

# Design and Testing of a VR Escape Room Game for Philippine Martial Law History

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**Abstract:** This paper presents a Virtual Reality Educational Escape Room game where players learn about the highly divisive Martial Law period in Philippine history. We describe the game's general design and the results of a user test to evaluate the game in terms of VR presence, immersion, and overall usability.

**Keywords:** Virtual Reality, Escape Rooms, Usability Testing, Philippine History

## 1. Introduction and Related Work

In recent years, Virtual Reality (VR) has been heavily employed by museums for historical learning applications, such as guided virtual tourism and simulated interaction with preserved cultural artifacts (Song & Evans, 2024). However, VR experiences that discuss serious subject matter are infrequent and provide restricted user interaction. Studies on controversial historical VR experiences such as *Wiktoria 1920* (Kazlauskaitė, 2023) and *The Anne Frank VR House* (Mulders et al., 2025) found that these experiences typically use a linear narrative progression and users do not perform any intentional actions besides moving to fixed spots, handling objects at predetermined times, etc., which may limit their potential for affective learning.

Several non-VR studies tackle the politically divisive topic of Philippine Martial Law in game-based learning (GBL) contexts. These include table-top role-playing games (De Vera, 2018) and semester-long game activities monitored via learning management systems (Despabiladeras et al., 2024); unfortunately, these require active facilitation by the instructor.

An alternative GBL method is Educational Escape Rooms or EERs, where the player solves learning puzzles in a locked room (Veldkamp et al., 2020). EERs may possibly improve learning over traditional methods through more direct bodily engagement, with tasks that are highly integrated with learning outcomes (Skulmowski & Rey, 2018). However, EERs still do require extensive facilitation by moderators and large floor spaces and equipment.

Thus, our team has developed a system for creating single-player VR EERs. The VR modality helps reduce the learning activity's facilitation requirements, as VR escape rooms require less floor space and setup time over successive play sessions compared to physical escape rooms. Our EER system is called Ateneo Virtual Reality Escape (AVRE), which runs on top of the open-source Godot Engine (Vidal et al., 2024). AVRE was used to develop a serious Philippine Martial Law History game, entitled *Heritage Hero: Secrets of the 'Golden Era'*, in collaboration with the Ateneo Martial Law Museum and Library. Here we describe the game's design and the results of a preliminary user test to show its potential effectiveness.

## 2. Game Design

The intended audience of the VR game are Filipino young adults (ages 15-25) with an overall play time of 30 to 60 minutes. The escape room is themed around an abandoned mansion belonging to a crony of former president and dictator Ferdinand E. Marcos, Sr., who declared Martial Law in 1972 and was ousted during the 1986 EDSA Revolution. The mode of the escape room is to solve the mystery of the abandoned mansion, which is divided into three areas, each of which tackles a specific aspect of the Martial Law regime (see Figure 1):

- The **study** focuses on the *press freedom* aspect. The player pieces together several propaganda materials about the era, as well as operates a confiscated printing press machine that symbolizes the control that the Marcoses had over mass media.
- The **kitchen** focuses on the *public health* aspect. This area allows the player to bake Nutribun bread, a key component of the public health program of the historical period.
- The **bedroom** focuses on the *economic development* aspect. The player deciphers confidential documents such as architectural construction blueprints and contracts relating to the infrastructure projects of the Marcoses, which were marred by controversies.



Figure 1. Main game areas. Left-to-right: study, kitchen, bedroom.

The game progression is not strictly linear and requires the player to revisit areas to solve puzzles fully. Unlike passive VR games, AVRE implements an object interaction system using hand controller tracking; the player has to perform twisting, levering, connecting, hitting, and wiping motions, directly linking player movement with intentional game actions to increase immersion and integration with learning objectives (Lee et al., 2023; Vidal et al., 2024).

These interactions are also supplemented with two special items: a *journal*, which tracks the player's current progress and gives an outline of the remaining tasks without directly giving hints to the player; and a *flashlight-radio*, operated via a manual crank (popular during the era), which can receive a "radio broadcast" that is, in reality, a hint to help solve the player's current puzzle. These additions serve to replace the moderator role in a traditional escape room game, allowing players to finish the game without outside help.



Figure 2. Special equipment to aid player progress: journal (left) and flashlight-radio (right).

### 3. Evaluation and Results

Fourteen (14) participants joined the user testing and were composed of Ateneo de Manila University students with an average age of 19.86 ( $\pm 0.86$ ), all healthy adults who voluntarily provided consent and feedback. Self-assessment on a scale of 0 to 6 reveals that the participants have limited familiarity with VR games (2.64) and the Meta Quest 3 headset used for the study (1.57) but were more familiar with escape room games (3.00) and digital adventure games (4.29). The participants were also asked to answer an iGroup Presence Questionnaire (IPQ) (Tran et al., 2024) and a subset of the PLAY Game Heuristics (Desurvire & Wiberg, 2009). See Figure 3 for a visualization of the questionnaire results.

Following the recommendation of Tran et al. (2024) to correct each IPQ subscale from [0,6] to [-3,3], the ranking was determined to be **low** (-0.14) for *experienced realism*, **moderate** (0.54) for *involvement*, **high** (1.34) for *spatial presence*, and **exceptional** (2.28) for *general presence*. We note that the participants may have correlated the questionnaire items about experienced realism with higher-fidelity art assets (e.g., high texture and animation quality), which were admittedly limited by our team's art production capabilities. Despite this, the

general presence is still high, suggesting that participants were aware that they were immersed in a virtual world and would willingly suspend disbelief.

The scores of the PLAY heuristics were also treated similarly to the IPQ: since items in the questionnaire had both positive and negative statements, responses for the latter statements were reverse scaled; then, scores were averaged according to category. The game was evaluated with an exceptional level of immersion (5.35), high gameplay value (4.80), and high usability (3.92).

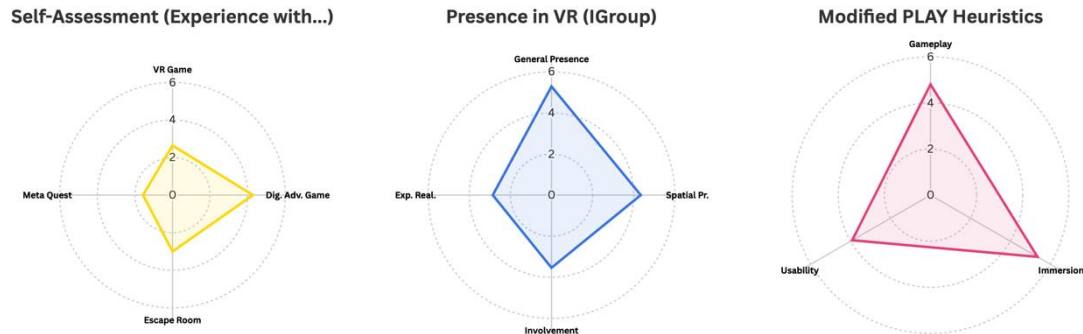


Figure 3. Summary of self-assessment (left), IPQ (middle) and PLAY heuristics (right).

The participants also gave open-ended evaluation responses. Some usability issues, such as players experiencing discomfort and nausea due to the VR modality, were brought up. Despite this, participants reported that the kitchen and bedroom areas are engaging due to real-world familiarity with the escape room puzzles therein, i.e., cooking and architecture. A majority of participants found the scope of the learning content sufficient, but some found it lacking and suggested other controversial topics to add (such as censorship and bribery during the featured historical period). These topics were included in the final game as optional quests.

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