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Learners' Gaming Experiences in the Issue-Based Board Game <Mosa Tayal>

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Abstract

An increasing number of game designers have begun incorporating contemporary social and environmental issues into their game designs, which has given rise to issue-based board games. These games involve mechanisms such as role-playing, resource allocation, and interest negotiation to immerse participants in contextualized learning experiences. Within socially interactive scenarios, learners are exposed to diverse perspectives, thereby cultivating empathy and historical thinking. By examining learners' overall engagement and experiences with issue-based board games from their own perspectives, researchers can help address the challenge of balancing gaming enjoyment with historical learning. This study therefore employs a questionnaire to investigate learners' gaming experiences following their participation in an issue-based board game. The results reveal a high level of overall engagement with the game mechanisms, with particularly strong ratings for interactivity and enjoyment—even when learners did not realize they were learning history. These findings indicate that the game effectively stimulates learning motivation and facilitates peer communication and collaboration.

Keywords: Issue-Based Game, Board Game, Gaming Experiences, Historic Thinking, Tayal.

1 Introduction

As 21st-century core competency education continues to gain momentum, interdisciplinary learning and problem-based learning have increasingly become focal points in contemporary teaching practices. This is especially true in curricula that address humanities and social issues, where enhancing learner engagement, critical thinking skills, and capacity for practical action has emerged as a pressing challenge in instructional design. In contrast, the traditional teacher-centered model of knowledge transmission is no longer effective in stimulating participants' interest or fostering deeper thinking. In response to this pedagogical shift, more and more educators are exploring the integration of game elements into the classroom [1]. Among these, board games—with their capacity for situational simulation and clear goal orientation—have gradually carved out a place within the realm of game-based learning.

With the growing popularity of board games, an increasing number of game designers have begun incorporating pressing contemporary issues—such as social, political, and environmental topics—into their game designs. This trend has led to the emergence of Issue-Based Board Games, which blend thematic exploration with strategic thinking, offering a learning medium that engages both cognitive and behavioral dimensions [2]. Through game mechanics such as

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role-playing, resource allocation, and interest-based negotiation, participants are able to participate in context-rich learning experiences. These simulated social interactions allow learners to explore diverse perspectives, fostering empathy and problem-based thinking skills [3].

Issue-Based Board Games not only serve as valuable extensions of classroom instruction, but also hold significant potential to support self-directed learning. Within the immersive context of gameplay, participants can naturally construct knowledge frameworks and develop value-based judgments. The educational and social significance of these games makes them powerful tools for guiding players to recognize and reflect on complex societal issues. Themes such as historical conflict, cultural transformation and societal change have been thoughtfully embedded into the structures and narratives of board games. Through gameplay, players are encouraged to engage in historical inquiry, analyze cause-and-effect relationships, and consider multiple perspectives on past events. This interactive format not only deepens their understanding of complex historical contexts but also fosters critical thinking and empathy. Indeed, the use of Issue-Based Board Games has evolved beyond entertainment, becoming powerful tools in educational settings for cultivating historical thinking, promoting public understanding of history, and stimulating civic engagement through reflective exploration of the past.

In existing board game designs, many works, despite having clear educational objectives and emphasizing knowledge transmission or skill training, tend to fall short in fostering historical thinking. These games often focus on factual recall, the reenactment of singular events, or the selection of predetermined answers, offering limited opportunities for players to engage in multi-perspective historical interpretation, causal reasoning, or value-based reflection. The challenge in designing educational board games lies in enhancing the depth of learning—particularly in cultivating critical and historical thinking—without compromising playability and enjoyment. Achieving this balance requires the integration of well-crafted game mechanics and immersive narrative structures. Only through such thoughtful design can educational board games simultaneously deliver meaningful learning outcomes and engaging gameplay experiences, encouraging players to actively reflect on the underlying meanings and complexities of history while enjoying the game. It not only reflects learners' acceptance of the content and format, but also influences their willingness to continue participating and their intrinsic motivation to learn. Therefore, adopting the learners' perspective to examine their overall experience and engagement with Issue-Based Board Games can help address the issue of balancing between gaming and learning. Learner engagement is closely tied not only to the entertainment value, interactivity, and level of challenge in the game, but also to the degree of identification and acceptance of the knowledge conveyed, the perspectives presented, and the emotional resonance evoked through gameplay. A comprehensive analysis of engagement with Issue-Based Board Games can thus offer valuable empirical insights to inform future game design and practical applications.

Therefore, the central research question of this study is: What are learners' overall experiences and levels of engagement with Issue-Based Board Games as a learning tool? The study focuses on several key dimensions that influence the learning experience, including perceived game difficulty, personal feelings, interactivity, historical thinking, enjoyment, and the sense of autonomy, factors that reflect learners' subjective experiences during gameplay. By conducting an integrated analysis of both quantitative and qualitative data, this study seeks to deepen understanding of how these factors shape overall engagement. The findings can enhance the practical effectiveness and implementation potential of such game-based teaching tools within educational settings.

2 Related Works: Issue-Based Board Games

Game-based learning (GBL) is an instructional design approach that integrates game mechanics, motivational incentives, and interactive elements into educational settings. Its goal is to stimulate learners' motivation, enhance engagement, and support the processes of knowledge construction and skill internalization through game-based activities [4]. Whitton [5] further emphasizes that the core of GBL lies not simply in "learning through games," but in creating meaningful and purposeful learning experiences by incorporating key features of games, such as strategic challenges, real-time feedback, autonomous decision-making, and goal orientation. Such learning environments are particularly effective in promoting learners' motivation, self-efficacy, and problem-solving abilities.

According to Gee's [6] Good Learning Principles, a successful educational game should embody characteristics such as challenge, feedback, and situated learning. Issue-based games represent a pedagogical approach centered on contemporary social, political, environmental, and cultural issues. Their purpose is to engage learners in real-world contexts, encouraging them to identify problems, participate in discussions, and develop the capacity for problem-solving.

This educational philosophy is deeply rooted in Dewey's Experience and Education [7], which emphasizes that learning should be closely connected to real-life social experiences. By confronting open-ended and dynamic problem scenarios, learners are encouraged to develop critical thinking and practical action skills. Issue-based learning intersects with concepts such as civic education, social justice education, and inquiry-based learning, with a core emphasis on guiding participants to explore diverse perspectives, engage in value negotiation, and reflect on ethical and civic actions [8]. For instance, when exploring issues related to climate change, participants might take on roles representing government agencies, corporate entities, and civil society organizations. This role-play allows them to analyze the issue from multiple viewpoints and better understand the complexities of public policy-making, resource allocation, and value-based conflicts. Middendorf and Pace [9] also emphasize that engaging participants with open-ended and controversial issues not only enhances knowledge acquisition but also teaches them to confront uncertainty and navigate complexity, both of which are core competencies for the 21st century.

To enhance immersion and motivation in the learning process, issue-based learning has, in recent years, increasingly incorporated cross-media elements such as digital media, game mechanics, and narrative design, resulting in a diverse array of instructional formats. Particularly at the secondary and higher education levels, research has shown that issue-based learning effectively fosters student motivation, empathy, critical thinking, and action-oriented learning [10]. This approach holds profound implications for cultivating socially engaged "active citizens" and realizing the educational goal of "meaningful learning." Issue-based board games naturally integrate these core elements, and among them, role-play plays a pivotal role in deepening the learning experience. By assuming distinct characters embedded in complex social, political, or historical contexts, players are encouraged to inhabit perspectives different from their own, negotiate conflicting interests, and engage in situational decision-making. This performative dimension not only enriches narrative immersion but also enhances players' emotional resonance and ethical reasoning. Studies have found that when participants take on roles, make decisions,

and receive immediate feedback within a game setting, both their cognitive understanding and emotional engagement can be significantly enhanced [11]. As a concrete and structured form of gameplay, board games demonstrate unique advantages in educational contexts: (1) Their clear rules help establish a well-defined and coherent learning process. (2) Their tangible, hands-on elements and face-to-face interaction enhance learner engagement and a sense of immersion. (3) Their inherent social nature—particularly through role-based interactions—promotes collaborative learning, perspective-taking, and the development of communication skills [12], as well as behavioral and strategic thinking engagements [13].

Board games, which do not rely on high-tech equipment, offer a high degree of feasibility and practicality in educational settings. They are particularly well-suited for guiding participants through advanced learning activities such as issue exploration, simulated debates, and role-based negotiations. Clear rules and win-loss mechanics of board games can stimulate both competitive and cooperative motivation among learners [14]. When combined with issue-based scenarios and role-playing elements, participants often naturally engage in critical thinking and the construction of viewpoints during gameplay. For example, the issue-based board game Climate Negotiation Game allows players to take on the roles of national representatives, simulating policy negotiations between environmental protection and economic development priorities. Through this process, participants gain insights into the multiple considerations and complexities underlying real-world decision-making [15] [16]. In higher education contexts, the use of board games has been shown to significantly improve learner engagement, self-directed learning, knowledge transfer, and teamwork skills [17]. Similarly, when board game design incorporates narrative structures and real-time feedback mechanisms, it can deepen learners' emotional engagement and memory retention [18]. Although digital games have seen rapid development in recent years, physical board games continue to offer irreplaceable flexibility and controllability in educational applications. Especially in small-group learning and issue-based discussion settings, they provide opportunities for rich, interactive engagement between teachers and participants, as well as among peers—ultimately enhancing the depth and quality of the learning experience.

Therefore, this study adopts a learner-centered perspective to examine participants' overall engagement and learning experiences after participating in a course that incorporates issue-based board games as a teaching medium. Through a mixed-methods approach that integrates quantitative survey data and qualitative supplemental insights, the research investigates several key dimensions that influence the learning process—such as game difficulty, personal engagement, interactivity, historical thinking activation, enjoyment, and perceived autonomy. By analyzing and synthesizing the quantitative data, the study aims to gain a comprehensive understanding of how various design elements impact learners on cognitive, affective, and motivational levels. The findings are intended to serve as a valuable reference for optimizing instructional design and refining the practical implementation of issue-based board game curricula in future educational settings.

3 Game design

3.1 Game Content

This study incorporates the issue-based board game <Mosa Tayal>, which is house designed around historical events in Taiwan, with the goal of creating an immersive learning environment that fosters historical empathy, role-playing, and reflective decision-making [19]. The game centers on critical moments in the history of Taiwan's Indigenous Tayal people, presenting players with decision-making scenarios rooted in culturally and historically significant contexts.

The gameplay features multiple roles and diverse perspectives through interactive tasks, guiding players to engage with the narrative from the standpoint of specific historical figures. Players are encouraged to deeply consider the motivations, cultural, social, and political, behind each character's actions and choices. As the game progresses, players must make decisions based on evolving contextual information and individual role objectives, which in turn influence the direction of the storyline and the outcomes of various missions. This highly participatory and interactive design enables players to gain a more concrete understanding of the historical setting and context. Through repeated cycles of judgment, debate, and reflection, learners gradually develop their problem-solving skills, critical thinking abilities, and the capacity to interpret history from multiple perspectives.

The players play five roles in the game: Qing/Japanese Dynasty, Tayal 1, Tayal 2, Tayal 3, and Han Chinese. The distribution and scale of land held by each role are based on historical documents, reflecting the relative strength and influence of each role. The core theme of the game centers on the historical trajectory of the Tayal people in Taiwan. Set within an authentic historical context, the game not only reconstructs the Tayal's encounters with external forces, marked by invasion and resource exploitation, but also vividly portrays their acts of resistance and cultural responses. Each historical event featured in the game goes beyond surface-level reenactment, embedding multiple interpretations of social values, cultural survival, and ethical conflict. Through these layers, players are guided to engage in deeper reflection and dialogue, fostering a richer and more critical understanding of the complexities faced by the Tayal people throughout history.

The game incorporates five key historical issues, with the design intention extending beyond the mere reenactment of past events. It emphasizes uncovering the underlying structural problems and deep-rooted social concerns embedded within these events, such as the shaping and conflict of cultural identity, unequal resource distribution, interethnic tensions, and the influence of international political forces. Through contextualized and interactive gameplay, players are immersed in simulated experiences that allow them to engage with the complex power dynamics and value tensions present in historical contexts. This immersive approach is deliberately aligned with the principles of historical thinking, aiming to foster critical engagement with the past rather than passive consumption of facts. Players are encouraged to examine cause-and-effect relationships, consider the perspectives of multiple historical actors, recognize continuity and change over time, and reflect on the moral and ethical dimensions of historical choices. Each scenario is carefully crafted to encourage players to develop multi-perspective interpretations of history, fostering the ability to embrace diverse viewpoints and cultivate a nuanced understanding of social complexity.

3.2 Gaming Procedure

The game consists of six structured procedural phases (Figure 1), designed to gradually immerse

players in the historical context and deepen their understanding and reflection on historical events through interactive decision-making.

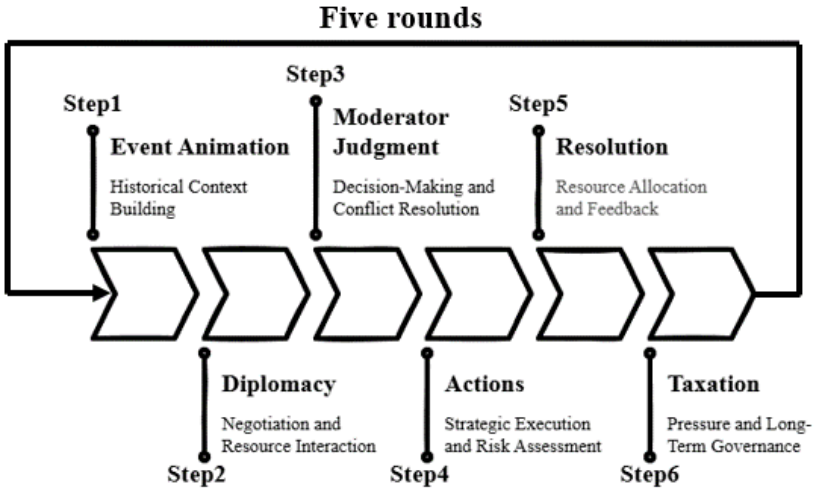

Figure 1: Game Process

As the game progresses (Figure 2), it enhances immersive learning while fostering the development of strategic thinking, resource management, and social negotiation skills. The steps are as follows:

1. Event Animation: Historical Context Building & Immersive Learning

Before the game begins, players scan a QR code to watch an animated video that presents the historical background and conflict of the current round. By combining visual storytelling and narrative elements, the animation helps players grasp the setting and build empathy with their roles, enhancing their immersive experience and motivation to learn.

2. Player Diplomacy: Negotiation and Resource Interaction

During the diplomacy phase, players engage in dialogue, negotiation, and coordination to adjust their strategic plans and allocate resources. This process encourages the development of conflict resolution, cooperation, and social interaction skills, while simulating real-world scenarios of resource competition and negotiation.

3. Moderator Judgment: Decision-Making and Conflict Resolution

In this phase, the game moderator renders decisions and rulings, simulating the role of governance and authority in society. This element helps players become aware of the impact of power structures on decision-making, deepening their understanding of the dynamic balance between official intervention and individual agency.

4. Player Actions: Strategic Execution and Risk Assessment

Based on their strategies, players perform two to three action rounds, including: (1) Territorial Expansion: increasing their influence by placing transparent overlays to mark land; (2) Combat Actions: using dice rolls to simulate conflict outcomes, which can be influenced by alliances and other factors. This phase emphasizes strategic thinking and risk evaluation, encouraging players to adapt flexibly to changing conditions.

5. Game Resolution: Resource Allocation and Feedback

At the end of each round, the system tallies resources and redistributes land based on players' actions, providing immediate feedback. Players can review the effectiveness of their strategies and adjust their future plans, enhancing their skills in resource management and long-term planning.

6. Taxation Mechanism: Economic Pressure and Long-Term Governance

This stage simulates historical tax systems, including: (1) Land taxes for players bordering Qing or Japanese powers; (2) Population taxes based on the number of people controlled; (3) A progressive increase in tax pressure from the Qing and Japanese regimes as rounds advance. This mechanism helps players grasp the complexity of economic governance and consider how policy shifts affect group survival.

After the taxation phase, the game returns to the event animation and proceeds to the next round. The full game consists of five rounds, allowing players to continuously revise their strategies within a coherent storyline, embodying a process of dynamic historical learning and knowledge internalization.

Figure 2: Gameplay with Technology-enhanced Actions

4 Research Methods

4.1 Research Participants and Procedure

This study invited a total of 20 in-service elementary school teachers from a school in Taiwan to participate as research subjects to experience and evaluate the game; at the same time to discuss the possible integration of the issue-based board game into their instructional design. The participants taught across various disciplines: 11 served as homeroom teachers primarily responsible for Mandarin and mathematics instruction, 2 taught natural sciences, 5 were in charge of arts and humanities courses, and 2 taught social studies. Their ages ranged from 25 to 50, representing a cross-generational spectrum of teaching experience. All participants had prior experience with board games, which facilitated their understanding of the gameplay process and the educational potential of the tool. The game-based learning session included a series of structured components, such as game instructions, animated event briefings, worksheet completion, gaming movements, and reflection.

Pre-test and post-test mechanism was implemented to ensure comprehensive data collection and enhance the reliability and validity of the study. Prior to the activity, all participants were required to sign an informed consent form and complete a background questionnaire, which gathered personal demographic information as well as prior experience relevant to the game and the study context.

After the game session, participants completed a Game Engagement Survey and a Gameplay Reflection Sheet, designed to prompt them to revisit their in-game decisions and interactions, thereby engaging in initial metacognitive reflection. Both the quantitative and qualitative data collected served as the foundation for research analysis, providing a comprehensive

understanding of the potential and effectiveness of issue-based board games in educational practice.

4.2 Research Tool

To understand participants' gaming experiences and overall evaluations following the gameplay, this study employed a quantitative questionnaire for data collection (Table 1). The questionnaire covered total of 20 question-items in six key dimensions: Game Difficulty, Game Interactivity, Historical Thinking, Operational Autonomy, Game Enjoyment and Personal Engagement. These dimensions were designed to comprehensively capture players' cognitive and affective responses to the issue-based board game, offering insights into their perceptions and emotional engagement throughout the learning process.

The multiple-choice section of the questionnaire employed a five-point Likert scale ranging from "Strongly Agree" (5) to "Strongly Disagree" (1). Each item was categorized and organized according to its corresponding dimension (see Table 1). In addition to the closed-ended questions, the questionnaire also included an open-ended short response question: "Based on your experience with this game, please provide any feedback or suggestions for improvement." It is to collect participants' subjective opinions on the game content and design, serving as a source of qualitative supplemental data. To ensure content validity, the questionnaire was reviewed and revised by three experts with relevant professional backgrounds. Once responses were collected, the data underwent statistical analysis to assess participants' engagement across the different dimensions, providing quantitative evidence for evaluating the effectiveness of the issue-based board game as a teaching tool.

Table 1: Classification of Gaming Experience Questions

Dimensions	Question Items
Game Difficulty	Question 1, 2, 3, 4
Game Interactivity	Question 8, 10
Historical Thinking	Question 6, 7, 14, 15
Operational Autonomy	Question 5, 17
Game Enjoyment	Question 13, 16, 19
Personal Engagement	Question 9, 11, 12, 18, 20, 21

5 Results

According to the results of the gaming experience survey conducted in this study (Table 2, Figure 3), participants expressed a highly positive attitude toward the course design and instructional implementation.

Table 2: Descriptive Results for Gaming Experience Dimensions (N=20)

Dimension	M	SD	Range	SE
Game Difficulty	3.38	0.16	0.35	0.08
Game Interactivity	4.08	0.04	0.05	0.03
Historical Thinking	3.31	0.18	0.45	0.09

Operational Autonomy	3.50	0.14	0.20	0.10
Game Enjoyment	3.77	0.08	0.15	0.44
Personal Engagement	3.65	0.19	0.55	0.08

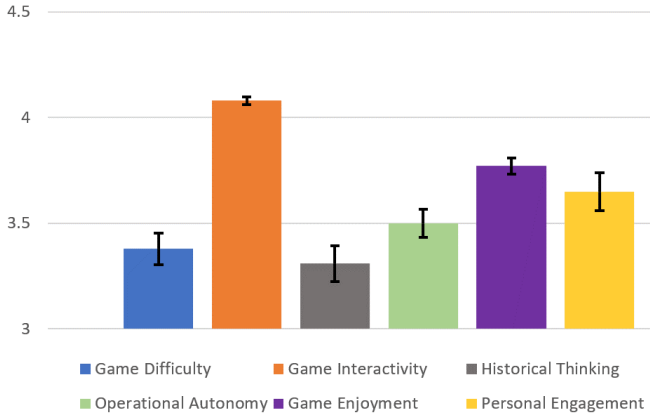

Figure 3: Results of Gaming Experience Survey

Quantitative data show that participants gave the highest ratings to the course's interactivity (M = 4.081, SD=0.04) and enjoyment (M = 3.77, SD=0.08) indicating that the interactive scenarios created through game-based learning effectively fostered communication, negotiation, and collaborative behaviors among learners. These interactions, in turn, significantly enhanced their motivation to learn and willingness to participate. In addition, both perceived autonomy (M = 3.50, SD=0.14) and personal engagement (M = 3.65, SD=0.19) received moderately high positive evaluations, suggesting that most participants experienced a sense of agency and subjective positive learning experiences during gameplay. However, these two aspects were rated slightly lower compared to interactivity and enjoyment, warranting further exploration into the underlying reasons. Based on qualitative data and student feedback, some learners reported that during role-playing and decision-making tasks, the assigned character roles occasionally conflicted with their personal beliefs or values, which in turn affected their decision-making and emotional engagement in the game. This phenomenon may reflect the intentional tension embedded in role design—a mechanism aimed at recreating the diverse perspectives and complex ethical dilemmas of historical contexts. Such design intentionally introduces conflicting role objectives, resulting in a certain degree of decision pressure and psychological challenge. Overall, while participants' sense of autonomy may have been somewhat constrained by the structured framework of the game, this limitation itself carries significant educational value: in authentic historical contexts, individual actions are often shaped by role expectations, social norms, and situational constraints. Through such constrained, immersive interactions, learners gain a more realistic understanding of the decision-making dilemmas faced by historical figures, thereby deepening their historical comprehension and emotional resonance.

Compared to the high ratings received for interactivity and enjoyment, the survey results indicate that participants gave relatively lower scores for difficulty (M = 3.38, SD=0.16) and historical thinking (M = 3.31, SD = 0.18) This outcome may suggest that learners were less aware of the cognitively demanding aspects of knowledge engagement and deeper-level thinking during their participation in the course. More specifically, some participants may not have fully experienced the logical construction of historical knowledge or causal reasoning throughout the gameplay. Additionally, during the execution of character tasks and decision-making processes, there may have been limited engagement with multi-perspectivity, historical source interpretation,

or critical reflection—all of which are essential components of higher-order historical thinking. As a result, the perceived intensity of learning in the area of historical cognition may have been comparatively weak during the learning experience. Moreover, the relatively low rating for difficulty suggests that there is still room for improvement in the game mechanics or instructional design in terms of cognitive challenge. While the course successfully emphasized situational interaction to spark student engagement and created an appealing learning atmosphere, an overemphasis on gameplay elements—at the expense of cognitive load—may have led some participants to perceive the course as lacking in intellectual depth or academic rigor.

The results indicate that while the course successfully balanced gaming and learning by fostering high engagement through interactivity and enjoyment, it leaned more heavily toward emotional involvement than cognitive challenge. Based on these observations, future course designs could aim to retain the existing strengths of interactivity and enjoyment while further integrating components that explicitly foster historical thinking skills. For instance, tasks such as multi-source analysis, perspective-based debates, and reconstruction of historical cause-and-effect chains could be introduced to enhance participants' ability to comprehend and interpret the underlying logic of historical events. At the same time, moderately increasing the complexity of learning tasks and the difficulty of decision-making may help raise participants' sense of challenge and achievement, ultimately enhancing both the instructional effectiveness and the depth of historical learning.

In summary, the issue-based board game <Mosa Tayal>, developed for this study and grounded in historical events from Taiwan, proved effective in promoting peer interaction and enhancing learner engagement. However, there remains room for improvement in guiding historical thinking and deepening content knowledge. This finding also reflects a broader tendency among participants to perceive the historical narrative within the game as a background element, rather than as a central factor contributing to the game's appeal.

6 Conclusion

This study employed an Issue-based learning strategy as its core framework, integrating historical events related to Taiwan's Indigenous peoples with strategic board game mechanics to develop <Mosa Tayal>, an educational board game characterized by immersive role-playing elements. Through a combination of questionnaire and behavioral observations, the study explored the game's initial impact on learners' engagement and learning outcomes. The results indicate that players responded positively to the overall game design, with particularly high ratings in the areas of interactivity and enjoyment. These findings suggest that the game holds clear advantages in stimulating learning motivation and fostering peer communication and collaboration. Complex and multi-faceted game design can heighten cognitive challenge while simultaneously expanding the space for strategic decision-making, transforming gameplay into a highly interactive and open-ended learning environment [20]. Within this context, learners must adapt their strategies in response to specific historical constraints and institutional limitations, exercising bounded freedom to make critical decisions and value judgments. This process not only fosters strategic thinking from a character's perspective but also cultivates learners' sensitivity to social and historical contexts.

A closer examination of players' role-playing processes during the game reveals that the content, which is closely tied to localized historical events in Taiwan, not only provides meaningful cultural context but also deepens players' understanding of historical settings and

character circumstances. Many participants demonstrated strong identification with their assigned roles during strategic decision-making. Due to the tight integration between task design and character scenarios, players naturally adopted action patterns shaped by historical perspectives and critical awareness. Some even reported experiencing a temporary detachment from their own identities, fully immersing themselves in the cognitive and emotional states of their roles. This led to a heightened sense of immersion and the development of historical empathy. Such phenomena directly align with the principles of immersive learning and identity construction theory [21], which suggest that when educational games are designed with challenging role-based tasks and context-rich scenarios, they not only foster emotional engagement and intrinsic motivation, but also guide learners into multi-perspective, position-based historical inquiry. This, in turn, supports knowledge transfer and the deepening of historical thinking, key objectives in history education.

Therefore, in future implementations of similar course designs and instructional practices, it is essential to systematically strengthen the connection between game-based activities and the core concepts of historical thinking, including chronological understanding, multi-perspectivity, causal reasoning, and source interpretation. By incorporating well-structured task hierarchies and clear scaffolding mechanisms, educators can design learning processes that progressively stimulate critical thinking and deep understanding. Such approaches are crucial to guiding learners beyond mere participation and interaction, toward active inquiry and critical engagement with historical issues. Only through this intentional design can game-based learning fully realize its potential to "educate through play," enabling learners to achieve deep comprehension and knowledge transformation within an immersive and enjoyable environment—ultimately fulfilling the dual goals of education and the cultivation of historical literacy.

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