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Research Gamification: Using commercial video games to explore Chinese traditional art

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Abstract
This research investigates the impact of video games on analyzing Chinese traditional art. It provides a game development and researcher participation model that reveals how games can foster knowledge creation and transfer. 3D modelling in video games significantly improves educational settings as they offer cultural experiences. The research underlines the combination of technology and digital art, calling for using video games in educational institutions for better cultural and identity integration with academic approaches. More empirical research is needed to strengthen the claim of these constructs in scientific and artistic research.

Keywords: Gamification, Traditional Chinese Art, Knowledge Production, 3D Modeling

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1.0 Introduction

Incorporating digital media platforms in real life refers to platformization, which has resulted in the ever-increasing blurring of boundaries between different worlds. This has been covered by Helmond (2015) and later by Vallis et al. (2024), which emphasized merging the real with the virtual and the artificial with the natural. Therefore, technology has become an essential facilitator of cognitive and practical skills ranging from entertainment to wearable technology that enhances work productivity (Pietroni & Ferdani, 2021). This blend of the digital and the physical forms illustrates the unity between these technology paradigms and other social phenomena like education, culture, and knowledge production (Jandri et al., 2018). In support of this, Bacalja et al. (2024) argued for a post-digital game industry, claiming that scholars should analyze reality through gaming media and invite everyone to participate in the discourse.

Video games, beyond being simple providers of entertainment, have evolved into important cognitive instruments utilized in education, training, and even scientific investigation (Bacalja et al., 2024; Ferdani et al., 2020; Wang et al., 2024). Due to technological innovations, Liu and Zhang (2023) argue that modern games have moved to focus on cultural and educational contexts.

Chinese traditional art possesses profound significance in history, making it deeply important to study. The primary focus is to examine its contemporary relevance and encourage cross-discipline and technological methods for its research and preservation (Peng, 2023; Deng, 2023). With the evolution of commercial games into more advanced simulators, the opportunity to preserve cultural motifs

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and information has emerged (Deng, 2023). Besides their entertaining capability, these games now demonstrate real-world practical applications as realistic simulations that transfer knowledge, which is made possible with advanced engines and "real-time" capabilities (Valls et al., 2016; Grogan & Meijer, 2017; Lukosch et al., 2018; Lukosch & Comes, 2019).

However, despite the robust analog and instrumental attributes of contemporary commercial games, the potential for these games to serve as a digital research tool for traditional Chinese art and to effectively facilitate knowledge production and transfer remains inadequately supported by theoretical frameworks and practical strategies. Zhao and Wang (2024) suggest that the potential of video games in knowledge dissemination and knowledge transfer have not been explored and valued. Although they are not regarded as crucial in Chinese scholarship, He, Li, and Chen (2024) point out that research done in China on video games tends to be unilateral, looking at the industry's cultural influence and economic development.

To address this gap, this research employs a systematic literature review approach to study the use of video games as cultural mediums. It seeks to create an analysis of the issues surrounding the application of commercial video games in art research. The objective of this study is to develop an analytical framework, grounded in existing theories, to assess the effectiveness and limitations of commercial games as a research tool for traditional Chinese art. Subsequently, a researcher involvement model is proposed to demonstrate how researchers can acquire artistic knowledge through game-based practice.

2.0 Literature Review

The growing significance of commercial video games as tools for knowledge transfer and cultural heritage preservation supports the rationale for this study, which intends to use these games to research into Chinese traditional art. The literature review is subdivided into four sections.

2.1 Commercial Game and Knowledge

Popper (1979) suggested that knowledge is contained in systems and media other than experience. Jenkins (2011) corroborated this by emphasizing that cultural knowledge is communicated through media, where video games greatly aid learning and educational training. This coincides with the view of Gee (2009), who underlined that commercial games are perfect pedagogic devices because they incorporate a wide range of information that is absorbed unconsciously (Shliakhovchuk & Munoz Garcia, 2020). In the modern gaming industry, titles like "World of Warcraft" and "Assassin's Creed" are utilized for educational objectives, where modern visual and audio technologies transform them into cultural and scientific instruments (Reinhard, 2018; Ferdani et al., 2020). Reed (2024) reported that many young children utilize the knowledge they acquire from games in real life, which makes commercial games valid scientific instruments.

2.2 The Use of Chinese Art in Video Games and Their Commercialization

Everything from traditional Chinese Opera and Calligraphy to Chinese painting forms has cultures that video games can replicate with exquisite precision. As Deng noted in 2023, contemporary video games utilize modern audiovisual methods to recreate artistic texts, which is a step towards realism. This stance facilitates the integration of old Chinese art into games by converting cultural features like architecture, music, and stories into game components (He Li & Chen, 2024). There are notable milestones in creativity and innovation of art preservation within the Chinese gaming industry. Liu and Zhang (2023) identified several resources for art within games and how these resources can be effectively used in knowledge transfer as gamified knowledge environments.

2.3 3D Modelling as a Scientific Research Tool

Research has shown that 3D modelling in video games increases engagement and interest while acting as effective research (Pietroni and Ferdani, 2021). Such models are not limited to reproduction but serve cognitive functions by preserving the objects' knowledge and value. As noted by Sorin and Nikodem (2007), in conjunction with 3D modelling's potential in research, there must be an effort to establish reliable evidence that links virtual models to professional expertise. This link is essential in archaeology, where digital environments centre around 3D reconstructions that enable understanding (Ferdani et al., 2020). Complete modelling of an environment performed by the game "Black Myth: Wu Kong" is an example of a digital knowledge system (Zhao and Wang, 2024). This indicates that the digital modeling environment of modern commercial games is prompting players to absorb knowledge and information.

2.4 Ludology

Ludology shifts attention from conventional gameplay either-or propositions to play (Huizinga, 2008). Games are historically essential for human acquisition and culture transmission (Bauman, 1995). During the Century of Play, reflexive actions shape players' cognition (Bacalja et al., 2024). Avatars enhance players' identification as narrative characters and modify their cognition of real-world attributes (Klimmt, Hefner, & Vorderer, 2009). Such narratives can emotionally transform one's attitude toward historical contexts (He & Li, 2020). Ludology affirms using video games as cultural tools, endorsing "Slow Gaming," which aims for education and contemplation within different gaming contexts (Gintere, 2021).

Using these concepts, their arguments make the most sense in pedagogy aimed at fostering understanding of and engaging with the phenomena of traditional Chinese art through the lens of commercial video games.

3.0 Methodology

In the preceding section, we critically analyzed the legitimacy of commercial video games as a digital information environment, while also exploring their potential applications in scientific research and cultural preservation. The following section will employ a exhaustive literature review to illustrate its effectiveness as a research tool in art research. For this purpose, such as Google Scholar, Scopus, Web of Science, and China National Knowledge Infrastructure (CNKI) were used. Each database allowed the compilation of relevant papers through the use of "game," "art," "culture," "reality," "method," "research," "framework," and "involvement" as keywords to limit the scope. The range of literature collected for analysis was between 2005 and 2025, including many years of significant technological progress in culture, especially cultural studies.

3.1 Literature Review and Criteria

Since this study deals with the art of the Chinese domain, CNKI was the most important database as it contained authoritative materials relevant to the Chinese academic field (Peng, 2023). The CITED research from CNKI was drawn from journals listed in the Chinese Social Sciences Citation Index (CSSCI), thus guaranteeing their academic quality and relevance. Based on the above conditions, a total of 22 articles were retrieved.

Particular inclusion and exclusion criteria were defined to guarantee that the selected literature met the research aims. The criteria for exclusion were the following:

- Informal Articles: To retain academic rigour, papers containing extended abstracts, articles less than three pages long, research proposals, oral and visual proposals, and briefings were excluded.
- Lack of Key Terms: Excluded were papers that did not include key terms "game," "art," "reality," and "framework."
- Lack of Research Focus: Articles that studied games to improve a firm's internal management or other gamification areas other than commercial games were excluded.
- Lack of Case Study: Papers that fulfilled the key terms but did not provide specific case analyses were excluded.

For the inclusion criteria, the literature had:

- Framework or Model Development: Articles that provide a framework or model concerning cultures and games.
- Player Practices: Studies that focused on explaining the frameworks of the player practices.
- Game Design for Realism: Research aimed at the design of games for realistic systems delivery.
- Case Studies: Any article that included concrete case studies using games within artistic and cultural settings.

After applying the aforementioned inclusion criteria, six articles were retained for this study, while sixteen articles were excluded.

3.2 Construction of Participation Models and Analytic Frameworks

Based on the collected literature, the research developed an analytic framework to demonstrate the role of commercial games as art research instruments and a researcher participation model to show user engagement pathways. Following Kurapati (2017) and Zhao and Wang (2024), the analytical framework captures the logic of 'capability,' 'simulation,' 'interaction,' and 'knowledge transfer,' which together form the operational logic of using commercial games for research purposes (Zhao & Wang, 2024).

The researcher participation model, derived from Calleja's Player Involvement Model, subsumes spatial, narrative, and affective engagement modes. This model demonstrates how researchers extract cultural information through game interactivity, effectively merging digital research with non-digital approaches.

This study is a testament to the credibility of the far-reaching implications that systematically chosen literature provides when bound to a secure theoretical framework. Thus, it claims that the originality of this research rests on the unprecedented uses of video games for Chinese traditional art studies and a blend of digital humanities with traditional humanitarian disciplines. However, a research approach relying solely on literature reviews can only establish the legitimacy of video games as a tool for art research. It does not provide a comprehensive exploration of the extent to which these games can be embraced. This issue requires further elaboration through additional empirical studies in future research.

4.0 Findings

4.1 An analytical framework for the commercial game as an artistic research tool

The first research objective of this study is to develop an analytical framework for the logic of the operation of commercial games as a tool for research into traditional Chinese art. The proposed framework is built upon the Zhao and Wang (2024) knowledge play framework Fig.1 and the design concept of Kurapati (2017) Fig. 2. The former has as its foundation the theory of knowledge distillation, which is part and parcel of the mechanisms of a tremendous amount of knowledge and culture embedded in game technology and how participants in the game are made to perceive and receive the game so that the aim of knowledge production and transfer is achieved. The latter is an approach to game design aimed not at producing entertaining experiences but rather focusing more on meaning and how to represent it. This combination of Kurapati's (2017) design methods has been effectively used in several studies (Lukosch et al., 2018).

Knowledge System	Knowledge Objective	Knowledge Reduction -Transfer
Knowledge system in games	Multi-media information acquisition; Extract artisitc knowledge	1. Visual symbols in games (character design, scene design) 2. Audio elements (background music, special effects audio, etc.) 3. Game text (mission, dialogue)
Knowledge production and interaction between game and audience	playful and immersive interactive design	1. Game task completion 2. Role Play engagement 3. Players expand their knowledge reserve (geography, customs, history, etc.) through games
Knowledge dissemination and transfer of the audience	Promote the secondary dissemination in the player community; Players' discussions and creations inside and outside the game	1. Content sharing on players' social platforms 2. Expansion of knowledge outside the game 3. The quantity and quality of the player's secondary creation 4. How often players interact with other players

Fig. 1 Analytical framework based on knowledge distillation theory from Zhao and Wang

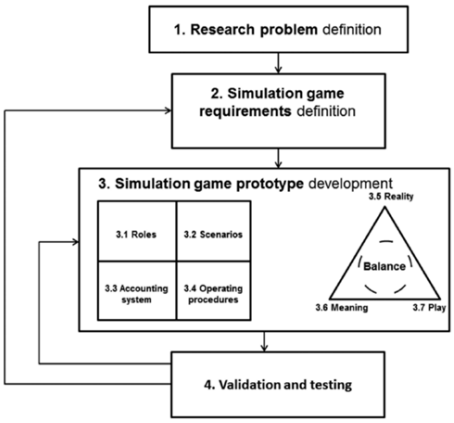

Fig. 2 Kurapati's framework for simulation game as a research instrument

We combine these two frameworks to explain how a commercial game functions as an art research tool and what restricts its efficacy. The analytical framework of this study is included in Figure 3. Each component will be described subsequently.

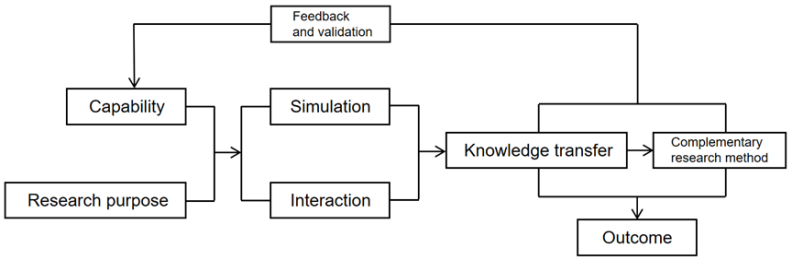

Fig. 3 Analytical framework for the commercial game as an artistic research tool

The combination framework specifies fundamental characteristics that limit the effectiveness of commercial games as research instruments and identifies their shortcomings.

a. Capability: This construct describes the researcher's requirement to possess a combination of skills in gaming and traditional Chinese art forms. Researchers who understand the gaming medium and know how to work with game mechanics are in a more favourable position to derive relevant information from the virtual environment.
b. Research Purpose: The researcher must set out the research questions one seeks to answer before playing the game. This enables directed searching, for example, testing speculation concerning artistic patterns or cultural motifs during specific historical periods.
c. Simulation: Architecture, 3D character, and story design, as well as their animations, are aspects of video games that employ multi-prong simulation strategies. This form of blended learning enhances authenticity and makes games more realistically educational for cultural learning purposes.
d. Interaction: The interaction pathways make working thoroughly within the 3D environment possible and facilitate collecting and recording important information. These pathways promote interaction with the information in written, spoken, and drawn form from many angles.
e. Knowledge Transfer: These interactions permit the researcher to gather intricate information actively. However, this information must be analyzed, situated, and verified with other research strategies to draw valid conclusions.

f. Complementary Research Methods: This approach of establishing a known environment within the game allows it to be grouped with supplementary research domains like interviews, context reviews, and case studies to maintain scientific accuracy and strengthen the authenticity of results established within the gaming world.
g. Feedback and Validation: These feedback loops involve confirming and refining information gained while playing video games, thus ensuring the conclusions drawn are scientifically accurate and correct regarding information reliability.
h. Outcome: Guided by these findings, there is scope for an aesthetic analysis of the outcomes, comparative studies, and culturally driven research inductives.

4.2 A Researcher Involvement Model

Commercial games serve as an unconventional approach to traditional art research. The second objective of this study is to design a researcher involvement model that captures the user practitioner's workflow. This model is based on the Calleja's (2007) Player Involvement Model. The Calleja model addresses the aspects of materiality. The Player's avatar is their embodiment within a virtual reality system and serves as a nexus for technology, representation, and signification (Rehak, 2013). The Player Involvement Model identifies six modes of deep participation in video game interaction: Tactical Involvement, Performative Involvement, Affective Involvement, Shared Involvement, Narrative Involvement, and Spatial Involvement (Calleja, 2007). Together with the knowledge framework of games by Zhao and Wang (2024), we constructed a model which we named the Researcher Involvement Model (figure 4). This model elucidates the logic of participants investigating traditional Chinese art. Each of these involvement constructs encompasses a collection of research subjects and objectives. These modes of involvement are not mutually exclusive; they interact, adding value and knowledge in the process. Subsequently, we offer the consequences for each mode.

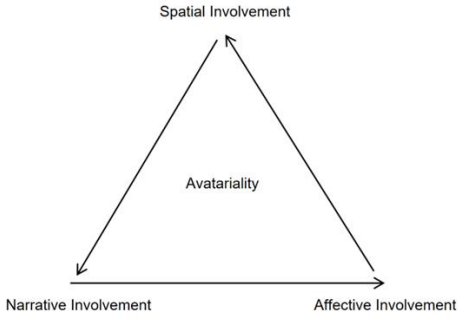

Fig. 4 Researcher Involvement Model for Traditional Chinese Art Study

The Model of Researcher Involvement describes how any researcher interested in Traditional Chinese Art may utilize games. This model derives from Calleja's Player Involvement Model, which identifies three pathways of involvement which are:

a. Spatial Involvement: Researchers examine game spaces by examining their visual and auditory features, including high-fidelity simulations. This pathway analyzes contextual representations and associated elements concerning traditional arts like architecture and sculpture.
b. Narrative Involvement: Through gameplay, researchers investigate story elements and character connections that describe the past and other socio-cultural aspects. Emergent narratives constructed from player activities provide a better understanding of culture and history.
c. Affective Involvement: Researchers come to terms with the cultural aspects of the game through the avatars they embody, which enable golfers to step into the gaming world. This involvement helps us understand the impact and ethical dimensions of ancient China's artistic traditions and social responsibilities.

The results highlight the hybrid blend of gaming and traditional research approaches, which innovatively shape and enrich knowledge while focusing on its possible scientific and cultural importance.

5.0 Discussion

This research into commercial video games as a teaching resource for traditional Chinese art prompted a discussion of this innovative interdisciplinary field. This discussion revolves around two principal issues: the credibility of games as research tools and the organizational logistics of researcher participation.

The scientific side has developed an analytical construct that illustrates the credibility of games as advanced simulators that can aid traditional art research. The construct highlights several essential elements: the availability of skilled researchers in avatar role-playing along with art history, the game version simulations' fidelity and account, and other components. (Pietroni & Ferdani, 2021) These researchers can utilize games to an optimal extent. However, the research points out that games should not be used as the only vehicle for conducting research. Using digital methods in combination with non-digital methods such as interviewing and archival research enables researchers to obtain credible and comprehensive data.

Importantly, in-game interactions provide rich understanding. The simulative capability entails different forms of cultural representation, which need interdisciplinary unpacking. Lukosch et al. (2018) observed that gaming activities with rich log and context scaffolding features improve the likelihood of the research being accurate and validated. However, for these interactive features to be truly scientific, the games need to allow for multivariate research approaches, including but not limited to reconstructions of context accuracy and narrative accuracy of the story.

While considering the practically active researcher participation model, the study identifies three pathways to operate: spatial, narrative, and effective participation. Each mode assists with particular research objectives. Spatial participation enables the study of the external manifestations and environments of specific art forms, such as architecture and sculpture, using virtual reality as pseudo-fieldwork sites (Zhao & Wang, 2024). Narrative involvement investigates a game's plot and considers the socio-cultural and relational aspects. This feature allows an emergent narrative framework that does not restrict the narrative deconstruction of the research findings to a single story.

Emotional engagement helps forge relationships with avatars, which builds empathy and deeper understanding. This emotional attachment enables traditional Chinese art scholarship to be more interpretatively reflexive owing to shared experiences and intersubjective perceptions (He & Li, 2020). Such engagement makes it possible to comprehend the artistic and moral aspects within the context of history.

The discussion showcases the possibility of integrating commercial gaming into culture and science as another pedagogical tool. There is ample opportunity in this area, and the suggested interdisciplinary approaches have the potential to foster active participation. Further research might provide additional empirical evidence and illustrations to turn the innovative model into the dominant scholarly methodology.

6.0 Conclusion

This study proposes an analytical framework and a model of researcher involvement that substantiate and facilitate the utilization of commercial games as research tools within the domain of Chinese traditional art. The result indicate that the scientific validity of commercial games as research instruments is influenced by several factors, including the researcher’s own knowledge base and gaming proficiency, the fidelity, reliability, and transparency of simulation techniques, the interactivity of the games, and the complementarity of supplementary research methods. These factors collectively determine the robustness and credibility of commercial games as research tools. Additionally, this research identifies three modes of researcher participation—spatial involvement, narrative involvement, and affective involvement—which enable the acquisition of knowledge and information, thereby aiding the achievement of research objectives. However, the results also underscore the need for further evidence-based studies to validate the proposed frameworks and assess the integration of academic research and gaming in scholarly contexts. Future research will require additional empirical investigations and data to more comprehensively explore the potential of video games as effective tools for art research and to determine their broader acceptance among the academic community.

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Paper Contribution to Related Field of Study

This research describes the new function of commercial video games in educational and cultural investigation, mainly to help understand and preserve traditional Chinese art. It defines platformization as a form of merging the physical and digital worlds and argues that sophisticated video gaming offers an opportunity for information and culture transfer. Through a systematic literature review, the study shows how video games can improve educational processes and contribute to understanding different cultures. The research puts forward an analytical framework to investigate the functions of these video games as research tools, particularly concerning framing the phenomena of simulation, researcher involvement, and power. Furthermore, a model of the researcher involvement criteria is suggested for narrative engagement with the games for culture detection. In conclusion, the study stresses the value of integrating digital and offline approaches for traditional research to broaden the scope of academic inquiry and protect cultural heritage.

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