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Combining Cultural Heritage and Gaming Experiences: Enhancing Location-Based Games for Generation Z

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Abstract: Location-based games (LBGs) are an effective tool to enhance engagement in cultural heritage experiences. Especially for digital natives (i.e., Generation Z), LBGs are a new way to experience cultural heritage. However, combining the heterogeneous experiences of cultural heritage and gaming without losing control of the game is a challenge for LBG development. This qualitative study proposes a model for combining cultural heritage experiences and gaming in LBGs based on the experiences of Generation Z. Fifteen research participants were asked to play-test the LBG *Jungdong Milseo*, and the findings were derived through the methodology of the constructivist grounded theory. The study focused on two research questions: "How can the heterogeneous experiences of cultural heritage and gaming be combined in LBG?" and "How does Generation Z perceive cultural heritage experiences through LBG?" The findings revealed that Generation Z wanted LBGs to include historical and cultural information that can only be experienced through games. This study, which combines cultural heritage experiences and games in LBG based on the experiences of Generation Z, proposes a model centered on the elements of site-based play, loose story, and mutually pervasive environment, and is expected to serve as a practical guide for LBG development.

Keywords: location-based games; Generation Z; gamification; cultural heritage

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1. Introduction

Cultural heritage refers to what humankind inherits from the past and utilizes in the present [1]. When cultural heritage is focused on culture, it becomes a component of the identity of groups and individuals who share that culture, whether tangible or intangible. In addition, cultural heritage is a common asset that has economic, social, cultural, and educational value for human beings in the present. Therefore, it is not unreasonable to promote the utilization of cultural heritage in various fields. However, the way humans modernize their cultural heritage takes many forms, depending on the zeitgeist and generational differences. Sustainability has emerged as a prominent and timely concern in the realm of cultural heritage. Finding a balance between preservation and utilization is an important issue because cultural heritage does not belong only to the current generation but also to future generations. In particular, the consumption of cultural heritage through tourism has been identified as one of the biggest threats to cultural heritage. Consequently, it is important to pursue a sustainable relationship between cultural heritage and tourism [2].

Meanwhile, digital media have had a significant impact on accessing and preserving cultural heritage, including in the tourism industry. In particular, digital media play a role in preserving cultural heritage in perpetuity or increasing access to it [3]. It also plays an important role in the modernization and sustainable use of cultural heritage. As digital natives, Generation Z (that is, people who were born between 1995 and 2010) seeks more digitized and gamified experiences [4] when it comes to cultural heritage. Furthermore, heritage experiences need to be reinvented as innovative experiences that reflect the needs of this generation [5,6]. Cultural heritage tourism has also been exploring innovative ways

to attract visitors through cutting-edge technological advancements [7]. In this context, location-based games (LBGs) are a new way to experience cultural heritage that reflects these changes. LBGs are games played in real spaces where the player is located, mediated by mobile technology [8]. Among cultural heritage spaces and structures, those that hold memories of history and culture are particularly relevant to LBGs.

Furthermore, since cultural heritage sites are often tourist destinations, the combination of gaming and cultural heritage experience falls under the larger conceptual category of gamification of tourism. Gamification is "the process of game-thinking and game mechanics to engage visitors and solve problems" [9], and it is utilized in various fields requiring user engagement, including tourism. In the tourism sector, practices and studies using game formats in all aspects of tourism (before, during, and after a visit/activity) to maximize tourists' experiences are ongoing [10]. The expected effects of integrating gamification in tourism include raising brand awareness, enhancing tourists' experiences and engagement, and improving customer loyalty, entertainment, and employee management [11]. Of these, LBGs are particularly related to tourists' engagement with tourism destinations and points of interest [12,13].

Research on the gamification of tourism mainly aims to clarify tourists' motivation to participate in games involving tourism destinations. Tourists' motivation to play games involving tourism destinations is initially characterized by their search for information but later shifts to intrinsic stimuli such as fun, challenge, and a sense of accomplishment [11]. Additionally, while game-playing has a strong impact on the motivation to visit tourism destinations, tourists tend to play games only when they have recreational value [14]. Local residents who are not tourists also prioritize fun, competition, and rewards when playing LBGs [15]. These studies show that tourists' motivation to play LBGs is more focused on recreational purposes.

Research on the combination of LBGs and cultural heritage experience can be largely divided into two strands. The first, which is the dominant one, refers to the educational impact of cultural heritage experience through LBGs [16–20]. The use of games in cultural heritage experiences can be motivating [21,22] and can foster collaborative learning [23] and reflect on history [24]. LBGs have also been shown to have a positive effect on learning, entertainment, social interactions, engagement, and change of attitude toward cultural heritage [25]. In particular, the use of LBGs in cultural heritage experience has been shown to stimulate children's imagination [26] and to have a significant effect on their emotional connection to cultural heritage [27]. These studies show that the purpose of combining cultural heritage experiences with LBGs is primarily to enhance educational engagement with cultural heritage. In the broader context of tourism, the purpose of LBG experiences is to engage and entertain, while when narrowed down to cultural heritage, the purpose of LBG experiences is to learn. This means that achieving authenticity in cultural heritage experiences needs to be deepened to the level of learning. On the other hand, this also means that when LBGs are used in cultural heritage experiences, they need to be more closely linked to the content of the heritage rather than simply being a tool to capture the content.

The second research strand aims to gain insights and develop guidelines for LBG development by studying actual LBG cases [28,29] or developing and testing LBGs [12,15,30–32]. The problems and insights highlighted by these studies in LBG development can be categorized into two types.

The first type refers to connecting media technology with real cultural heritage destinations. This includes issues related to the accuracy of augmented reality (AR) and global positioning system (GPS) [13,33], motion recognition [28], and installation of quick response (QR) codes [12,15,30–32]. In particular, connecting participatory multimedia experiences to the site is challenging [13]. Experiencing cultural heritage through LBGs is a mediated interaction between individuals and cultural heritage, facilitated by diverse media devices. Therefore, these studies emphasize that the accuracy or convenience of device operation

is important for the LBG experience, but securing the stability of device operation is a difficult problem.

The second issue concerns the factors considered in the development of LBGs for cultural heritage experience. Among the previous studies, this issue is the most relevant to the topic of this research. The research of Ballagas et al. [28] presents six insights obtained from their self-developed LBGs, three of which address the balance of cultural heritage experience and gaming. These are the issues of (1) whether to focus more on the game itself or on tourism, (2) whether the game restricts visitors' movement, and (3) how to balance education and entertainment [28]. Xu and Weber's research shows that for a game to provide meaningful cultural heritage experiences, not only extrinsic rewards, such as points or treasure, are needed but also intrinsic rewards, such as relatedness, competence, and autonomy [34]. Weber argues that the extrinsic rewards presented by LBGs should not be emphasized over the intrinsic rewards presented by cultural heritage experiences. Rubino et al., suggest that LBGs can be a suitable solution for enhancing cultural experiences in museums [35]. However, they point out that while the game allows for extensive exploration of the museum, players will only acquire superficial knowledge of the proposed content [35]. Similar to Weber, they point out that the use of LBGs can lead to a superficialization of the cultural heritage experience. Luiro et al. present the development process of a game based on Finnish history and cultural heritage and suggest that it is challenging to strike a balance between historical accuracy and an engaging narrative [36]. They appeal to the difficulty of combining the historical facts of cultural heritage with the narrative fiction of LBGs.

In summary, the abovementioned studies show that combining LGBs and cultural heritage experiences is a challenging endeavor, involving disparate elements such as new media devices and cultural heritage, entertainment and education, and historical facts and fictional stories. These studies also caution against overwhelming the cultural heritage experience with the gaming experience when using the latter to enhance the former. However, while there is consensus on the challenges and difficulties of combining LGBs and cultural heritage experience, there is a lack of research on how to optimize it.

Therefore, this study presents a model that can guide the development of LBGs from the perspective of combining cultural heritage experiences and games, focusing on the experiences of Generation Z. Using LBGs for cultural heritage experiences is one way in which Generation Z is modernizing heritage. Moreover, since utilizing LBGs in tourism involves combining the heterogeneous experiences of the digital environment (mobile devices), the analog environment (actual location), gaming and cultural heritage experience, and fun and education, more focused research is needed. However, while demand for utilizing LBGs in tourism is increasing, there is a lack of guidance for developing such services.

Therefore, this study aims to explore a model for the effective combination of gaming and cultural heritage experience in LBGs by examining the experiences of actual visitors during gameplay. For this purpose, participants from Generation Z, who are digital natives, played the LBG *Jeongdong Milseo*, which is available in South Korea. Subsequently, data on the gameplay process were collected from the perspective of combining cultural heritage and gaming experiences through focus group interviews. The collected data were analyzed using grounded theory methodology, while a model for combining cultural heritage experience and gaming in LBGs was created. The present study is expected to facilitate understanding regarding the combination of heterogeneous elements such as digital and analog technologies or gaming and cultural heritage experience and serve as a model for developing LBGs for cultural heritage experience.

Research Question 1: How can the heterogeneous experiences of cultural heritage and gaming be combined in LBGs?
Research Question 2: How does Generation Z perceive cultural heritage experiences through LBGs?

2. Materials and Methods

2.1. Characteristics of LBG Jeongdong Milseo

Jeongdong is an area with a unique character, home to palaces from the Joseon Dynasty such as Gyeongbokgung and Deoksugung, as well as cultural heritage from the Japanese colonial era. For foreign tourists, it is a place where they can experience Korean culture and history, while for urbanites like the participants in this study, it is an escape where they can immerse themselves in the past while being in the midst of a modernized city center.

Jeongdong Milseo is a mobile-based LBG that was launched in South Korea in 2019 and has been in service ever since, with Jeongdong as its backdrop. The developer, Real World Inc., provides various LBGs through mobile apps. *Jeongdong Milseo* is set in an alternate reality in February 1919 and assigns players the role of delivering funds for independence activities as a member of the Gwangmu Association, an anti-Japanese organization. Players sequentially solve eight missions consisting of a total of 20 quizzes or puzzles while traveling between cultural heritage sites from the Japanese colonial era, such as Deoksugung, Myeongdong Cathedral, and Gyeonggyojang. When all missions are completed, the independence funds are delivered to Kim Gu, the most well-known anti-Japanese activist in South Korea, and the game ends. The game allows players to experience an alternate reality in 1919 South Korea within historical spaces that contain traces of the Japanese colonial era.

The game requires not only a mobile app with AR features but also mission letters (secret letters in the game's setting) containing clues needed to solve puzzles. Figures 1–3 and Table 1 illustrate the content of the LBG *Jeongdong Milseo*.

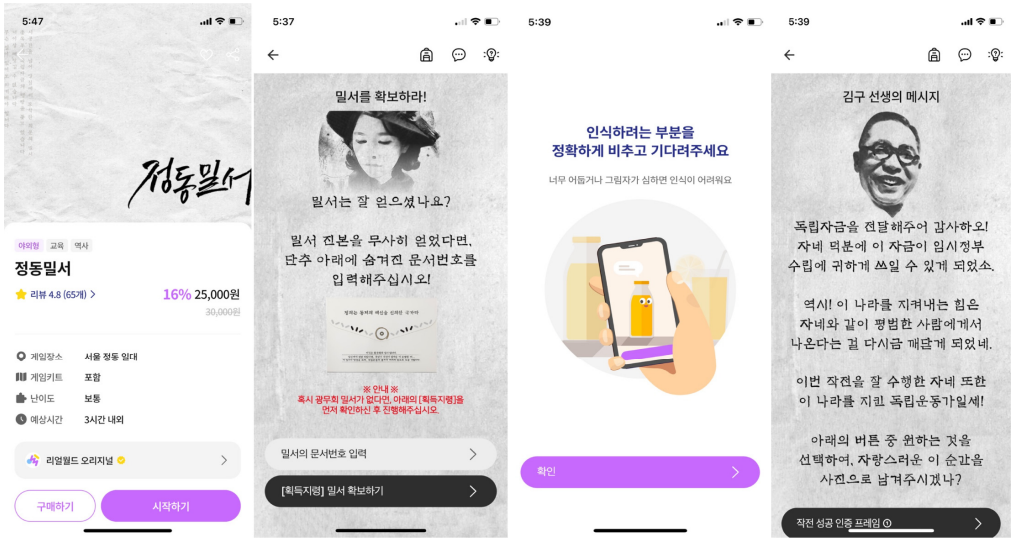

Figure 1. Screenshots of the *Jeongdong Milseo* mobile app (from left to right: game-start screen with basic information about the game, mission screen to present quest, AR feature screen, game-end screen with a message from Kim Gu).

Table 1. Characteristics of *Jeongdong Milseo* missions.

Mission Order	Mission Location (Tourism Destination)	Mission Content	Remarks (Used Media)
1	Seoul Hall of Urbanism & Architecture (former Jeongdong Communications Bureau)	Tutorial Mission (Verify membership in Gwangmu Association)	Quizzes and Puzzles
2	Myeongdong Cathedral	First Mission (Obtain withdrawal certificate from missionary)	Quizzes and Puzzles Uses AR

Table 1. *Cont.*

Mission Order	Mission Location (Tourism Destination)	Mission Content	Remarks (Used Media)
3	Deoksugung Entrance	Second Mission (Find seal)	Quizzes and Puzzles Uses phone (Listen to mission)
4	Deoksugung	Third Mission (Withdraw independence funds)	Quizzes and Puzzles Uses AR
5	Former Shin-A Ilbo Annex	Clue 1 to find the final mission location	Quizzes and Puzzles
6	Yewon School	Clue 2 to find the final mission location	Quizzes and Puzzles
7	Yewon School Intersection	Clue 3 to find the final mission location	Quizzes and Puzzles
8	Gyeonggyojang	Deliver independence funds (Kim Gu's message)	Operation success Take verification photo

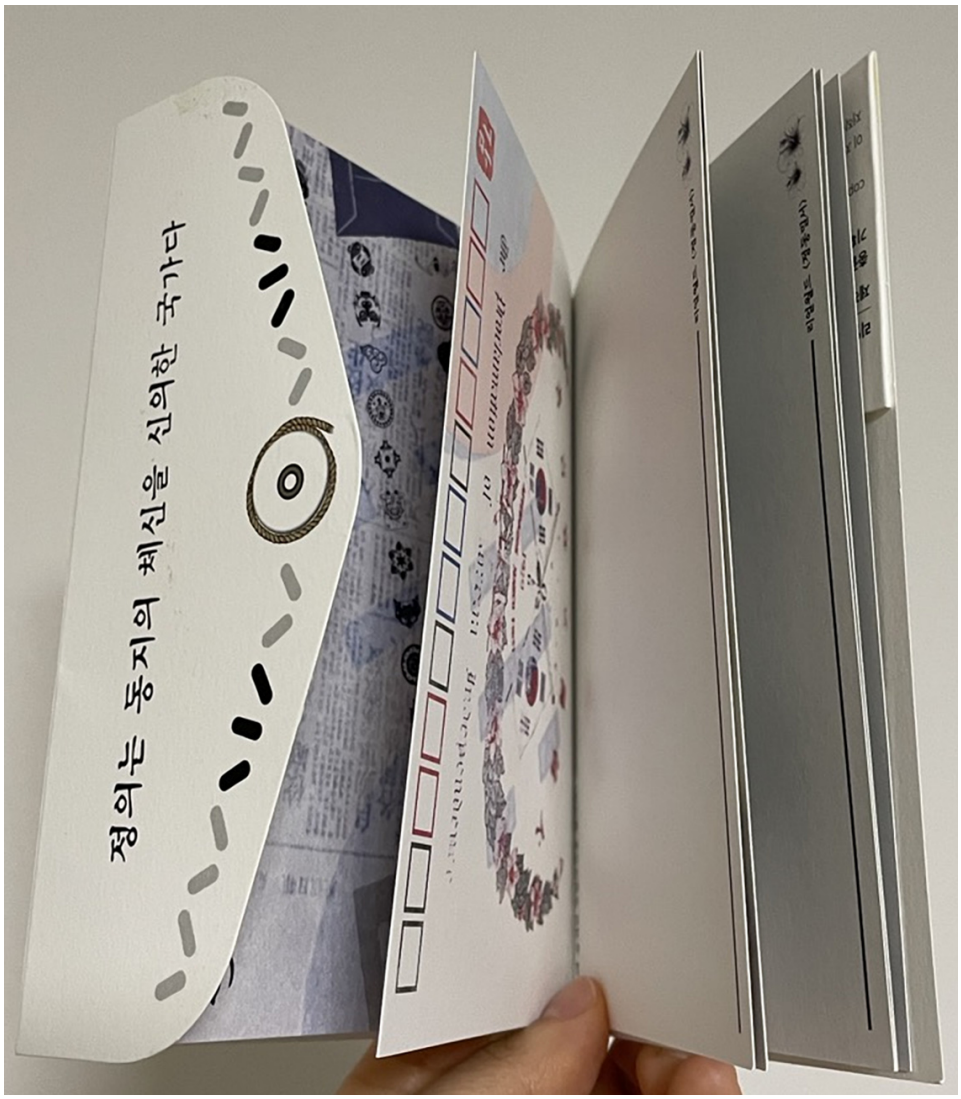

Figure 2. *Jeongdong Milseo* mission letters with clues to complete quests.

Figure 3. Movement path throughout Jeongdong during gameplay of *Jeongdong Milseo* (The numbers 1–8 represent the places the player visits for gameplay and the order in which they travel).

2.2. Constructivist Grounded Theory and Focus Group Interviews

2.2.1. Research Method

The purpose of this study is to explore a model that combines the two heterogeneous experiences of cultural heritage and gaming in LBGs using the research method of grounded theory. Grounded theory, one of the representative methods of qualitative analysis, is a research methodology that integrates a series of processes of collecting and analyzing subjective data through an iterative process and then developing a theory based on the data [37]. This process is consistent with the objective of this study, which is to derive a model that combines cultural heritage experiences and gaming from the subjective experiences of the participants' gameplay. In particular, this aspect of "combining" does not exist in the LBG itself but is a momentary and subjective experience that occurs only when playing the game and is, therefore, difficult to measure quantitatively. Grounded theory is also widely used as a research methodology in the field of tourism, which deals with the subjective experiences of tourists similar to gameplay [38].

Meanwhile, constructivist grounded theory emphasizes flexible procedures and the researcher's interpretive perspective, unlike traditional grounded theory. In constructivist grounded theory, the constructed theory is not entirely derived from the subjective experiences of the participants but considers the researcher's interpretation as a part of the theory construction [39]. The main difference between traditional grounded theory and constructivist grounded theory occurs at the stage of theory construction. In particular, traditional grounded theory presents a framework for theory construction, such as a "paradigmatic model" [40], in order to eliminate the researcher's subjective interpretation as much as possible during the theory construction stage. However, in constructivist grounded theory, the context other than the research data, such as the researcher's knowledge of the research problem and social discourse, also plays an important role in the theory construction process. As such, constructivist grounded theory emphasizes the openness of the theory construction process for creative construction [39]. This aspect is why this study adopts a constructivist perspective among grounded theory. The combination of cultural heritage experiences and gaming is not only a subjective experience but also a layered phenomenon in which various contexts, such as the use of media, the situation of the cultural heritage

site, the players' media, and cultural heritage literacy, operate simultaneously. Therefore, it was decided that openly constructing a model based on the analysis of the research data would be more appropriate for the topic of this study.

In this study, participants were interviewed after playing the LBG *Jeongdong Milseo*. As mentioned in the introduction, the group was limited to Generation Z individuals, who are familiar with mobile environments and seek new experiences in tourism. Focus group interviews were used to facilitate interaction within the group. While focus groups cannot represent a specific population, they allow participants with a clear sense of purpose for the study to engage in intensive discussions on the research topic [41]. Therefore, it was judged that this would be a suitable research methodology for the focused topic of combining tourism and gaming in LBGs.

2.2.2. Selection of Research Participants

In combining gaming and heritage experiences, this study focuses on the experiences of Generation Z, who are particularly familiar with digital games and devices. Accordingly, the participants were limited to members of Generation Z who had no experience playing LBGs but were familiar with mobile environments. Additionally, participants' gender was considered.

The participants were selected from volunteer students enrolled in a course taught by the researcher. The study's topic and purpose, the anonymity of the interview content, and compensation were communicated verbally during class and through eCampus notices. Regarding ethical issues related to research execution, gameplay and interviews were not related to sensitive personal information. However, considering the professor–student relationship between the researcher and participants, written consent was obtained after multiple reminders that participation in the research was voluntary and separate from participation in the class. Through this process, 15 college students aged 19–24 years were selected as participants. They were required to participate in the interviews based on their experience after playing *Jeongdong Milseo*. This required a significant amount of time from participants. Therefore, the participants were provided with a compensation of KRW 100,000, which included the cost of purchasing the *Jeongdong Milseo* game for KRW 15,000.

The participants were instructed to individually download the app on their mobile phones and play the game between 21 May and 23 May 2022. The participants were not selected from existing players because their memories of the gameplay experience could vary depending on when they played the game. In addition, LBGs are played in actual spaces—*Jeongdong Milseo* is played outdoors. Therefore, it was intended for the participants to play the game in as similar an environment (season, weather, etc.) as possible to focus on the research topic of combining tourism and gaming. The amount of time participants spent playing the game varied from one and a half hours to two and a half hours.

The general characteristics of the research participants are shown in Table 2.

Table 2. Information on study participants.

Category	Participant	Gender	Age	Experience Visiting Jeongdong	Alone or Accompanied	Time Taken to Play the Game
Group 1	1	Female	19	No	Alone	2 h 30 min
	2	Female	19	No	Alone	2 h
	3	Male	19	Yes	Accompanied	2 h 30 min
	4	Male	19	No	Alone	1 h 30 min
	5	Male	19	No	Accompanied	2 h 30 min

Table 2. *Cont.*

Category	Participant	Gender	Age	Experience Visiting Jeongdong	Alone or Accompanied	Time Taken to Play the Game
Group 2	6	Female	22	Yes	Alone	1 h 30 min
	7	Female	21	Yes	Accompanied	2 h
	8	Male	20	Yes	Alone	1 h 30 min
	9	Male	22	Yes	Alone	1 h 30 min
	10	Female	20	Yes	Alone	2 h
	11	Male	19	No	Alone	2 h
Group 3	12	Male	20	No	Alone	2 h 30 min
	13	Female	23	No	Accompanied	1 h 30 min
	14	Female	24	Yes	Accompanied	2 h
	15	Female	19	Yes	Accompanied	2 h 30 min

2.2.3. Data Collection

Considering the duration of the interviews, ease of interaction among participants, and individual schedules, the 15 participants were divided into three groups for interviews: Group 1 (five people), Group 2 (six people), and Group 3 (four people). The interviews were conducted over three days, from 30 May to 1 June 2022. The interviews were conducted in person in the researcher's office and lasted about 1 h and 30 min to 2 h. The time gap between playing the game and the interview was minimized to conduct the interview when the participants' memories of the gameplay were still vivid.

The interview questions in this study were designed by applying the question process proposed by Krueger [42]. The questionnaire was emailed to the participants in advance, and the questions were designed as shown in Table 3.

Table 3. Interview questionnaire.

Opening Questions
1. Please talk about the following four things in order: Date and time of visit: year/month/day/hour Time spent experiencing content Previous experience visiting the content area Experienced content alone or with a companion
Introductory Question
2. After playing *Jeongdong Milseo*, did it feel closer to a cultural heritage experience or a gaming experience?
Transition Questions
3. Was *Jeongdong Milseo* helpful in experiencing the cultural heritage destinations?
Key Questions
4. Please describe your experience with *Jeongdong Milseo* in detail. Feel free to mention both positive and negative aspects.
5. How would you create a game like *Jeongdong Milseo*?
6. Do you have any thoughts about trying an LBG of this kind again?
Ending Question
7. If there is anything you missed the opportunity to say or wanted to say but could not because it was not included in the questions, please feel free to share.

All interviews were conducted by the researcher and were recorded. Although the interviews were conducted with participants answering prepared questions in order, par-

ticipants were encouraged to exchange opinions during the key question stage to foster interaction among them. To further encourage interaction among the participants, they were provided with paper and writing utensils to freely record their thoughts or opinions of others. The researcher listened carefully to the participants' answers and took notes, only intervening when there was ambiguity. The researcher also asked additional questions during the closing question stage based on noted points of curiosity. After the interviews of the three groups were completed, the recorded content was transcribed within 24 h for analysis.

2.2.4. Data Analysis

The transcribed interview data were analyzed through the processes of initial coding, focused coding, and theoretical coding proposed by Charmaz [39]. The processes of initial coding and focused coding were conducted iteratively rather than sequentially; after conducting the first round of initial and focused coding, initial coding was performed again, and repeatedly compared and modified concepts and categories.

Since this study was conducted by a single researcher, the peer examination method was used to ensure validity and avoid bias in data collection and analysis. Advice was received once during the question development process and once during the coding process from a group of peer researchers. Peer researchers provided input on two aspects of the question development process. The first was whether the interview questions were appropriate to address the research question, and the second was whether the questions were open-ended rather than closed-ended. Additionally, during the coding process, peer researchers compared the initial coding to the focused coding and commented on whether the focal coding was approaching saturation.

3. Results

According to the data analysis results, 87 concepts were constructed in the initial coding process, and similar concepts were condensed into 55 categories, as shown in Table 4. The 55 categories were focus-coded into 11 categories, while during theoretical coding, the 11 categories were further reduced to 4 categories.

Table 4. Coding results.

Initial Coding	Focused Coding	Theoretical Coding
Wanted to finish the game quickly due to the hot weather and decreased physical strength. Thought the gameplay playing area was too large. The average playtime of the participants was about 2 h. If they started the game late in the afternoon, they had to rush through the gameplay due to closing times. Thought the gameplay time should be shortened.	The conflict between game completion and the physical environment	Site-based "play"
Felt they needed to finish the game faster than the expected playtime (around three hours) provided in the instructions. When concentrating on the game, they focused only on the backgrounds and buildings emphasized by the game. Felt they had to quickly move to the next mission location after clearing a mission. Wanted to return and enjoy the cultural heritage at a slow pace since they could not fully enjoy them while solving the quizzes.	The conflict between game completion and tourism	

Table 4. *Cont.*

Initial Coding	Focused Coding	Theoretical Coding
Annoyed that they had to retrace their steps because they could not learn the next mission location before finishing the previous one. Could not think about going anywhere else because the next mission location was revealed only after finishing the previous one. Wished the ending point of the game was announced like the starting point. Wanted to know beforehand how many places they had to visit. Wished they could choose where to go like in an open-world game.	Predefined mission order	Site-based "play"
Ended up paying close attention to places they might have otherwise passed by without noticing in order to solve quizzes. Learned about places they did not know while solving quizzes. Learned trivial things while solving quizzes. Enjoyed solving quizzes using the numbers on tombstones (Deoksugung) and the patterns on walls (cathedral).	Rediscovery of cultural heritage sites	
Wished the quizzes could draw out the historical significance of the locations. Some quizzes were solvable even without being at the location. Wished there were questions that utilized more historical knowledge. Enjoyed examining the tombstones closely to solve the quizzes.	Site-based quizzes without the actual site	
Lost momentum when AR recognition did not work (skipped due to cathedral construction). The provided map was inaccurate, so they had to go back and forth several times. Felt immersed when receiving a mission through a phone call after inputting the phone number.	Inaccurate and failed feedback	
The story was relatable for all Koreans. Felt like a real independence activist as the story was about the history of the Jeongdong area. Felt invited when the game mission letters were delivered to their home. Too many things to consider before immersing themselves in the role of an independence activist (e.g., weather, noise, and quiz difficulty). Not enough hands to use multiple media (e.g., mission letters and mobile app).	Disrupted roleplaying	Loose "story"
Felt like an independence activist when receiving the priest's message in the cathedral mission. Independence activist's speech in the phone mission was moving. The appearance of Kim Gu in the ending was moving.	Interaction with characters	
Refreshing to play the game outdoors. Checked quiz answers without solving because they were too hard. Noise from nearby protests and other sources interfered with immersion. Felt embarrassed playing the game alone in a crowd.	Outdoor environment: a "magic circle" with holes	Mutually pervasive "environments"
Would have been boring if played alone. Helpful to have a companion when solving questions. Would have been embarrassing without a companion. Would be nice to receive help from staff at Deoksugung or the exhibition hall. Would be nice to interact with people, not just places and objects, while doing missions.	Social environment: lack of human interaction	

Table 4. *Cont.*

Initial Coding	Focused Coding	Theoretical Coding
Disappointed compared to expectations after having tried an (indoor) escape room game. Found the content simple even though they like games. Found it more fun than expected since they did not have any information or expectations about the game. Some fresh and interesting parts, but the interest level drops for an adult audience. Wished there were more experiential elements. Would not pay for a similar game but would play if it were free. Reducing the "history" keyword would make it more enjoyable for adults.	Ambivalence about the gaming experience	Ambivalence
Only played; did not learn. Thought that just getting them to visit the location was somewhat of a success. Aroused interest in the location, but the experience did not feel meaningful. Seemed more suitable for families or children's education. Wished more historical materials were provided. From a cultural heritage lover's perspective, wished more locations were included in the game.	Mixed satisfaction with the cultural heritage experience	

3.1. Site-Based Play

3.1.1. Conflict between Game Completion and the Physical Environment

Because LBGs are games played in real spaces, participants experienced conflict between the goal of experiencing the game's ending and the physical environment. In particular, the hot weather and the size of the gameplay area were problematic. In the context of the general cultural heritage experience, visitors can adjust their schedule depending on the weather or the environment of the destination. However, in the case of games, once started, visitors make an implicit commitment to play until the end, and poor physical conditions tend to undermine their motivation to continue playing. In the case of *Jeongdong Milseo*, the estimated playtime suggested by the app was about three hours, but the actual average playtime of the 15 participants was about two hours. Moreover, the play area is approximately 158,225 m^2. The fact that the participants finished the game more quickly than the estimated playtime suggests that the weather and the size of the play area contributed to the burden. Additionally, participants could not quit the game halfway and had to play until the end to participate in the study, which also seems to have acted as a burden.

> I felt that movement took too long, both in terms of time and distance. After reaching Jungmyeongjeon Hall of Deoksugung, I started to feel tired. (Participant 2)

> I checked my step count at that time; I had walked over 10,000 steps. (Participant 12)

Time constraints also acted as a physical barrier to gameplay. The game itself has an estimated playtime but no specific time constraints. However, since the participants started the game at different times, for those who started late in the afternoon, the closing hours of facilities like the exhibition hall and Deoksugung became a time constraint. Participants used expressions such as "guideline", "struggle", "hurry", and "burden" regarding these physical constraints, expressing that the temporal, spatial, and physical environments were obstacles to completing the game. Some participants also expressed that they would like the playtime to be shorter. Since LBGs are played in actual time and space, it is essential to set the game's time and space appropriately to ensure game completion.

3.1.2. Conflict between Game Completion and Tourism

While the physical environment posed obstacles to completing the game, game completion itself became a problem by acting as an obstacle to tourism. As discussed in the introduction, according to previous studies, game formats that provide goals and rewards help visitors engage with cultural heritage destinations. However, participants commonly felt they lacked the psychological leisure to fully enjoy the tourism destinations, as they were focused on the game's missions and outcomes. Many participants used expressions like "clearing" the game or missions, which demonstrates the nature of a game that cannot be quit halfway.

> When you visit the location and clear the mission, you have to move on to the next one right away. Usually when you hear "Please go to the next location", you just go in that direction. So before leaving, I did not have thoughts like, "Should I take a look around here before moving on?" As a result, I feel like I went to many places, but despite the fact that they are valuable cultural heritage sites, my understanding of the places themselves is lacking. (Participant 6)

One participant felt that they could only play the game "well" by completing it in less time than the three hours suggested by the app. Also, many participants regretted that they could not fully enjoy the cultural heritage destination while playing the game. This created motivation for revisiting the tourism destinations but also confirmed that they experienced psychological conflict as the "sense of achievement" from playing the game and the "freedom" or "leisure" of the cultural heritage experience were in conflict. The goal-oriented nature of games has the power to present goals to players and strongly engage them in achieving those goals. However, when this goal orientation is focused on the game, it can have a counterproductive effect on engagement with the tourism destination. A game structure that does not interfere with cultural heritage experience while still following the game's goals is necessary.

3.1.3. Linear Missions with a Set Order

The research results indicated that the starting and ending points of gameplay in LBGs are important. Since LBGs are games played in real spaces, the process of going to a cultural heritage destination to play the game and then leaving the cultural heritage destination after finishing the game must be considered. The start and end of the game do not take place in a single location, such as in front of a monitor like in digital games. Because of this, participants wanted to know beforehand where the game starts, where it ends, and how many places they have to visit to play the game. Generally, in digital games, not knowing the next mission helps keep players motivated for the game. However, participants also perceived the missions in the location-based game as a sort of guide revealing the experience route.

> The game felt like a guide. It felt like it was guiding the way, and I had to go to the places it told me to. (Participant 9)

The sequential nature of the missions also posed an issue during gameplay. Cultural heritage guides present cultural heritage destinations in a certain order, but in reality, there is no need to strictly follow the guide's suggested order, and skipping certain places is not a problem. However, in games like *Jeongdong Milseo*, completing the previous mission is a prerequisite for the next mission, leading to a forced sequential nature. The inability to skip or choose the order of missions was found to hinder participants' engagement.

> While doing a mission at Deoksugung, I came across a beautiful spot and went to take a picture. After taking the picture, when I tried to resume the mission, I had to retrace my steps. This happened several times, which made the game less interesting and somewhat annoying. (Participant 13)

As the sequence was enforced, participants who wanted to momentarily step out of the game to enjoy the cultural heritage destination had to retrace their steps to resume the

mission. Some participants did not even consider deviating from the mission route due to the sequence's compulsory nature. Cultural heritage guides also present linear routes to visitors. However, a cultural heritage guide's "suggested" order and a game mission's "compulsory" order are different. Therefore, it is necessary to design LBGs with linear routes but missions without a set order.

3.1.4. Rediscovering Cultural Heritage Sites

The participants felt satisfied when game missions were connected to the cultural heritage destination. Eight out of fifteen participants had previously visited the area, and they expressed satisfaction in learning something new through the game. The participants with prior visits used expressions such as "details", "minor things", "discovering things I did not know", "new", and "in-depth" to convey that they had new experiences even during a revisit. In particular, many participants expressed satisfaction with quizzes involving numbers written on tombstones in Deoksugung or patterns on the cathedral walls.

> I was able to visit places that I might have just passed by, thinking it was just an alleyway. At Deoksugung, there was a mission to check the patterns inside the columns. Through this, I learned that the patterns were different on each column, and it was nice to take a closer look at places that I would usually just pass by. (Participant 8)

In the research results presented above, within the macroscopic cultural heritage destination experience (moving between places and missions), the gaming experience (a kind of compulsory activity) overpowered the cultural heritage experience. However, at the microscopic level of experiencing places and objects, the results showed that connecting the game with the cultural heritage destination allowed players to rediscover cultural heritage sites. When increasing engagement with cultural heritage destinations through games, it is more effective to enhance the experience within a single location rather than connecting multiple locations.

3.1.5. Site-Based Quizzes without the Actual Site

The sense of presence in the quizzes was an essential factor in determining participants' engagement. Participants who felt a connection between the mission and the site felt satisfied after completing the mission. In particular, participants often used the term "directly" when expressing satisfaction, feeling that the mission and site were closely linked.

> What left the deepest impression was when I had to look at the numbers on the tombstones with my own eyes, and then apply them to the picture (mission letter quiz) to find the combination. (Participant 10)

Conversely, participants stated that their engagement decreased when they encountered quizzes that did not sufficiently utilize historical or cultural heritage knowledge or when they encountered quizzes that did not necessarily need to be solved at a specific location.

> They were not based on historical knowledge but on skills used in escape room games, which I did not even play in the first place. I wondered why I would pay for such a tormenting experience when it would be better to implement more historical knowledge, such as searching for things on the internet or using the Deoksugung map. (Participant 4)

Missions (composed of multiple quizzes) that occupy a large portion of the gameplay are the medium that combines cultural heritage and gaming experiences. Generally, games have a structure that maintains engagement by gradually increasing the intensity of challenges through systems like levels. For this reason, players also consider mission difficulty when choosing a game to play. However, in designing missions for LBGs that integrate cultural heritage experiences, it seems that how closely the mission is connected to the cultural heritage destination is a more critical factor than the mission's difficulty in determining engagement.

3.1.6. Inaccurate and Failed Feedback

Jeongdong Milseo is designed as a combination of a mobile app and mission letters, integrating AR features when solving quizzes. AR is used three times in *Jeongdong Milseo*, and participants felt more engaged with the site when AR recognition was successful. However, when AR recognition failed, their engagement with the game was affected. Visitors described this as "losing momentum", "losing motivation", or "feeling empty".

Particularly, the first AR feature in the cathedral was replaced with an alternative quiz due to construction inside the cathedral, which negatively affected the gaming experience. Thirteen out of fifteen participants had negative opinions about the use of AR in the Cathedral Quest. Additionally, the map provided in the mobile app did not accurately show the locations necessary for gameplay, and the need to use multiple media inconvenienced the participants.

> In my case, there were problems with the AR, as it suddenly stopped working on my phone. When that happened, it offered hints as a substitute, but that was somewhat disappointing. Up until that moment, I felt immersed in the game, but after that, it felt more like just a mobile game, which was disappointing. (Participant 7)

Conversely, one mission required participants to solve quizzes to find a phone number; upon calling that number, a voice actor portraying an independence activist would present the next mission. Participants commonly expressed that they felt as if they were actually participating in the independence movement during this mission.

> During the game, we had to make a phone call. My immersion had already broken at the cathedral, but when I made the call I thought, "This is so crazy", and became re-immersed in the game, even if just a little. (Participant 9)

Regardless of the sophistication or diversity of the technology used in the game, it is essential for the game to provide appropriate and accurate feedback (reactions) when visitors take action during gameplay. Even though the phone call mission did not use new technology like AR, it led to a positive experience through successful feedback. While missions serve as the medium connecting the cultural heritage experience and gaming experience in terms of content, various mobile technologies physically connect the cultural heritage destinations with the game. Therefore, although it is important to create high-quality game content, accurate feedback from mobile technologies connecting the physical cultural heritage destinations and the game must be prioritized.

3.2. Loose Story

3.2.1. Disrupted Roleplaying

Jeongdong Milseo assigns participants the role of an independence activist and invites them to participate in the game through this role. When participants purchase the game on the app, mission letters (secret letters in the story) are delivered to their homes. Participants stated that this format helped raise their expectations for the game. This roleplaying plays a crucial role in strengthening the game's engagement through its narrative elements.

Also, even if seven of the fifteen participants had never visited the Jeongdong area before, most of them were aware through school education that the area was closely related to historical events during Japanese rule. Because of this, they easily recognized the story's subject matter and the role assigned to them, and they positively assessed that it suited the Jeongdong area.

> When I was going from Deoksugung to Gyeonggyojang, the buildings were still old like in the past, so I felt like I had become a real independence activist for a moment. (Participant 5)

It was not the story itself but the historical nature of the Jeongdong area and the authenticity of historical buildings that helped participants immerse themselves in the fictional story. However, this realism of the gameplay sites did not only help participants

engage with the story through their roles. Participants expressed that there were too many things to pay attention to (e.g., the weather, surrounding noise, quiz difficulty, and other environmental and gameplay elements) before they could immerse themselves in the role of an independence activist. The physical inconvenience of having to alternate between mission letters and the mobile app also hindered participants from immersing themselves in their roles.

> Honestly, I did not feel like I had become an independence activist. I tried, but there were too many distractions for me to immerse myself in the role, including the weather. (Participant 9)

In general, games with narrative elements involve the player taking on the protagonist's role in the first person when playing the game. Immersing oneself in a role is not easy, even in a controlled environment provided by a single medium like a computer. It is even more challenging in an LBG, where players have many things to pay attention to. Therefore, instead of forcing players to maintain immersion in a particular role, it may be more suitable to structure the story in an omnibus format that allows them to experience the story regardless of any distractions.

3.2.2. Interaction with Characters

In terms of the narrative, participants commonly evaluated their interactions with the game's characters positively. In the early mission at the cathedral, participants received confirmation that they were members of the Guangwu Association from a priest, who was also an independence activist. In the middle of the game, during a phone mission, they received praise and encouragement for their mission from another independence activist. Participants expressed that they felt emotionally engaged in the story through these missions. Particularly, most participants mentioned the game's ending. At the end of the game, participants deliver independence funds to Kim Gu at Gyeonggyojang and hear his eloquent speech urging independence.

> When I was delivering the funds and having a conversation with Kim Gu, that scene was emotional because it closely overlapped with what I learned about Gyeonggyojang from my history studies. Gyeonggyojang is where Kim Gu stayed and also where he was assassinated. That experience of being able to have a conversation with him at Gyeonggyojang itself was very moving for me. (Participant 15)

Rather than experiencing narrative-related emotions through the overall narrative (i.e., the plot or storyline), participants were more engaged in the story through interactions with the characters. Therefore, instead of having participants follow the plot through missions, having different characters interact with them at each location or mission could be an alternative to enhance the player's narrative experience.

3.3. Mutually Pervasive Environments

3.3.1. Outdoor Environment: A "Magic Circle" with Holes

The fact that the game was played outdoors also affected participants' gameplay and satisfaction. Though playing the game outdoors was a "fresh" and "novel" experience, the outdoor environment also had many distractions. Despite playing the game in May, participants commonly experienced negative impacts on gameplay due to unusually hot weather. Additionally, the game's location near Gwanghwamun, an area with many protests, resulted in distractions due to noise from protesters.

> When I came out of the City Hall station, it was a weekend afternoon, so the whole street was full of protesters. So, I guess there were issues like the weather and the time. There was an intense heat wave when I played the game, and I did not think about environmental constraints like that. (Participant 10)

The outdoor urban environment not only contains physical obstacles such as weather and noise but also the potential for psychological obstacles. In LBGs, tourism destinations and game spaces are also everyday spaces. Focusing on the game's fictional context while in a crowd of people in daily life is not only difficult but also causes a sense of alienation.

> I was on my way home from work. Playing this by myself in a crowd as if I were the only one who was really busy was slightly embarrassing. It might not be something that I would do on my own. (Participant 12)

In outdoor games like LBGs, it is difficult to block out the surrounding environment and create a solid "magic circle". Instead, games can be designed to incorporate various elements of daily life from the outdoor environment and real-life context. Although factors such as the weather may be difficult to control, other elements, such as protesters and commuting crowds, can be incorporated into the story as "busy pedestrians on the streets of Gyeongseong in 1919".

3.3.2. Social Environment: Lack of Human Interaction

Participants felt that there was a lack of human interaction during the game. This is ironic considering that participants felt the surrounding crowds were a hindrance to their immersion in the game. However, the lack of human interaction was related to the participants' desire to engage with other people in the game. Six out of nine participants who played the game alone experienced discomfort in using the mobile app, difficulty in solving quizzes, and a psychological sense of alienation, whereas those who played with a companion had a more positive experience.

> I solved some questions and my friend also solved some too. It was definitely easier to solve the questions when we put our heads together, and it would have been somewhat embarrassing to walk around playing the game alone, so I played it with my friend. (Participant 3)

Participants expressed their disappointment at the lack of interaction with on-site staff, such as those at the exhibition hall or Deoksugung. This suggests that in LBGs, not only the connection between the cultural heritage and gaming experiences is important, but interaction with local residents is also a crucial element. Therefore, designing the game to allow for solving quizzes with a companion or other people or allowing players to seek help from staff at cultural heritage destinations could help engage players in the game.

3.4. Generation Z's Ambivalent Satisfaction

Observing the participants' responses and conversations regarding their overall satisfaction with the *Jeongdong Milseo* experience, the researcher strongly felt that participants experienced ambivalence about their experience. This was common across all three groups. Twelve out of the fifteen participants could not clearly say whether they liked or disliked the *Jeongdong Milseo* experience. Most responses took the form of "some aspects were good, but others were disappointing".

3.4.1. Ambivalence about the Gaming Experience

Ambivalence about the gaming experience stemmed from the game being novel and interesting in some respects but falling short of the expectations of adult participants. As the game was centered around historical material, its educational nature was not conducive to making the game "fun". Generation Z participants identified themselves as adults and demanded sophisticated, adult-appropriate experiences. Moreover, satisfaction with the gaming experience was also related to participants' prior gaming experience. In other words, the participants, who were familiar with sophisticated mobile games, found the game content simplistic, falling short of their expectations, and unsuitable for adult audiences.

> I think the content itself is a little lacking for adults to play right now. It might be helpful for children, but I'm not sure if adults would really make time for this. I think it would be helpful to prepare more content for adults. (Participant 13)

3.4.2. Ambivalence about the Cultural Heritage Experience

Ambivalence about the cultural heritage experience was related to the authenticity of the experience. Participants used expressions like "unable to experience deeply", "unable to truly appreciate", "not touching", and "superficial". This suggests that participants had expectations for a genuine or deep experience, as the cultural heritage destinations they experienced through *Jeongdong Milseo* were related to Korea's heart-wrenching historical heritage.

> Since I do not usually visit historical sites for fun, it is true that this game gave me a starting point to go there, but it felt like I only experienced it without really learning anything. When I visit historical sites, I usually try to see and think more about what kind of place it is and what meaning it holds, but when playing the game, I was too focused on moving on to the next part, so I think I missed out on the learning I would have done if I had just gone there normally. (Participant 12)

Participants' dissatisfaction with the gaming experience was attributed to the historical aspect of the experience, while those who were dissatisfied with the tourism experience felt that the game triggered interest in the cultural heritage destinations but lacked depth and authenticity in the experience. This suggests that, for Generation Z, cultural heritage destinations are not places they would be motivated to visit without a specific purpose and that the use of games can be an incentive to visit these places. However, for the LBG experience to be authentic, the combination of gaming and heritage requires a deeper level of integration.

3.5. Structure Combining Cultural Heritage Experience and Gaming Experiences in LBGs

Reflecting the results of focused coding, this study created a theoretical structure for combining cultural heritage and gaming experiences in LBGs, as shown in Figure 4. The results of focused coding were derived based on factors that hinder the combination of cultural heritage and gaming experiences, and these were converted into improvements and incorporated into the theoretical structure. The derived LBG structure consists of elements of play, story, and environment. In this case, the missions are what connect the elements of play, story, and environment into a single game. In LBGs, missions determine under what environmental conditions a player will solve a quiz and experience a story. They become the point of contact and intersection between gaming and cultural heritage experiences.

First, play in LBGs must be thoroughly based on the actual site of the cultural heritage destination. One method for this is to structure play with missions that have no predetermined order. The first factor that caused conflict between gaming and cultural heritage experience for participants, as identified during focused coding, was that the gameplay took a long time or covered a large area. To solve this problem, visitors should be able to choose the missions that they can play. For example, in *Jeongdong Milseo*, participants had to complete all eight missions, but allowing them to selectively complete only a few missions and still finish the game would enable tourists to adjust the time and space of gameplay according to their preferences.

The inability to choose not only the missions but also the order of solving them were factors that caused conflict between gaming and cultural heritage experience for participants. To solve this problem, tourists should be able to choose not only the number of missions but also the order in which they complete them. This way, the compulsory nature of the game will not undermine the autonomy of tourism. This alternative can be visualized and represented as shown in Figure 5. The left figure represents the current mission structure of *Jeongdong Milseo*, while the right figure represents the alternative mission structure. As shown in the right figure, visitors should be able to complete the game by performing only missions from Group A or only missions from Group B. Within

each group, players can also decide the order in which they complete the missions. Highly motivated visitors may complete all the missions, whereas others can enjoy the game without interfering with the cultural heritage experience if the only complete a portion of the missions.

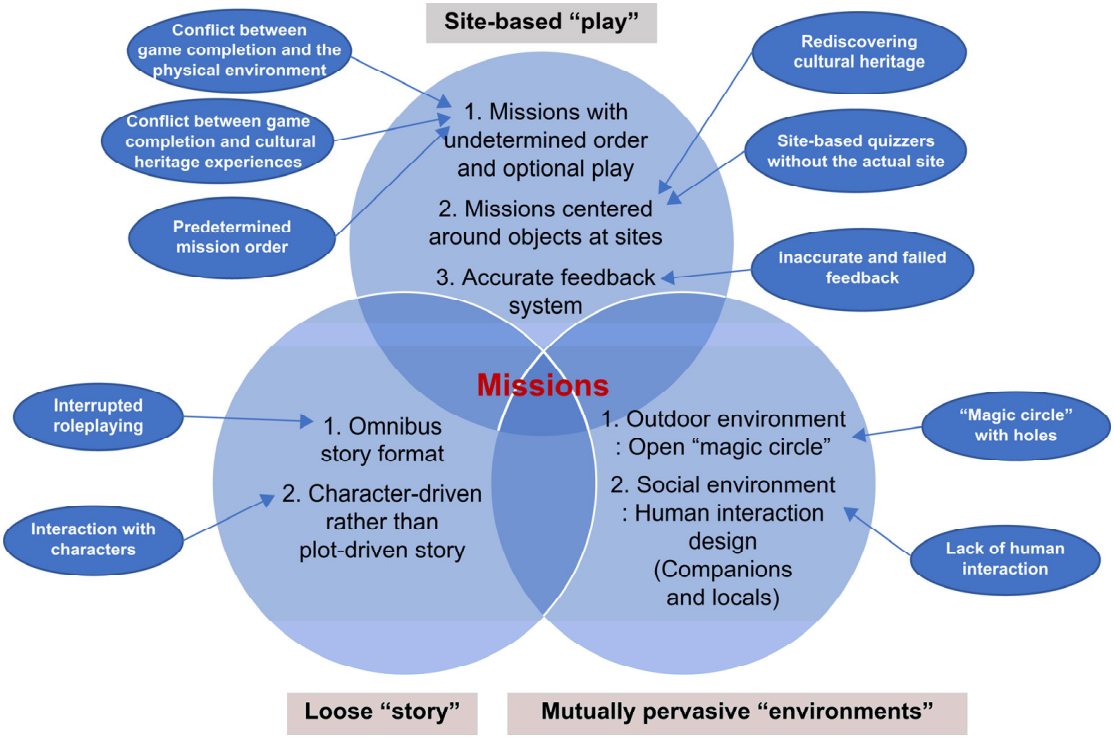

Figure 4. Structure combining cultural heritage experience and gaming experiences in LBGs.

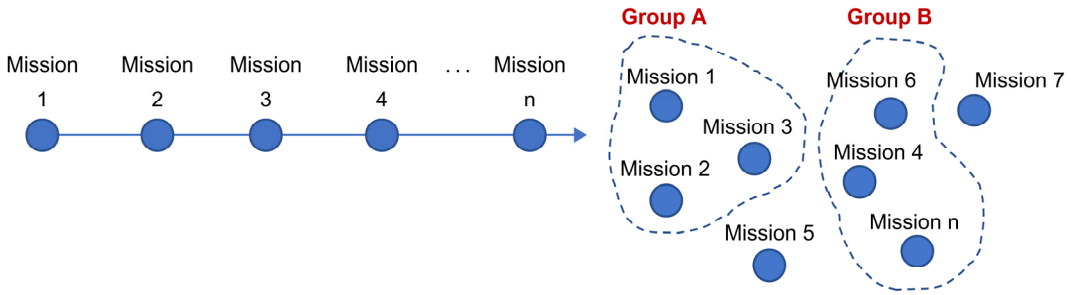

Figure 5. Gameplay in the LBG *Jeongdong Milseo* (**left**), alternative (**right**).

The second method is to have missions centered on objects at the sites. Participants felt that cultural heritage experience and gaming were closely related when they discovered cultural heritage through the game's missions, which they would not have learned about without guidance. Conversely, when the game was not connected to elements at the sites, such as buildings or objects, participants felt skeptical about the gameplay itself. Ultimately, in LBGs, the combination of cultural heritage and gaming experiences must be linked not only on a macro level (connections between sites, route suggestions, etc.) but also on a micro level, such as buildings or objects, for all quizzes and missions.

The third method involves an accurate feedback system. Participants found that their motivation for gameplay was significantly reduced when features such as maps or AR in the mobile app did not function correctly or required workarounds. Mobile apps are the most basic medium connecting destinations and games, physically linking cultural heritage destinations and gaming. Therefore, when combining tourism and gaming in LBGs, accurate app feedback is not optional but a necessary condition. As such, when

designing a game, while it is important to create diverse and high-quality content, the developer must ensure that the app functions correctly under various circumstances.

In LBGs, the second element of combining tourism and gaming is the story, which should be loose. Since LBGs use various media and are played in the real world, it is difficult for players to fully experience a single, complete story with a beginning and an end. The loose story must also be accompanied by a site-based play.

As shown on the left side of Figure 6, the current narrative of *Jeongdong Milseo* has a clear linear structure where players are given the mission of delivering independence funds and go through various events. However, LBGs have a structure where players experience the play and story simultaneously through missions. Therefore, if visitors can choose play experiences without a predetermined order, the story should also be experienced in the same way. The right side of the figure shows the alternative method where players can experience the story selectively and in any order without affecting the gameplay. In this case, an omnibus format is suitable, with each story (Stories 1–6) as a separate, complete story rather than part of a larger narrative that connects to other stories. Additionally, having characters interact with players in each story can be effective in providing emotional experiences throughout the story. For example, by applying this format to *Jeongdong Milseo*, players can meet different independence activists in each mission, listen to their stories, and interact with them. This way, even if players do not experience all the stories, it will not affect their gameplay.

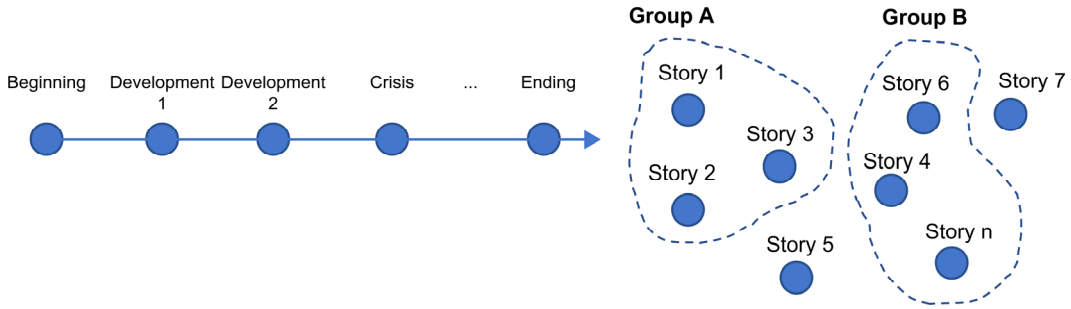

Figure 6. Story structure of the LBG *Jeongdong Milseo* (**left**), alternative (**right**).

Finally, the third element of combining cultural heritage experiences and gaming in LBGs is mutually pervasive environments. LBGs are played in real-world spaces, so various physical and psychological factors inherently "invade" the gaming experience. Participants felt that these real-world factors interfered with their LBG experience. However, instead of blocking out the surroundings and creating a solid "magic circle" of fiction, accepting the inherent characteristics of LBGs and allowing various contexts of the real world to "pervade" the space by creating an open magic circle could be a better strategy. Participants often used expressions like "I felt immersed" or "My immersion was broken" during the coding process. This suggests that based on their experiences with traditional digital games, participants have a preconceived notion that a good game is one that can be played with complete immersion, blocking out the surroundings. Therefore, it could be a better strategy to actively utilize the real-world context in LBGs by including on-site objects and people in the game's mission design. This way, players can accept values other than immersion as virtues of the LBG gameplay.

4. Discussion

From the results of this study, three discussion points pertaining to the research problem emerge.

The first discussion point is the issue of Generation Z's perception of cultural heritage experiences through LBGs. Similar to the findings of previous studies that LBGs have a positive impact on visitation intentions for tourist destinations [14], participants in this study also perceived LBGs as helpful in encouraging them to visit cultural heritage sites.

These perceptions demonstrate a lack of willingness to visit cultural heritage sites in cities unless they have some purpose or meaning. In particular, participants in the study found that the LBGs they played sparked their interest in cultural heritage destinations, even though they had a low opinion of the game experience itself. This suggests that Generation Z has a high level of demand for such experiential content as they are exposed to a variety of digital content, including games, on a daily basis. This also ties in with their perception of educational experiences through LBGs. Generation Z needs fast interactions that can satisfy their curiosity and provide instant gratification [5,6]. This is not to say that Generation Z is only looking for fun and rejecting educational experiences when it comes to LBG-enabled cultural heritage experiences. However, they want their experiences to be differentiated by small details that can only be discovered through on-site gameplay rather than information that can be learned without the use of a game. This relates to the question of the sustainability of using LBGs in cultural heritage experiences. The use of LBGs in cultural heritage experiences is not just about engaging people through the form of a game. LBGs can provide a new cultural context for cultural heritage that cannot be physically altered, whether it is a fictional story or has educational content. This aligns with Gen Z's cultural tendency to seek out new, personalized experiences. The sustainability that LBG can provide to cultural heritage is not the physical sustainability of preservation but rather the cultural sustainability of being able to present new values to suit the changing times.

They also want historical information to be woven into the mission rather than simply delivered superficially through a game. The development of LBGs that target Generation Z shows that the combination of a game and a cultural heritage experience needs to be more carefully designed. Experiencing cultural heritage through LBGs once again emphasized that "Generation Z is a social generation" [43]. In the study, participants who played the game with a companion were clearly more satisfied than those who played the game alone. They also wanted to interact with others on-site while playing the game. They felt uncomfortable being cut off from their surroundings and forced to immerse themselves in the game. It is natural for Generation Z, as digital natives, to move fluidly between physical and online environments [44]. Therefore, a more effective model for LBGs based in physical environments, especially when targeting Generation Z, is to incorporate games that allow for active networking with others, both online and offline, rather than isolated immersion.

The second discussion point refers to what happens if LBGs do not achieve a balance between gaming and cultural heritage experiences. One possibility is that the reversal of roles, as cautioned in previous studies, can easily occur [13,28]. In the tourism sector, LBGs are mainly used as a way to enhance tourist engagement and enrich experiences at tourism destinations. However, an interesting finding is that the participants showed clear ambivalence in their experience of *Jeongdong Milseo*, reporting positive and negative aspects of both cultural heritage and gaming experiences. Generally, gamification, which involves applying gaming to other fields, is notable for two aspects. First is the goal-oriented aspect of gaming that focuses on achievement and victory, and second is the immersive and interactive aspect of digital media. However, the ambivalence shown by the study participants indicates that these two aspects, which are reasons for playing games, can be obstacles to engagement in cultural heritage experiences. The pressure to quickly achieve the game objectives can interfere with the autonomy and authenticity of the visitor's experience. Additionally, immersion in and various interactive requirements for playing the game (such as operating mobile apps or utilizing maps) can also interfere with elements such as the autonomy of cultural heritage experiences and serendipitous discoveries.

Finally, the third discussion point is linked to the second: the issue of "balance" and "combining" among the various considerations for combining gaming and cultural heritage experiences in LBGs. This study proposed three elements—play, story, and environment—as considerations for the aforementioned. The fact that these three elements are important in the combination of gaming and cultural heritage experiences is not completely new and has been revealed in existing studies. In LBGs and the gamification of tourism, several studies suggested play-related elements such as scores and rewards to help

the tourist experience [14,34], and the importance of story experience in the gamification of tourist attractions has also been emphasized [10,11,45]. Moreover, the importance of socialization elements in LBGs, such as interacting with accompanying participants or locals, has also been discussed [10,11,45]. However, the current study has gone beyond identifying each element and explored how these important elements intersect and interact based on missions in constructing a single experience. In LBGs, although play, story, and environment are important elements in enhancing the visitor's experience through the game format, it is important to ensure that they can create mutual synergy without interfering with each separate experience.

5. Conclusions

Combining cultural heritage experiences with new technologies is an inevitable direction for Generation Z, who are accustomed to experiences mediated by digital media. This study confirms that Generation Z has high expectations for the integration of gaming and heritage experiences, and it is expected that the model presented in this study can help facilitate such integration.

This study explored methods of combining the heterogeneous experiences of cultural heritage and gaming in LBGs through the methodology of grounded theory, with a focus on the experiences of Generation Z. According to our results, the participants experienced ambivalence between cultural heritage and gaming experiences. This ambivalence expressed by participants suggests Generation Z's perception of LBGs. As digital natives, Generation Z wanted a higher level of integration of cultural heritage and gaming experiences and wanted to experience expanded social networking.

Furthermore, this study presented alternative methods to solve these hindrances within the structure where play, story, and environment intersect through the theoretical coding process. First, three alternatives for site-based play are proposed: missions with no predetermined order and optional play, missions centered around objects at the sites and an accurate feedback system. Second, two alternatives for a loose story are proposed: an omnibus-style story and a character-centered story instead of a plot-driven one. Finally, two alternatives for mutually pervasive environments are proposed: open "magic circles" and human interaction design.

Of course, there are limitations to the research results presented in this study. The main issue is whether this theoretical structure can secure sufficient universality. The fact that this study focused on a single LBG played in a specific environment can be a limitation. These limitations can be addressed in future research with a wider range of LBG experiences. However, in this study, the author attempted to derive a meaningful theoretical structure from the research data by repeatedly going through the initial coding and focused coding processes over six months. Furthermore, it is expected that the theory derived from Gen Z study participants' experiences can serve as a practical methodology for LBG development.

In the age of convergence where media and content form networks, tourism is also moving toward integrating various content and utilizing multiple media. LBGs introduce fictional plays or stories into cultural heritage destinations in urban spaces where change is difficult or slow, providing a new context of experience by overlapping them. In this respect, LBGs can serve as a method to make urban cultural heritage destinations not just a part of everyday life but a place to visit repeatedly, enabling sustainable tourism. From a sustainability perspective, LBG's approach to renewing cultural heritage is one that achieves cultural sustainability without compromising physical sustainability. In addition, LBG's use of games and digital media to sustain cultural heritage is in line with the characteristics of Generation Z, who will be the main players in preserving and utilizing cultural heritage in the future.

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