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Ronald, Fernandez and Mico Gabriel, Alfaro and Lendon
Jay, Calvo and Leonora Alexandra, Seasol and Arwen Elijah,
Zape

Universidad de Manila

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BAYANI CHRONICLES: A 3D MOBILE GAME ON THE LIVES AND LEGACIES OF PHILIPPINE NATIONAL HEROES

Ronald B. Fernandez

ORCID ID - 0009-0007-0979-6315

Professor, College of Computing Studies, Universidad de Manila,
Philippines

Mico Gabriel C. Alfaro

Lendon Jay T. Calvo

Leonora Alexandra L. Seasol

Arwen Elijah F. Zape

UG Students, College of Computing Studies, Universidad de Manila, Philippines

ABSTRACT

In the digital age, traditional approaches to history education often fail to sustain student engagement and foster knowledge retention. This study presents Bayani Chronicles: A 3D Mobile Game on the Lives and Legacies of Philippine National Heroes, a capstone project designed to merge cultural learning with interactive digital entertainment. Developed using the Unity game engine, the project transforms Philippine history lessons into immersive experiences through quest-based storytelling, open-world exploration, and interactive mini-games. Guided by game-based learning theories and the Agile development model, the study employed developmental and experimental approaches. Data were collected from three respondent groups: students and teachers from Jose Abad Santos High School – Manila, and representatives of the National Historical Commission of the Philippines (NHCP). Evaluation using the ISO/IEC 25010 quality framework showed that the game achieved an overall “Above Average” rating across eight quality criteria, with particularly strong scores in usability, functional suitability, and educational value. Students emphasized the game’s ability to sustain interest and improve comprehension, teachers recognized its promise as a supplemental teaching tool, and NHCP representatives affirmed its historical accuracy and cultural relevance. These findings suggest that 3D mobile games can serve as innovative platforms for education, fostering both meaningful learning outcomes and renewed appreciation of national heritage.

Keywords:

Game-based learning, Philippine national heroes, 3D mobile game, interactive storytelling, cultural heritage, educational technology, Unity game engine

1. INTRODUCTION

In today’s digital era, technology has transformed education by introducing interactive and engaging platforms such as gamified systems and online learning tools. Among these, game-based learning has emerged as an effective strategy, combining interactive narratives, problem-solving activities, and immersive environments to enhance motivation and knowledge retention. Research has consistently shown that 3D learning environments support comprehension and student engagement by providing experiential and participatory opportunities.

In the Philippines, history education plays a vital role in shaping national identity and cultivating cultural appreciation. However, traditional methods that rely heavily on textbooks and lectures often fail to capture student interest, leading to limited retention of historical knowledge and weakened patriotism. While digital tools have been integrated into education, they are not always designed to encourage deep learning or engagement with national history.

The capstone project Bayani Chronicles: A 3D Mobile Game on the Lives and Legacies of Philippine National Heroes addresses these challenges by providing an interactive medium that transforms history into an engaging experience. Through quest-driven storytelling, open-world exploration, and interactive puzzles, the game encourages curiosity, critical thinking, and appreciation for the legacies of Philippine heroes. By combining gamification with historically accurate narratives, the project seeks to strengthen historical literacy and inspire a renewed sense of cultural pride among students.

2. OBJECTIVES

The primary objective of this study is to design and develop Bayani Chronicles: A 3D Mobile Game on the Lives and Legacies of Philippine National Heroes that addresses the challenge of sustaining students' interest in learning history. Specifically, the study aims to create a game that integrates interactive storytelling, historically accurate narratives, and engaging gameplay mechanics to transform history lessons into meaningful experiences. Furthermore, it seeks to evaluate the game's quality and educational potential through the ISO/IEC 25010 software quality framework, focusing on functional suitability, usability, performance efficiency, compatibility, reliability, security, maintainability, and portability. Students and teachers from Jose Abad Santos High School – Manila provided feedback on usability, engagement, and classroom applicability, while NHCP representatives evaluated cultural and historical accuracy. By achieving these objectives, the study demonstrates how educational games can bridge history and technology, fostering deeper learning and renewed cultural appreciation.

3. METHODOLOGY

This study adopted a combination of developmental and experimental research methods to design, build, and evaluate Bayani Chronicles: A 3D Mobile Game on the Lives and Legacies of Philippine National Heroes. The developmental phase focused on creating the game itself, while the experimental phase evaluated its educational effectiveness and technical quality.

3.1 Developmental Approach

The game was developed using the Unity game engine and guided by the Agile Software Development Life Cycle (SDLC). This iterative process included requirement gathering, game design, coding, and continuous testing. Stakeholder requirements were collected through consultations with students and teachers of Jose Abad Santos High School – Manila, as well as representatives of the National Historical Commission of the Philippines (NHCP) who ensured historical accuracy. Development involved designing storylines, characters, and environments, integrating gameplay mechanics, and refining the system through multiple test cycles.



Figure 1. Agile Methodology

3.2. Experimental Approach

The evaluation phase assessed the game based on the ISO/IEC 25010 quality standards, covering eight criteria: Functional Suitability, Performance Efficiency, Compatibility, Usability, Reliability, Security, Maintainability, and Portability. Three respondent groups participated in the evaluation:

- Students from Jose Abad Santos High School – Manila, who assessed usability, engagement, and learning value.
- Teachers from the same institution, who evaluated the game's potential as an educational supplement.
- NHCP representatives, who validated historical accuracy, cultural fidelity, and educational appropriateness.

Surveys and structured feedback forms were used to gather both quantitative ratings and qualitative comments. Data were analyzed by calculating weighted means and comparing perceptions across respondent groups. Additional observations from respondents were noted to provide deeper insights into technical and educational implications.

3.3 Ethical Considerations

All participants provided informed consent before participating in the study. Confidentiality of personal data was maintained throughout, and the game content was carefully designed to uphold respect for Philippine history and culture.

4 GAME DESIGN AND IMPLEMENTATION

Bayani Chronicles: A 3D Mobile Game on the Lives and Legacies of Philippine National Heroes was developed as an interactive, story-driven educational tool. The game combines open-world exploration, quest-based learning, and mini-games to present the lives and legacies of Philippine heroes in a way that is both engaging and historically accurate.

4.1 Narrative and Heroes

The game currently features 10 national heroes as part of its initial implementation: José Rizal, Andrés Bonifacio, Emilio Aguinaldo, Apolinario Mabini, Marcelo H. del Pilar, Graciano López Jaena, Antonio Luna, Gregorio del Pilar, Melchora Aquino, and Gabriela Silang. Each hero is represented through unique quests, interactive dialogues, and storylines that highlight their historical contributions. In the full implementation, an additional 27 heroes will be introduced, expanding the educational scope and content.



Figure 2. Character Selection Screen

4.2 Gameplay and Core Mechanics

The game is designed around a quest-based progression system, where players explore historically inspired environments, interact with non-playable characters (NPCs), and complete missions that reflect key events in each hero's life. Gameplay includes:

- Exploration: Open-world environments modeled after significant historical settings.
- Interactive Puzzles: Challenges that require critical thinking to reinforce learning.
- Mini-games: Short, engaging activities linked to historical events or concepts.
- Combat and Strategy: Historically accurate, limited combat scenarios to immerse players in the struggles faced by heroes without overshadowing educational content.

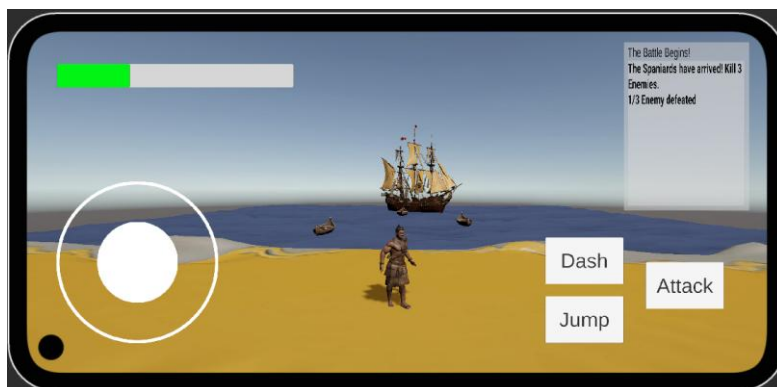


Figure 3. Screenshot of Sample Gameplay

3.4.3 Educational Features

The game integrates interactive storytelling and gamification principles to improve motivation and comprehension. Dialogues are designed to simulate conversations with historical figures, reinforcing factual learning while encouraging curiosity. Learning objectives are embedded in the game's progression system, ensuring that players absorb historical knowledge while engaging in gameplay.



Figure 4. Dialogue Screen Sample Gameplay

3.4.4 Technical Implementation

The game was built using the Unity 6 game engine, with the new Input System and joystick pack for mobile controls. Visual assets were designed to balance performance efficiency with immersive 3D environments, optimized for a range of Android devices. Iterative development and testing under the Agile SDLC ensured that gameplay mechanics, storylines, and user experience were refined continuously based on feedback from stakeholders.

5. RESULTS AND DISCUSSION

5.1 Demographic Distribution

Out of all respondents, 65% were students, 20% were teachers, and 15% were NHCP representatives. This ensured that the evaluation represented three critical perspectives: learners who experienced the game's usability and engagement, educators who assessed its pedagogical potential, and cultural experts who validated its historical accuracy.

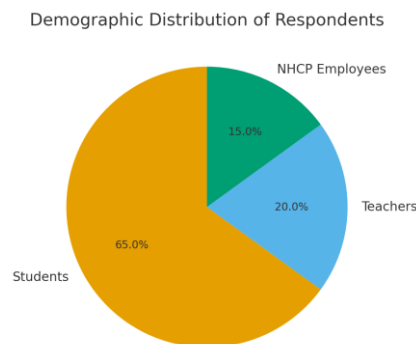


Figure 5. Demographic Distribution of Respondents

5.2 Functional Suitability

All groups rated the game highly in terms of its ability to meet intended functions. Students highlighted that the quests and missions directly conveyed historical lessons in an engaging format. Teachers noted that the game could effectively supplement classroom instruction. NHCP representatives emphasized that the game maintained fidelity to historical events and figures.

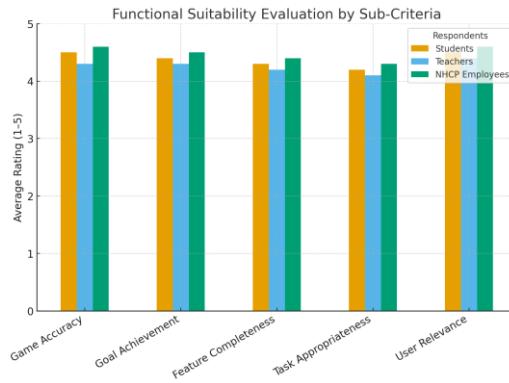


Figure 6. Functional Suitability Evaluation by Sub-Criteria

5.3 Performance Efficiency

Scores for performance were moderate, with some lower ratings from students using low-end Android devices. Technical issues such as occasional frame drops and longer loading times affected gameplay smoothness. Teachers observed that while the game functioned well on newer devices, optimization for a broader range of hardware would be necessary for wider adoption. This has significant implications for equity in Philippine education, as many students rely on budget smartphones. Ensuring optimization across a wider device spectrum would make the game more inclusive and accessible for public school learners.

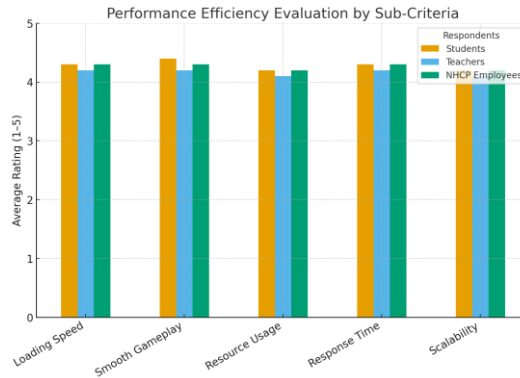


Figure 7. Performance Efficiency Evaluation by Sub-Criteria

5.4 Compatibility

The game scored modestly on compatibility, reflecting challenges in ensuring stable performance across different devices. Teachers pointed out that not all students owned devices capable of running 3D environments smoothly, which could create barriers to accessibility. NHCP respondents, while not primarily concerned with technical limitations, also noted that compatibility improvements would make the game more inclusive. Improving compatibility could help integrate the game into more classrooms, especially if paired with school-provided tablets or computer labs. This would expand its potential as a teaching resource nationwide.

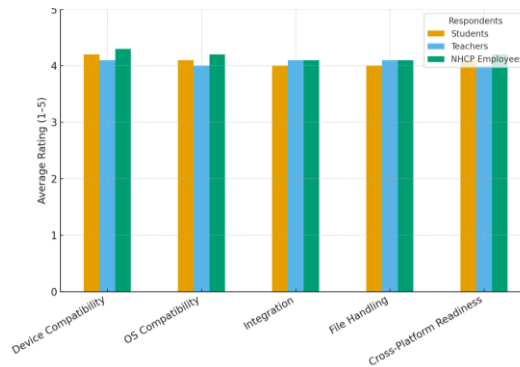


Figure 8. Compatibility Evaluation by Sub-Criteria

5.5 Usability

Usability received the highest ratings across all groups. Students praised the intuitive controls and engaging interface, while teachers valued the accessibility of the gameplay mechanics, noting that minimal instruction was required for students to navigate the game. NHCP representatives also commended the game for presenting history in a format that was easy to follow and appealing to modern learners. High usability indicates that minimal training is required, making the game practical for both classroom and independent learning. This ease of adoption lowers barriers for educators and encourages self-directed exploration by students.

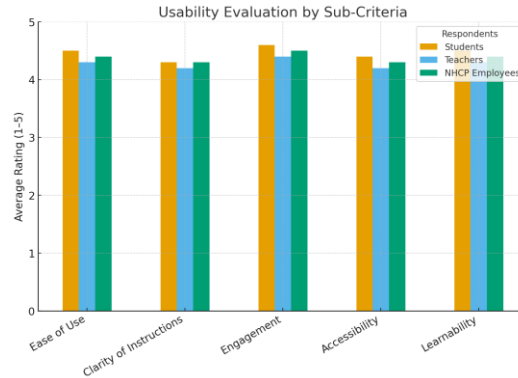


Figure 9. Usability Evaluation by Sub-Criteria

5.6 Reliability

Reliability was rated slightly lower compared to usability. Students reported occasional glitches such as temporary freezing when multiple quests were active. Teachers expressed concern that technical interruptions could disrupt learning momentum during class-based implementation. These findings indicate that while the system is generally stable, additional bug testing and quality assurance are needed. Reliability is critical in classroom settings, where technical interruptions can disrupt lesson flow. Enhancing stability would strengthen teacher confidence in using the game as a formal teaching aid.

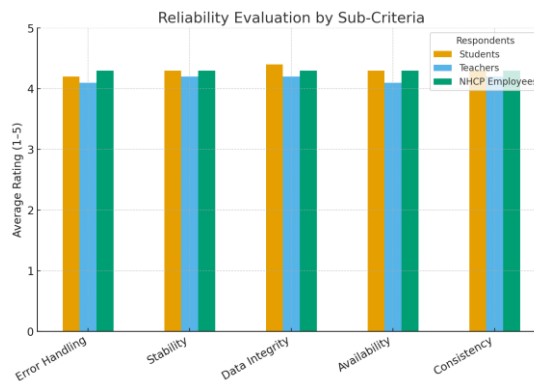


Figure 10. Reliability Evaluation by Sub-Criteria

5.7 Security

Security scored well overall, particularly since the game is primarily offline and does not expose sensitive user data. Teachers appreciated this feature as it reduces risks when introducing the game in academic settings. However, future online components, if implemented, would require additional measures such as data encryption and user authentication to maintain security. While offline design reduces risks, preparing for secure online features in the future (e.g., leaderboards, cloud saves) would allow broader scalability while safeguarding student data.

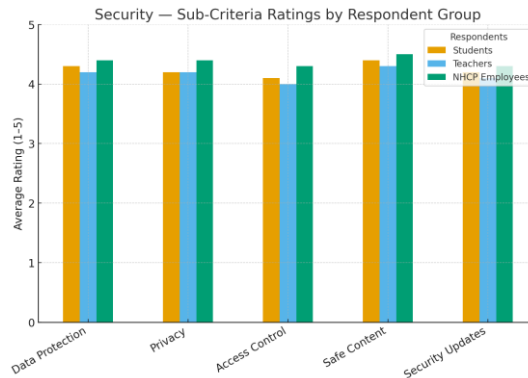


Figure 11. Security Evaluation by Sub-Criteria

5.8 Maintainability

Maintainability received moderate ratings, as the current version of the game is in its initial phase. Teachers and NHCP representatives noted that expanding the content to include additional heroes and historical contexts would require efficient update mechanisms. This indicates that building a modular system architecture will be important for sustainable long-term development. Strong maintainability ensures sustainability, especially when expanding from 10 to 37 heroes. A modular system will allow new content and updates without disrupting the existing game structure.

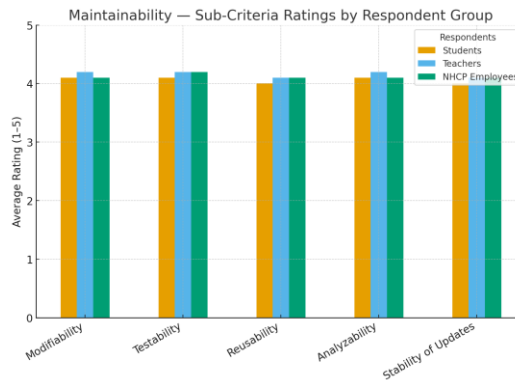


Figure 12. Maintainability Evaluation by Sub-Criteria

5.9 Portability

Portability scored the lowest across groups, as the game is currently limited to Android devices. Students and teachers expressed interest in iOS and PC versions, which would expand accessibility. NHCP representatives also suggested that broader platform availability would increase the game’s reach and impact in educational and cultural contexts. Expanding to iOS and PC platforms would significantly widen reach, enabling students and educators with diverse devices to use the game. This would make the tool more adaptable across varying school infrastructures.

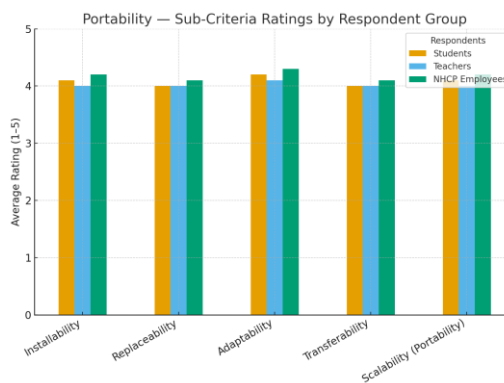


Figure 13. Portability Evaluation by Sub-Criteria

5.10 Overall Analysis

The overall results indicate that Bayani Chronicles achieved an “Above Average” performance across all ISO/IEC 25010 criteria. Usability, functional suitability, and educational value emerged as the strongest aspects, confirming the game’s ability to engage learners and deliver meaningful historical content. Meanwhile, lower scores in performance efficiency, compatibility, and portability highlight the technical challenges typical of 3D mobile games, particularly in resource-constrained environments. Importantly, NHCP representatives validated the game’s cultural and historical accuracy, underscoring its value not only as an educational tool but also as a medium for preserving and promoting national heritage.

6. ACKNOWLEDGEMENT

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7. CONCLUSION

The development and evaluation of Bayani Chronicles: A 3D Mobile Game on the Lives and Legacies of Philippine National Heroes demonstrated the potential of 3D mobile games as effective tools for enhancing history education. By combining quest-based storytelling, open-world exploration, and interactive puzzles, the game provided an engaging medium for students to connect with the lives and contributions of national heroes.

Evaluation across three respondent groups—students (65%), teachers (20%), and NHCP representatives (15%)—produced an overall “Above Average” rating under the ISO/IEC 25010 framework. Students emphasized improved engagement and comprehension, teachers highlighted its promise as a supplementary learning resource, and NHCP representatives validated the game’s historical and cultural accuracy. The strongest results were recorded in usability and functional suitability, confirming that the game was intuitive, accessible, and aligned with its educational objectives.

Nonetheless, challenges were identified in performance efficiency, compatibility, and portability, particularly when running on low-end devices or outside of Android platforms. Addressing these limitations through optimization, modular design, and cross-platform support will be vital for ensuring broader accessibility and long-term sustainability.

In conclusion, Bayani Chronicles successfully bridged entertainment and education by transforming historical lessons into interactive experiences. Beyond its immediate classroom application, the project contributes to cultural preservation and national pride by providing learners with a dynamic way to rediscover Philippine heroes. With further refinement, it holds strong potential to serve as a scalable model for integrating game-based learning into history education in the Philippines.

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