慶應義塾大学学術情報リポジトリ
Keio Associated Repository of Academic resouces

Title	GEM : design of an escape board game for youth to reconnect to ancient Chinese history
Sub Title	
Author	张, 旻昊(Zhang, Minhao) 大川, 恵子(Ōkawa, Keiko)
Publisher	慶應義塾大学大学院メディアデザイン研究科
Publication year	2019
Jtitle	
JaLC DOI	
Abstract	
Notes	修士学位論文. 2019年度メディアデザイン学 第723号
Genre	Thesis or Dissertation
URL	https://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=KO40001001-00002019-0723

慶應義塾大学学術情報リポジトリ(KOARA)に掲載されているコンテンツの著作権は、それぞれの著作者、学会または出版社/発行者に帰属し、その権利は著作権法によって保護されています。引用にあたっては、著作権法を遵守してご利用ください。

The copyrights of content available on the KeiO Associated Repository of Academic resources (KOARA) belong to the respective authors, academic societies, or publishers/issuers, and these rights are protected by the Japanese Copyright Act. When quoting the content, please follow the Japanese copyright act.

Master's Thesis
Academic Year 2019

GEM: Design of an Escape Board Game for Youth to Reconnect to Ancient Chinese History

Keio University
Graduate School of Media Design

Zhang Minhao

A Master's Thesis
submitted to Keio University Graduate School of Media Design
in partial fulfillment of the requirements for the degree of
Master of Media Design

Zhang Minhao

Master's Thesis Advisory Committee:

Professor Keiko Okawa	(Main Research Supervisor)
Professor Matthew Waldman	(Sub Research Supervisor)

Master's Thesis Review Committee:

Professor Keiko Okawa	(Chair)
Professor Matthew Waldman	(Co-Reviewer)
Professor Ichiya Nakamura	(Co-Reviewer)

Abstract of Master's Thesis of Academic Year 2019

GEM: Design of an Escape Board Game for Youth to Reconnect to Ancient Chinese History

Category: Design

Summary

China is a country with over 4000 years history, and people lived on the history , learn from the past for better development. However, as China entered digital era, the youth seem to find a life goal that they more likely to study science rather than social science, and Chinese history has been ignored by youth. History is recognised as "useless" subject in terms of job hunting or personal interest. Thus, young generation of China is gradually losing connection with history.

GEM is an escape board game with historical subject designed for Chinese youth who are disconnected with history. The purpose of GEM is to reconnect Chinese youth with Chinese history though game experience. The evaluation result has shown that the game can establish an connection between the player and the subject, in terms of igniting interest and curiosity.

This paper will introduce the current situation of disconnection between Chinese youth and Chinese history ,and how GEM is designed to reconnect the two subjects. In addition, the paper discusses the result and future possibilities of the design.

Keywords:

Gamification,Chinese History,Education,Cultural Value

Keio University Graduate School of Media Design

Zhang Minhao

Contents

Acknowledgements **vii**

1 Introduction **1**

1.1. Disconnection of Youth with Chinese History 1

1.2. Game Situation in China 2

1.3. Thesis Organization 3

2 Related Works **5**

2.1. Studies on perception towards history among young generations in China 5

2.2. Escape Game 6

2.2.1 Escape Game as Learning Tool 6

2.2.2 Escape Game as Emotional Generator 6

2.2.3 Escape Game as Cross-Cultural Presentation 7

2.2.4 Escape Game Examples 7

2.3. Summary 10

Notes 10

3 Game Design **11**

3.1. Introduction 11

3.2. Game Value Creation 11

3.3. Engagement via game experience 11

3.4. Overview 12

3.4.1 Why Yue'lu Academy as Subject 12

3.4.2 Design Inspiration 13

3.5. Concept 16

3.6. Game Components 18

3.6.1 GEM: Pilot Version 18
3.6.2 GEM: Game Components 21
3.6.3 Game Play 25
3.7. Target Player 29
Notes 30

4 Proof of Concept **31**
4.1. Method 31
4.2. Result 35
4.2.1 Result: Game Related Discussion 39
4.2.2 Result:Chinese History Related Discussion 41
4.3. Analysis 43
4.3.1 Group A Data Analysis 45
4.3.2 Group B Data Analysis 47
4.3.3 Gender disparity 49
4.4. Summary 50

5 Conclusion **51**
5.1. Conclusion 51
5.2. Limitations and Future Works 52

References **55**

Appendices **57**
A. Sample of Pre-Survey and Post Questionnaire in Evaluation . . . 57

List of Figures

1.1 Figure:China's Game Situation in Global Market 2

2.1 Rusty Lake-Roots 8
2.2 Escape Board Game Room 25 8
2.3 China: The Middle Kingdom 9
2.4 1880 China 10

3.1 Yue'lu Academy 12
3.2 Terror Infinity 14
3.3 Kaleidoscope of Death 14
3.4 Escape Board Game Hako Onna 15
3.5 Game Package of GEM 18
3.6 Pilot Version Design Draft 19
3.7 Map-tiles of GEM Pilot Version 19
3.8 Components of GEM Pilot Version 20
3.9 Figure:GEM: Pilot Version Testing 21
3.10 Map-tiles Design of GEM 22
3.11 Chip Design of GEM 23
3.12 Card Design of GEM 24
3.13 Characters Design of GEM 25
3.14 Game Manual: Choosing an Character 26
3.15 Game Manual:Decide the Starting Map 27
3.16 Manual for GEM: Game Setup 27
3.17 Manual for GEM: How to Play 28
3.18 Manual for GEM: Game Setup 29

4.1 Participants Writing Pre-Surveys 34
4.2 Testing 34

4.3 Experiment of Group A1 36
4.4 Experiment of Group A2 36
4.5 Experiment of Group A4 37
4.6 Experiment of Group A5 38
4.7 Evaluation Materials of Group B 38
4.8 Experiment of Group B 39
4.9 Board Game Playing Experience of the Participants 40
4.10 Experiment of Group B 41
4.11 Group A: Evaluation of Knowledge Presentation 42
4.12 Group B: Evaluation of Knowledge Presentation 42
4.13 Memory Presentation of Group A and Group B 45
4.14 Group A-Involvement Rating 45
4.15 Group A-Concentration Rating 46
4.16 Group A-Concentration Rating 46
4.17 Group A-Memorization Rating 47
4.18 Group B -Involvement Rating 47
4.19 Group B -Concentration Rating 48
4.20 Group B -Concentration Rating 48
4.21 Group B -Memorization Rating 49

A.1 Figure:Sample of Pre-Survey Group A and Group B 57
A.2 Figure:Group A: Sample of Post Questionnaire 58
A.3 Figure:Group A: Sample of Post Questionnaire 59
A.4 Figure:Group B: Sample of Post Questionnaire 60

List of Tables

4.1 Group A Schedule and Experimental Situation 32
4.2 Group B Schedule and Experimental Situation 32

Acknowledgements

Project GEM is truly my "gem". The birth of GEM thanks to many people who gave me generous support and encouragement.

I would like to thank Keiko Sensei who is always being supportive and guiding me in my research as well as my life.

I would like to thank Matthew Sensei for helping me in design, and giving me a lot of inspiration.

I would like to thank my parents for supporting me all the time without any condition.

I would like to thank Hui, my soul partner who encouraging me when I have difficulty, and offering those astonishing artworks for my design.

I would like to thank my friends of 04 and 06, thanks for the accompany in these months. I will never forget the time I spent with you.

I want to thank Kane-chan, spare your time for me to think of the game, and encourage me.

I would like to thank Global Education, it is my honor to join this warm, happy family. Thanks to all members for helping me with my design, I really enjoy the time spend with you guys.

And lastly, I want to say thank you to myself for being hardworking and not being defeated by the difficulties.

Chapter 1
Introduction

China is a country owns more than four thousand years of history. In the long river of China history, the nation developed cultures and philosophy that still apply to today's China. As one of the biggest economic entities in the world, China has gone through a long journey of learning lessons from past failures and looking for a new way of development and sustainability. Nowadays, China seems to enter an era of peace. Meanwhile, a social problem is slowly growing, then become a serious issue. Today's young generation has gradually forgotten the importance of history. This research is aimed at solving the social problem of disconnection between the youth and ancient Chinese history via game design so that to reconnect the two together.

1.1. Disconnection of Youth with Chinese History

China is stepping into an age called "digital/mobile 2.0," that refers to the rapid development of electronic technology. The accessibility of the internet nearly covered the entire country, and most of the tasks can be accomplished by a single smartphone. Under such digitized social background, the mindset of the young generation gradually fits the current tendency.

People with modern minds are attracted by new things rather than reflect the past. This phenomenon is because of China's educational system and ideology. In China's high school, students have to choose their "preparatory course", and the "preparatory course" divided into two major departments: social science and science. Until 2017, the portion of social science major and science major is 1:3(Jiang 2017), which science is more popular than social science. This is because

China usually emphasizes the importance of "usefulness", thus science majors like machine learning, computing science have been called "hot majors" in China's colleges. The great leap of China's economy mainly relies on its science majored talents' efforts, therefore the "useless" subjects like literature, history, sociology, and the rest are gradually desolated.

Knowing history is essential for people, especially the youth to "rooting people in time"(Corfield 2018b). The study states that people without a "root" feel less secured and skeptical about his or her identity. History plays a role of building a subconscious sense of "spiritual home" for people so that they can obtain a sense of ownership and belongingness.

1.2. Game Situation in China

The game as a way of entertainment, takes a considerable part in Chinese people's life and work. The high accessibility of wireless connection allows people to enjoy the internet everywhere and anytime. Also, the fast speed wireless environment enables complicated operation such as playing games. The internet situation made China's game industry flourish, up until 2018, China owns 6.26 billion game users, and actual sales accounted for approximately 23.6% of the global game market(gco 2018a)(Figure 1.1).

Figure 1.1 Figure:China's Game Situation in Global Market (gco 2018a)

The game industry has become one of the most competitive entertainment forms, and people would like to spend time on it. The above data shows the

potential and trend of China's game industry, which the game is more and more involved in people's daily life.

Escape Game is originated from a PC game *Escape room* while the game developers started to explore small-scale game rather than multiplayer online game. (Huai 2018) The success of first escape game set an example to game developers, many similar games have been developed. Escape game takes shape in many ways, both online and offline forms can apply the concept to the game. The emergence of escape game inspired new business models in entertainment.

Escape game emphasis immersive experience during the play due to its perfect creation of the worldview. For now, there are three main game formats of escape game. First one is real escape game. In real escape game, also known as an escape room, the players are literally locked in a room and required to observe, to decode the password, interact with any object in the room, plus communicate with other players to find the key to the room. The second one is a digital escape game that the players will mainly interact with the world in the screen in the digital format escape game. The digital format escape game allows variety in the presentation of complicated or fancy worldview such as the futuristic world. Thirdly, which the player can deeply involve to a worldview setting, there is a board game. Boardgame format requires more reading and imagination to the player that the player has to understand the worldview by both visual design and manual book. The player may have to repetitively read the information written on the manual, cards, or other objects of the game in order to get used to the rule and worldview of the game. Unlike digital or real escape game, board game appeal to the player ' s initiative that the player needs to take the initiative to explore the game.

By noticing the feature of arouse initiative of the player, this research choose escape board game as the approach method in order to find out the way of improving interest of the players to history.

1.3. Thesis Organization

- In Chapter One, introduce the current social situation of disconnection between China's young generation and China's ancient history, as well as the

game situation among the young generation. Mainly addresses the goal and approaches of this research.

- Chapter Two discusses the academic researches and approaches related to this research goal. This chapter discusses how others work to connect history to a certain group of people, focusing on the effectiveness in history learning, and finally how this research will combine history and escape game together.
- Chapter Three describes how this research will reconnect China's ancient history with China's young generation by game design.
- Chapter Four talks about the evaluation, analyze the pilot version and second version of the design and discussion about the game.
- In Chapter Five, the final chapter summaries the entire research from research goal, research background, design thinking process, and evaluation. And also the future works and possible development of the design.

Chapter 2
Related Works

2.1. Studies on perception towards history among young generations in China

Even though the youth do not pay attention in history, educators regard history learning as a crucial part of education. There is a concept called "Edutainment". It is the combination word of education and entertainment, the idea is to include entertaining components and methods in education so that to improve the interest(Fujimoto 2007) . The educators have been studied and experimented various methods to ignite the learning interest in the history of youth. *Microlecture*, as new-style lecture style has become very popular in school teaching recently due to its bright and straightforward knowledge structure and interactive based mechanism. Unlike traditional lecturing style, *micro-lecture* enables quickly knowledge installment and additional components like music, audio, and moving pictures, can tight students' attention on the subject(Yanan 2019).

Another approach often used in the historical study is an association method. Chinese educators have invented various association methods in order to raise the learning interest of youth.The method conducted from multiple aspects such as comparative, chronicle, literally association and so on. The primary function of the association method is to establish a comprehensive historical view so that history became "alive". For example, literally association combines literature and historical events so the learner can always reflect on the knowledge. Wei gave an example of *Three Kingdom*, a historically based novel described the strategic battles and complicated people relationships during the Warring States Period, which mentioned lots of historical characters and events. The literal expression of literature can attract learner's attention, and the learner can always reflect on

the history through the literature and vice versa(Xiongbo 2018).

2.2. Escape Game

Escape game emerged as new style entertainment and quickly hit into China's market. Escape game is a game genre that the player is "locked" in a place, and they have to search the place to get clues by solving puzzles or collecting tools to get out of the place. This game style satisfied the needs of youth that they could express their individuality as well as interaction. The specialty of an escape game is that the game itself provided the participants' motivation to play, which the participants psychologically become a part of the experience. The player consistently coherent to the subject of the game due to the particular characteristics and such playing style offered the inspiration for education.

2.2.1 Escape Game as Learning Tool

Previous studies showed that escape Game could be used to achieve a pedagogical purpose. According to Nicholson's research, he addressed that escape game system can create "passion around specific topics that then can be used as the spark to then ignite interest"(Stone 2016) Moreover, the unique property of an escape game is puzzle solving; the solution is not shown in the setting so that the player needs to use their brain to think about the clues. This process is equivalent to an ordinary learning process, and also train people to solve the problem individually.

2.2.2 Escape Game as Emotional Generator

As one of pedagogical method, escape game system has gradually took part in education due to its functionality of let the player to "find a deeper connection to the underlying topic"(Stone 2016).

Escape game is usually aligned with a story that gives the player a clear goal while they are playing. Unlike other genres, escape room game has one, and the only one goal, which is to escape from the trapped place, and the player ' s goal is to find out the solution to achieve that simple goal. During the process of escape, the player(s) need to check every corner of the " room " (all spaces in an escape

room are defined as “room”) , trying to gain useful tools or clues that could help them to find the key or solution to the room. Each object and tool is given a piece of narration to the whole story that when the players obtain an object or a tool, it triggers a narrative so that they can figure out the entire story.

Reveal more narration would be a trigger of the player's interest in the subject that the player has already established somewhat connected to the game subject.

2.2.3 Escape Game as Cross-Cultural Presentation

Since escape game is a situation game that can make all information readily available, the players need to gather the information and come up with the solution by themselves. The game-style of an escape game is to experience in a setting. Thus the game could not rely on the players' prior knowledge of the subject, yet to provide enough knowledge in an indirect yet understandable way.(Kaminske 2018)

2.2.4 Escape Game Examples

Rusty Lake Series

Rusty Lake is a puzzle-solving style escape game , the player needs to interact with the object appears in the scene to collect items and unlocked the story. The entire story reveals while opening more items and interactions. The highlighted point of *Rusty Lake* is its smart storytelling, the player could explore the story through minimal information. The game is more about letting players find their solutions but replying on the textual explanation.

Figure 2.1 Rusty Lake-Roots

Room 25 Ultimate

Room 25 Ultimate is an escape board game with a "scary" theme, which the players have to escape from a complex without dying via cooperation. The game has essential but minimal components, most of the game are played in the players' heads, which add fun and challenges.

Figure 2.2 Escape Board Game Room 25
(Rouze 2016)

Chinese History Related Board Game

Although history genre has always been popular in the game market, and there are many similar works published. Based on the research on board game sharing

platform,*Board Game Geek* [1], a number of China-themed board game are been registered. However the majority of them are strategic war game that aim to conquer countries or to overcome an specific incident. Escape conceptual game of history is waited to be created.

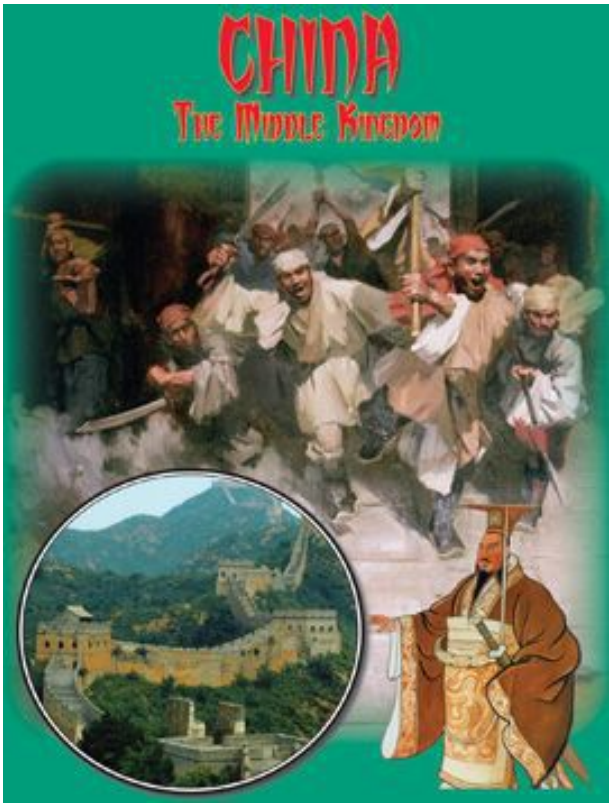

Figure 2.3 China: The Middle Kingdom
(Rouze 2016)

China: The Middle Kingdom

China: The Middle Kingdom is a war game covers China's history from 400BC to today,and the players are required to compete with each other to achieve objectives.

1880:China

Another example of board game of Chinese history is *1880:China*.It is a strategy game that the players trade among each other to earn money or properties, the background setting in a chaotic period of China, a lot of unpredictable factors

made into the game.

Figure 2.4 1880 China
(Rouze 2016)

2.3. Summary

In a nutshell, the educators have put effort into researching how to reconnect the youth with ancient Chinese history. Their method of combining fun elements like literature inspires the design. Also, the existing games offered valuable references in terms of designing game mechanics. These related works have laid the groundwork for the game design; the achievements of predecessors affect the later design thinking process.

Notes

1 BoardGameGeek,a boardgame rating and sharing platform
`https://boardgamegeek.com/boardgame/26999/china-middle-kingdom`

Chapter 3
Game Design

3.1. Introduction

Ermi and Mayra states the game-play is an extension of human experience, and the game experience can be defined as “an ensemble made up of the player’s sensations, thoughts, feelings, actions, and meaning-making”(Laura and Frans 2005)in the setting. The design process is a journey of how to expand the human experience in a settled situation.

As one of the countries with ancient civilization, China’s history can trace back thousands of years. Since it is too difficult to input entire history into one game, the selection of historical story became very important.

3.2. Game Value Creation

According to Lazzaro, “a game’s value proposition lies in how it might make its players think and feel” (Lazzaro 2199), the primary function of the game is to provide a different perspective for the player in terms of the visual, social and cultural system, sensation and the rest. This research intended to embody the cultural value of Chinese history through game design, to enlighten the university students who have less or no interest in Chinese history.

3.3. Engagement via game experience

The studies of gameplay states that games are more like “artifacts” than media (Hunicke and Zubek 2199) , the players do not just start playing in a ready-set mode, but also “actively take part in the construction” of experiences such

as “bring their desires, anticipation and previous experiences with them, and interpret and reflect the experience in that light.” (Laura and Frans 2005) The creation of engaging experience is highly considered in the game design to let Chinese youth realize that “all people and peoples are living histories(Corfield 2018b)”.

3.4. Overview

3.4.1 Why Yue’lu Academy as Subject

Every game work is come from nowhere but initiated by a strong creative-motive. GEM is a game aimed at building the connection between Chinese history and the people who are not very interested in it. The game has to enlighten the target player in terms of expanding their human experience while planting game factors into their memory.

The reason for this topic selection is because of the value of Chinese culture and philosophy originated and developed in this ancient Academy. Yue’lu Academy is on the east side of Yue’lu Mountain in Changsha, the capital city of Hunan Province. The Academy has witnessed a history of more than one thousand years without any disruption or dispute. The Academy has known for its role in the dissemination of academic learning where China’s scholars assemble(yue 2010).

Figure 3.1 Yue’lu Academy

Yue'lu Academy used to open to the public for visiting, however, due to the maintenance necessity and flow control, Yue'lu Academy became charge system. The expensive ticket put people off meanwhile lose interest. Yue'lu Academy, as one of the most representative historical heritage, is experiencing the difficult situation of being neglected. The current status of Yue'lu Academy is a microcosm of the proposed research question: How to reconnect youth with ancient Chinese history?

Thus the author picked Yue'lu Academy as the subject of board game design, aim to establish a connection by understanding the history of Yue'lu Academy.

3.4.2 Design Inspiration

Novel

Kaleidoscope of Death [1]is a Chinese horror fiction with great popularity among horror novel fans. The novel belongs to a popular category of “infinite horror” ,a new style genre of horror which originated from 2007,laid down the concept of "endless horror experience" by the author of *Terror Infinity.* [2] The protagonist enters a “gate” that connects to another world, and he has to accomplish the mission inside the gate and find the key to run away. The charming point of “infinite horror” is the endless loop that the protagonists and his friends can never escape from the cycle. Thus “infinite horror” system gives randomness to the story, and make the story more unpredictable.

Figure 3.2 Terror Infinity
(zhttty 2007)

Figure 3.3 Kaleidoscope of Death
(Yang 2018)

However, the author set various inevitable events in the story so that to increase the difficulty level for the protagonist to overcome. The author referenced many existing story background, also including the historical context that the protagonist has to interact with historical figures to obtain the clue. The author did not change any of the historical facts but to let the character to experience history. This arrangement allows the reader to enjoy the story under a familiar context with entertaining elements, and the detailed description of historical figures.

Escape Board Game

Hako-onna is a horror survival game utilized escape room game concept. The players separated into two groups: hako-onna and the survivors, and the survivors have to escape from the trapped mansion that hako-onna hovering. The survivors have to find the way out to the mansion by revealing the backup cards to find items or show skills. On the other hand, as the antagonist of the game, the players who play the role of Hako-onna attempt to haunt the survivors and turn them into Hako-onna ' s servant. One highlight point of this game is the twist that the survivor can turn into Hako-onna ' s servant by chance. Hako-onna set up many obstacles that could randomly happen anytime, which increases the entertainment for the game.

Figure 3.4 Escape Board Game Hako Onna
(Ejin 2016)

The commonality of this research and Hako-onna is the uncertainty in the story. Boardgame can bring the player into a brand new worldview, and the players have to make a choice and act in the setting; same as history, people make choices and

do some acts to achieve some goals, but they cannot predict what will happen by their decisions. The mechanism of Hako-onna inspired the design, in terms of creating atmosphere and improving the immersion of worldview.

3.5. Concept

Project GEM is a game addressing the importance of Chinese history to the young generation. It presents many historical facts and related persons that contributed to Chinese history. The goal of the game is to reconnect youth with Chinese history via playing experience.

- Name: GEM

  GEM is the homo-phonic of the Chinese character"見," which has meanings of "discovery," "explore," and "communication."The definition of "見" accurately describes the central concept of the game, and delivers the message that the game is trying to convey to the target players: Find and reconnect to Chinese history through exploration and communication.

  Furthermore, GEM stands for the English word "gem," implying the value of history is like a gem, bright and precious.

- Artistic Style: GEM adapted to hand drawing art style to provide an aesthetic experience. The hand drawing style is catering to the characteristics of the ancient lifestyle since most of the publications, maps, and identity cards are hand-drawn.

- Genre : Escape game,Indie,Board game.

  Escape Game : GEM applies the concept of escape game that the goal for players is to escape to the future, this concept contains the author's research goal of reconnecting the future (target player,youth) and the past (ancient Chinese history).

  Indie Game : GEM is an indie game that the entire game design is created by the author for academic use, and purposely oriented to the Chinese youth who are disconnected to ancient Chinese history.GEM did not receive any financial support from any organization.

Board Game: GEM is a tabletop board game that allows maximum of 4 players to play.

- Theme: History of Yue'lu Academy. The game subject is specified to history in Yue'lu Academy, an ancient academy with over thousands years history. The appeared persons and scenes are actually existed, and the narration of GEM is based on the real historical events as well.

- Mechanics : Competition ,Modular Board, Role Play.

  Competition Game: GEM adopted player vs. player (pvp) style, the player will attempt to make contribution on the way of achieving game goal.

  Modular Board: In order to escape to the future, the player needs to explore the modular board to find clues and accomplish the mission.

  Role Play: GEM player will be given a instant identity, and the identity will effect the game experience and the result of competition.

- Platform: Tabletop. At present stage, GEM is an escape board game only for tabletop.

- Story: Four irrelevant persons,an athlete, an engineer,an actor and a writer were invited to trial of the newest scientific invention ——Time Machine. They coincidentally participated in the raffle ticket activity of Science via social media, and now they step into the time machine, fast the seat belt, wear a cool designed smart watch and wait to begin. Everything seems so serious and real, they did not even think about that they could really transport to the past. Now they are. They were landed in an ancient complex, and being alone. Their smart watch pop up a message says they have to achieve two conditions in order to go back to the future. First, explore all the landmarks of Yue'lu Academy.Secondly, collect all pieces of time machine while exploring. They will try to explore and overcome the obstacles for the same goal—-go back to the future.

- Game Play: GEM is an escape board game composed by various components with history of Yue'lu Academy as subject.This game can be played by four people maximum, and each set will spend approximately one hour.

Figure 3.5 Game Package of GEM

3.6. Game Components

3.6.1 GEM: Pilot Version

GEM pilot version is made to test the functionality and play-ability of the game, it is the very first prototype of the concept. GEM pilot version is created based on the drafts, the components were limited and the mechanism was much simpler than the latest version.

In pilot version, there was only one map that contained four main landmarks, the idea was to let the players play on one map, all the chips are placed at the beginning, the player will flip the chip when they took a step.

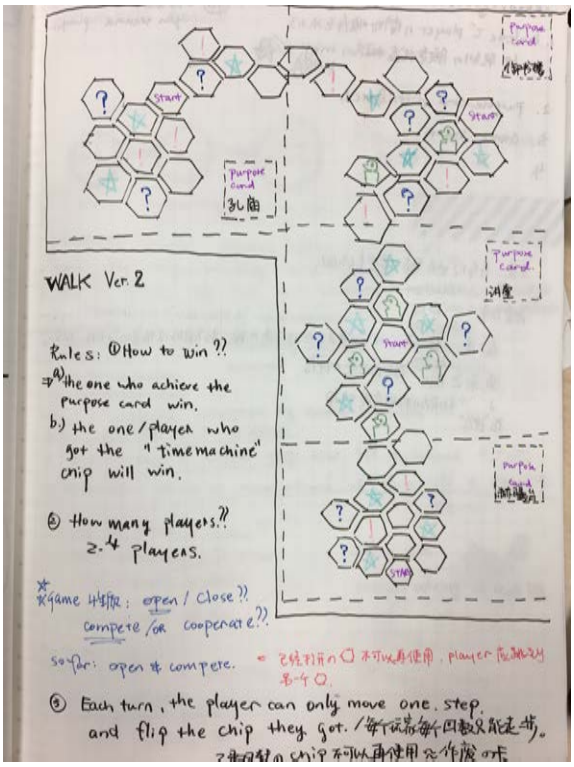

Figure 3.6 Pilot Version Design Draft

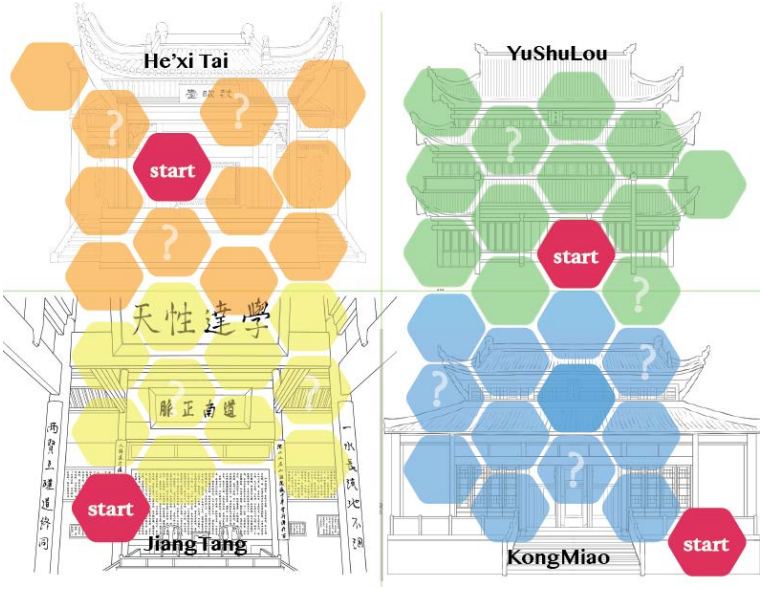

Figure 3.7 Map-tiles of GEM Pilot Version

Also in pilot version, there was purpose card for each player to accomplish. The initial idea was to give each player a goal on the game, so that to encourage them continue playing.

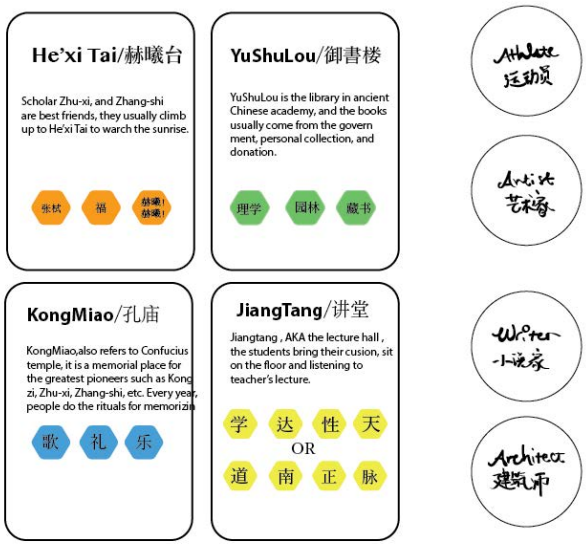

Figure 3.8 Components of GEM Pilot Version

Pilot Version Testing

The first testing has been conducted while the pilot version of GEM was produced. The mechanism of the first version was slightly different from the second version that the chips have to be placed on the map-tile from the beginning.

The first test play was conducted in April 2019, and the participants said the game is lack of balance because the content of the chips were uncovered and placed randomly,the chances of getting different chips were unbalanced.

And since the map-tiles were already placed with chips, the players have less motivation to explore other's map that they would only focus on their starting map.As a result the communication among the participants were largely decreased because they only concentrated on their own map.

Figure 3.9 Figure:GEM: Pilot Version Testing

In terms of artistic presentation, the players were satisfied and preferred the hand drawn style which make them feel friendly and less serious.So the game kept this art style to the next version.

Based on the feedback and result of the first testing, the author modified the game mechanism and visual design, then launched the second edition GEM, the final version of this project.

3.6.2 GEM: Game Components

- **Map-tiles**

  Yue'lu Academy is an architectural complex, WALK reproduces its four symbolic architectures into map-tiles for the players to explore each architecture as well as the spots.

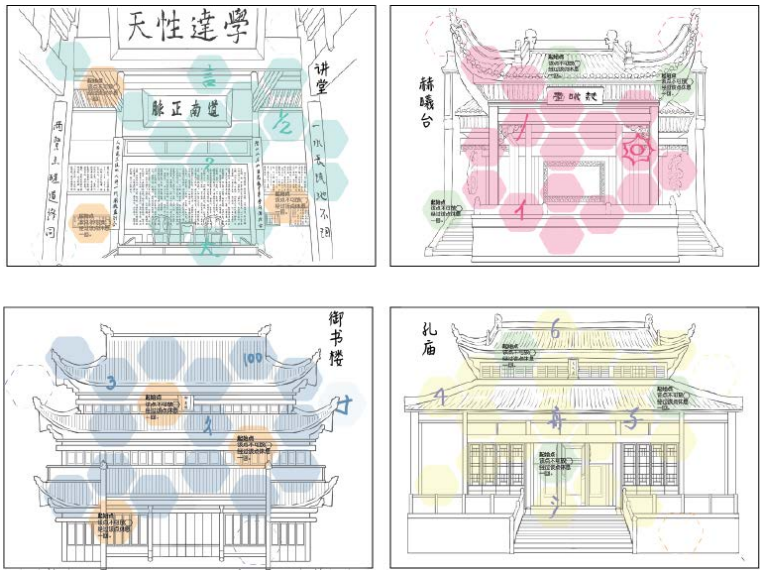

Figure 3.10 Map-tiles Design of GEM

- **Chips and Cards**

  Chips are the main tools for player to play the game. Chips play multiple roles such as paving the road on map,revealing an item and the rest. The game adopted hexagon-shaped design due to its unique shape that allows multiple combinations. There are four illustration types of chips in the game: star, question mark, scholar figure, and random kanji or Arabic number. Chip with random kanji or Arabic number represents landmark, chip with scholar figure represents tool, chip with star represents mission, and chip with question mark represents surprise.

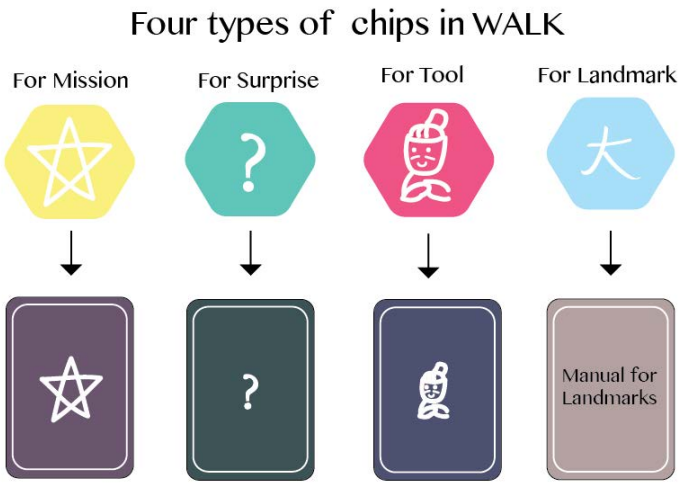

Figure 3.11 Chip Design of GEM

- **Cards**

  Accordingly, cards are designed for fulfil the entertainment and competitive elements for the game, the player shall draw the corresponding card from card pile based on the picture of the chip. during game-play.The player will interact with three types of cards to play the game.

Figure 3.12 Card Design of GEM

Each type of card plays different role in the play, and the player will draw the corresponding card based on the chip they draw.

- **Character Design**

  The game has set original characters that each player will play in the game. Since the game is for four players, there are four identities: athlete, engineer, actor, and writer. The four characters were set as an ordinary person from age 18 to 34 which match to the age range of the target player. The four characters have their own occupation, age, birthday, and life experience. And their information is printed on the identification cards in order to increase the involvement between the player and the character.

Figure 3.13 Characters Design of GEM

3.6.3 Game Play

- **Game Set up**

  Each player chooses a character chip that he or she will play as well as the corresponding identification card(Figure 3.14). Identification card shows basic information of the character, and in order to the make the game more playful, the game designed the character's intellectual value and physical value, these two values varies based on the identity of the character. For instance, the athlete has 7 points of his physical value but 3 points in his intellectual value, and the writer has 7 points of intellectual value but 3 points in his physical value. The two values will effect the process and narration of the player, meanwhile creating reality of the character so that to provide a immersive experience during the play.

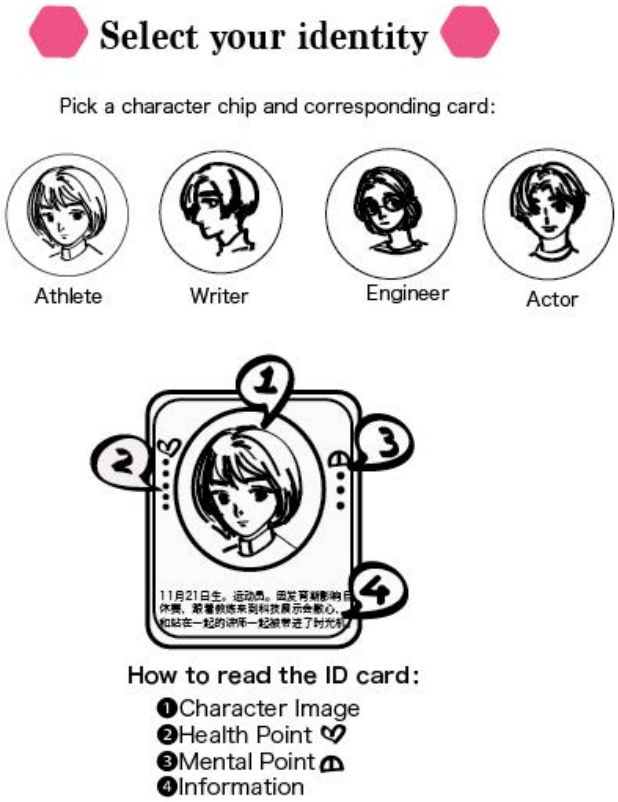

Figure 3.14 Game Manual: Choosing an Character

Then using the roulette to decide the starting map(Figure 3.15). Each color represents the corresponding map, for example when the brush pen shaped needle pointed on green, the player shall starts from the map of green-colored map.

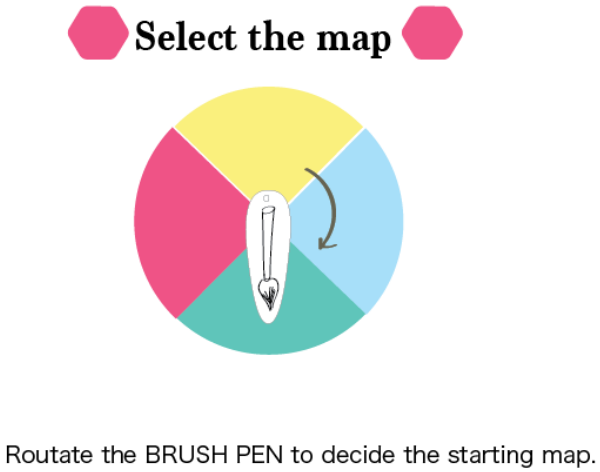

Figure 3.15 Game Manual:Decide the Starting Map

Arrange four maps based on the real composition of Yue'lu Academy (Figure 3.16), and place chips beside the map with same color. Place the identification cards, map chips, mission cards, surprise card and tool cards on beside.

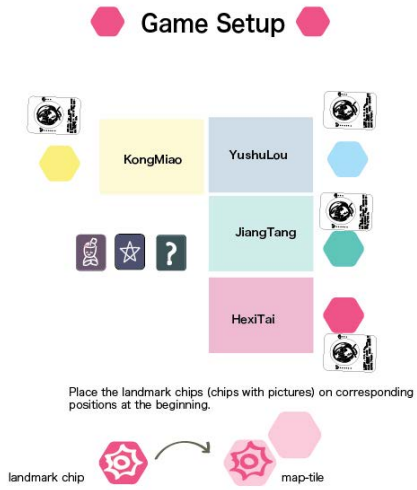

Figure 3.16 Manual for GEM: Game Setup

Place the chips with textures on the corresponding slots on the map at the

beginning.

- **How to Play**

  Players choose one starting point on their own map, then every player can move only one step in each turn. While the player make a move, he or she has to draw a chip and place on the map in order to create a "road" for himself or herself. Flip the chip and check the texture, then draw corresponding card from the card piles and follow the instruction written on the card(Figure 3.17).

  In order to disseminate the history of Yue'lu Academy， all cards and landmarks are all public after revealed. The player will read out the information and share to other players.

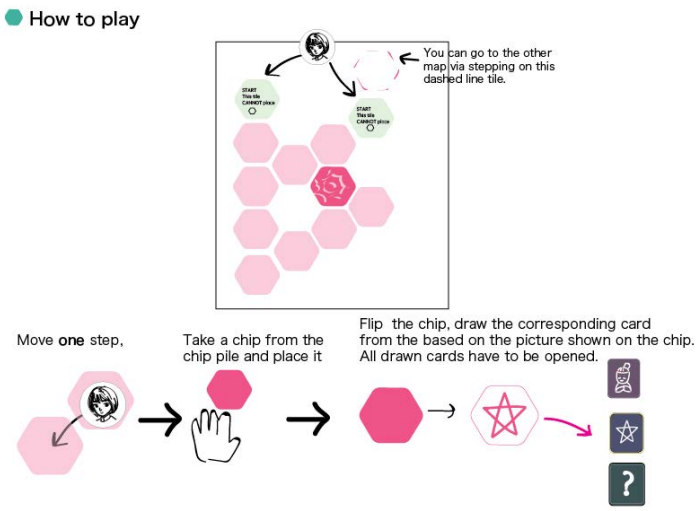

Figure 3.17 Manual for GEM: How to Play

- **Component for Spice: Time Machine**

  GEM is an escape board game aims to reconnect China's young generation with ancient Chinese history,thus the game designed a plot of *back to the future*. Four time travellers accidentally fell to ancient Yue'lu Academy, and they need to explore the academy in order to collect all the time machine

pieces to go back. This part attempts to establish the connection between the past and the future, as well as call to the theme of the research.

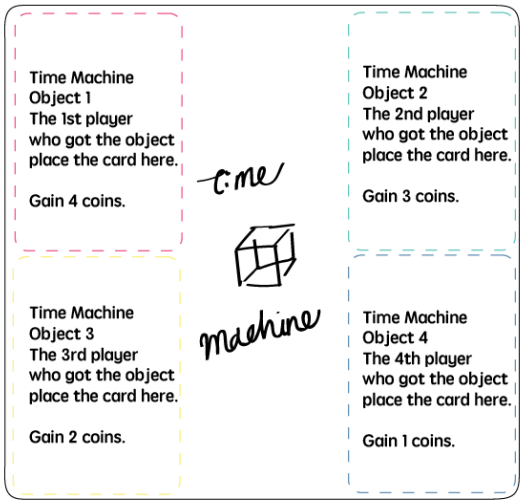

Figure 3.18 Manual for GEM: Game Setup

3.7. Target Player

Since GEM is a escape board game aimed at building a connection between the people who are not much interested in history with Chinese history, the targeted users for this game will be non-art major students, people who have less chances to involved with history, or have less interest in history. According to a social investigations about the interest of China ' s university students of 2017, social science and art majors such as fine arts, history, music are categorised as high unemployment risk majors, as known as " red card majors " [3]. In comparison , the growing demand majors like computing science, engineering, digital media art are known as " green card majors " that students graduated from these majors are easier to find a job with higher salary in the future.Thus in China, people more likely to choose science than art, even they are capable to learn, they will not pay attention on "useless" subjects.

It is the matter of choice but interest, this research intended to reconnect the

youth with ancient Chinese history by triggering their interest toward the subject via an acceptable way.

Notes

1 Kaleidoscope of Death
https://www.novelupdates.com/series/kaleidoscope-of-death/

2 Infinite Horror
http://www.wuxiaworld.com/novel/terror-infinity#

3 Red Card Majors, the term describes the majors difficult to find a job
http://scholarsupdate.hi2net.com/news.asp?NewsID=25020

Chapter 4
Proof of Concept

4.1. Method

The method of this evaluation is baseline test of two focus groups, playing testing observation, interview, and baseline test.

In this evaluation, there are 3 types of data to be collected :

- Video recordings of participants during the play or reading
- Questionnaire responses
- Verbal and non-verbal emotional cues

Procedure

The evaluation is conducted in a science and technology majored university, and recruited the participants from 18 to 34 years old, both included undergraduate students and graduate students. The evaluation recruited total of 40 participants, and divided the participants into two groups: Group A and Group B, each group conducts respective assignments as following:

- Group A: Play GEM
- Group B: Read an article of Yue'lu Academy

Since Group A requires four participants as a testing unit, the research divided them into 5 focus groups named from Group A1 to A5 made a schedule as following:

Group	Time	Place	# of Player	Pre-Survey	Post-Discussion	Recording
A1	2019/5/12 8:30∼9:30	DLUT	4	○	○	○
A2	2019/5/12 10:00∼11:00	DLUT	4	○	○	○
A3	2019/5/12 13:00∼14:00	DLUT	4	○	○	○
A4	2019/5/12 14:30∼15:30	DLUT	4	○	○	○
A5	2019/5/12 16:00∼17:00	DLUT	4	○	○	○

Table 4.1 Group A Schedule and Experimental Situation

Group	Time	Place	participants	Pre-Survey	Post-Discussion	Recording
B	5/12 45min	DLUT	20	○	○	○

Table 4.2 Group B Schedule and Experimental Situation

The last 3 columns represent the experimental situation of completeness, using "○" or "x" to express the completeness of each section.

Before testing, the participants of both groups will be conducted a pre-survey is conducted to the participants, answering questions based on the following topics:

- Experience of playing board game
- Frequency of playing board game
- Recent interests of the participant
- Cultural related activities or media programs

The first topic intends to understand the board game situation of the participants, see their understanding and familiarity with the board game.

The second topic asked the frequency of playing a board game is to get better acquainted with how much the participant is into playing a game so that to presume the acceptance level of the game.

The third topic would like to know the interest of youth, and what kind of things will draw their attention.

The fourth topic would like to understand how deeply the youth and cultural stuff are involved. Since culture is a reflection of history, the involvement level of cultural stuff will presume if youth have the potential to have an interest in history.

After writing pre-survey, the instructor will give a 5 minutes instruction and the participants can ask questions anytime during the testing if anything confused them. The time setting is 45 minutes, and for Group A, 15 minutes extension is allowed since the playing game would be varied according to the actual play time. Two groups start at the same time but the finishing time is flexible due to personal differences.

Two groups required to write a questionnaire which include couple questions about Yue'lu Academy:

- Persons appeared in the game/article
- Landmarks appeared in the game/article
- Events appeared in the game/article
- Objects appeared in the game/article

The participants have to write down as much as possible they can recall from the previous experience. Additionally, they are not allowed to review the game or the article while writing down the answers.

Except for the memory presentation, both groups participants also required to answer specific questions about the game design such as the knowledge presentation, game mechanism, narration design and so on. Additionally, both groups are required to describe their playing or reading experience in the following aspects:

- The level of involvement
- The level of concentration of the subject
- The level of memorization of the game play/reading

The three aspects are asked to measure how much the participants engaged to the testing process.

Figure 4.1 Participants Writing Pre-Surveys

The testing process was recorded in two ways: filming and note.Filming aimed to save the raw material of the entire process, and note was typed down to record some noteworthy points.

Figure 4.2 Testing

Memory as Measuring Unit

A study of how motivational influences on memory analyzed the relevance between and incentives that triggers long term memory. Game participants can learn knowledge during playing because of the incentive mechanism designed in the game. Emerging research by Murty and Dickerson demonstrates that “ intrinsically rewarding incentives can promote enhanced learning ” (Murty and Dickerson 2199). In game settings, participants voluntarily dedicate to the game playing without external factors. participants

A research on the relationship between interest and memory shows that " interest, because curiosity and interest have inherent properties to direct and sustain attention , facilitating efficient remembering.(Germain and Hess 2007) " Since memory has deep connection to the extent of interest, the evaluation uses memory as the measurement unit in order to test if the participants become interested in the subject they interact with.Therefore in the evaluation process, the participants will receive a test paper after the evaluation, in order to measure the level of interest based on their memory performance.

4.2. Result

Group A's evaluation have more variables since it was a multiple participants' activity, the speed of understanding the game differs among players, each group has quick learners and slow learners, the playing time also varies depends on the level of understanding of both the game and the subject.

Observation: Group A Testing

The participants of Group A1 and Group A2 had shown great interest in the relationship among the appeared characters. Through the interview of these two groups, there were feed-backs like "It is such a surprise that Zhu-Xi and Zhang-Shi are best friends", "I knew them individually, but I did not know they were friends and worked together","I would like to know more about these people"and so on. Also, Group A and Group B could call the most names in questionnaire, on question *Please write down the person you remember from the game.*

Figure 4.3 Experiment of Group A1

Figure 4.4 Experiment of Group A2

Group A3 participants showed an extreme emotional expression during the evaluation. One of the participants barely play games so she spent most of the

time to get used to the game. On the other hand her memory presentation was good because she carefully read all the information while trying to understand the game.In contrast, the winner of Group A3 was a mature player who quickly pick up the game rule and showed the best memory presentation in the post-questionnaire. The other two participants showed a strong passion in the game itself, but did not paid too much attention on the subject thus both of them performed poorly in the memory presentation.

Group A4 is made up for four guys from different academic status. They were combined with two graduate students and two undergraduate students.One of the undergraduate student showed high initiative to the game, and he pick up the rule quickly and started to help others to understand the game. Other participants took more time to figure out the rule of the game, but they read the information on each card and manual carefully. Thus in the memory presentation, all of them performed excellently

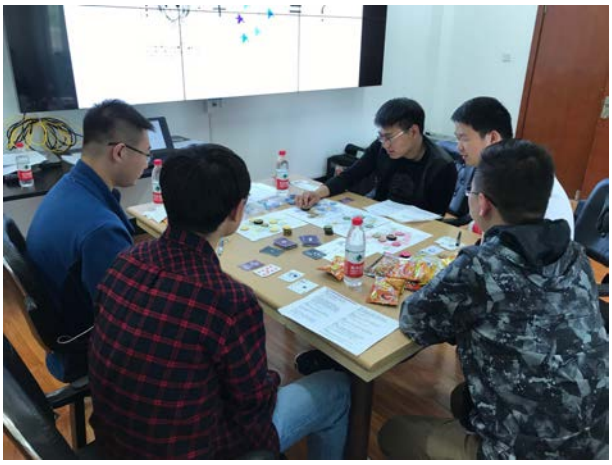

Figure 4.5 Experiment of Group A4

Group A5 were four undergraduate students, one of the participant said she never played any kind of game and the rest of them more or less have some game experiences. The participant without any game experience actually played an excellent game as well as the memory presentation, in terms of engagement level and concentration level ,her feedback was very high too. The entire group was quick learners, and highly cooperative, they read out all the information on the

cards or manual loudly, trying to figure out the mission by themselves without asking for help.

Figure 4.6 Experiment of Group A5

Observation: Group B Testing

Group B testing allows more flexibility in the space and timing since it is an individual task, thus Group B participants were given out an reading material about Yue'lu Academy and a set of questionnaire.

Figure 4.7 Evaluation Materials of Group B

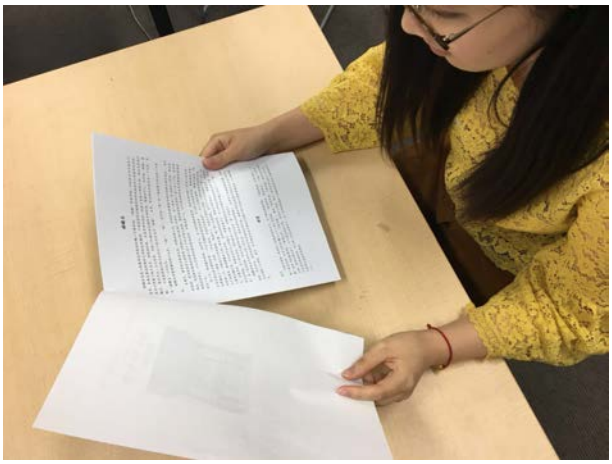

Figure 4.8 Experiment of Group B

Group B participants were very quiet during the entire process. Since their task was very straight forward, they were reading the articles until the time limit. There was a variation in the reading speed and reading habit.Some of them read once then close the article, and some of them read couple times.

4.2.1 Result: Game Related Discussion

This section discusses the game design, and appeared data is all from Group A's feedback and interview since only Group A play the game. The evaluation conducted a short interview after the playing, specifically ask questions about the game. The data shows that 95 % of the interviewees have experience in playing board game, and they have game playing habits that they averagely spend 2 to 4 hours every week in playing various types of games.

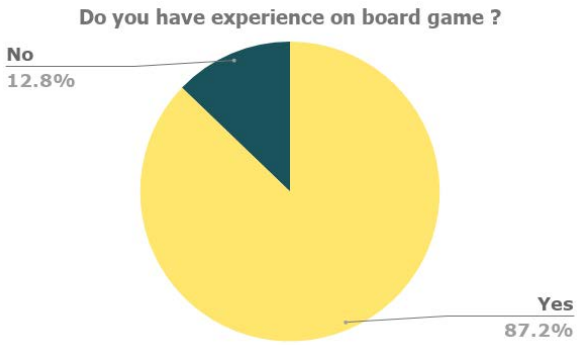

Figure 4.9 Board Game Playing Experience of the Participants

The research conducted a short discussion with each focus group based on the questionnaire. The bar graph below shows the entire evaluation on game design. The research let the participants to rate each item from 0 to 10 (0="Absolutely Negative",10="Absolutely Positive"), the number on each bar represents the average score of the corresponding item. For level of engagement, the participants showed higher level of involvement during the play, according to the statistical data from collected questionnaires, the questionnaire required the participants to evaluate the level of involvement from scale 1 to 10,the larger the number, the more engaged, and the result showed the average degree of involvement is 8.23 out of 10 which indicates high level of engagement in during the play.

Uncertainty is one of the factors effects the participants' engagement level, many participants enjoyed the playing method of the game, the action of draw a chip and fill the map largely stimulated their curiously because "I don't know what I will get next, and where I am going", which largely increase their coherence to the gameplay.

The entire rating showed approximate data, that all the item are slightly higher than the middle number (5=Middle Number). The game visual received almost same sore as the engagement level, most of the participants adored the artistic style. Likewise, the reward system gain high score of 8 due to the competitive mechanics would stimulate the motivation of the participants.

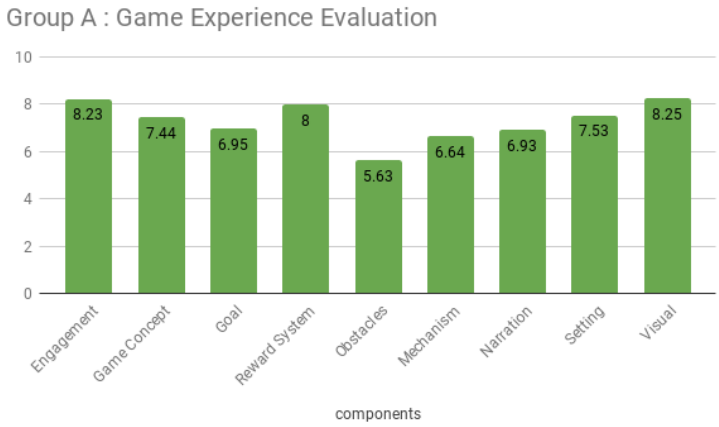

Figure 4.10 Experiment of Group B

On the contrary, many participants mentioned the inadequate obstacle setting. Since GEM is a mildly competitive game, they would like to meet more obstacles for them to solve and overcome. Also in terms of entertainment, reasonably set obstacles would allow them become repeaters of the game.

4.2.2 Result:Chinese History Related Discussion

GEM is oriented to the participants who have less or no interest to history study, attempting to arouse interest of the participants. The experiment was conducted in a science school that the students rarely got chance to involve with history.

The research let the participants evaluate the knowledge presentation in the game or the article. As pie charts shown below, both groups rate the similar level of knowledge presentation which means they perceive both the game and the article informative.

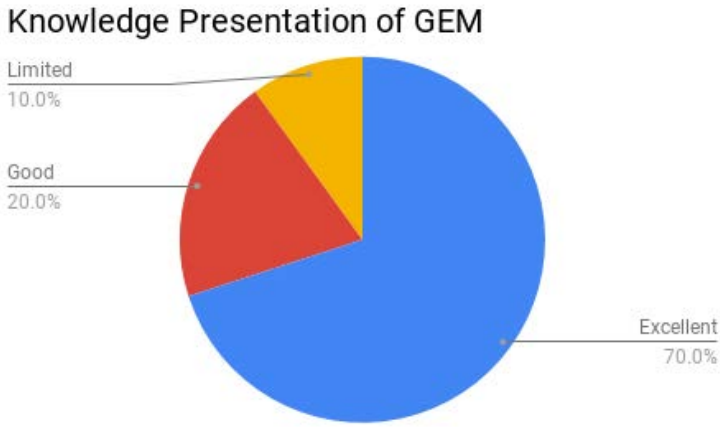

Figure 4.11 Group A: Evaluation of Knowledge Presentation

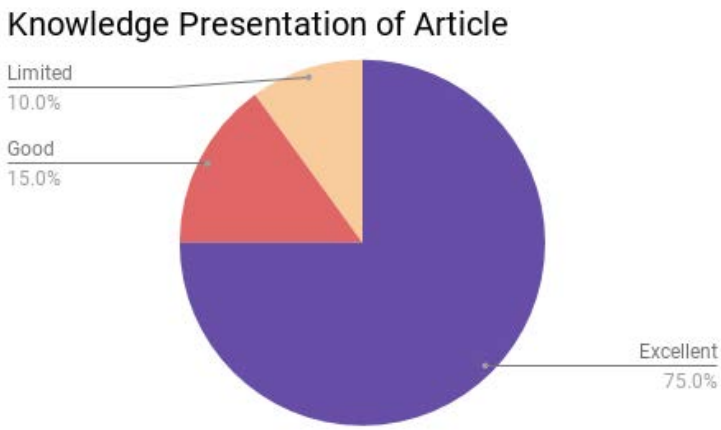

Figure 4.12 Group B: Evaluation of Knowledge Presentation

The other part of the interview is about the change of mind toward history. The experiment was recorded, and through the observation videos, there were conversations like "the name of the landmarks are beautiful", "I did not know these two scholars knew each other", "what happened exactly in these places?", that the participants were communicating about the contents of the game.The reading group did not make any noises during the testing, they were quietly reading the article until the time limit.

The research interviewed each participated group about their feeling about the subject, see if there is any changes in their mind and perception.

As a result,GEM was more successful in terms of reconnect youth and history, in the post-interview and discussion, the Group A participants showed higher interest in the subject, some of them even started searching on the appeared persons and landmarks. Group A talked a lot about the people relationships in the interview, they showed curiosity in those people and stories happened among them.

In contrast, Group B did not mention about such topics during the discussion, they were more focus on the meaning of the names rather than the historical events.

A participant from Group B explained the reason that she could rarely get interested in the subject because “reading an article can hardly rise interest on the subject because it was too informative to read through”. Similar feed-backs from Group B were ”too professional”and ”too difficult”, the difficulty of the subject effects the understating of readers and in fact, some of the participants read the article twice or more during the session due to the reasons described above.

4.3. Analysis

Analysis: Result of Memory Presentation

Both testing groups did a memory test after the evaluation, and they are asked to write down the answers based on the game or the article. During the memory test, the participants could not communicate with each other or review the game or the article. The questions of memory tests divided into four categories: person (or name), landmark, event, and object of Yue'lu Academy.

Figure 4.13 shows the result of the two groups' memory performance. Both groups showed a similar rate of memorization in persons and landmarks. Both groups could recall most of the persons and landmarks because these two components usually appeared together. For instance, there is the fact that Zhang-shi was the headmaster of Yue'lu Academy, he gave lectures in the lecture hall. Thus the participants could easily connect the person ”Zhang-shi”, and the landmark,

"Lecture Hall" so that to form a comprehensive impression.

However, in terms of event category, Group A showed a higher performance than Group B that This is because the events are closely connected with the appeared persons and landmarks, and in the article, it seems like separate story from the persons and landmarks but individual happenings. Additionally, the participants of Group A could communicate with each other during the play; the event played the role of gathering the persons and the landmarks. The participants were impressive by the events because they experienced it.

On the other hand, Group B showed a higher memory presentation in the object memorization. An object is more like an entirety that appeared in the article, which is easier to leave an impression. However, the historical event is too descriptive that they could hardly summarize the actual event. However, an object is very explicitly named, so it is easier to memorize.

In comparison, Group A showed a significantly lower level of memorization in the object. The participants of Group A said this is because the historical object usually appears as a tool card in the game; thus the participants recognize the objects as tools. In the post feedback, some participants mentioned the consumption of tool cards (object)was very fast, so they could not answer anything in the memory test.

Through the memory presentation, the participants showed a higher interest in the contents that were related to persons. This data would be helpful in the future modification of the game design.

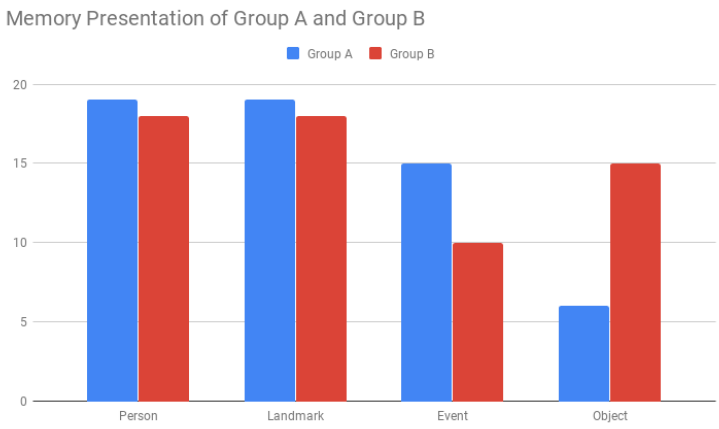

Figure 4.13 Memory Presentation of Group A and Group B

4.3.1 Group A Data Analysis

The Group A participants provided three types of rating on a scale from 0-10(0="Strongly Disagree ", and 10="Strongly Agree"), from the level of involvement, the level of concentration to the subject and the level of memorization of the evaluation process.

The majority of participants showed a higher rating on the level of enjoyment. As shown in the graph below, 19 out of 20 participants gave a higher score of involvement, part of them even gave full score in the involvement rating, and means the participants were engaging in the game experience.

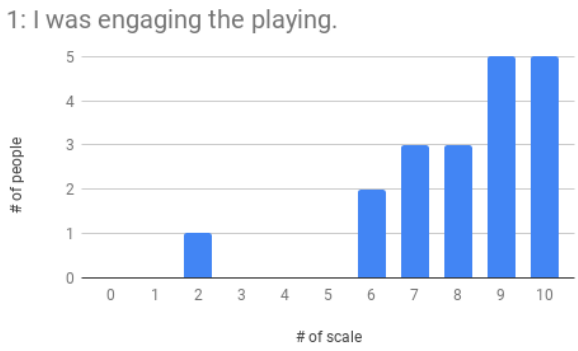

Figure 4.14 Group A-Involvement Rating

They maintained a consistent attention on the gaming subject during the process (Figure 4.8), and they kept long time concentration through the game that 75% of them performed a high rating score.

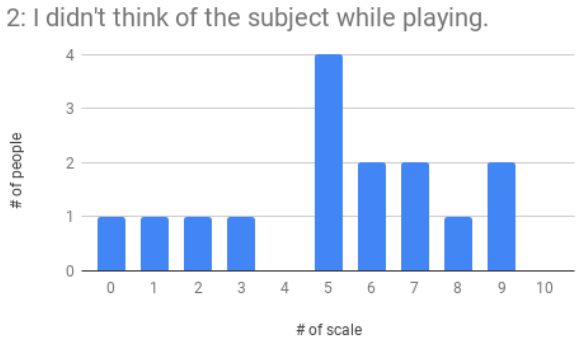

Figure 4.15 Group A-Concentration Rating

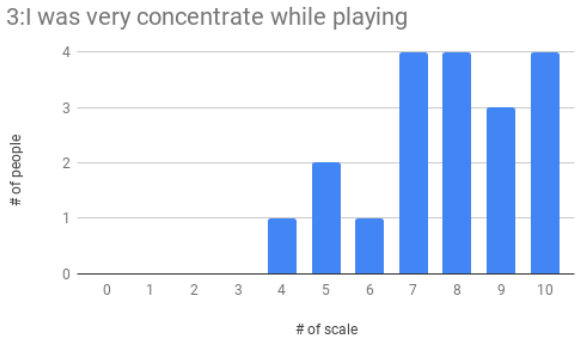

Figure 4.16 Group A-Concentration Rating

Furthermore in memorization rating, nearly 95% of the participants said they could memorize most of the contents, and some participants can fully memorize the contents.

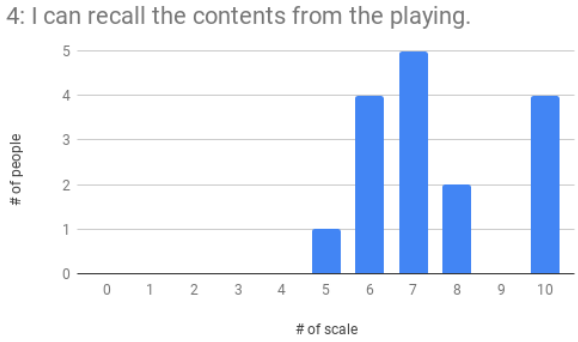

Figure 4.17 Group A-Memorization Rating

4.3.2 Group B Data Analysis

Group B collected same amount of data as Group A, but Group B's questionnaire excludes the questions about the game experience, the rest of the questions are same as Group A.

Group B also asked the participants to rate the level of involvement, concentration and memorization.Compare to Group A, Group B showed a divergence of attention during the evaluation. Nearly half of the participants showed a low level of involvement rating.

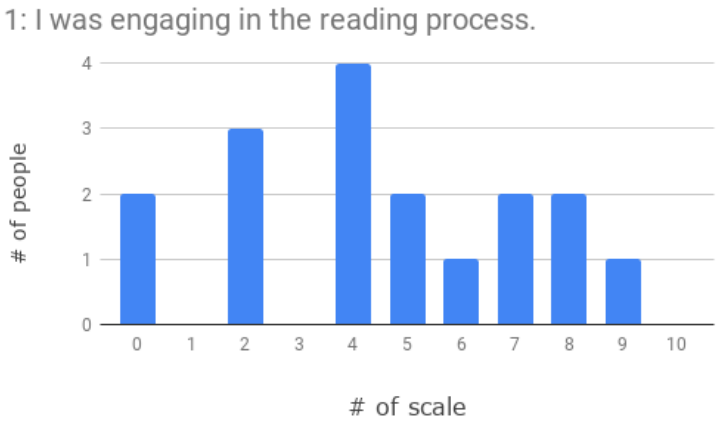

Figure 4.18 Group B -Involvement Rating

Similarly, Group B showed a low in concentration rating that 60% of the par-

ticipants could not fully think of the subject while reading, but concentrate on the reading because of time limitation.

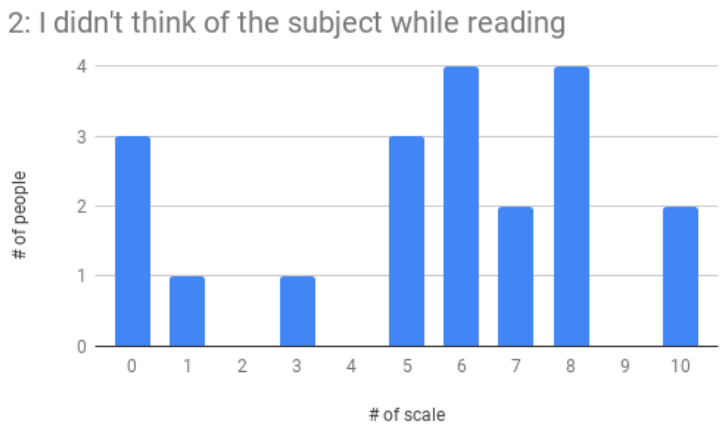

Figure 4.19 Group B -Concentration Rating

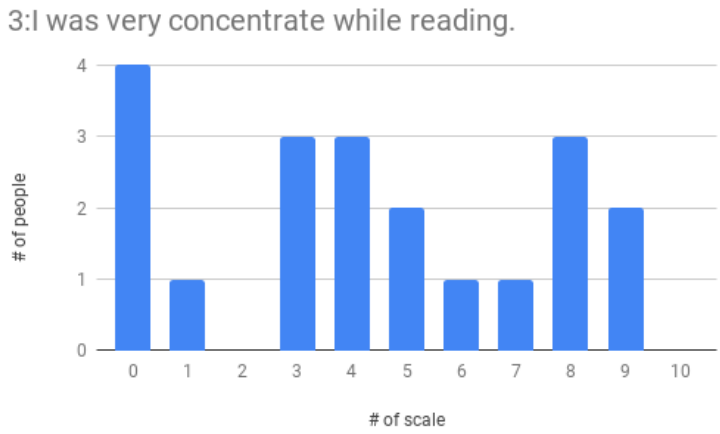

Figure 4.20 Group B -Concentration Rating

In terms of memorization rating,the overall impression of the previous reading behavior showed a shallow number. The participants could nearly recall the contents from the reading.

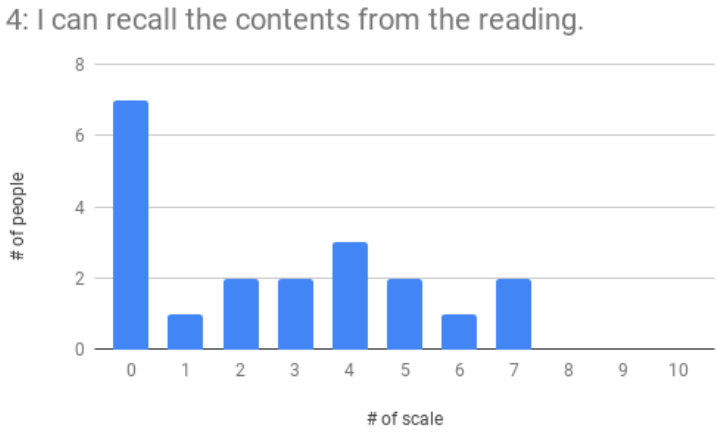

Figure 4.21 Group B -Memorization Rating

Moreover, there is a remarkable phenomenon that Group B's answer in memory presentation, the participants basically remembered contents appeared in first part of the article. The contents from the second half part of the article rarely mentioned in the memory presentation. In comparison, Group A's participants showed comprehensive answer, this might indicate that the focus level is keep decreasing during the reading.

To sum up, the overall under-performance of Group B indicates that reading can barely affect the perception of the target players toward the subject.

4.3.3 Gender disparity

By reviewing the questionnaires on the memory presentation, it shows a difference in genders.Female testers are more likely to memorize the persons' relationship and related stories. For instance, in the question of asking their impression on appeared persons, female testers' answers were shown as paired names such as Cheng brothers. In male testers' answer sheets, usually answered one of the brothers but they could not call the name of the other one. Female testers were good at remembering the persons based on the relationships, other than Cheng brothers, they also remembered friendship between Zhang-Shi and Zhu-Xi, thus in their answers Zhang-Shi and Zhu-xi were both written. Comparatively, in male testers' answers were more fragmented and random, they usually put individual

names but a pair.

In summary, this testing found that female testers showed better performance in association memorizing method. Male testers are more likely to learn the persons and objects they interacted or communicated. Moreover, both gender groups had difficulty in remembering the objects appeared in the game or the article. The difference in genders would become a remarkable point in the further development of the design but also require more quantitative data to support this argument.

4.4. Summary

As a result, GEM has received a positive outcome in terms of reconnecting the youth and Chinese history by reviewing the data and feedbacks. GEM successfully mobilized the enthusiasm of Group A's participants, they became curious about the subject and would like to explore more on the subject. In comparison, Group B's participants did not have much difference in their mind through reading.

Memory presentation of the two groups highlighted the good points of the game design as well as the shortcoming. GEM players performed well in memorizing persons, landmarks and events due to the frequent interaction appear in the game. Article readers performed better in the object but showed the negative result in terms of reconnection to the subject.

Also, GEM players expressed a high level of engagement, concentration, and memorization according to their experience, and in contrast, the article reader showed a significantly lower level of the above indicators.

Although there are still some flaws to be fixed, generally the experiment provided useful data and feedbacks that could apply to future works.

Chapter 5
Conclusion

5.1. Conclusion

Through this research, GEM actually help to reconnect the youth and Chinese history.The making of GEM is a journey of reflection of history. The entire design process has experienced topic selection, brainstorming, ideation, conceptualization, prototyping, and testing, finally became a proper history-themed escape board game.

The idea of GEM came up with a simple motivation: how to reconnect China's young generation with ancient Chinese history? And how to make them realize the value of their history became a critical issue to solve. Then everything started from the topic selection that Yue'lu Academy has been selected as the game theme because it shared the same problem as the research proposed. The research went into a deeper understanding of Yue'lu Academy and sorted out a more accurate historical timeline, related persons, and events to form an entire narration. The prototype was made to test the viability, and confirmed the final version; GEM conducted a more significant scale evaluation. The testing result provided useful data as well as a reference for future works.

In the aspect of game design, the mechanics of paving chips on map-tiles received useful feedback that the participants perceived as innovative gaming mechanism. The only problem is the consumption of the object(tool) cards are too fast to let them take a good look, which affected the memory presentation on objects.

In the aspect of artistic expression, the participants enjoyed the hand-drawn art style design. This is because the majority of the participants hobbling in comic, animation, and game; therefore, such art style appeal to target users.

Also, in the aspect of narration, GEM conveyed the message of history of Yue'lu Academy, which created an engaging experience, meanwhile ignite the partici-

pants' curiosity. Since the information on the game was limited, many of them started to search on the topic after the play.

The result of memory presentation has shown the effectiveness in learning. The game experience improved the level of concentration, thereby left an impression to players. They did better performance in comprehensive understanding,and ignite their curiosity and interest toward the subject. And this finding will help people to improve the memory on underlying topic, align with the significant improvement in concentration, memorization and involvement.

Besides, this project can apply to other topics regardless of the subject since the result shows the effectiveness. Moreover, for further research, the game can be expanded to other platforms, such as utilized in classroom activities, workshops, and exhibitions. The teachers and students can work together to make a real escape room so that GEM will no longer be limited in tabletop, but extend to real-life application.

Project GEM extracts the elements from escape game, and these elements effectively reconnect the youth and Chinese history. Escape game is different from other game genres; it has a clear goal and restrictive game setting, which enables the player to keep thinking and moving. Also, board game style allows the player to move their hands,the game components are tangible so that the player can to interact with the actual objects and people. The limitations in the game setting help the player to focus on the experience. In the level of concentration and involvement proved the effectiveness of these elements.

In summary, the game has received a substantial result, but it still has a long way to perfection. By reviewing the feedbacks from discussion and interviews, GEM is treated as an individual game but have some immaturity that waited to be fixed and optimized.

5.2. Limitations and Future Works

The testing proved that GEM could work as a proper game, the mechanism and the reward system were well-designed but also had a lot of potentials. Even though GEM achieved the goal of reconnecting youth and history to some extent, the knowledge and the information carried by board game are limited.

Boardgame style has a limitation in spaces and scale. GEM is a tabletop game that the number of players and also the presentation of subject content are limited in the table. Thus it is essential to expand the game to a larger applicable platform. By utilizing the concept of GEM, there are many more possibilities of reconnecting people with a subject. GEM converts the characters, objects, and events into cards, chips, maps, and so on. However, the game has the potential to improve in terms of accuracy and realization.

Therefore, as future work, the design can be elaborated by following adjustments:

- Adding digital components to the game design. Digitization allows further development in terms of improving the accuracy, the map of Yue'lu Academy can be expanded because there are many landmarks included in the architecture complex, but in board game expression, some detailed have to be abbreviated or simplified. The digitized map allows more possibilities in exploration, which provide the player a more accurate and authentic experience.

- Human relationships can go into a deeper level and connected with related historical events. Since most of the players showed a significant interest in the persons' stories, by adding humanity, factors might enable higher interest on the topic.

- Enhance the character design, add more original characters enables multiple plays. As the map expands, the game allows more players to join, and different roles can cooperate or compete with each other, the play style may vary.

- Adjust the object card (tool card) consumption problem, attempt to let the players keep the cards longer so that they could have a deeper impression about the objects.

- Explore the existing historical persons, build connections among each person so that to form a broader historical view and full persons' relationship view.

- Optimization of narration and plot of GEM, enhance the connection between the landmarks and the persons to create a whole storyline. Develop each landmark so that to operate side storyline could put into consideration.

In conclusion, Project GEM offers a direction that an escape board game can effectively build a connection between the player and the subject. The player who is not or less interested in ancient Chinese history changes mind after the gameplay, this testing result could apply in various topics. The disconnection of youth and "old things" happened due to changing social structure and demands. However, people still need a root that they could always reflect on their identity.

References

Corfield, Penelope J. (2018b) "All people are living histories – which is why History matters."

Ejin, Go (2016) "Hako Onna."

Fastrich, Kerr T. Castel A. D. and Murayama K., G. M. (2018) "Thirst for Knowledge: The Effects of Curiosity and Interest on Memory in Younger and Older Adults.,", p. 5, April.

Fujimoto, Toru (2007) "Serious Game."

(2018a) "2018 China's Game Industry Report: China as the Biggest Game Market in the World."

Germain, Cassandra M and Thomas M Hess (2007) "Motivational influences on controlled processing: Moderating distractibility in older adults," *Aging, Neuropsychology, and Cognition*, Vol. 14, No. 5, pp. 462–486.

Huai, Guan (2018) "The room of reality room escape game design and research," *Industrial Design Engineering*, Vol. 1, No. 1, pp. 1–2.

Hunicke, LeBlanc M., R. and R Zubek, "MDA: A Formal Approach to Game Design and Game Research," *Industrial Design Engineering.*

Jiang, Xiaobin (2017) "Is science student smarter than art student?", April.

Kaminske, Althea Need (2018) "Learning from Escape Rooms."

Laura, Ermi and Mayra Frans (2005) "Fundamental Components of the Gameplay Experience: Analysing Immersion," in *DiGRA &#3905 - Proceedings of the 2005 DiGRA International Conference: Changing Views: Worlds in Play.*

Lazzaro, N, "Why We Play Games: Four Keys to More Emotion in Player Experiences."

Murty, Vishnu P. and Kathryn C. Dickerson, *Motivational Influences on Memory*, Chap. 9, pp. 203–227.

Rouze, François (2016) "Room 25 Ultimate."

Stone, Zara (2016) "The Rise of Educational Escape Rooms," 06.

Xiongbo, Wei (2018) "Association Method," *Education Modernization*, Vol. 39, pp. 376–377.

Yanan, Liu (2019) "Application of Microlecture in High School History Teaching," *Educational Practice and Research*, Vol. 01.

Yang, Xixi (2018) "Kaleidoscope of Death Episode."

(2010) "Yuelu Academy."

zhttty (2007) "Terror Infinity."

Appendices

A. Sample of Pre-Survey and Post Questionnaire in Evaluation

Pre-survey : Basic Information & Game Experience

Time_____Location:_____ ;Weather_____:

1.Personal info (please tick or describe)

(1)Sex:□Male □Female;Age:

(2) Birthplace : Province_____ City_____;

(3)Major of Study:_____ ,The reason why you choose your major:_____

2. Personal Interest

(1) What is your hobby?_____

(2) How many hours do you spend on your hobby? (e.g. Playing the game 3 hours / week)

_____

(3) In the recent 3 years, is there anything you become interested in?

_____

(4) Why do you interested in?

_____

(5) In the recent 3 months, is there any new technology/exhibition/game you are interested in?

_____

(6) Do you like reading?□ Yes □No

(7) What kind of reading format do you prefer?

□Printed books; □Digital books; □Magazine; □Comic; □Art book □Illustration book □ Others: _____

3. Entertaining Activities

(1) Do you play board game/tabletop game?

□yes; □no

(2) If yes for Q1, please answer the following questions:

· What board game /tabletop game do you play? (the name of the game))_____

· The frequency of playing a game? (e.g. 2~3 hours/ week)_____

· What kind of tabletop game do you play?

□escape game □role playing; □strategy; □technology advanced; □education; □player vs game; □manifest; □player vs player; □others:_____

· What kind of subject you are interested in?

□adventure; □horror; □economy; □history; □SF; □real life; □Doujin-related □other:

(3) If your answer is NO for Q1, What is the reason stop you from playing tabletop / board game? □I am not interested in □it's time-consuming □It's hard to gather many people (multiple player game)□too busy □expensive □ others:_____

Figure A.1 Figure:Sample of Pre-Survey Group A and Group B

Post Questionairee (Fill it after the game play)

A) Game experience

1.I am very into the game while playing:

0 1 2 3 4 5 6 7 8 9 10

Strongly Disagree ——————————————Strongly Agree

2.Have you experienced the following components while playing and how do you rate them(Please tick on the item you experienced, and circle the number of level) :

□game concept 0 1 2 3 4 5 6 7 8 9 10

□Goals 0 1 2 3 4 5 6 7 8 9 10

□Reward 0 1 2 3 4 5 6 7 8 9 10

□Conflict 0 1 2 3 4 5 6 7 8 9 10

□Competition 0 1 2 3 4 5 6 7 8 9 10

□Storytelling 0 1 2 3 4 5 6 7 8 9 10

□Rules0 1 2 3 4 5 6 7 8 9 10

□Time 0 1 2 3 4 5 6 7 8 9 10

□Setting0 1 2 3 4 5 6 7 8 9 10

□Beauty 0 1 2 3 4 5 6 7 8 9 10

3. Do you feel the historical worldview via the game?
□Yes □No

If YES, what components make you feel so?
□Design and visual

□Story

□Goal of the game

□Game mechanism

4. If NOT, which components "stop" you from feeling the worldview of
Through the game, can you feel the worldview represented in the game?

5. Can you gain some knowledge about Yue'lu academy through playing the game?

Figure A.2 Figure:Group A: Sample of Post Questionnaire

6. If yes for Q6, which component(s) can help you to better understand the history of Yue'lu Academy?

☐ mission
☐ map
☐ landmark
☐ mechanism
☐ historical character and his/her story
☐ manual
☐ visual design
☐ interaction with other players
☐ scenario

7. Are there any impressive things while playing the game?
Characters appeared in the game: _____(please be specific)
Landmarks appeared in the game: _____(please be specific)
Event happened in the game: _____(please be specific)

8. How do you evaluate the knowledge represented in the game?

☐Excellent knowledge
☐good knowledge
☐limited knowledge

9. Are there any remarkable points in the game? What do you like to know about the history of Yue'lu Academy?

10.Answer the questions below based on our experience with Chinese history using the board game :

Not at All 0 1 2 3 4 5 6 7 8 9 10 Exactly Yes

☐I enjoyed this testing, it was fun: 0 1 2 3 4 5 6 7 8 9 10

☐I did not think about the subject while I was playing : 0 1 2 3 4 5 6 7 8 9 10

☐This activity caught my attention :0 1 2 3 4 5 6 7 8 9 10

☐I would recall the process of this activity: 0 1 2 3 4 5 6 7 8 9 10

Figure A.3 Figure:Group A: Sample of Post Questionnaire

Group B: Post Questionnaire (Fill it after the game play)

1. Are there any impressive things while playing the game?
Characters appeared in the game: _____(please be specific)
Landmarks appeared in the game: _____(please be specific)
Event happened in the game: _____(please be specific)

2. How do you evaluate the knowledge represented in the game?

☐Excellent knowledge

☐good knowledge

☐limited knowledge

3. Can you feel the historical worldview through reading?

☐Yes ☐No

4.Can you have a better understanding of the history of Yue'lu Academy?

☐Yes ☐No

5. Answer the questions below based on our experience with Chinese history using the board game :

Not at All 0 1 2 3 4 5 6 7 8 9 10 Exactly Yes

☐I enjoyed this testing, it was fun: 0 1 2 3 4 5 6 7 8 9 10

☐I did not think about the subject while I was playing : 0 1 2 3 4 5 6 7 8 9 10

☐This activity caught my attention :0 1 2 3 4 5 6 7 8 9 10

☐I would recall the process of this activity: 0 1 2 3 4 5 6 7 8 9 10

Figure A.4 Figure:Group B: Sample of Post Questionnaire