

RESEARCH ON THE DESIGN PRACTICE AND COMMUNICATION EFFECT OF MOBILE GAMES UNDER THE GUIDANCE OF XUZHOU HAN CULTURE COMMUNICATION*

Zhang Wei¹ and Atitthep Chaetnalao²

¹⁻²Faculty of Decorative Arts, Silpakorn University, Wang Tha Phra Campus, Thailand

Corresponding Author's Email: chaetnalao@hotmail.com

Received 23 May 2026; Revised 7 June 2026; Accepted 9 June 2026

Abstract

The purpose of this study is: 1) to analyze the communication adaptability of youth groups to mobile games with Chinese culture themes; 2) Evaluate the influence of game experience, situational narration, interactive task and visual symbol design on the understanding and dissemination of Chinese culture; 3) Verify the market acceptance and application conversion value of game derivative peripheral products. In this study, 14-35-year-old youth were taken as the target population, and data were collected from 134 young subjects who participated in the experience test of Chinese culture-themed mobile games by using the methods of user experience research, quasi-experimental research, questionnaire survey and product acceptance research. The research tools are descriptive statistics such as frequency, percentage, average and standard deviation, etc. for the analysis of structured questionnaires and market observation records.

Citation:



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Zhang Wei and Atitthep Chaetnalao. (2026). Research On The Design Practice And Communication Effect Of Mobile Games Under The Guidance Of Xuzhou Han Culture Communication.

Modern Academic Development and Promotion Journal, 4(4), 448-467.;

DOI: <https://doi.org/10.>

<https://so12.tci-thaijo.org/index.php/MADPIADP/>

The results show that: 1)90.31% of the respondents think that the adaptability of Chinese culture-themed mobile games in cultural communication has reached "friendly" or above, which shows that this media form has a high acceptance for young people; 2)91.05% of the respondents think that games can help them to improve their understanding of Chinese culture, and 92.55% of the respondents think that games are "sufficient" or more playable, which shows that situational narration, task interaction and visual design can enhance cultural understanding and participation interest at the same time; 3)90.30% of the respondents are satisfied or very satisfied with the overall game experience. The observation results of offline peripheral products also show that derivative products with cultural recognition and practical functions can attract consumers to stay, ask and choose, which initially reflects the potential of transforming Chinese cultural digital experience into realistic cultural and creative consumption. Generally speaking, mobile games with the theme of Chinese culture can provide a digital media path with educational, interactive and application transformation value for the spread of regional traditional culture.

Keywords: Mobile games, Xuzhou Han culture communication, youth groups, user experience, product acceptance.

Introduction

Xuzhou is one of the important areas of Han culture. The structure of Chu King's Tomb, Cliff Cave's Tomb, the ritual space of Han Dynasty and related cultural relics together constitute the resources of Han culture with distinctive regional characteristics. Compared with the general tomb history narration, the unique value of the Cliff Cave Tomb in the Han Dynasty in Xuzhou lies not only in its archaeological form, but also in the fact that its spatial structure, ritual order, cultural relics patterns and regional history can be transformed into scenes, tasks, roles and interactive mechanisms in digital games. Therefore, this

paper regards Xuzhou Han cultural resources as the cultural prototype of mobile game design, rather than a simple historical background. At present, traditional cultural communication still faces three problems in the youth media environment: first, cultural heritage information is mainly static display, text description or image display, which is not interactive enough; Secondly, the ritual system, burial space and cultural relics symbols in the Han Dynasty are complicated, and it is difficult for young audiences to form a situational understanding in a short time; Third, the transformation chain between digital experience and cultural and creative products is still unclear, and the effect of cultural communication often stays at the level of one-time viewing. Mobile games have the media characteristics of task-driven, visual immersion, interactive feedback and continuous participation, which can transform complex cultural information into an exploratory, operational and memorable experience process. Previous studies have proved that digitalization, three-dimensional modeling and game engine can promote the visual display and immersive experience of cultural heritage, but the research on how regional Chinese cultural resources are transformed into mobile game mechanism, how to influence young people's cultural understanding and how to further extend to derivative peripheral products is still relatively insufficient. Based on this, this study focuses on the design practice of mobile games with Chinese culture theme, and analyzes the adaptability, experience effect and application transformation value of mobile games in Chinese culture communication by combining user experience test and market observation.

Objectives

1. This paper discusses the adaptability of youth groups to mobile games with Chinese cultural themes as cultural media and its influencing factors.

2. Analyze the relationship between design variables such as game mechanism, visual symbols, situational narrative and interactive tasks and cultural understanding, cultural interest and user satisfaction.

3. To verify the market acceptance and application conversion value of game derivative peripheral products.

Literature Review

Games can continuously inspire the younger generation to approach the complex cultural heritage in a more acceptable way and encourage them to explore archaeological sites and cultural heritage more deeply (Al Tamimi et al., 2023). With the help of three-dimensional modeling, digital replicas can be created for research and analysis. One of the main advantages of the three-dimensional model is that it is non-contact and will not have adverse effects on the elements of the original cultural heritage (Ramm et al., 2022). Many landmark cultural heritage sites around the world are being or have been digitized. For example, in 2019, Istanbul's Soleimani-Yeh building complex was fully digitized, which produced three-dimensional models and virtual reality experiences (Kan et al., 2019). The synergy between new technology and cultural heritage is of great value. Three-dimensional visualization has become a mature non-invasive tool to study and record historical sites and cultural heritage (Caro & Hansen, 2015). Related research also reminds us that digitalization is not the same as effective communication. If cultural heritage is only copied as a visual model, but not transformed into task mechanism, narrative logic and interactive feedback, its educational effect and communication depth are still limited. Therefore, cultural game design needs to establish a balance between historical accuracy and entertainment experience.

In the evaluation of user experience, user experience includes not only usability, but also comprehensive feelings such as emotion, aesthetics and

pleasure(Hassenzahl & Tractinsky, 2006). The user experience questionnaire proposed by Schrepp et al. (2017) provides a quantitative tool for interactive product evaluation(Schrepp et al., 2017). Technology acceptance model shows that perceived ease of use and perceived usefulness will affect users' willingness to accept technology products(Davis, 1989). Therefore, in this study, user experience, cultural perception, satisfaction and willingness to continue to use are included in the experience test indicators of Xuzhou Han culture-themed mobile games. When applying these theories to Chinese cultural theme games, we need to pay more attention to whether the cultural content is understood by users, whether the cultural symbols are recognizable, and whether the interactive tasks can promote memory and recognition.

In terms of market acceptance, that consumers' perception of price, quality and value will affect their purchase judgment(Zeithaml, 1988); Further explained that price, brand and product information will affect consumers' product evaluation and purchase intention(Dodds et al., 1991). Consumer experience has both hedonic value and practical value(Babin et al., 1994). Therefore, in this study, the game experience, cultural understanding, satisfaction and acceptance of peripheral products are brought into the same research framework to make up for the "more digital display and less user verification" in the existing research; Many design descriptions; There is insufficient connection between game experience and cultural and creative transformation.

Conceptual Framework

As shown in Figure 1, the conceptual framework of this study consists of five levels: cultural resources, design transformation, user experience, communication effect and market transformation. Different from simply describing the research process, this framework emphasizes the relationship between core variables: Chinese cultural resources and game design variables as

independent variables, mainly including historical scenes, cultural relics symbols, visual styles, task mechanisms and narrative interaction; Immersion, usability, cultural recognition and perceived usefulness as intermediary factors; Cultural understanding, cultural interest, overall satisfaction and purchase intention are the dependent variables. The theoretical logic of this framework is: when Chinese cultural resources are transformed into visual scenes, interactive tasks and situational narratives, users are more likely to form immersive experiences and cultural recognition; Immersion and usability further affect users' understanding, satisfaction and willingness to continue to participate in cultural content; When the cultural symbols in the game are transformed into practical and aesthetic peripheral products, cultural communication can extend from digital experience to real consumption scenes

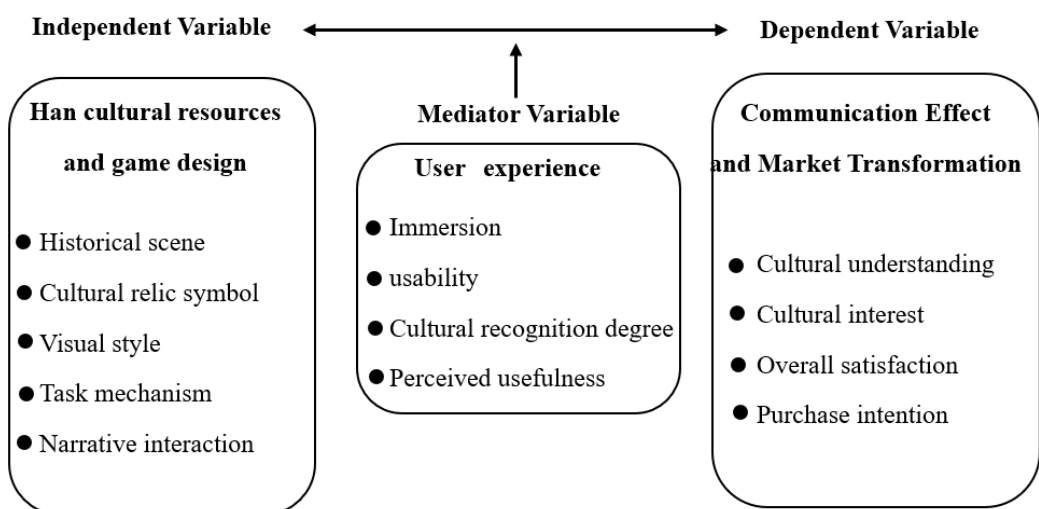


Figure 1 Conceptual Framework of "Design-Experience-Dissemination-Transformation" for Xuzhou Han Cultural Theme Mobile Games

(Source: Constructed by the researcher)

Methodology

1. Research Scope, Population, and Sample

The population of this study consisted of Chinese youth aged 14–35, mainly including senior high school students, university students, and young people with undergraduate educational backgrounds. The research sample comprised young participants who took part in the experience test of the mobile game for “Han culture communication,” with a total of 134 participants. All participants completed the game experience process and submitted valid questionnaires. Therefore, this study obtained a total of 134 valid samples.

The determination of the sample size referred to Yamane’s sample size formula, which is commonly used in social science research:

$$n = \frac{N}{1 + N(e)^2}$$

where n represents the sample size, N represents the population size, and e represents the margin of error. This study adopted a 95% confidence level, with the allowable margin of error set at $e = 0.05$. In the actual research process, considering the accessibility of the research participants, the organisational conditions of the game experience test, and the valid recovery of questionnaires, 134 valid samples were finally determined and obtained.

In terms of sampling methods, this study adopted a combination of purposive sampling and convenience sampling. First, based on the research objectives, the researcher selected young participants who met the age range, possessed basic mobile game experience, and were able to understand the content of the Han culture-themed game. Second, based on the accessibility of schools, youth groups, and related experience activities, eligible participants were invited to participate in the game experience test and complete the questionnaire. This sampling method is suitable for empirical social science

research focusing on user experience, cultural communication effects, and the verification of applied transformation.

2. Research Instrument

The main research instrument used in this study was a questionnaire, which was designed to collect feedback data from 134 participants after they completed the experience test of the Han culture-themed mobile game. The questionnaire focused on game experience, cultural communication effects, and market acceptance. Its purpose was to analysis the adaptability, level of understanding, acceptance attitude, and potential for applied transformation of Han culture-themed games among young people.

To ensure the content validity of the research instrument, this study adopted the Index of Item-Objective Congruence (IOC) for validity testing. Experts in relevant fields were invited to evaluate the consistency between the questionnaire items and the research objectives. According to standards commonly applied in social science research, the IOC value of each questionnaire item should not be lower than 0.50. If the IOC value of an item was lower than 0.50, the item was revised or deleted based on the experts' suggestions, so as to ensure that the questionnaire content could effectively measure the research objectives.

3. Data Collection

The data collection of this study was mainly completed through a combination of game experience testing and questionnaire survey. The researcher first explained the research purpose, experience procedure, and questionnaire completion requirements to the participants. After obtaining informed consent, the participants were then invited to take part in the experience test of the Han culture-themed mobile game.

The data were collected from April 19 to April 25, 2026. The researcher adopted a combination of offline group experience sessions and online

questionnaire completion. After completing the game experience, the participants filled out a structured questionnaire. The questionnaires were distributed mainly through an electronic questionnaire platform or in paper form, ensuring that participants could respond based on their actual experience.

A total of 134 questionnaires were distributed in this study, and 134 questionnaires were returned. All 134 questionnaires were valid, resulting in a valid response rate of 100%. During the data collection process, the researcher screened for invalid responses, duplicate submissions, and obviously incomplete questionnaires in order to ensure data quality.

If the study involved the participation of schools, institutions, or relevant organisations, the researcher obtained permission from the relevant institutions in advance and informed the participants that the study was conducted solely for academic research purposes. All data were processed anonymously to protect participants' privacy and to comply with research ethics.

4. Data Analysis

This study adopted a data analysis approach based primarily on quantitative analysis, supplemented by qualitative interpretation. After the questionnaire data were organised, statistical software was used for analysis in order to examine the adaptability, cultural communication effects, and market acceptance of the Han culture-themed mobile game among young people.

Descriptive Statistical Analysis

Descriptive statistics were mainly used to analysis participants' basic information, evaluations of the game experience, evaluations of cultural communication effects, and assessments of market acceptance. The specific statistical methods included the following:

Frequency was used to analysis the distribution of participants' basic information, such as gender, age, educational background, and game experience.

Percentage was used to indicate the proportion of each response option within the overall sample.

Mean was used to reflect the overall evaluation level of participants regarding game experience, cultural understanding, communication effects, and satisfaction.

Standard deviation was used to analysis the degree of dispersion in participants' responses and to determine whether the sample opinions were relatively concentrated.

Results

1. Adaptability of Youth Groups to Xuzhou Han culture-Themed Mobile Games

Based on the game design model of Han cultural sites, the scene design of Han cultural game engine is carried out, and the structure of Han tomb sites is restored 1: 1 through field research and archaeological records. Collect relevant historical and cultural analysis and extract representative Xuzhou Han cultural elements such as stories, cultural relics and colors, and design cultural relics symbols and appropriate virtual design on the premise of respecting historical facts. Add virtual activation elements in a static environment. Attract the experienter and have a sense of time and space. Combine visual symbols with game mechanism design, and spread Xuzhou Han culture in the way of game narration (Figure 2).

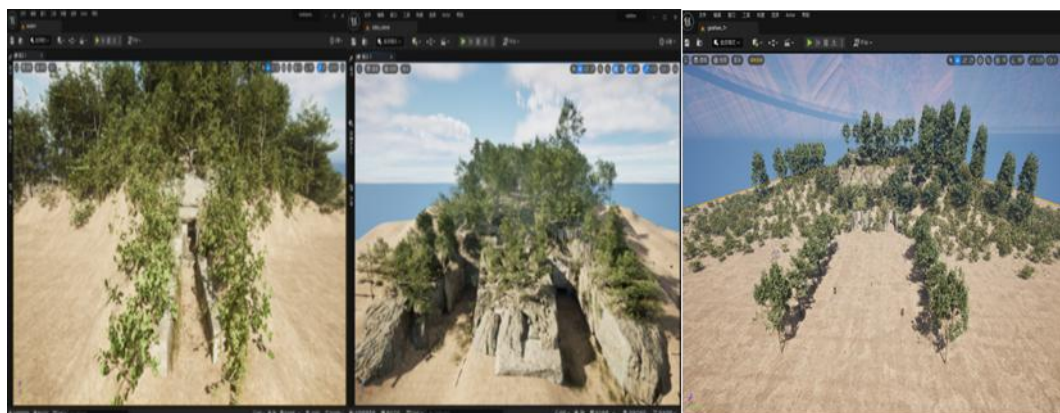


Figure 2 Chinese-related elements mobile game scene design

(Source: Constructed by the researcher)

Table 1 Respondents' Evaluation of the Cultural Adaptability of Xuzhou Han culture-Themed Mobile Games

Choice	Subtotal	Percentage
Very friendly	75	55.97%
Friendly	46	34.34
Common	13	9.7%
Unfriendly	0	0%
Very unfriendly	0	0%

Table 1 shows that 121 out of 134 respondents chose "very friendly" or "friendly", accounting for 90.31% in total. This result shows that mobile games with Chinese culture theme have high adaptability as a media of youth culture, and there is no obvious rejection feedback.

2. User Experience and Cultural Communication Effect of Xuzhou Han culture-Themed Mobile Games

Table 2 Respondents' Perceived Improvement in Understanding Xuzhou Han culture through Mobile Games

Choice	Subtotal	Percentage
Very helpful	79	58.96%
Helpful	43	32.09%
Common	12	8.96%
Not very helpful	0	0%
It doesn't help at all	0	0%

Table 2 shows that 122 respondents think that games are "very helpful" or "helpful" to enhance the understanding of Chinese culture, accounting for 91.05% in total. The results show that presenting Chinese cultural content through visual scenes, plot tasks and interactive narration can effectively lower the threshold for young people to understand traditional culture.

Table 3 Respondents' Evaluation of the Playability of Xuzhou Han culture-Themed Mobile Games

Choice	Subtotal	Percentage
Very abundant	76	56.72%
Sufficient	48	35.83%
Common	9	6.72%
Insufficient	1	0.75%
Very inadequate	0	0%

Table 3 shows that 124 respondents think that the game playability is "sufficient" or above, accounting for 92.55% in total. This shows that the content of Chinese culture does not weaken the entertainment of the game, but can enhance the continuous participation of users through tasks, exploration and plot promotion.

Table 4 Respondents' Overall Satisfaction with Xuzhou Han culture-Themed Mobile Games

Choice	Subtotal	Percentage
Very satisfied	79	58.96%
Satisfied	42	31.34%
Common	13	9.7%
Dissatisfied	0	0%
Very dissatisfied	0	0%

Table 4 shows that 121 respondents expressed "very satisfied" or "satisfied" with the overall experience, accounting for 90.30% in total. This shows that the game has formed a good balance between cultural content expression, operation experience and entertainment participation.

The data shows that Xuzhou Han culture theme mobile games have a good foundation of user satisfaction. Higher satisfaction shows that the game has formed a certain balance between cultural content expression and entertainment experience, which can make users get a better sense of experience and cultural cognition in the process of participating in the game. This further shows that using mobile games as a carrier of Xuzhou Han culture communication has practical feasibility and promotion potential.

3. Market Acceptance and Application Transformation Value of Game-Derived Peripheral Products

In order to further verify the market acceptance and application transformation value of the peripheral products derived from Xuzhou Han cultural theme mobile games, this study carried out product launch tests in real consumption scenarios. According to the photo shown in Figure 3, the game-related peripheral products, including cultural theme cards, stickers, postcards, refrigerator stickers, pendants, cultural and creative seals and other peripheral products, are presented at the test site in the form of booth display. The visual design of the product incorporates Xuzhou Han cultural symbols and traditional pattern elements, which makes it not only culturally recognizable, but also young, interesting and daily consumption.



Figure 3 Han cultural -related elements mobile game scene design

(Source: Photographed by the researcher)

Figure 3 shows the offline launch test site of peripheral products derived from Chinese culture theme games. On-site products include cultural theme cards, stickers, postcards, refrigerator stickers, pendants, cultural and creative seals, etc. Visual design incorporates Chinese cultural patterns, colors and game symbols. The observation results show that consumers stop, watch, ask and choose, which shows that this kind of products have certain visual appeal and initial market acceptance. It should be noted that the current evidence mainly comes from on-site observation and photo records, which is not enough to prove the clear commercial benefits. Therefore, this paper defines it as "initial market acceptance" and "application transformation potential", and does not directly exaggerate it as a mature commercial achievement.

Therefore, this market launch test shows that the peripheral products of Xuzhou Han cultural theme games have certain market acceptance and application promotion value. Its value is not only reflected in product sales, but also in the re-dissemination of cultural symbols, the establishment of emotional connection between users and the extension of cultural influence of game IP. This also shows that if cultural theme games can be combined with peripheral product development and offline market testing, it will help to promote the transformation of traditional culture from digital experience to real consumption scenes. At the same time, spread culture from multiple channels.

Discussion

The results show that mobile games with Chinese cultural themes have high communication adaptability, cultural understanding promotion, playability and overall satisfaction among young people. The positive evaluation ratio of the four core indicators all exceeds 90%, which shows that mobile games can transform relatively complex Chinese cultural knowledge into more acceptable

experience content for young people through situational narration, visual symbols and interactive tasks.

From the design mechanism, the communication effect of the game does not simply come from "putting culture into the game", but from the combination of cultural symbols and game mechanism. The space of Han tombs can be transformed into exploration routes, symbols of cultural relics can be transformed into task clues, historical stories can be transformed into plot advancement, and traditional patterns and colors can be transformed into visual recognition systems. The above design variables jointly enhance the user's immersion, cultural recognition and participation interest.

From the perspective of market transformation, the test of peripheral products shows that Chinese cultural elements have the possibility to enter the daily consumption scene. Consumers show high attention to products with clear patterns, portability and collection value, which shows that cultural symbols in digital games can be further extended to physical cultural and creative products. However, because this study does not provide sales, purchase conversion rate or consumer interview coding results, the relevant conclusions should be expressed as preliminary verification, not final commercialization proof.

Compared with the existing research on digitalization of cultural heritage, the contribution of this study lies in putting regional Chinese cultural resources, mobile game design, user experience test and observation of peripheral products into the same research chain, emphasizing that cultural communication is not only a visual display problem, but also the result of the joint action of user behavior, interaction mechanism and application transformation.

Conclusion

This study focuses on the design practice and communication effect of mobile games with Chinese culture theme. Based on the questionnaire data of

134 young subjects, the study found that 90.31% of the respondents recognized the adaptability of this game form in the spread of Chinese culture, 91.05% of the respondents thought it was helpful to enhance the understanding of Chinese culture, 92.55% of the respondents thought the game was playable enough, and 90.30% of the respondents expressed satisfaction or very satisfaction with the overall experience. These results show that mobile games can enhance the interest, understanding and willingness of young people to participate in Chinese culture to a certain extent.

On the theoretical level, the research brings cultural resources, game design variables, user experience, cultural communication effect and market transformation into the same analytical framework, which provides an operable research model for the gamification communication of regional cultural heritage. On the practical level, the research shows that Chinese cultural symbols, the space of Han tombs, traditional patterns and historical narratives can be transformed into scenes, tasks, roles and peripheral products, thus expanding the digital communication and creative development path of traditional culture.

It should be emphasized that the conclusions of this paper should be strictly limited to the range that the existing data can support. Because the current results are mainly based on descriptive statistics and field observation, significance test, correlation analysis or regression analysis have not been reported completely, so the causal relationship cannot be inferred excessively. Follow-up research should supplement individual data, expand sample sources, and carry out long-term follow-up to further verify the relationship among game mechanism, immersion, cultural identity and purchase intention.

Recommendation

At the same time, there are some limitations in the research, and the sample coverage and long-term communication tracking dimension can still be further expanded. In the future, the design innovation and long-term communication path research of Xuzhou Han cultural games can be further deepened by combining new media communication channels and immersive interactive technology.

1. Further enhance the in-depth expression of Xuzhou Han cultural content.

In the game design, a clearer knowledge system can be established around the rituals, costumes, buildings, tombs, utensils, characters and historical figures in the Han Dynasty, so that players can not only "see" cultural symbols, but also understand the historical significance and cultural value behind them.

2. Optimize the combination of cultural content and game mechanism.

The knowledge of Xuzhou Han culture should not be presented directly in the form of long paragraphs, but should be integrated into tasks, plots, puzzles, collection and role growth. This will not only keep the game interesting, but also enhance the naturalness and effectiveness of cultural communication.

3. Improve the continuous playability of the game.

Subsequent design can increase the level of checkpoints, task changes, reward feedback and exploration space, so as to avoid users' repetitive feeling after a short experience. At the same time, we can design different levels of difficulty and cultural information according to different user groups, and combine with emerging media to innovate communication paths. So that young people, tourists and mass players can get their own experience.

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