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TROPA RUN: MOBILE ADVENTURE GAME EXPLORING HISTORICAL PLACES IN THE PHILIPPINES

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ABSTRACT

Nowadays, mobile games serve not only as a form of entertainment but also as instruments for cultural preservation and education. Nevertheless, Filipino culture and history remain underrepresented in mobile gaming, which restricts opportunities for younger generations to engage with their heritage in significant ways. To tackle this issue, the developers created Tropa Run: Mobile Adventure Game Exploring Historical Places in the Philippines. The objective of the game is to enhance historical awareness and foster cultural appreciation through engaging missions, straightforward storytelling, and enjoyable gameplay. Tropa Run is a three-dimensional (3D) adventure running game where users must complete missions in order before unlocking the next stage. Each mission is set in a famous landmark: Intramuros, Calle Crisologo, the Banaue Rice Terraces, Colon Street, and the Relief Map of Mindanao. These locations were chosen to highlight the rich cultural legacy of Luzon, Visayas, and Mindanao. Additionally, an endless mode is included, allowing users to keep playing even after finishing the missions. To enhance the game's engagement, it incorporates trivia challenges, rewards, and brief narratives centered around three characters—Rai, Aya, and Kiko—who assist users as they navigate through each locale. These components increase relatability and contribute to a more immersive experience. With optimized graphics, simple controls, and a user-friendly design, Tropa Run runs smoothly on different mobile devices, making it accessible to many users. Game testing showed very positive results, with an average rating of 4.7 out of 5. Most users said they not only enjoyed the game but also learned more about the historical sites featured. This demonstrates that Tropa Run can be enjoyable as well as informative, contributing to the enhancement of cultural understanding and national identity among young people.

Keywords:
Mobile games, Filipino culture & history, Tropa Run, Historical awareness, Cultural appreciation, Landmarks, National identity

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INTRODUCTION

In recent years, mobile games have become increasingly popular, especially among younger demographics like children, teens, and young adults. With the prevalence of smartphones and mobile apps, more users are accessing mobile games not just for entertainment but as a tool for acquiring knowledge. This change has given rise to game-based learning, an approach that employs the use of gaming mechanics—such as interactive challenges, engaging worlds, and rewards—to enhance the learning process and enable users to retain material better. When historical material is incorporated into gameplay, it can make the learning process more engaging, enjoyable, and effective (Dela Cruz et al.,2023).

In the context of the Philippines itself, there are already educational mobile games that integrate culture, history, and gameplay successfully. For example, KaSAYSAYan is an educational game that introduces crucial historical events in an entertaining narrative form, simplifying the complexities of the subjects for the players. Similarly, Galà allows users to explore various historical sites throughout the country, essentially making learning a virtual quest (Dela Cruz et al., 2023; Inquirer POP!, 2022). These games have proven that mobile platforms can be effective media for providing cultural and historical education in a manner that engages the interest of the youth.

Building on the success of these mobile learning tools, the purpose of this study is to examine how mobile game design can further increase user engagement and historical knowledge. Precisely, it aims at creating a 3D endless running mobile game which integrates chosen Filipino historical sites into its levels and missions.By this strategy, the game aims to offer the player both entertainment and short but significant understandings of the nation's extensive historical context. Finally, this research hopes to help advance the expanding study of educational technology by encouraging historical consciousness through interactive and easy-access mobile gaming experiences.

OBJECTIVES

The general objective of this study is to create a 3D animated mobile game that enables players to virtually visit and learn about the historical places in the Philippines. With the aim of promoting historical awareness, cultural appreciation, and interactive learning through mission-based gameplay.

The study aims to focus on the following specific objectives:

1. To analyze user engagement by gauging the degree of passionate and active involvement in the game and ascertaining engagement as a critical element for interest and motivational retention.
2. To analyze how the mobile game impacts users' learning about historically significant places in the Philippines using the games interactive storytelling and mission-based educational play to identify the knowledge users remember, insights of history and the overall educational value the game provides.
3. To study how game design components—including graphics, sound, challenges, and narrative—influence people's historical conscience and participation.
4. To improve interaction and history learning from a user-centric design perspective in matching game functionalities to gamer requirements and preferences.

METHODOLOGY

The development of Tropa Run: Mobile Adventure Game Exploring Historical Places in the Philippines follows the methodology of Agile, which means the focus here is on iterative design, testing, and refining. The whole process consists of the development of the system, gathering of data, and the strategies of testing to verify both smooth gameplay and cultural relevance.

This study uses the Agile Methodology, which focuses on iterative development, testing, and improvement. The development includes planning the game structure, designing the characters and environment, coding the core mechanics, and integrating sound, graphics, and educational content. In doing so, the game follows a number of

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phases comprising testing and evaluation to detect problems and corrective refinements. Such a process ensures sustained quality in terms of gameplay appeal for Tropa Run.

Figure 1 Agile Methodology

1. Planning

Listing the game's needs, like historical content, game mechanics, and features. This phase involves surveying potential users for which to understand their preferences and recommendations and conducting reviews on existing mobile games related to TROPA RUN, and suggesting technical needs to build an effective and culturally accurate platform.

2. Design

Making game layouts, creating characters using blender, and adding historical missions. To portray character models of Filipino culture accurately it is created using Blender while levels and game layout were designed to reflect iconic Filipino landmarks and missions based in historical contexts.

3. Development

Coding the game in Unity using C# and the GIMP as the graphics editor and the Audacity to edit the sounds. Utilizing gimp for 2d textures and interface elements and development was done in UNITY using C# for game logic scripts. Audacity was integrated for in-game music and effects relevant to Filipino culture.

4. Test

To test if the game plays well or not and to fix bugs for faster performance. To carefully assess the game's mechanics, errors, bugs and smooth transitions the game went through rigorous integration, unit and performance testing that are based on the findings to effectively deliver a stable and responsive game while ensuring the compatibility of android devices.

5. Deployment

Releasing the game for testing and collecting feedback of the end user. End users were tasked to explore levels, missions and trivia to provide feedback on the game's content and issues on the game. Questionnaires were used that are focused on gameplay, educational content, and user experience that were collected to improve the games contents.

6. Review

Improving the game based on the feedback of the player or end user to enhance the user's experience. And then analyzed to be used on revisions for the aspects of the game. To be accurate on historical contents it is validated and the user interface elements were improved for better navigation. Gameplay was adjusted to

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maintain the engagement whilst improving educational delivery. This process helped the game's performance and relevance.

CRITERIA	MEAN SCORE	INTERPRETATION
Functionality	4.8	Excellent
Usability	4.8	Excellent
Reliability	4.7	Excellent
Efficiency	4.5	Excellent
Maintainability	4.5	Excellent
Portability	4.6	Excellent

(System Evaluation Table)

RESULTS AND DISCUSSION

The surveys and tests confirm that Tropa Run: Mobile Adventure Game Exploring Historical Places in the Philippines is efficient, reliable, and well-accepted. With weighted means consistently above 4.7, the system demonstrates high usability and stable performance. Overall, it successfully achieves its goal of making historical learning more accessible, engaging, and enjoyable for its users. The survey results on the system evaluation, presenting the respondents' ratings on functionality, usability, reliability, efficiency, maintainability, and portability.

The testing and evaluation produced the following results:
Functionality: All intended features were developed and operated successfully.
Usability: Controls were easily to learn by players; interface design was appreciated.
Educational Impact: After playing the game, the users learned something about Philippine historical sites.
Engagement: The game encouraged players to continue playing thanks to the interplay of challenges, and cultural content.

Results from this study suggest that TropaRun effectively combines gamification with history learning.

ACKNOWLEDGEMENT

We, the proponents of Tropa Run, would like to sincerely thank everyone who has been part of this journey and helped us complete this study. First of all, we are truly grateful to our capstone adviser, Mr. Ronald B. Fernandez, for his patience, guidance, and constant encouragement while we were working on this project. His advice and constructive feedback have been a big help in improving our work. We also extend our thanks to our technical adviser, Mr. Kenneth Odtuhan, for sharing his knowledge and giving us valuable suggestions that strengthened the technical side of our study. Lastly, we would like to thank Ms. Daryl Joy Tonido, our grammarian, for her time and effort in helping us refine our paper and making sure our work was clear and well-written.

We would like to thank Mr. Eufemio O. Agbayani III, Historic Sites Development Officer II of the National Historical Commission of the Philippines (NHCP), for sharing his knowledge about Philippine history, which really helped us give more depth to our study. We are also thankful to the NHCP for their support, and to our respondents for giving their time and honest answers that became a big help in improving our project.
Above all, we want to thank our families and friends for always being there for us. Their support, patience, and encouragement kept us going and gave us the strength to finish this study, even with all the challenges we went through.

CONCLUSION

The development of "Tropa Run: Mobile Adventure Game Exploring Historical Places in the Philippines" through the integration of Unity Engine and OOP (Object Oriented Programming), has successfully fulfilled the

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study's objective. The system consists of an endless running game mechanics with culturally relevant events and trivias that benefits end-users, which provides entertainment and insights to Philippine history. By conducting testing and evaluation has shown that the game is user-friendly, effective in promoting cultural learning and interactive gameplay.

With the integration of user-centered design has ensured that the gameplay is not purely entertainment but also educational that provides a positive feedback that confirms it as a potential supplementary tool for educational and historical awareness. To validate the findings of the system to meet its goal is by enhancing user engagement, interactive supportive learning and through fostering appreciation of culture through mobile gaming.

REFERENCES

[1] Dela Cruz, J., Santos, M., & Ramirez, L. (2023). "Game-Based Learning and the Integration of Historical Content in Mobile Games". *Journal of Educational Technology and Innovation*, 15(2), 45–58.
[2] Inquirer POP! (2022). "Galà: Mobile Game Lets You Explore Philippine Historical Sites". Retrieved from https://pop.inquirer.net/
[3] Malahito, R. V., & Quimbo, M. A. T. (2020). "Gamification in higher education: Impact on student motivation and learning outcomes. Journal of Educational and Human Resource Development". *University Knowledge Digital Repository*, 8. Retrieved from https://www.ukdr.uplb.edu.ph/journal-articles/364/
[4] Dela Cruz, J. (2020–2021). "Lakbay: Reinforcing creative teaching strategies in junior high school history classes with gamified learning resources". *Tuklas.* Retrieved from https://tuklas.up.edu.ph/Record/UP-8027390931311397688
[5] Pacturan, D. B., Sabacajan, B. T., & Nahial, W. L. (2024). "Integration of gamification in teaching and students' academic performance: Basis for action plan". *Philippine E-Journals.* Retrieved from https://ejournals.ph/article.php?id=22988
[6] Maggioni, L., & Fox, E. (2020, June 30). "Learning in history". *Oxford Research Encyclopedia of Education*. Retrieved from https://oxfordre.com/education/display/10.1093/acrefore/9780190264093.001.0001/acrefore-9780190264093-e-957
[7] Oceja, J., Abián-Cubillo, D., & Torres-Trimallez, M. (2022, September). "Games for teaching and learning history: A systematic literature review". *ResearchGate*. Retrieved from https://www.researchgate.net/publication/364578225_Games_for_Teaching_and_Learning_History_a_Systematic_Literature_Review