Learning and Culture Protection in Video Games

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Abstract:

Since some people are addicted to playing video games, people always think that video games can only fascinate the players and negatively affect people's health, such as myopia. However, video games also provide social values such as special group caring, and culture protection and publicity. There are a lot of Chinese domestic video games, even some overseas video games, all contain some Chinese elements. The thesis includes literature reviews which show that video games can help to learn, and some current games which contain elements about Chinese culture are also analyzed to prove that video games can truly protect and propagandize Chinese culture. Also, to prove that the players can absorb the information related to the culture, a game regarding Datiehua, this Chinese intangible cultural heritage is made and offered to classmates. The result shows that the players can truly memorize that information through the video game.

Keywords: Datiehua, video games, learning, culture protection.

1. Introduction

1.1 Literature Review

In a lot of previous studies, authors and researchers indicate that video games can help players to learn brand new things. Firstly, in a book review of Video Games and Learning: Teaching and Participatory Culture in the Digital Age, which is reviewed by Kandise Salerno, states that the author of this book offered a lot of evidence about how an educator constructs educational video games as an appropriate curricular project and proves educational video games can be effective to be utilized in educational environments. (Kandise, 2013). In 2003, Gee states that video games themselves such as System Shock 2, Deus Ex, Pikmin, Rise of Nations, Neverwinter Nights, and Xenosaga: Episode 1 are learning machines. The games themselves learn and learn as well, so they are played by a lot of people long-termly. (Gee, 2003). Also, he said that if a video game can not be learned well by the players, it will face a problem of low quantity of sales. In addition, better games show more learning principles. (Gee, 2012). Thus, the players can continuously absorb new knowledge and skills through playing video games. Parsayi's conclusion of the experiment is that video games are a really useful and suitable tool for depicting a story, since it can provide an immersive atmosphere for the player by dubbing the text and allocate an appropriate background music. Besides, the literature also states that it is easier for the player to identify with

the protagonist of a video game, than a novel. (Parsayi, 2018). Furthermore, Somerdin analyzed a game called Zero Escape. The conclusion is that if the story segments and puzzle portions appear in the games alternatively, and this causes the Zero Escape obtain an improvement of storytelling in four aspects: a stronger suspension of disbelief, emotional immersion, the Future Narrative, and narrative reversal. Other games' analysis in this experiment also shows this pattern. (Somerdin, 2016). So, players can achieve higher learning efficiency by taking advantage of the players' appreciation toward the characters and games. Gee again, in 2006, wrote another article which discussed the benefits video games offer toward the field of learning. He said that good video games assign intelligence to real players and to artificial intelligence characters in the game. The meaning is that the characters in the game have the skills or characteristics which can help to achieve the final goal of the game, and the players' responsibility is to control the characters to finish the tasks or to discover the most appropriate orientation for themselves. Gee takes the game Full Spectrum Warrior as a specific example. The player uses buttons on the controller to issue commands to two teams of soldiers be trained, and they need to successfully keep the soldiers alive and complete the game. One part of the game a soldier understands is the formation of various battle formations; the other part the player must understand is when to use different battle formations. This distribution applies to all aspects of specialized military knowledge in the game. Through this way of distributing knowledge and skills between the characters in the game and the real world players, the player is guided and supported by the knowledge of the virtual characters. This eases some of the cognitive burden on the player, placing it in intelligent tools that can do more than the learner is currently capable of doing on their own. It allows the player to start understanding the knowledge before they really know the knowledge, also known as performance before competence. As a result, players end up gaining abilities by trying, winning, or failing, rather than reading a lot of text before being able to participate in the activity. Furthermore, even younger learners can translate the information in the well-organized curriculum video games into school-based skills and conceptual understanding by introducing them into professional practice as a valuable form of deep learning. (Gee, 2006). If other workers such as doctors, scientists, politicians can also achieve "performance before competence", they may master the corresponding skills faster and deeper.

1.2 Summary

The above studies all show that video games can help players to master skills and learn knowledge, so if the games contain cultural elements, the cultural elements should be memorized theoretically. If this can really be achieved, so many vanishing cultures may be saved.

Based on this information, this study mainly analyzed some video games which contain Chinese culture elements, and a game regarding a Chinese intangible cultural heritage called Datiehua is made. The game is to both introduce Datiehua to the classmates and to prove that video games really contribute to culture protection.

2. Methods

Literature review method and experimental method are mainly used in the entire study. The games which contain Chinese culture elements are analyzed and explained in the thesis. The experiment contains three steps: checking the classmates' understanding of Datiehua, making the game, and offering the game to the classmates and checking their understanding again.

2.1 Game Analysis

Nowadays, many domestic video games include some Chinese intangible cultural heritage elements, and these video games skilfully combine those elements with the games themselves. Paper Bride is a Chinese adventure puzzle game developed by HeartBeatPlus. The game is a national style of painting, and contains more traditional Chinese folk culture. Paper Bride is a series of video games, and this series already includes eight games. All games in this series are Chinese folk suspense puzzle games, and many Chinese intangible cultural heritage elements are included. The main purpose of Paper Bride is to find the weird missing bride, so the characters in the game all wear Chinese traditional dresses. For example, paper cutting, clay sculpture, and Chinese shadow puppetry are both widely utilized in these games. In Paper Bride, Paper Bride 2 Zanglingcun, and Paper Bride 3 Yuanyangzhai, Go, which is one of the oldest and most complex Chinese intellectual games ever devised, has appeared. In Paper Bride 2 Zanglingcun, the character leads the players backstage for an opera performance. The player experiences a little bit of Chinese traditional opera through the game. Also, a key game instrument in this game is an oil-paper umbrella, which is one of the ancient traditional articles of Han nationality. In Paper Bride 3 Yuanyangzhai, Xiangqi, which is a Chinese traditional chess, also international chess, originated in China, has a long history in China. It is a two-player antagonistic board game, mainly popular in countries with Chinese and Chinese culture circles. The same game also contains a puzzle game based on a percussive vocal instrument called Chinese gong chimes.

It appeared in the Tang Dynasty and became popular in the Yuan Dynasty, and it is often used in folk music, local opera and temple music. The background music of Paper Bride 3 Yuanyangzhai is performed by a Chinese traditional instrument: suona horn. Suona horn is a Chinese traditional double-reed woodwind instrument and it is a member of the oboe family in the world. After thousands of years of development, the suona horn has its unique temperament and timbre, and has become a representative national wind instrument in China. Also, one of the visual background includes sundial, which is an instrument for observing the time of the sun's shadow, mainly according to the position of the sun's shadow, to specify the hour or the number of moments at that time, which is a more commonly used timekeeping instrument in ancient China. Red string, which is a Chinese traditional compensation of marriage, is the main element in Paper Bride 4 Hongsichan. Also in this game, content about Liuyi (six skills) also exists. Liuyi (six skills) are the six skills in the Chinese aristocratic education system of the Zhou Dynasty, including Li, The Book of Music, archery, driving carriage, calligraphy, and numeracy. Meanwhile, the player also performs as a Chinese traditional worker which sounds like the night watches. The function of this job is to patrol and tell the time at night. A common traditional folk handicraft called paper lantern is also a prop in this game. In Paper Bride 5 Laishengxi, the designers add a lot of opera elements under the guidance of Chengdu Peking Opera Research Institute. Gong and drums are an example, since they are the pillars of the rhythm of the play. It is an indispensable instrument in Han folk culture. Other Chinese elements such as puzzles, origami, hand shadows and kites also integrated into the game's puzzle level; even Chinese intangible cultural heritages like paper-cutting, Chinese acupuncture, movable type printing, abacus and shadow puppetry are discovered in the game.

Since Chinese shadow puppetry is really common and famous around the world, it not only exists as an element in the games in the series Paper Bride, but even directly becomes the art style of Nuo Shi. This video game uses Chinese shadow puppetry as the art style, tells the story about a traditional and ancient custom of exorcising evil spirits: Nuo opera; Nuo opera is one of the Chinese intangible cultural heritages.

The Rewinder is a 2D Chinese style monster adventure puzzle game. The game incorporates folklore, traditional Chinese monster culture (black and white impermanence, ox-headed and horse-faced demons in Hades, etc.) into puzzle elements to create a unique gaming experience. Many traditional Chinese elements are integrated into the game's puzzle part, such as steelyard, abacus, opera-face, and spinning vehicle. When encountering the level of the steelyard, the player needs to understand what each scale on the scale represents. Finally, it is necessary to infer the unknown weight according to the weight of the known weight, and solve the puzzle.

2.2 Proposal Questionnaire

As the game is going to be provided to the classmates, a questionnaire is first utilized to check their understanding of Datiehua. The questions are designed based on an important article Brilliance of the brave which is published by China Daily which tells about the basic information and a specific group of Datiehua. The literature states that scrap iron is melted to 1,600 C to create molten iron fireworks; it mentions that the Datiehua this activity uses special scoops made from willow roots to keep the molten iron, and key information about the performers' clothing is also mentioned in this article, which are sheepskin coats and bamboo hats. (China Daily, 2022). An investigation method is used to determine what content the game should share with the classmates. The result from a questionnaire will help to prepare the appropriate information and material for the game. The questionnaire is used to investigate how deep the classmates know Datiehua. The majority of the population are classmates who either understand this Chinese intangible cultural heritages. The conclusion is drawn from asking them questions about some basic information which is read from convincing literature. Two questions are provided to 20 students. After knowing the classmates' understanding of Datiehua, the content is defined, which are the training process for the performers and the composition of the huge pergola which must be used in the performance.

2.3 Game Production

The game is made by the software Gamemaker. The tutorials are from the official website of it. The key points of using it is to add sprites, objects and rooms. Then edit programs about mouse and keyboard input and set the corresponding operation. Firstly, a character wearing a professional performance costume for Datiehua is drawn, and the player is going to control this character by using keyboard input, which D is advancing, A is retreating, and W is jumping.

(The character)

Since this is a 2D jumping game, blocks are created for characters to stand.

(The block)

Also, it is important to change the room of the game by clicking the mouse, so the corresponding object is created and the function of each object is defined.

Menu

(Back to the start room)

Start

(Start the game)

Exit

(Exit the name)

The background is also drown.

As people will focus on the visual effect in the game, content regarding Datiehua is put into the background and block.

However, since their is limitation of time and technique, not all the content are covered in the levels of the game. A video which includes information about the huge pergola is introduced in a video.

2.4 Final Experiment

After the game is produced, it is offered to 12 students. All the students answered a questionnaire related to the content in the game. The result shows a positive conclusion.

3. Theoretical Basis

To achieve the game, several simple codes are used.
Firstly, some variables are created. The codes are shown below:

```
walk_speed = 5;
jump_speed = 10;

grav = 0.7;

vsp = 0;
hsp = 0;
```

Then, it is important to control the character by using the input of the keyboard. The method is to add events toward the character object, then we can control the character by pressing the corresponding keyboard. As D is advancing, A is retreating, and W is jumping, the code for each keyboard is shown below:

D: x += walk_speed;
A: x -= walk_speed;
W: y -= jump_speed;
Thirdly, to ensure the character can jump as usual, gravity

should be defined. (Which is the variable grav). The code of this step is shown below:

```
y = y + vsp;
vsp = vsp + grav;
```

Then, to ensure the character can "stand" on the blocks, collision relationship should be defined. The effect of their collision should be to stop the player, so the vertical speed should be 0. (Which is the variable vsp). The code is just vsp = 0; .

Changing the room is a key point of video game, the key code is room_goto(); , and the name of the target room is inside the parenthesis. For example, if the left mouse button of start leads from the menu room to the first room, then left mouse button click event should be added, and room_goto (rm_first) should be written.

4. Empirical Analysis

4.1 Proposal Questionnaire Analysis

Question 1: How many years of history does Datiehua have?
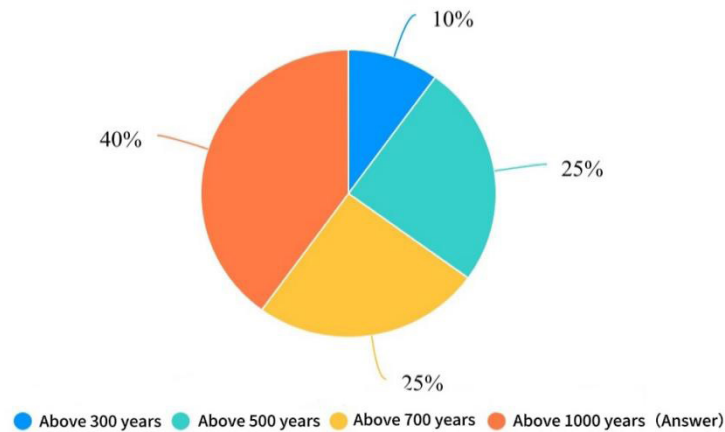
The right answer is "Above 1000 years", and 8 people got the question right. This question has an accuracy of 40 percent, which is also the highest in the whole questionnaire.

Question 2: To what degree celsius does the scrap iron need to be melted in order to make the molten iron for Datiehua?
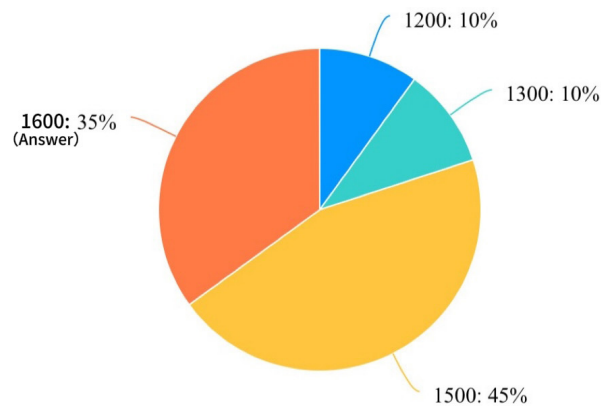
The true option is 1600, 7 students all did this question right (35%) .

Question 3: The clothes of the Datiehua performers (choose one hat and one coat) .
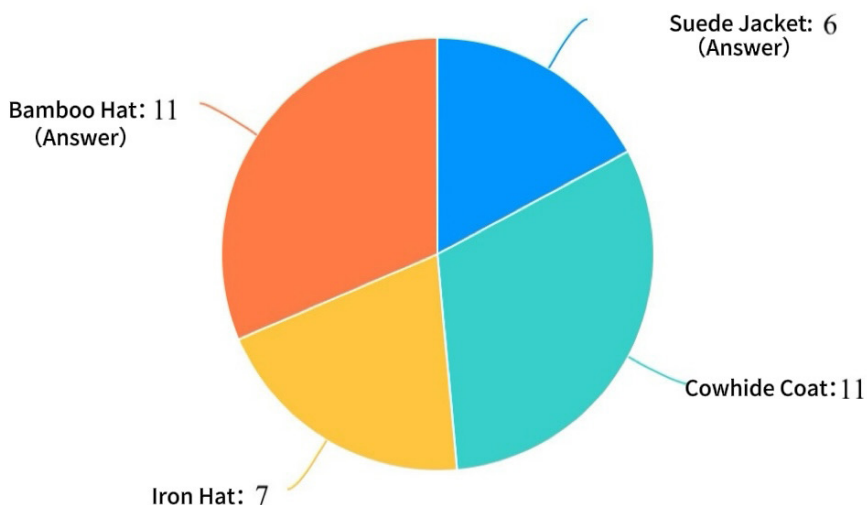
This question only holds an accuracy of 10 percents, most students did not choose the right option for the coat.

Based on the questionnaire, a phenomenon that the classmates know approximately nothing about Datiehua.

4.2 Game Experiment Analysis

Based on the observation, the students all show high concentration while they are playing the game. Also, the result of the questionnaire has a high accuracy.

There are 10 questions in this questionnaire, and the total points of this questionnaire is 100. 3 students got 100 (25%), 5 students got 90 (approximately 42.7%), 3 students got 80 (25%), and 1 student got 70 (approximately 8.3%). The graph below shows the result.

The first question is the first step that the performer should practice, the second question is the first step that the performer should practice, the third question is the first step that the performer should practice, the fourth question is the plant on the huge pergola, the fifth question is the other name of the firecracker on the huge pergola, and the remaining questions are all about the structure of the huge pergola. The graph below shows the accuracy rate of each question.

The accuracy rate of each question in the questionnaire									
Question	1	2	3	4	5	6	7	8	9	10
Accuracy Rate (%)	75	75	83.33	100	100	91.67	100	100	100	58.33

5. Conclusion

According to the literature review, video games can indeed help learning. The experiment in this study also concluded that video games can help people retain knowledge. The analysis of different video games shows that video games can achieve the purpose of promoting cultural knowledge by integrating cultural elements into the game story or level.

6. Discussion

6.1 Limitations

In the proposal report, the plan is to develop two games regarding Datiehua and Sichuan opera face-changing. The aim was to explore different aspects of interactive media through these two distinct projects. However, due to personal time constraints and technique limitations, only the game related to Datiehua was fully developed. This discussion reflects on the challenges encountered, the limitations of the outcomes, and future implications for similar projects. In addition, the previous goal for the game about Datiehua was to create an immersive and engaging interactive experience that would provide users with a comprehensive exploration of a specific theme. The intended design included advanced features such as a story progression and multiple choices in different parts, and high-quality graphics to enhance user engagement. Despite best efforts, the final version of the game about Datiehua fell short of the initial vision. The time constraints significantly impacted the development process, leading to a product that only partially met the set objectives. While the basic gameplay mechanics and introduction of the primary information implemented, the advanced features such as dynamic story progression and

multiple choices of the stories were not fully realized. The graphical quality was also compromised, resulting in a less immersive experience than initially intended. Several technical challenges further hindered the development of the game about Datiehua. The complexity of implementing dynamic story lines required more time and expertise than initially anticipated. Additionally, optimization issues caused performance bottlenecks, affecting the game's playability. These technical hurdles not only delayed the development process but also resulted in a product that was below the expected quality standards. One of the major setbacks in the development of the game about Datiehua was the inability to cover all the intended content. Many of the planned interactive elements had to be replaced with video explanations, detracting from the immersive experience. This shift from interactive gameplay to passive content presentation highlighted the project's technical shortcomings and impacted the overall quality of the final product.

6.2 Innovations

One of the key takeaways from this project is the importance of realistic time management and project planning. Future projects should incorporate more flexible timelines that account for potential delays and technical challenges. This approach would help ensure that all planned features can be fully developed and tested before the final release. The technical difficulties encountered highlight the need for continuous skill development. Investing time in learning advanced programming techniques and familiarizing oneself with the latest game development tools can significantly improve the quality of future projects. Additionally, collaborating with other developers or seeking mentorship could provide valuable insights and technical support. To avoid the shortcomings experienced in this study, future projects should focus on creating robust and interactive content. Ensuring that all planned features are feasible within the given resources and time frame is crucial. Additionally, exploring alternative methods of content delivery, such as modular game design, could help in managing complex projects more effectively. Expanding the user base for testing and feedback is essential for obtaining a comprehensive evaluation of the game. Engaging a larger and more diverse group of testers can provide valuable insights into user preferences and identify potential issues that might not be apparent with a smaller sample size. This approach will help in creating a more polished and user-friendly final product. The development of video games presented numerous challenges, from time constraints and technical difficulties to limited user testing. While the outcomes did not fully meet the initial objec-

tives, the experience provided valuable lessons for future projects. By addressing these challenges and incorporating the recommendations outlined, future game development endeavors can achieve greater success and create more engaging and high-quality interactive experiences.

As for the research topic, future research can involve more different cultures, such as paper-cutting or shadow puppetry, and strive to promote more Chinese culture. At the same time, comparison between video game education and traditional education can also be studied, and observe the similarities and differences between them. It is also possible to specialize in the pros and cons of video game education, as well as topics that study the integration of video game education with other majors, such as the psychological changes of students as they experience video game education. Developing video game education into VR game education can also be a good research topic. Specifically for video game education, topics such as how long the knowledge taught by video game education stays in human memory can be discussed.

6.3 Future Outlook

Video games are poised to revolutionize the future of education. As technology advances, educational games are becoming increasingly sophisticated, offering immersive, interactive learning experiences. These games can enhance student engagement, foster problem-solving skills, and promote collaborative learning. By seamlessly blending entertainment and instruction, educational games have the potential to make learning more enjoyable and effective. Furthermore, the rise of virtual and augmented reality technologies will enable even more immersive and personalized educational game experiences. As educational institutions and policymakers recognize the value of game-based learning, the integration of electronic games into the classroom of the future is set to become much more widespread and impactful.

The benefit of culture digitization is that it can bring cultures back into the public horizon, especially the daily lives of young people. As a popular way of entertainment for the younger generation, electronic games play an increasingly important role in the process of understanding the world and establishing the world outlook and values of the younger generation. Video games have become an important communication carrier in the fields of culture, entertainment, education, economy and so on. How to give full play to the role of digital games as a carrier and realize the deep inclusion of cultural emotion with intangible cultural heritage is an urgent problem for game designers and intangible cultural heritage researchers.

Acknowledgement

References

Squire, K. (2013). Video games and learning: Teaching and participatory culture in the digital age. Alberta Journal of Educational Research, 59(1), 129-132.

Parsayi, F., & Soyoof, A. (2018). Video games: The interface between language learning and storytelling. International Journal of Pedagogies & Learning, 13(2), 103-118.

Somerdin, M. (2016). The game debate: Video games as innovative storytelling. *The Oswald Review: An International Journal of Undergraduate Research and Criticism in the Discipline of English*, *18*(1), 7.

Gee, J. P. (2006). Are video games good for learning?. *Nordic Journal of Digital Literacy*, *1*(3), 172-183.

Gee, J. P. (2003). What video games have to teach us about learning and literacy. *Computers in entertainment (CIE)*, *1*(1), 20-20.

Gee, J. P. (2012). *Situated language and learning: A critique of traditional schooling*. routledge.

China Daily. (2022). Brilliance of the brave.

HeartBeat Plus.(2021). Paper Bride (Video Game). IOS, Android, Steam.

HeartBeat Plus.(2021). Paper Bride 2 Zanglingcun (Video Game). IOS, Android, Steam.

HeartBeat Plus.(2022). Paper Bride 3 Yuanyangzhai (Video Game). IOS, Android, Steam.

HeartBeat Plus.(2022). Paper Bride 4 Hongsichan (Video Game). IOS, Android, Steam.

HeartBeat Plus.(2023). Paper Bride 5 Laishengxi (Video Game). IOS, Android, Steam.

NetEase. (Unissued). Nuo Shi (Video Game). Unissued.

GameraGame. (2021). The Rewinder (Video Game). PC.

GameMaker. GameMaker Manual Index. https://manual.gamemaker.io/monthly/zh/GameMaker_Language/GML_Reference/GML_Reference.htm