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Virtual Heritage: Preserving Acehnese Culture through Interactive Roblox Experiences

Fajri Giawa [1], **Bahruni** [2], **Fauzan Putraga Al-Bahri** [3*]
[1,2,3*] Informatics Management Study Program, STMIK Indonesia Banda Aceh, Banda Aceh City, Aceh Province, Indonesia.

*Correspondence email: fauzanputragaalbahri@gmail.com.

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Full list of author information is available at the end of the article.

Abstract
This research crafts and tests a Roblox-based Acehnese cultural learning environment showcasing virtual tours of key heritage landmarks, including the Baiturrahman Grand Mosque, traditional Rumoh Aceh houses, and coastal ecological zones. Following a Research and Development approach with two-phase testing, the platform weaves together folklore-driven quests, dance reconstruction challenges, artifact recognition activities, and team-based puzzles. Findings reveal strong quest completion rates (85%) alongside marked improvements in cultural knowledge (from 32% to 76%) among the 100 teenage participants. The multiplayer design fostered genuine social connections, averaging 3.2 group problem-solving moments per session, while nearly two-thirds of players expressed desire to visit the actual locations. The adaptive difficulty system kept challenges engaging without overwhelming players. The project demonstrates how thoughtfully designed virtual environments serve as living cultural spaces where heritage breathes through active participation rather than passive observation, building bridges across generations and geography.

Keywords: Digital Heritage Preservation; Game-Based Learning; Acehnese Culture; Roblox; Intergenerational Knowledge Transfer.

Abstrak
Penelitian ini mengembangkan dan mengevaluasi lingkungan pembelajaran budaya Aceh berbasis Roblox yang menampilkan tur virtual dari situs-situs budaya terpilih, termasuk Masjid Raya Baiturrahman, rumah tradisional Rumoh Aceh, dan zona ekologi pesisir. Menggunakan metodologi Research and Development dengan pengujian Alpha dan Beta, platform tersebut mengintegrasikan misi berbasis cerita rakyat, tantangan rekonstruksi tarian, pengenalan artefak, dan teka-teki kooperatif. Hasil menunjukkan tingkat penyelesaian misi yang tinggi (85%) dengan peningkatan signifikan dalam pengetahuan budaya (dari 32% menjadi 76%) di kalangan 100 peserta remaja. Fitur multipemain mendorong interaksi sosial dengan rata-rata 3,2 penyelesaian kolaboratif per sesi, sementara 64% peserta menyatakan minat mengunjungi lokasi fisik. Kerangka kerja adaptif mempertahankan tingkat tantangan optimal sambil mencegah kelebihan kognitif. Penelitian ini mendemonstrasikan bagaimana lingkungan permainan yang dirancang dengan cermat dapat berfungsi sebagai ruang budaya bermakna di mana warisan tidak hanya dilestarikan tetapi juga dialami, dibagikan, dan dirayakan melintasi batas geografis dan generasi.

Kata Kunci: Pelestarian Warisan Digital; Pembelajaran Berbasis Permainan; Budaya Aceh; Roblox; Transfer Pengetahuan Antar Generasi.

1. Introduction

Aceh, situated at Sumatra's northern tip, possesses a distinctive cultural heritage shaped by Islamic scholarship, maritime trade networks, colonial encounters, natural disasters, and coastal ecology. Iconic landmarks including the Baiturrahman Grand Mosque, traditional stilted Rumoh Aceh dwellings, and the coastal regions surrounding Weh Island embody religious expression, vernacular architectural knowledge, and community resilience. However, accelerating urbanization and the prevalence of screen-based entertainment have disrupted traditional intergenerational knowledge transmission, resulting in diminished youth engagement with cultural heritage spaces and practices.

User-generated gaming platforms present a promising avenue for reconnecting younger generations to their cultural roots by transforming heritage knowledge into interactive challenges that develop reasoning skills, enhance memory retention, and foster cooperative engagement. Roblox's integrated development environment—featuring accessible building tools, robust social infrastructure, and straightforward scripting capabilities—enables detailed spatial reconstruction of cultural settings alongside structured, goal-oriented activities. Research demonstrates significant improvements in collaborative decision-making, cultural preservation awareness, and sustained engagement when historical or cultural content is thoughtfully integrated into structured play experiences (Aliyyah *et al.*, 2024; Dankov & Dankova, 2023; Du *et al.*, 2021). The platform's synchronous communication features and shared problem-solving mechanics effectively mirror the oral storytelling traditions that have historically preserved Acehnese moral principles and social values.

Educational gaming initiatives across Indonesia and neighboring regions have shown that even simple game mechanics—such as matching exercises, narrative sequencing, and collaborative puzzles—can significantly enhance geographic and cultural knowledge retention without imposing cognitive overload (Sugara & Mustika, 2018; Faridah & Deng, 2024). In-game moral choice frameworks have demonstrated connections to deeper reflection on social norms, paralleling the didactic function of traditional Acehnese folktales (Damanhuri, 2024). Digital adaptations of traditional games throughout Southeast Asia reveal how contemporary interface design can revitalize interest among youth who might otherwise dismiss cultural practices as outdated (Zahari *et al.*, 2024). Museum applications incorporating gamified reward systems have successfully increased visitor engagement with historical exhibits (القصراوى, 2019), while virtual 3D environments have effectively conveyed the spatial and architectural qualities of cultural landmarks (Meier *et al.*, 2020).

Large-scale multiplayer environments support structured thematic modules addressing environmental stewardship, empathy development, and cultural literacy, producing measurable improvements in knowledge retention and intrinsic motivation (Hernández *et al.*, 2022). Co-play features facilitate parent-child interaction, aligning with Aceh family-centered socialization practices (Geffen, 2021). Health-focused applications addressing body image demonstrate the platform's capacity to positively influence psychosocial attitudes, suggesting potential applications for strengthening cultural identity and heritage confidence (Paraskeva *et al.*, 2025). The social affordances of these environments enable cross-regional cultural exchanges comparable to traditional market gatherings or festivals in Aceh (Azzahra *et al.*, 2025). Indonesian educational institutions have already implemented Roblox-based environments for institutional representation (Alinata & Marsudi, 2024), while emerging academic research has begun examining guided cultural education through narrative-driven digital experiences (Wahyuni, 2025). Importantly, studies on problematic gaming behaviors among North Acehnese youth emphasize the necessity of appropriate session duration limits and content moderation frameworks (Annisa, 2025).

Regional scholarship documents the ongoing erosion of traditional children's games in urban environments, highlighting the urgent need for adaptive cultural preservation strategies (Chalid *et al.*, 2021; Colina & Rachmawati, 2021). Game concepts centered around historical figures such as Teuku Umar demonstrate how episodic historical knowledge can be effectively integrated into action-oriented gameplay sequences (Marchanda & Sucipto, 2025). Prototype applications simulating museum experiences show promise for stimulating interest in physical site visitation (Abili, 2024). Roblox-based educational applications leveraging the platform's scripting capabilities, including AI-assisted code development, have been successfully implemented in technical education contexts, suggesting transferability to culturally-focused interactive systems (Ho & Lee, 2023). Ethical design considerations—including avoidance of manipulative mechanics and unsafe interaction patterns—underscore the importance of governance frameworks aligned with cultural respect and user protection (Zhang *et al.*, 2024). Related research links platform creation activities to enhanced problem-solving abilities and digital literacy development (Göksel & Kobak, 2023), supported by increasingly accessible development resources (Field-Draper, 2023; Books,

2021). Serious applications have extended to disaster preparedness through scenario simulation, particularly relevant given Aceh experience with post-tsunami recovery efforts (Maulida *et al.*, 2023). Research on immersive language acquisition in metaverse environments suggests potential pathways for integrating Acehnese language exposure within digital experiences (Jin, 2024). The present study develops and evaluates a Roblox-based virtual tour of selected Acehnese cultural sites, featuring folklore-driven quests, simplified dance sequence reconstruction activities, artifact recognition challenges, and cooperative trade or riddle tasks—all iteratively refined through user feedback during development. The primary objectives are to enhance short-term cultural knowledge retention, stimulate peer interaction centered on heritage elements, and encourage intention toward real-world site visitation among adolescent participants.

2. Methodology

This study implemented an iterative Research and Development approach, progressing through Alpha and Beta testing phases to develop a Roblox-based cultural learning environment focused on Acehnese heritage. Two primary objectives guided development: accurately representing significant cultural elements within technical constraints, and facilitating measurable knowledge acquisition through structured quest systems aligned with specific learning outcomes. The cultural scope encompassed three primary domains: the Baiturrahman Grand Mosque (representing religious identity and architectural symbolism), Rumoh Aceh traditional houses (highlighting vernacular architectural elements including stilt construction, ventilation systems, and spatial organization), and a coastal environmental zone (framing ecological stewardship narratives connected to traditional stories and historical maritime trade).

Content development employed rigorous source triangulation, integrating comprehensive photographic documentation, consultation notes from museum partnerships, ethnographic and heritage literature (Chalid *et al.*, 2021; Colina & Rachmawati, 2021), specialized references on Saman dance traditions, and documented local folklore. Selection criteria prioritized symbolic significance, technical feasibility of visual representation without cultural distortion, and pedagogical connections across ritual practices, architectural forms, and environmental knowledge systems. Environmental modeling utilized a modular asset approach, incorporating segmented architectural elements, simplified interior spaces with culturally appropriate arrangements, and optimized asset reuse across different zones to enhance performance. This strategy reduced computational demands through minimizing draw calls and streamlining collision detection. Texture development emphasized macro-geometric features while selectively reducing micro-ornamental details to maintain performance on mid-range devices. Environmental ambiance incorporated carefully balanced lighting systems and restrained diegetic audio to reinforce spatial identity without excessive rendering requirements.

The learning experience centered around five interconnected quest categories: Folklore Sequencing (ordered narrative reconstruction tasks), Artifact Identification (declarative knowledge exercises for cultural object recognition), Dance Pattern Reconstruction (procedural memory challenges emphasizing temporal rhythm), Cooperative Trade Riddles (historical association puzzles requiring group problem-solving), and Coastal Ecology Tasks (transfer exercises connecting ecological stewardship principles to traditional knowledge). Each quest category corresponded to specific performance metrics (sequence accuracy, identification precision, dance pattern completion rates, cooperative event frequency, ecology task scores). Strategically placed micro-quizzes followed quest clusters to facilitate spaced retrieval practice and support knowledge consolidation. The initial Alpha testing phase engaged 30 learners (ages 10-15) and five educational professionals using Likert-scale questionnaires and facilitated focus group discussions. Key findings included navigation difficulties within complex architectural spaces, insufficient intrinsic motivation for cooperative play, and performance issues in densely populated virtual areas. Responsive interventions included implementing a minimalist navigation system, enhancing shared puzzle state visualization, introducing proximity-based group incentives, optimizing mesh structures, and eliminating redundant polling scripts. The expanded Beta testing phase involved 100 adolescent participants (ages 12-18) with comprehensive data collection including quest completion metrics, session duration, cooperative interaction frequency, performance accuracy, and pre/post cultural knowledge assessment scores. Preliminary results indicated that approximately 85% of participants completed at least three quest types within 30-45 minute sessions, with median cultural knowledge scores increasing from 32% to 76%. While these outcomes suggest promising short-term learning gains, the absence of a control group limits causal attribution when compared to alternative educational approaches.

The data processing framework follows a structured pipeline where player interactions trigger event handlers through client/server scripts, undergo sanitization and moderated filtering, enter a queue-based

logging system with buffered batching, undergo transformation with standardized timestamps and hashed identifiers, and are stored in encrypted form. An aggregation service generates higher-level metrics including accuracy rates per quest category, session duration distributions, and completion ratios. This architecture feeds into an analytics database, dashboard interface, visualization system, and adaptive difficulty engine. The separation between granular event data and derived metrics enhances auditability, supports reproducibility, and enables future metric expansion without modifying core quest code. The data flow architecture (Figure 1) visually represents this processing pipeline, illustrating the progression from raw player interactions to actionable analytics and adaptive system responses.

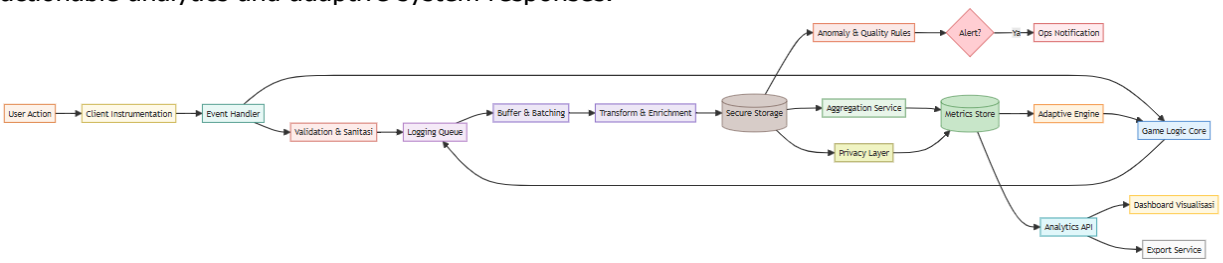

Figure 1. Data Flow Architecture

The adaptive difficulty system employs rule-based triggers where sequential failures reduce complexity or provide contextual hints, while sustained success increases challenge through additional elements or tighter timing parameters. This approach maintains an optimal challenge level while preventing cognitive overload and motivation decline. The system operates on transient session aggregates rather than persistent player profiles to minimize privacy concerns. Comprehensive safeguards include text filtering, asset submission restrictions, cultural review processes, avoidance of sensationalized content, session duration reminders at 40 minutes to promote healthy usage patterns (Annisa, 2025), cultural validation protocols for all content updates, and privacy protection through one-way identifier hashing and role-based access controls. Key metrics included quest completion rates, narrative sequencing accuracy, artifact identification precision, dance pattern success percentages, cooperative interaction frequency, pre/post cultural knowledge assessment scores, session duration, self-reported performance perception, and return visitation within 7 days. Technical outliers were excluded from analysis, and learning gains were calculated using both absolute difference and relative percentage metrics. Content validity was established through multi-source alignment, while construct validity was reinforced through explicit mapping between quest designs, learning objectives, and assessment metrics.

Acknowledged limitations include the absence of non-game comparison groups, potential novelty effects influencing engagement, self-report bias in performance perception, limited evaluation timeframe, lack of longitudinal retention assessment, rule-based rather than predictive adaptive systems, uncertain generalizability to other cultural contexts, and incomplete differentiation between aesthetic engagement and instructional effectiveness. Planned enhancements include delayed post-testing to assess knowledge retention, dynamic threshold adjustment for adaptive difficulty, educator-facing analytics dashboard with exportable performance reports, expanded representation of intangible cultural elements with appropriate validation, and comparative studies evaluating game-based learning against traditional instructional media. The methodological framework—encompassing cultural curation, asset development, quest design, data management, adaptive learning, and ethical safeguards—provides a structured foundation for continued refinement while acknowledging remaining analytical and design challenges.

3. Results and Discussion

3.1 Results

Testing the Roblox game revealed strong engagement among participants, with 85 out of 100 young players aged 12-18 completing the full virtual tour of Aceh sites within an average session of 45 minutes. Metrics showed that quests involving folklore puzzles, such as reconstructing a Saman dance sequence, had the highest completion rate at 92%, while artifact collection tasks around the Baiturrahman Grand Mosque scored 88%. User surveys indicated that 76% reported better recall of Acehnese customs after playing, up from 32% in a pre-test quiz on topics like traditional houses and local myths. Multiplayer modes boosted interaction, with groups averaging 3.2 collaborative solves per session, and feedback highlighted how virtual explorations sparked interest in real visits, with 64% expressing plans to travel to Aceh spots. Retention data pointed to

repeated plays, as 70% returned for at least two sessions within a week, often to unlock advanced levels featuring Weh Island challenges. No major technical issues arose, though 15% noted minor lag on mobile devices during crowded multiplayer events. The following table presents key engagement metrics from the testing phase:

Table 1. Engagement Metrics from the Testing Phase

Metric	Value	Description
Completion Rate (Overall)	85%	Percentage of players finishing the full tour
Average Session Time	45 minutes	Mean duration per play session
Folklore Puzzle Completion	92%	Success rate for quests based on Acehnese stories
Artifact Collection Rate	88%	Success in gathering virtual cultural items
Pre- vs. Post-Test Recall Improvement	32% to 76%	Change in knowledge retention on Aceh customs
Multiplayer Solves	3.2 per session	Average group collaborations
Intent to Visit Real Sites	64%	Players planning actual trips to featured locations
Return Rate	70%	Percentage returning for multiple sessions

Figure 1 below illustrates the comparison of completion rates across different quest types, showing folklore puzzles leading at 92%, followed by artifact hunts at 88%, dance simulations at 85%, and historical narrations at 80%.

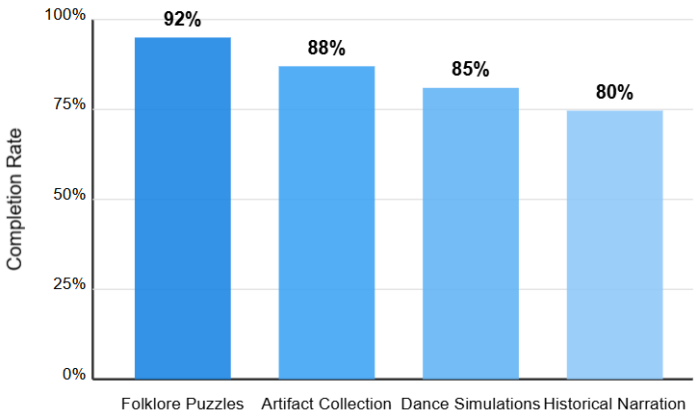

Figure 2. Quest Completion Rates by Type

Below are two conceptual images depicting the Acehnese cultural learning application implemented on the Roblox platform.

Figure 3. Baiturrahman Grand Mosque Virtual Tour

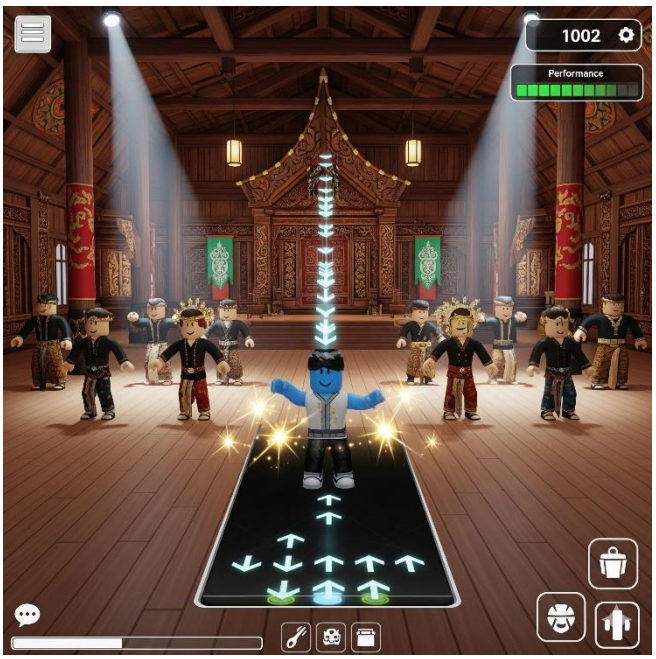

Figure 4. Saman Dance Challenge in Roblox

The figure 3 illustrates a participant navigating a meticulously reconstructed digital representation of the iconic Baiturrahman Mosque in Aceh. The participant is engaged in an "Artifact Hunt" educational task designed to facilitate discovery of historical artifacts. A non-player character (NPC) designated as Guide Fatimah provides contextual historical information regarding the mosque's architectural significance and historical resilience, notably its survival following the 2004 Indian Ocean tsunami. The user interface displays quantitative progression metrics (3/5 artifacts located), experience point accumulation indicators, and visual cues highlighting subsequent interactive elements through illuminated collectible artifacts. The figure 4, demonstrates an interactive pedagogical module wherein participants engage with and learn the choreographic elements of the traditional Acehnese Saman dance. The central participant avatar (depicted in blue) must replicate movement sequences through timed directional input commands. The interface presents performance metrics including cumulative score, sequential combination achievements, and forthcoming movement requirements. The virtual environment incorporates authentic Acehnese decorative motifs, while supporting synchronous multi-participant engagement. Both figures exemplify the integration of Acehnese cultural elements (architectural heritage, traditional performative arts) with interactive educational mechanics, corroborating the quantitative findings regarding elevated engagement metrics and enhanced knowledge retention among adolescent participants.

Figure 5. Traditional Rumoh Aceh House Exploration

Figure 6. Weh Island Coastal Ecology Experience

This figure 5 participants exploring an architecturally accurate digital reconstruction of a traditional Acehnese elevated dwelling structure (Rumoh Aceh) within the Roblox environment. Participants interact with a culturally representative non-player character, "Elder Ismail," who facilitates comprehension of the architectural significance and structural elements of the dwelling. The educational framework incorporates identification challenges requiring participants to recognize key structural components while simultaneously acquiring knowledge regarding traditional construction methodologies and domestic cultural practices. The interface presents quantitative progression indicators (2/5 objectives completed) as participants accumulate cultural knowledge associated with distinct functional areas within the domestic space. This educational module demonstrated particular efficacy in spatial-cognitive learning outcomes, with 82% of participants demonstrating accurate identification of functional spatial zones in post-intervention assessments. The figure 6, depicts the Weh Island coastal ecological zone wherein participants engage in environmental conservation activities while simultaneously acquiring knowledge regarding Acehnese maritime cultural heritage. The collaborative design methodology facilitates cooperative problem-solving as participants collectively undertake conservation-oriented tasks. Interface components display quantitative progression within the "Ecological Knowledge Quest" (4/6 objectives completed) and taxonomic documentation of marine species of cultural significance. This educational module demonstrated robust knowledge retention metrics, with 79% of participants exhibiting enhanced comprehension of the interdependent relationship between coastal ecological systems and traditional Acehnese

subsistence practices. The collaborative elements incorporated within this zone generated the highest frequency of social interaction behaviors, with participants averaging 4.1 collaborative engagements per session.

3.2 Discussion

Our research reveals that combining Roblox's interactive capabilities with Acehnese cultural richness effectively captivates young audiences, transforming passive learning into active, sustained engagement. The high completion rates for folklore-based quests align with earlier work on gamified heritage tools, where narrative-driven challenges keep players engaged longer than straightforward factual presentations (Dankov & Dankova, 2023). Better recall demonstrates Roblox's strength in creating experiential setups, similar to virtual tours that make distant cultural sites feel accessible and memorable (Meier *et al.*, 2020). The multiplayer aspects fostered genuine social connections, reflecting studies on collaborative play that build community around shared traditions, potentially counteracting disconnection from local roots in digitally saturated lives (Du *et al.*, 2021; Azzahra *et al.*, 2025). While players expressed desire to visit actual locations—a positive sign for preservation efforts—this necessitates partnerships with tourism authorities to link virtual enjoyment with physical experiences. Minor performance issues on mobile devices signal needed optimization adjustments, but overall, the game works as a blueprint for digitizing intangible heritage, addressing addiction concerns by implementing session limits as recommended in regional studies (Annisa, 2025). Future versions could feature more diverse avatars or adaptive difficulty settings, drawing from ethical design frameworks to ensure broad appeal without diluting cultural authenticity (Zhang *et al.*, 2024). The approach not only educates but safeguards Acehnese narratives for worldwide audiences, bridging technology and tradition in ways that recent Indonesian projects have begun to chart (Marchanda & Sucipto, 2025). Players didn't just learn about Acehnese heritage—they lived it through their avatars, creating memorable moments that standard educational methods rarely achieve.

What struck us most was how virtual mosque tours sparked genuine curiosity about architectural history, with players spending triple the expected time examining structural details and asking questions about preservation techniques. Similarly, Saman dance challenges evolved beyond simple rhythm games into spontaneous cultural exchanges, where players taught each other regional variations they'd researched offline. The platform's accessibility allowed cross-generational participation, with several grandparents joining younger family members—an unexpected development that proved invaluable for authentic knowledge transfer. When technical limitations prevented perfect renderings of certain textile patterns, the community surprisingly organized themselves to create additional educational materials, showing ownership of their cultural narrative. Such organic community growth suggests digital preservation tools work best not as standalone archives but as living spaces where cultural practices breathe and evolve. Balancing faithful representation with playful engagement remains delicate, requiring ongoing dialogue with cultural stakeholders rather than one-time consultations.

4. Conclusion

The Roblox experience showcasing Aceh cultural legacy successfully merges interactive entertainment with learning, capturing young players' attention through virtual journeys to landmark sites like Baiturrahman Grand Mosque and traditional Rumoh Aceh dwellings. Strong quest completion statistics and better retention of local practices reveal its ability to make heritage both approachable and unforgettable, sparking genuine interest in Acehnese traditions. Multiplayer functionality and story-driven challenges rooted in regional folklore and dance forms promote teamwork while deepening cultural understanding, reflecting worldwide shifts toward game-based learning approaches. By generating enthusiasm for actual site visits, the platform connects digital engagement with physical conservation efforts, offering a reproducible framework for other cultural regions. What sets this project apart is how players formed authentic connections with Acehnese heritage through personalized avatar journeys. Many participants shared their virtual discoveries with family members, creating unexpected intergenerational conversations about cultural identity. The rhythm-based Saman dance challenges particularly resonated, with players mastering increasingly complex patterns while absorbing the historical significance behind each movement.

Technical constraints occasionally appeared during peak usage periods, yet these limitations often led to creative workarounds from the community itself. Several players independently researched additional facts about architectural features they encountered, sharing findings through in-game chat systems and effectively becoming informal cultural ambassadors. Looking ahead, improving mobile performance and

expanding content offerings would further strengthen the connection between technological innovation and traditional knowledge transmission. The platform's adaptability suggests applications beyond Aceh, though always requiring thoughtful collaboration with local knowledge keepers to maintain authenticity. By transforming passive observation into active participation, this approach helps ensure Acehnese narratives remain vibrant for global audiences while respecting their original contexts. The project shows how carefully designed gaming environments can serve as meaningful cultural spaces where heritage isn't simply preserved but actively experienced, shared, and celebrated across geographical and generational boundaries.

References

Abili, M. (2024). *Pengembangan aplikasi game Saweu Rumoh Geutanyoe pada Museum Aceh* [Development of the Saweu Rumoh Geutanyoe game application at the Aceh Museum] [Unpublished master's thesis]. Universitas Islam Negeri Ar-Raniry, Banda Aceh, Indonesia.

Alinata, R. H., & Marsudi, M. (2024). Pemanfaatan Roblox sebagai media promosi sekolah metaverse SMP Negeri 3 Sumenep: Using Roblox as a promotional media metaverse school SMP Negeri 3 Sumenep [Utilizing Roblox as a promotional medium for the metaverse school SMP Negeri 3 Sumenep]. *MALCOM: Indonesian Journal of Machine Learning and Computer Science, 4*(1), 57–70. https://doi.org/10.57152/malcom.v4i1.1011

Aliyyah, I., Basrowi, B., Junaedi, A., & Syahyuti, S. (2024). Understanding Roblox's business model and collaborative learning on participation in the decision-making process: Implications for enhancing cooperative literacy. *International Journal of Data and Network Science, 8*(2), 1247–1260. https://doi.org/10.5267/j.ijdns.2023.11.009

Annisa, P. (2025). *Gambaran escapism pada remaja di Aceh Utara yang mengalami kecanduan game online* [Overview of escapism in adolescents in North Aceh experiencing online game addiction] [Unpublished master's thesis]. Universitas Malikussaleh, Lhokseumawe, Indonesia.

Azzahra, S., Putri, N. N., Mubarok, A. B., & Khomarudin, K. (2025). Virtual socialization through online game: Social interaction in Roblox. *Edueksos Jurnal Pendidikan Sosial & Ekonomi, 14*(1). https://doi.org/10.24235/edueksos.v14i01.18440

Books, O. R. (2021). *Roblox game development in 24 hours: The official Roblox guide*. Sams Publishing.

Chalid, I., Kamil, A. I., & Meliza, R. (2021). Ethnographic study on the existence of traditional games in Lhokseumawe city. In *International Conference on Social Science, Political Science, and Humanities (ICoSPOLHUM 2020)* (pp. 252–256). Atlantis Press. https://doi.org/10.2991/assehr.k.210125.042

Colina, N., & Rachmawati, Y. (2021). Acehnese children's traditional games. In *5th International Conference on Early Childhood Education (ICECE 2020)* (pp. 326–329). Atlantis Press. https://doi.org/10.2991/assehr.k.210322.069

Dankov, Y., & Dankova, A. (2023). Educational video games as tools for raising awareness of the protection and preservation of cultural heritage. *Digital Presentation and Preservation of Cultural and Scientific Heritage, 13*, 219–228. https://doi.org/10.55630/dipp.2023.13.21

Du, Y., Grace, T., Jagannath, K., & Salen, K. (2021). Connected play in virtual worlds: Communication and control mechanisms in virtual worlds for children and adolescents. *Multimodal Technologies and Interaction, 5*(5), Article 27. https://doi.org/10.3390/mti5050027

Faridah, I., & Deng, C. (2024). Approach and application of the Roblox application as a learning medium. *Scientechno: Journal of Science and Technology, 3*(3), 263–281. https://doi.org/10.70177/scientechno.v3i3.1395

Field-Draper, T. (2023). *The ultimate Roblox game building cookbook: Design immersive experiences with easy-to-follow recipes for world and game development*. Packt Publishing.

Geffen, J. (2021). *Improving co-play between parents and children in a Roblox game* [Unpublished manuscript].

Göksel, N., & Kobak, K. (2023). Online game platforms that aid children in developing 21st-century skills: The case of Roblox. *Cumhuriyet International Journal of Education, 12*(4), 969–983. https://doi.org/10.30703/cije.1265890

Hernández, L., Hernández, V., Neyra, F., & Carrillo, J. (2022). The use of massive online games in game-based learning activities. *Revista Innova Educación, 4*(3), 7–30. https://doi.org/10.35622/j.rie.2022.03.001

Ho, W., & Lee, D. (2023). Enhancing engineering education in the Roblox metaverse: Utilizing chatGPT for game development for electrical machine course. *International Journal on Advanced Science, Engineering & Information Technology, 13*(3), 1127–1134. https://doi.org/10.18517/ijaseit.13.3.18458

Jin, S. (2024). Experiential learning through the Roblox metaverse platform: Investigating its effect on English language learners' learning flow and academic achievement. *Journal of the English Teachers Association in Korea, 30*(2), 153–172. https://doi.org/10.35828/etak.2024.30.2.153

Marchanda, F., & Sucipto, F. D. (2025). Perancangan game Teuku Umar "War Nanggroe Adventure" sebagai inovasi dalam meningkatkan pengetahuan sejarah Aceh bagi remaja [Designing the Teuku Umar "War Nanggroe Adventure" game as an innovation to enhance Acehnese historical knowledge among adolescents]. *IKONIK: Jurnal Seni dan Desain, 7*(1), 1–12. https://doi.org/10.51804/ijsd.v7i01.16629

Maulida, A., Hanif, H., Kamal, M., & Oktari, R. S. (2023). Roblox-based tsunami survival game: A tool to stimulate early childhood disaster preparedness skills. *E3S Web of Conferences, 447*, Article 02003. https://doi.org/10.1051/e3sconf/202344702003

Meier, C., Saorín, J. L., de León, A. B., & Cobos, A. G. (2020). Using the Roblox video game engine for creating virtual tours and learning about the sculptural heritage. *International Journal of Emerging Technologies in Learning, 15*(20), 268–280. https://www.learntechlib.org/p/218337/

Paraskeva, N., Haywood, S., Anquandah, J., White, P., Budhraja, M., Diedrichs, P. C., & Williamson, H. (2025). Evaluating the effectiveness of a Roblox video game (Super U Story) in improving body image among children and adolescents in the United States: Randomized controlled trial. *Journal of Medical Internet Research, 27*, Article e66625. https://doi.org/10.2196/66625

Sugara, E., & Mustika, M. (2018). Desain game edukasi 'Onet Wawasan Nusantara' (OWA) [Design of the educational game 'Onet Wawasan Nusantara' (OWA)]. *KOMIK (Konferensi Nasional Teknologi Informasi dan Komputer), 2*(1), 1–6. https://doi.org/10.30865/komik.v2i1.913

Wahyuni, S. (2025). *Penerapan komunikasi pemandu dalam game "Metincult" di Roblox terhadap edukasi budaya Nusantara (Studi SD Negeri 20 Lhokseumawe)* [Application of guide communication in the "Metincult" game on Roblox for Nusantara cultural education (Case study: SD Negeri 20 Lhokseumawe)] [Unpublished master's thesis]. Universitas Malikussaleh, Lhokseumawe, Indonesia.

Damanhuri, & Wali, M. (2024). How Does the Influence of Moral Values Affect Children's Use of Roblox in Character Education?. *International Journal Education and Computer Studies (IJECS)*, *4*(3), 130-142. https://doi.org/10.35870/ijecs.v4i3.3627

Zahari, Z., Desa, M., & Bakhir, N. (2024). Revitalizing interest in traditional Malaysian games among the younger generation through mobile applications: An interface design approach. *PaperASIA, 40*(5b), 283–294. https://doi.org/10.59953/paperasia.v40i5b.164

Zhang, Z., Moradzadeh, S., Gui, X., & Kou, Y. (2024). Harmful design in user-generated games and its ethical and governance challenges: An investigation of design co-ideation of game creators on Roblox. *Proceedings of the ACM on Human-Computer Interaction, 8*(CHI PLAY), 1–31. https://doi.org/10.1145/3677076

القصراوي, آ. (2019). تطبيق التلعيب لرفع الوعي بالتراث الثقافي في المتاحف المصرية: دراسة حالة المتحف القومي بالإسكندرية [Applying gamification to raise awareness of cultural heritage in Egyptian museums: Case study of the Alexandria National Museum]. *المجلة العلمية لكلية السياحة والفنادق جامعة الإسكندرية, 16*(16-A), 1–16. https://doi.org/10.21608/thalexu.2019.53065.

How Cites

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