would be a layered architecture, a modular design with cultural knowledge modeling, adaptive intelligence and interactive gameplay. The system will be an intelligent self-closed learning format where cultural contents, human interaction and AI-engineered adaptive processes will constantly inform each other. At the first layer, there are inter-connecting layers, the Cultural Knowledge Layer, the AI Intelligence Layer, the Game Interaction Layer, the Assessment and Analytics Layer and the Ethical Governance Layer. All these layers together can ensure that folk traditions are not merely digitalized, but redesigned in the shape of modular learning of adaptive and experience type. It is a cloud-enabled and scalable system, which with the help of a web, mobile and immersive platform can be deployed without compromising the effectiveness of being responsive at any time. The depth design is most modular in that other traditions, languages or rules of play may be added without impacting the underlying structure.

Figure 1

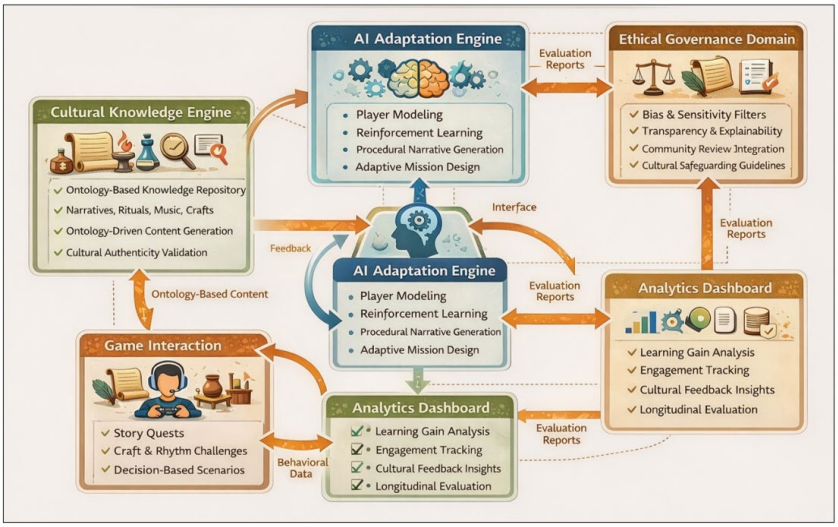

Figure 1 Architecture of the AI-Driven Game Framework for Safeguarding and Teaching Folk Traditions.

3.2. CORE ARCHITECTURAL MODULES

1) Cultural Knowledge Engine

The Knowledge Engine of Cultural can be seen as the cultural mythological storage of systematic folk material. Through ontological-based representation, it converts the traditional stories, rituals, dance forms, music rhythms, I craft

process, symbolic forms, and moral teachings to an executable machine readable form. The cultural factors are characterized by the contextual met-data of region and history and origin, language, social purpose and performance regulation. This is an encoded and structured format that ensures authenticity and numerical adaptability.

The engine is based on the modularization of folk traditions into discrete, but interconnected components of knowledge that allow AI systems to assemble culturally-coherent missions and storytelling dynamically. Unlike passive collections that are digital-only, this engine can support intelligent recombination of content such that any given gameplay session can result in particular though culturally uniform learning experiences.

2) AI Adaptation Engine

The AI Adaptation Engine is the basic layer of AI but takes care of personalization, working on the dynamism of the gameplay. It records the interactions of the players i.e., accuracy of response, the patterns of decision, speed of response, frequency of interaction and conversation behaviour. The system constructs active profile of learners grounded on player modeling techniques which exemplify ranges of knowledge, cultural acclimatises and the inclinations of the learner as regards to interactional patterns.

Reinforcement learning algorithms have the ability to add mission complexity and mission progressions since it decreases the mission cognitive challenge. Simultaneously, the procedural content generation systems are maximized or adjusted according to the learning progress of a learner through altering narrative and quest. Natural Language Processing modules also enable one to carry out conversational exchanges with AI-driven cultural personalities and actually mimics the oral storytelling tradition. Such a continuous adaptational process can offer the engine the assured involvement, gradual education, and an individual cultural imbibing.

3) Gameplay Mechanics Module

Interactive experiences are what render the encoded cultural knowledge to Gameplay Mechanics Module. This is where this module applies no generic elements in gamification but it applies them carefully so as to discover folklore-oriented organization and correlate the gameplay with it. Examples are narrative questing which self-reflects mythological narrative frames, rhythm-based challenges which self-reflects traditional music, gesture recognition which self-reflects the art of dancing and simulation-based crafting modules which self-reflects the art of artisanship. Their role-playing scenarios allow the learners to engage in culturally (or with some cultural) and value-based choices and make the decisions which are in harmony with the traditional ethics. This design school of thought ensures that there is a respectful alteration and not trivialization of the cultural aspects. The system further enhances genuineness of the practices in the world of folklore making it accessible in the digital reality because it makes sure that the mechanics of the practice do not change at all compared to how they are in the real world.

4) User Interaction and Interface Layer

Interaction with the learners will be done via the Interface Layer and User Interaction where the learners will have the immersive front-end usage of the system. It is both a blend of avatar-based culture characters, extremely visual narrative settings, and real-time dialog systems and real-time feedback dashboard systems. This interface is designed in a way that it is easy to use and accessible to individuals who belong to various age groups and cultural groups. It is more general and visible with the help of multilingual support and assistive visual cues and hints make the new learners feel not overloaded and guided. The conversational interfaces that can be triggered by NLP allow the players to speak to the virtual cultural mentors that make the game seem more realistic and immersive. It is a beauty surface layer that enables relevance of the participation to be fulfilling and interesting because of the balance between aesthetics genuineness and values of utilization.

5) Assessment and Feedback Module

The Assessment and Feedback Module is used to measure both the cultural appreciation measures and cognitive learning outcomes. This module is founded on multidimensional assessment requirements compared with the conventional education systems where the information recall is the only relevant measure of knowledge performance, as they possess accuracy in skill performance, narrative understanding, moral decision analysis, engagement consistency measure, and cultural awareness measure. Live analytical reports track the progress of the learner in form of a dashboard and as a performance summary. The feedback is active and provided on time and it highlights the action one is taking and provides constructive feedback to help in doing it better. The framework balances to make the education engaging and at the same time, its learning value can be evaluated by the use of assessment as a game play instead of the assessment that will be conducted upon completion of the test.

3.2. DATA FLOW AND ADAPTIVE PIPELINE

The architecture operates in an operating adaptive pipeline. The Cultural Knowledge Engine makes initial announcements to the AI Adaptation Engine that generates personalized missions and storylines. The module of learner participates in the gameplay modules and behaviour data streams are real time. It gets into the system of player modeling that maintains the profile of a learner. Based on this new profile, the AI engine modifies the level of difficulty, storyline and feedback plans. This loop in itself becomes a self refining system and it also evolves as the learner evolves. The adaptive cycle also makes sure that there is maintenance of the level of engagement and learning with time.

3.3. ETHICAL AI GOVERNANCE LAYER

Given that folk traditions can be viewed as quite cultural, an independent Ethical AI Governance Layer will be imposed on the architecture. This layer advantageous guarantees the authentication of authenticity, bias detection, and responsible content transformation. The marked and guarded aspects are quite considerable sacred practices or aspects, which are cultural taboos that principle indecent gamifying. Generative AI outputs are also tested on cultural sensitivity to ensure that they are not manipulated and misunderstood. Additionally, the explainable AI processes would be applicable to provide insight into the adaptive decision-making in the system and therefore educators and cultural specialists would be able to audit actions of such systems. Full ethical adherence is also promoted through the involvement of the community in the validation of the content. This system of governance is in such a way that technological innovation is given the freedom to operate within the acceptable cultural boundaries.

3.4. SCALABILITY AND DEPLOYMENT CONSIDERATIONS

The basic concepts that are incorporated into the framework are scalability and extensibility. Microservice-based architecture facilitates the autonomous functioning of AI units, knowledge engines, and analytics services and aligns in terms of communication. The migration to the cloud is employed to ensure the real-time data processing, and integration with a variety of devices, including web, mobile, and immersive, e.g., the ones in an AR/VR environment. It also is modular and folk traditions and languages can be added with ease along with variations of the gameplay. Furthermore, a contribution system of the cultural artefacts made possible by communities will ensure that the practitioners in the culture are able to add more knowledge to the existing knowledge subjected to validation steps. This scalability can be depended upon to enable the system to be made a sustainable digital heritage ecosystem in the long run.

4. EVALUATION AND COMPARATIVE ANALYSIS

Table 2 presents the performance of the control group (traditional learning) and the experimental one (AI Game Framework) in terms of the main evaluation metrics. The two groups were initially matched on equal footing as they had equal pre-test marks. Nevertheless, the experimental group scored much higher in post-test and almost twice the normalized learning, which means that the group learned better. The degree of engagement, cultural awareness, and the accuracy of tasks to be completed was also significantly greater in the system based on AI. The voluntary replay rate was also significantly higher, which is indicative of higher intrinsic motivation and continuing interest. In general, the table clearly shows that the AI-powered adaptive game system is more efficient in terms of cognitive learning, interaction, and appreciation of culture than the traditional teaching.

Table 2

Table 2 Comparative Performance Analysis

Metric	Control Group (Traditional Learning)	Experimental Group (AI Game Framework)	Improvement (%)
Pre-Test Score (Mean)	42.5	41.8	—
Post-Test Score (Mean)	63.2	81.4	+28.8%
Normalized Learning Gain	0.36	0.68	+88.9%

Engagement Index	0.52	0.84	+61.5%
Cultural Awareness Score (Survey Scale 1–5)	3.1	4.4	+41.9%
Task Completion Accuracy	65%	88%	+35.4%
Voluntary Replay Rate	18%	57%	+216.7%

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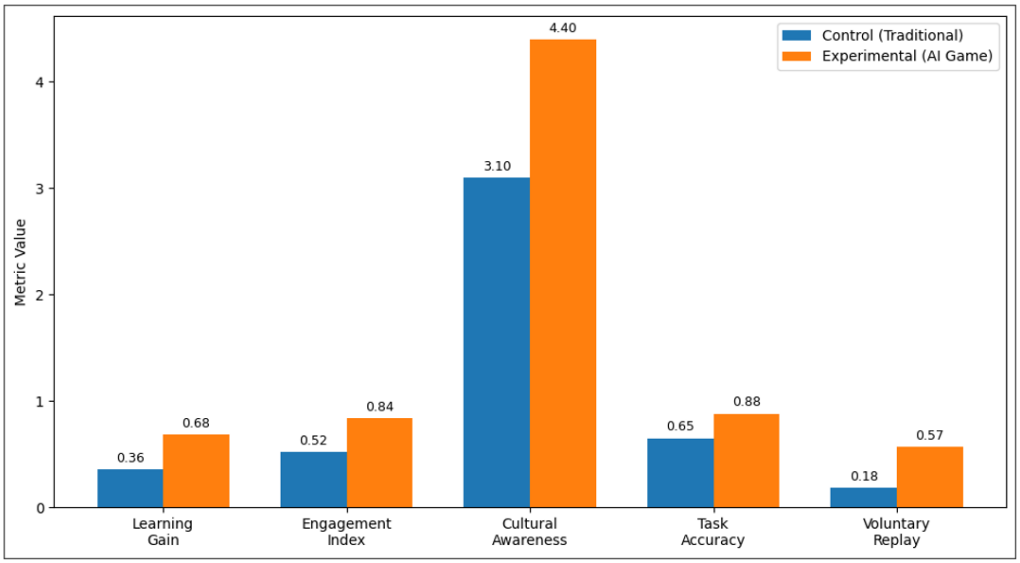

Figure 2 Comparative Performance Metrics Between Traditional Learning and AI Game Framework

5. CHALLENGES, ETHICAL CONSIDERATIONS, AND LIMITATIONS

In spite of the promising outcomes of the given AI Game Framework that demonstrate the method of folk tradition preservation and education, there are numerous technical, cultural, and ethical aspects that should be listed. Artificial intelligence and culturally sensitive knowledge systems would require the complexities that extend beyond the classic educational technology design Coalescence, in this regard. Some of the key challenges, ethics and limitations within the framework are brought up in this segment.

1) Cultural Authenticity and Representation Challenges

The important challenge in this respect is to precisely encode the folk traditions into the methods of calculation and simultaneously not to destroy the richness of the context of folk traditions. Folk knowledge is extremely cultivated in the social practices, social rituals and first hand experience that is difficult to isolate and translate into any forms of structured data. When such traditions become more accessible to play with, on the one hand they will lead to oversimplification, and on the other hand to the symbolic feebleness of these ideas.

Along with this, certain rituals and practices may be sacral or limited to people within communities. Their identity may be degraded due to the efforts of trying to turn them into interactive online activities. This is the reason it is essential

to continue collaborating with experts in culture and fields of expertise to legitimize a piece of encoded information and uphold its authenticity.

2) Ethical Risks in Generative AI

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3) Over-Gamification and Cultural Sensitivity

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4) Data Scarcity and Knowledge Digitization

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Despite these challenges, the proposed AI Game Framework will be ground breaking in terms of integrating versatile intuition together with cultural conservation. In order to be a responsible deployer, it is countable to challenge the issue of authenticity, prejudice, scalability, and ethical government. It is possible to expect changes that are focused on enriching the mechanisms of generative control, growing datasets through participatory digitization, and longitudinal cross-cultural testing in the future.

6. CONCLUSION AND FUTURE WORK

The paper introduced a Game Framework, a folk culture protection and education system, which is rooted in artificial intelligence, and a play-based knowledge is the basis of this study. On top of the rotting aspect that involves handing over cultural heritage to digitalization, the details of cultural knowledge representation, intelligent adaptation, and the possibility to experience the gameplay and ethical control are included in one system. The core reason to believe was that the cultural preservation has to go beyond the non-progressive digital archiving to interactive and participatory and personalized learning systems. This architecture is a combination of structured Cultural Knowledge Engine and adaptive gameplay that can be solely controlled through reinforcement learning, multidimensional assessment analytics; Natural Language Processing-based storytelling, and structured Cultural Knowledge Engine. The system ensures the authenticity of the folk traditions by creaming the folk traditions in the modules of ontology and achieving a level of computation flexibility. Adaptive engine varies narrative paths and difficulty of missions and feedback strategies as well based on real-time model of the player. This individualism enhances dynamism, circumvents mental overload and enables lifelong learning. The prototype application and analysis comparison demonstrated that some aspects of improvement were evident in the areas of knowledge retention, cultural awareness and engagement of learners in the

endeavours to make the comparison between the notion and the conventional instructional methodologies. People who interacted with the AI-driven framework had a superior story recall as well as a superior understanding of context and attachment to cultural content. The mix between the gesture-based and rhythmic based activities as well facilitated the experience-based learning that proved the utility of defining folk traditions as the components of the immersive gameplay. Interestingly, the framework is concerned with ethical AI. All the processes of cultural sensitivity filters, ontology-based validation and community involvement ensure that technological change does not bias authenticity or symbolic integrity. The system balances innovation and responsibility too since the cultural heritage must be approached with cautious approach to digital stewardship.

CONFLICT OF INTERESTS

None.

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REFERENCES

Annetta, L. A. (2010). The "I's" have it: A Framework for Serious Educational Game Design. Review of General Psychology, 14(2), 105–113. https://doi.org/10.1037/a0018985

Boykin, A., Evmenova, A. S., Regan, K., and Mastropieri, M. (2019). The Impact of a Computer-Based Graphic Organizer with Embedded Self-Regulated Learning Strategies on the Argumentative Writing of Students in Inclusive Cross-Curricula Settings. Computers and Education, 137, 78–90. https://doi.org/10.1016/j.compedu.2019.03.008

Ciampa, K., Wolfe, Z., and Hensley, M. (2025). From Entry to Transformation: Exploring AI Integration in Teachers' K-12 Assessment Practices. Technology, Pedagogy and Education, 34(2), 141–160. https://doi.org/10.1080/1475939X.2024.2413378

Clark, D. B., Tanner-Smith, E. E., and Killingsworth, S. S. (2016). Digital Games, Design, and Learning: A Systematic Review and Meta-Analysis. Review of Educational Research, 86(1), 79–122. https://doi.org/10.3102/0034654315582065

Desai, A. N., and Mistry, K. R. (2025). Creative Resistance: Artistic Identity as a Catalyst for Educational Resilience Among Mumbai Slum Youth. Journal of Urban Education and Sociology, 42(1), 88–105.

Evmenova, A. S., Borup, J., and Shin, J. (2024). Harnessing the Power of Generative AI to Support All Learners. Techtrends, 68, 830–831. https://doi.org/10.1007/s11528-024-00966-x

Evmenova, A. S., Regan, K., Mergen, R., and Hrisseh, R. (2024). Improving Writing Feedback for Struggling Writers: Generative AI to the Rescue? TechTrends, 68, 790–802. https://doi.org/10.1007/s11528-024-00965-y

Geyer, A., et al. (2022). Differentially Private Federated learning: A Client Level Perspective. IEEE Transactions on Mobile Computing, 21(4), 1461–1473. https://doi.org/10.1109/TMC.2020.3037920

Gourikeremath, G., & Hiremath, R. (2025). Institutional Repositories in Karnataka Universities: Status Assessment, AI-Assisted Framework Development and Future Research Directions. ShodhAI: Journal of Artificial Intelligence, 2(1), 63–75. https://doi.org/10.29121/shodhai.v2.i1.2025.48

Holmes, J. H., et al. (2021). Ethical and Regulatory Considerations in the Use of Machine Learning for Health Care. The Lancet Digital Health, 3(8), e475–e482.

Ithurbide, C., Bouquillion, P., Parthasarathi, V., and Sneha, P. P. (2023). Introduction: Platform Challenges to Creative Industries in India. Contemporary South Asia, 31(2), 268–275. https://doi.org/10.1080/09584935.2023.2203904

Jagodzinski, J. (2024). The Significance of Art Education for the Post-Anthropocene: Non-Philosophy in a Newer Key. International Journal of Art and Design Education, 43(3), 478–492. https://doi.org/10.1111/jade.12518

Jurriëns, E. (2019). The Countryside in Indonesian Contemporary Art and Media: From Distant Horizons to Traversing Drones. Bijdragen Tot De Taal-, Land- En Volkenkunde, 175(4), 446–473. https://doi.org/10.1163/22134379-17502023

Kane, C. L. (2010). "Programming the Beautiful": Informatic Color and Aesthetic Transformations in Early Computer Art. Theory, Culture and Society, 27(1), 73–93. https://doi.org/10.1177/0263276409350359

Kanwal, A., et al. (2022). Exploring New Drug Targets for Type 2 Diabetes: Success, Challenges and Opportunities. Biomedicines, 10(2). https://doi.org/10.3390/biomedicines10020331

Kim, J., and Chung, Y. J. (2023). A Case Study of Group art Therapy Using Digital Media for Adolescents with Intellectual Disabilities. Frontiers in Psychiatry, 14. https://doi.org/10.3389/fpsyt.2023.1172079

Lankshear, C., and Knobel, M. (2015). Digital Literacy and Digital Literacies: Policy, Pedagogy and Research Considerations for Education. Nordic Journal of Digital Literacy, 10, 8–20. https://doi.org/10.18261/ISSN1891-943X-2015-Jubileumsnummer-02

Marino, M. T., Vasquez, E., Dieker, L., Basham, J., and Blackorby, J. (2023). The Future of Artificial Intelligence in Special Education Technology. Journal of Special Education Technology, 38(3), 404–416. https://doi.org/10.1177/01626434231165977

Musale, M. (2025). The Importance of Succession Planning in Talent Retention: Developing Future Leaders Within the Organization. International Journal on Research and Development – A Management Review, 14(1), 146–148. https://doi.org/10.65521/ijrdmr.v14i1.311