

*An Analysis of the Acceptance and Anxiety of a Historical Strategic Planning Game by
Combining Real Person Non-player Character Mechanism*

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The Asian Conference on Education 2022
Official Conference Proceedings

Abstract

Under the influence of Covid-19, distance synchronous learning has gradually become popular. Online history courses are a major challenge for teachers, as the one-way lecture and assessment may make learners lack motivation and even cause learning anxiety. History educational games allow learners to take on the role of historical figures, have the opportunity to experience historical events in simulated situations. The highly realistic game situation is expected to provide learners with a good learning experience and further reduce learning anxiety. In this study, we designed a historical strategic planning game, "The Battle of Yiwei", which incorporates a real-person NPC mechanism. The instructor acted as an NPC, and the learners would play the role of historical figures in the game and explore and interact with the real-person NPCs in a realistic historical scenario to complete historical strategic planning. The study also conducted a preliminary assessment with six participants. The objectives of the learning activities were to complete the experience of three historical events in the game and to conduct strategic planning. This study also initially measured the game acceptance and activity anxiety of the learners. Based on the descriptive statistics, game acceptance and game elements were significantly higher than median of the five-point scale (i.e., 3), and activity anxiety was below the median. The preliminary results indicated that learners rated the game highly, both in terms of its usefulness for learning historical knowledge and its smoothness of operation and activity anxiety was low.

Keywords: Real-Person NPC, Online Educational Game, History Learning, Game Acceptance, Activity Anxiety

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Introduction

Under the influence of Covid-19, distance synchronous learning is becoming more popular and has become one of the choices for many teachers and students, and educational games are no exception. History courses have been severely affected by the epidemic, distance learning is a test for both teachers and students, and technological advances are a challenge for learning history in this era (Sulistyo et al., 2021). We always know the successes and failures of historical battles in books, and the historical progress, but we seldom know the actual situation of the battles. Historical games allow learners to understand what happened in the past, and the realistic world provides learners with a good learning experience and knowledge related to many historical events, and historical games are more helpful for learners' historical learning (DeFreitas , 2006; Ymran et al., 2018). Therefore, our research team (Mini Educational Game development group in e-Learning Research Center, National Taiwan University of Science and Technology, NTUSTMEG) has developed a historical strategy game with Gather Town. The historical educational game "The Battle of Yiwei" recreated the historical scenes, as shown in Figure 1. The game allowed learners to understand the thoughts and experiences of historical figures at that time in each event, and also to piece together the complete context of historical battles through the acquisition of information, and finally to complete the tactical planning. Challenging tasks can also motivate learners' history learning (Cruz et al., 2017). Learners took on the role of historical figures in the game and performed multiple tasks guided by real-person NPCs. In addition, learners can also send investigators to the front line to obtain historical information. And answer on Google Jamboard to complete the strategic planning, as shown in Figure 2. The purpose of this study is to analyze learners' game acceptance and activity anxiety through a history strategy planning game, so as to evaluate the initial results of the game and explore the future development direction.



Figure 1 The starting screen of the game "The Battle of Yiwei"



Figure 2 The answer page of a task

Methods

The participants in this study were recruited through a recruitment process, and two groups (6 in total) were engaged in the learning activities. In order to assess learners' game acceptance, this study modified the technology acceptance scale proposed by Davis (1989), which contains two dimensions, perceived usefulness, perceived ease-of-use. In addition, the game design elements were evaluated using the five-point Likert's scale with reference to the game motivation elements proposed by Hou (2016). Krashen (1987) developed the Affective Filter Hypothesis, and the Chinese version was adapted to the Learning Experience Scale by Hung (2001). To assess learners' activity learning anxiety, this study adapted the Activity anxiety inventory translated by Hung (2001) and used a five-point Likert's scale. In order to evaluate the game "The Battle of Yiwei ", the whole learning activity was conducted for 90 minutes. It included a role-playing phase (30 minutes), game event 1 (20 minutes), game event 2 (20 minutes), and game event 3 (20 minutes).

Results and Discussions

In this study, SPSS was used to analyze the Activity anxiety scale and the Game acceptance scale. Table 1 presented the statistical results of activity anxiety, with overall anxiety ($M=2.15$) being below 3 (median=3 on a 5-point scale) and reaching a significant. It indicated that the learner's anxiety in the game was low. According to the statistical results of game acceptance, the overall acceptance ($M=4.35$), sub-dimensions of perceived usefulness ($M=4.50$) and perceived ease of use ($M=3.94$) were significantly higher than the median; game design elements ($M=4.37$), sub-dimensions of uncertainty ($M=4.67$) and achievement ($M=4.00$) were higher than 3, while the sense of control ($M=3.83$) was not significant. The results showed that learners were highly receptive to the game, and that the game was cognitively helpful to learners, acquired relevant knowledge, and was easy to operate.

Table 1 *Descriptive statistics analysis and One-Sample Wilcoxon signed-rank test of Gameplay anxiety, Game acceptance, Game design elements*

Dimension	<i>M</i>	<i>SD</i>	<i>p</i>
Gameplay anxiety	2.15	0.58	.027*
Game acceptance	4.35	0.14	.027*
perceived usefulness	4.50	0.69	.026*
perceived ease-of-use	3.94	0.68	.044*
Game design elements	4.37	0.29	.026*
Sense of control	3.83	0.98	.102
Uncertainty	4.67	0.52	.023*
Achievement	4.00	0.63	.034*

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Conclusion and Limitations

This study designed a historical strategic planning game with a real-person NPC mechanism that can help learners explore and plan in the game map. According to the statistical results, the overall anxiety was below the median, which means that learners did not feel too much anxiety during the game. It was presumed that the addition of real-person NPCs guided the learners in the game and gave enough time for strategic planning, thus alleviating the learners' anxiety about the activity. The acceptance rate of the game was higher than 3, which

showed that the learners had a high evaluation of the game "The Battle of Yiwei" and a high acceptance of the knowledge given and the operation of the game. This study was not significant in terms of activity anxiety, however, moderate anxiety can be helpful for learners (Wang et al., 2015). Therefore, the ARCS motivation scale proposed by Keller (1987) and the Mind flow scale (Kiili, 2006) can be used in the future to explore its correlation with activity anxiety and to assess learners' flow status during games. This is an opportunity to gain insight into the degree of learner motivation and flow status in the application of the strategic planning game designed and developed by the research, which incorporates a real-person NPC mechanism for teaching.

Acknowledgments

This research was supported by the projects from the US Air Force Office of Scientific Research (AFOSR) project (20IOA038) and Ministry of Science and Technology, Republic of China, under contract number MOST-110-2511-H-011-004-MY3, MOST-108-2511-H-011-003-MY3.

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