The Creation of A Massive Multiplayer Online Adventure Game for Cooperative Learning

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Abstract

This research intends to design interactive hypertext adventure game named "Liar A-Chi" by using MMOAVG and commercial game development methods. The research goal is to rebuild and reproduce 19th century Taiwan's multiethnic conflicts, confrontations and unifications of different cultures, races and religions by creating interactive virtual scenarios, and to suggest key essentials of cooperative learning for digital games through qualitative methods. It is hoped to create an original 3D digital games with emotional charms showing the essence of Taiwan local history and geography.

Keywords: Adventure Game, Cooperative Learning, Multiethnic Interactions, Massive Multiplayer Game.

1. Introduction

Recently computer games have been proposed as a potential learning tool by educational researchers [2]. Currently, most Adventure Game(AVG) on the market are Computer Role Playing Game(CPRG), and very few are developed into Massive Multiplayer Online Game (MMOG). They are normally based on stories that are interesting and attractive. The games emphasize on the elements of "exploration" and "puzzle". The goal of this research is to make AVG into multiplayer game so that players can interact with others online that their cooperative ability can be increased through the process. It is an innovative creation and this paper would demonstrate how it is designed and developed to reach the goal.

The purpose of this research is to introduce a new "Massively Multiplayer Online Adventure Game (MMOAVG)" game-type and a proof-of-concept game design document (GDD) that involve some key learning strategies such as heterogeneous groups [12] positive interdependence and individual accountability [4] to foster a cooperative virtual environment. This game is called "Liar A-Chi". It's aimed to suggest a brand new learning model concept that can support and enhance the motivation and self-esteem of group members during cooperative learning activities by knowing and providing internal values that they want for their adventure gaming experience. The game play [6] process is also expected to increase players' learning through understanding and remembering naturally over time. The research goal is to describe a MMOAVG type of digital cooperative learning game designs using hypertext narrative and game instance technology [9] to construct the story content of multiple nodes. Therefore, players will be allowed to explore alternative paths within the game, walk through different choices and consequences by themselves; or share, combine and renew each other's resources and capabilities to co-create a unique tale by cooperative teamwork, which is supposed to be more encouraged and flexible forced by the game mechanics.

The potential users of this project's end product are forecasted to be teenagers and modern people whom are willing to know about local folklores, traditional cultures, and Historical Geography of Taiwan, but prefer interactive multimedia learning ways than traditional teaching-learning styles. The original main story content of "Liar A-Chi" will revolve around four different virtual main characters. These main characters are given different races, cultural backgrounds, religious beliefs, and individual personalities to represent different viewpoints about Taiwan's historical events throughout the late nineteenth century. The history results won't be changed, but will be retold and re-experienced by player themselves in various game situations. Hopefully researchers will find the role in guiding and supporting this research's future by creating more cultural valued and emotional charmed cooperative adventure games.

2. Literature review

2.1. Adventure Game(AVG)

Adventure Game (AVG) is a genre of Electronic Games. Electronic Games is also called Video Games or Computer Games. Games in this genre are mostly proceed with learner input or choice of commands to

activate actions. It emphasizes on the exploration of story clues and continuously solving all kinds of puzzles. It challenges learners' observation and analysis abilities. AVG is similar to Role-playing game (RPG) but with one difference. In AVG, the attributes of the characters that the players control are fixed and would not influence the progress of game.

American AVG are mostly based on text process statement in conjunction with command making and solving puzzles. Yet, Japanese AVG has more elements including setting, character, and objects. Players can move, making conversation, and observe in the game using the interaction window. Some people would call it as Text-AVG [1]. This research aims at AVG game genre trying to merge the American and Japanese AVG features. It extracts the exploration and puzzle elements from the American AVG and hypermedia and interaction elements from the Japanese AVG, and then adding the online multiplayer functions to create a new game genre called MMOAVG.

2.2. Cooperative learning

Cooperative learning is a way of learning together in which students discuss with each other, expand their thinking and expectations in order to guide students to higher order of cognitive thinking and stimulate their multiple learning developments. In such environment, students can cooperatively work on complicated, interesting, and open tasks so that its internalization becomes part of students' independent development [7]. The most important goal of cooperative learning is to provide students with the knowledge, concepts, skills, and understandings they need to become happy and contributing members of our society [10]. Both observation and think-aloud protocols indicated that most participants lacked a reflection process for performance analysis, new knowledge generation, evaluation, and integration, which are essential for learning as a cycle of probing the world – a major knowledge-construction format for game-based learning [2].

This research inserted cooperative learning concept into AVG allowing students to experience the fun of having cooperative interactions. In cooperative classrooms, students are expected to help each other, to discuss and argue with each other, to assess each other's current knowledge and fill in gaps in each other's understanding (e.g. [3], [10]). Cooperative learning is also used in online learning and online teaching platform (e.g. [5], [8]). According to the literatures, cooperative learning can have positive influence to the students. Therefore, this research uses cooperative learning in MMOAVG so that the game is not only for entertainment but also for improving learning effectiveness and stimulating players' thinking ability.

2.3. Tabletop Role Playing Game(TRPG)

The game process of Tabletop Role Playing Game (TRPG) is different from other online games and most of the puzzle games. TRPG is based on dialogue and text. TRPG generally requires players to build a team of 3 to 5 people for the game among those, one would be assigned as Game Master (GM) who holds a major part of the game control including the development of the narrative [11]. In *Dungeons & Dragons* (D&D or DnD)(TSR, 1974), it is called the Dungeon Master (DM); in The *World of Darkness* series (White Wolf, 1991), it is called Storyteller (ST); in Generic Universal Role-Playing System (GURPS), it is called GM. The GM is in charge of keeping the narrative flowing, providing dynamic feedback to the actions of the player avatars, using e.g. on-the-fly updates [11]. It is responsible for the discourse, acts as Non-Player Characters (NPC) such as villagers, monsters, and so forth, that to make judgment to the players' actions. Others play the characters in the game. GM holds big rights and manipulates the styles of the game and progresses of the stories. The participants are the story readers and creators at the same time.

3. Game design

3.1. Character, Racial relations

Through the four main characters, Frey the English businessman, Yuki the Japanese Ainu, Ryu the Imperial Japanese Navy sailor, and Yuna the Taiwanese aboriginal girl, players will explore four separate non-linear adventures, and their paths of bringing them together. "Liar A-Chi" intertwines a timeline and several events of 19th-century Taiwanese history through the characters' stories, to create a multi-path story. Their background settings are described as follows:

1. Frey: He's a young man who came from the United Kingdom. Frey's family has focused on running international trade businesses for many generations.

2. Yuki: Yuki is from Japan who sailed to Taiwan to find her brother Ryu.

3. Ryu: Ryu was separated from his family by a natural disaster in childhood. In order to seek the way that can protect and reunite with his family, Ryu joined the Imperial Japanese Navy to sail around the world.

4. Yuna: Yuna is a beautiful local aboriginal girl in southern Taiwan. After stop the thieves from stole her ancestor's holy blade, the tribal elder told Yuna that she has to carry her ancestor's wishes by fulfilling their promises and protecting their pride.

Although these four main characters are fictional, their personal backgrounds and home countries are deeply related to Taiwan in late 19th century, they encounter each other in Taiwan and learn to support each other to achieve the mutual goals. Players can identify with the characters and experience their perspectives and situations according to their backgrounds. In this game, there is basic storyline in the whole structure, and the

stories trigger the tasks to be resolved. The four main characters meet and cooperate with each other in the story so that the story continues and diverge as they go. It becomes a constant cycle of the gaming mechanism.

3.2. Class, Skills relations

Ever character in this original game "Liar A-Chi" has his own individual class and skills, and the corresponding occupational transformation map. Each role of a Class has a beginner job in order to carry out the job training. As they play along, the player would be advanced into the intermediate job and master job based on two options: (1) Player can change jobs freely as long as they can meet the job requirements. (2) In the storyline, players choose different dialogues which spontaneously would change jobs according to the preferences.

The skills of the four main characters are different according to their classes. Players need to know the skills of each character and the understanding between the team members. Teamwork puzzle is in line with the cooperative learning theories proposed by Slavin [10] that the three points include elevate students' learning effectiveness, promote students' thinking, problem-solving, integration abilities, as well as increase students' interpersonal relationships.

Each class has exclusive skills which can be used to complete tasks or to solve puzzles. The number of puzzles is much more in the copy of tasks compared to the single task. Each player must make good use of the skills of each role so that each individual can contribute their skills in cooperative puzzles. They cooperate with each other, and solve the problems together in order to successfully complete the tasks.

3.3. Instance

The genre of the game in this research is cooperative-AVG in which the Instances is adopted from TRPG. In instance, many role-playing games or other types of games have tasks for players to solve. This research uses the shared parameters of the copy including single and multi-instances. The team leader is the captain. In the process of gaming, players experience MMOAVG to nurture the tacit understanding of culture and the analysis capabilities to increase self-confidence and enhance performances.

This research uses cooperative-TRPG as the basis for Instance. One player is appointed as the captain and a room is opened for the instance. Other players can choose to join any of the teams to solve the instance together. The captain must meet the needs of the instance, and choose the characters and classes needed to complete the tasks. Cooperative-TRPG emphasizes on allowing the players to experience the cooperative gaming process from the multiplayer games. They can take actions according to their own preferences and be responsible for what they did. That makes the game fascinating.

4. Research methods and analyze

4.1. Cooperative learning game design

The game design in this research is to collect materials of Taiwan history and develop suitable background stories for the game. The narratives would be extended to become the hypertext cooperative learning game. This research incorporates eight elements of AVGs to form the innovative MMOAVG. There are two elements adopted from the general setting of AVG including description and interactive; two elements from the American AVG including explore and puzzle; two elements from the Japanese AVG including story/dialogue and hypermedia; two elements from related theories including cooperative learning and being online. Putting the eight elements together, this research defined MMOAVG for learning purposes.

1. Descriptions: The full description of the characteristics of the environment by the use of simple text dialogue or pictures to explain the relationship between environmental background story, character, time, and task; that is, situations in the game.

2. Interactive: By clicking the mouse, the system would show the effect of turning pages. The facial expression of the characters and the scenes in the game will change according to the text description so that the stories would also change with the players' interaction with the characters in the game.

3. Explore: Players would conduct exploratory excavations to the unknown parts and collect the information and items to use in the game. It emphasizes on the exploration of the story clues by testing players' observation and analysis abilities.

4. Puzzle: The game relies solely on the puzzles to unlock story tasks to promote the subsequent development of the plot.

5. Story, Dialogue: The story was carried on as the players choose from the options of the dialogue. The plot would bring out different tasks.

6. Hypermedia: The game has background visualization, 3D portrait of the characters, texts, music, character voice-over, and other elements; at turning points of the story or scenes for making impressions would have full-screen pictures to aid to the text expressions.

7. Cooperative learning: The instance provides a multiplayer cooperative learning area so that the player would enter the room to experience a new adventure puzzle task which requires them to accomplish by cooperation.

8. Online: The game uses the online mechanism to allow players to interact with others around the world. closer to each other through cooperative learning.

The relationship between the eight elements of MMOAVG defined in this game is as Figure 1.
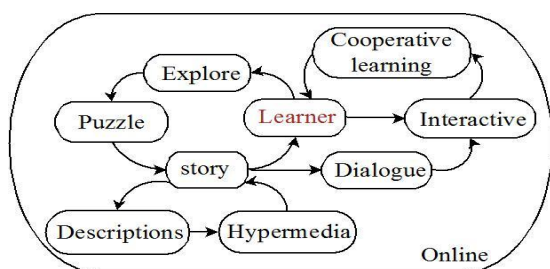
Figure 1. MMOAVG

4.2. Cooperative learning game analysis

In the future, after the game testing is complete, there will be an online gaming experiment for the players. It is expected to find positive results of using the cooperative learning game to enhance the players' learning effectiveness, as well as promote players' thinking skills, problem-solving ability, and integration abilities. The process of how players solving the puzzles and how they cooperate with team members would also be analyzed. Questionnaire about players' background information, gaming experiences, preferences, and feeling about the game would be cross-analyzed to know their view toward the MMOAVG. The discussions , reflections, and questions posted on the game forum would also be documented and analyzed to know their thoughts toward the game and the cooperation process. Feedbacks and awards of virtual treasures would also be given to encourage players to make advance gaming.

The research would collect data from three aspects including the players' learning process, gaming satisfaction, and learning effectiveness. From the completion rate of the instances, logs and records would be analyzes to review the design of the game. Therefore, the research would conduct both quantitative and qualitative data analysis methods.

5. Conclusion

The research goal is to rebuild and reproduce 19th century Taiwan's multiethnic conflicts, confrontations and unifications of different cultures, races and religions by creating interactive virtual scenarios, and to suggest key essentials of cooperative learning for digital games through qualitative methods. Players would use the perspectives of UK Citizen, Japanese, Taiwanese Aborigines to review the history and experience the interaction between different ethnicities. This research combines cooperative learning and narrative-AVG concept to let the players to be immersed in the stories. By choosing the virtual characters and forming their own teams, players have made their own stories of "Liar A-Chi".

It is expected that this research can be extended to provide more developmental and evaluation experiences, and thus generate guidelines for future developments. Through digital games, players can have more motivation to learn various skills through the fun, and experience the history, geography, and culture of their own country. It is hoped that this game can be a resourceful entertainment and effective learning tools for the players.

Acknowledgement

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