

Exploring the sense of immersion of MMORPG game design

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Abstract. MMORPG game as the a representative product of video game from its birth to the present more than several decades, have been developing at an astonishing speed and MMORPG player groups have expanded. Nevertheless, there are questions being raised of the relatively new and successful field of sense of immersion of MMORPG game design. In the previous studies, the theory of flow had been testified to be the tremendously significant to explore sense of immersion while performing the activities and it had been applied to many different domains. Based on three conditions of that are necessary to achieve the flow state, the paper addresses the predicaments by analyzing the research results in relation to previous design report on the sense of immersion of MMORPG game design. The paper also provides the constrictive thoughts and productive sketches on how to promote the sense of immersion of MMORPG game using the design artifacts in an early design process.

Introduction and background

The video games have gone through a memorial period of growth since Wil Crowther wrote a straightforward FORTRAN program in 1972 (1). From a simple map of avoid the trap to today's real-time strategy, role playing, business strategy, and other types of video games; From console games to millions of people online MMORPG games; from 2D to 3D, the games have grown rapidly in both the technology and design. In particular, with the constant development of computer and network in recent years, computer games as the combination of experience economy and the network economy have become the new favorite of the IT industry and perform a strong growth and profitability potential. As the most representative products of the video game, MMORPG game with its massive game tasks and strong sense of immersion have gained a well-deserved attention and become more widely sought.

The term MMORPG was coined by Richard Garriott, the creator of Ultima Online, in 1997. MMORPG game is a genre of role-playing video game. In the MMORPG game, a very large number of players will play various roles, interact with one another within a virtual game world, and then consciously regard the imaginary world of the games as real world. By imagination, players could generate some of the emotions and experience they would not be able to undergo in real life. In recently, MMORPG game designers in the world have been creating and designing various types of MMORPG games according to the requirement of various players. When a player found a MMORPG game suit their taste and they want to be the part of the game environment, it manifests the game had created a higher sense of immersion. Zhang Jing (2006) formulated that if players in the game reach to a profound sensation, get the psychological and physical satisfaction, and produce a sense of pleasure and stimulation through the initiative imagination, the sense of immersion of game has already been fulfilled. The sense of Immersion is the first-level goals to pursue for all games. As an interactive form of entertainment, MMORPG game design and production always attach a great weight on the sense of immersion of game design. MMORPG game industry is still in its infancy. Many MMORPG game companies have created a great number of MMORPG games which have no much attraction for players. In addition to technical reasons, it is largely because the issues and concept of sense of immersion of MMORPG game design is not fully comprehended by the MMORPG game designers. With the expansion of MMORPG game market, the next generation of the MMORPG games is crying out for the design strategies which could be able to improve the MMORPG game immersion. Raising the game immersion is because the fun experience in the flow state is prerequisite for players to play the game continually (Fong, Rong, and Sheng, 2009). In the previous studies, the three conditions that are necessary to achieve the flow state had been testified to be the tremendously significant to explore the achievement of

sense of immersion while performing the activities. In order to improve the sense of immersion of MMORPG game design, it is necessary to analyzing and testing the specific use phenomenon in the MMORPG game, and search for the problems concerning the sense of immersion according to three conditions.

The paper attempts to problemaize the aspects of sense of immersion in the MMORPG game by referring to my own user studies of MMORPG game, huaxia online. Moreover, issues of sense of immersion will be analyzed and discussed from three conditions. At the same time, the paper summarizes and concludes some constructive thoughts and productive sketches on how to enhance the sense of immersion of game design using the design artifacts in an early design process. I hope this paper will contribute to MMORPG game industry to improve and develop the ability of designing game with deep immersion.

Review of related literature

At present, the researches on the sense of immersion of MMORPG game design based on conditions for flow state are extraordinarily rare. Most of the researches mainly explored the relevant definition of MMORPG game as well as the theory of MMORPG game design and development. The focus of these studies is to formulate the MMORPG game is how to develop and the new profit model of MMORPG game.

Flow theory

The flow theory was originated by Mihaly Csikszentmihalyi in 1975. Mihaly Csikszentmihalyi (1975) who is a Hungarian psychology professor defined that flow is the mental state of operation in which a person in an activity is fully immersed in a feeling of energized focus, full involvement, and success in the process of the activity. Flow state in which people are so involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will do it even at great cost, for the sheer sake of doing it. Csikszentmihalyi (1988) stated that a balance between the challenges perceived and the skills a person brings to it. Csikszentmihalyi and lefevre (1989) indicated that when both challenges and skills are high, the person is not only enjoying the moment, but is also stretching his or her capabilities with the likelihood of learning new skills and increasing self-esteem, and personal complexity. Ghani, Supnick and Rooney (1991) demonstrated two key characteristics of flow. Two key characteristics of flow: the total concentration in an activity and the enjoyment which one derives from an activity...the precondition for flow is a balance between the challenges perceived in a given situation and skills a person brings to it. Hoffman and Novak (1996) define flow as the state occurring during network navigation which is: 1) characterized by a seamless sequence of responses facilitated by machine

interactivity, 2) intrinsically enjoyable, 3) accompanied by a loss of self-consciousness, and 4) self-reinforcing. To experience flow while engaged in an activity, consumers must perceive a balance between their skills and the challenges of the activity, and both their skills and challenges must be above a critical threshold. Charlene Jennett, AnnaL.Cox, Paul Cairns, Samira Dhoparee and Alison Walton in the article *Measuring and Defining the Experience of Immersion in Games* defined the concepts of Flow, Cognitive Absorption, Presence and Immersion and then designed the questionnaire in relation to immersion. Finally, they accomplished three tasks: 1) to measure the subjects' ability to convert from the non-immersive task to immersed task 2) to measure the change of eyes both in immersive tasks and non-immersive tasks 3) to investigate the factors affecting the immersion. Donghong Zhu in his book *The Exploration of Flow Theory in Network Environment* explained the element of flow theory under the network environment and depicted three methods measuring the flow experience presented by Hoffillan and Novak. Zhang Jing (2007) described the factors affecting the game immersion from the macroscopic view. It includes virtual environment of games, interactive interface, the background story, interesting characters, etc.

Flow experience

Csikszentmihalyi (1993) defined eight dimensions of the flow experience: (1) Clear goals and immediate feedback (2)Equilibrium between the level of challenge and personal skill (3) Merging of action and awareness (4)Focused concentration (5)Sense of potential control (6)Loss of self-consciousness (7)Time consciousness (8)Autotelic or self-rewarding experience. Hoffman and Novak(1996) identified and Novak et al.(2000) empirically measured and modeled a set of key constructs related to flow, including interactivity, involvement, focused attention, skill, control, challenges, arousal, telepresence, time distortion, and exploratory behavior. In addition to providing theoretical understanding of what leads to flow experiences, these constructs can also be used to characterize flow experiences. Based on Csikszentmihalyi's definition, Chen (2006) indicated that the generation of flow experience include three stages in terms of antecedents, experiences and consequences. Gaming researchers, Sweetser and Wyeth (2005) have addressed the issue of player involvement through their model called *GameFlow*, which is based on Csikszentmihalyi's (1990) seminal work on the psychology of flow states. The model could able to measure players' skills in the game, but can not fully describe how to enhance players' game experience in the game.

Conditions for flow

There are three conditions that are necessary to achieve the flow state:

1. One must be involved in an activity with a clear set of goals.

This adds direction and structure to the task. 2. One must have a good balance between the perceived challenges of the task at hand and his or her own perceived skills. One must have confidence that he or she is capable to do the task at hand. 3. The task at hand must have clear and immediate feedback. This helps the person negotiate any changing demands and allows him or her to adjust his or her performance to maintain the flow state. (Csikszentmihalyi, Abuhamdeh, and Nakamura, 2005)

Flow is not predictable nor is it possible to manipulate or be forced. A flow state can be entered while performing any activity; however this is most likely to occur when the task is being performed for intrinsic purposes (Csikszentmihalyi, 1988. Snyder, Lopez, 2007).

Flow in game

Jenova Chen in his paper flow in game discussed the implementation of immersion in the game and methodology of player-oriented dynamic regulation of the challenges in the game. Besides, he designed two games flow and cloud. Flow was created especially for testing the achievement of dynamic regulation of the challenges in the game. In the game flow, the players navigate a creature swimming in a surreal biosphere, feeding other organisms, evolving, and moving to the depths. The simplest operation being utilized in the game flow provide a possibility for both gamers and non-gamers to participate, it also reserved some challenges for the hardcore gamers. The game offered a wider range of game play from move around, predator to selective evolve and high-intensity combat. Cloud is a very simple game. Players control a sick child flying through the vast sky, the vast sea, and into white clouds. White clouds can be collected and released without any conflict and fighting. The players can only experience a very pure pleasure of freedom and flight feeling like a childhood dream. By played and discovered these two games, I found that the designer focused on the players' feelings and aesthetic experience in the beautiful surroundings.

Design report

As discussed the main intention of design study was to search for the problems in the MMORPG game and refine the design base on the data analysis. Thus, this being said it is important to focus on a specific use phenomenon while playing the game. In the initial phase of design study, the information regarding the MMORPG game had been collected, and then the representative MMORPG game huaxia online had been selected as research object to execute the user studies according the information from internet. The UCD method in terms of heuristic evaluation, usability testing, and questionnaires had been adopted as the main research methods to analyze specific user phenomenon and find the issue influencing the sense of immersion in the MMORPG game. The findings of user

study will provide intuitive and effective results for me to refining the design of Huaxia Online.

UCD methods and selected informants

Heuristic evaluation is to allow a small group of evaluators to assess user interface design and identify whether these interfaces accord to the recognized usability principles. In addition, they need to find out the usability problems in the user interface design and the problems will be emphasized in the course of user interface redesign. In general, heuristic evaluation specifically involves a number of evaluators to assess respectively. The way will avoid the assessment limitation by single evaluator. During the evaluation, evaluators repeatedly view the user interface to detect various types of interface elements, and compare it with a range of recognized usability principles. Each of the evaluators has to check user interface separately. After the evaluation, all evaluators need to exchange and integrate the evaluation results. In general, heuristic evaluation is an efficient, low-cost usability approach. Two of my friends were recruited during the heuristic evaluation. They were selected deliberately because they are familiar with MMORPG Huaxia online. Thus, the game had been evaluating in a smooth and diplomatic manner. The design problems existing in the game had been listed as the reference for refining the design. Usability testing is the most basic method used to evaluate a product by testing it on users. It not only can be used to help researchers find usability issues as well as users' expectations, but this method can also inspect system's effectiveness, efficiency and subjective satisfaction. This is in contrast with heuristic evaluation where a number of evaluators use different methods to evaluate a user interface without involving users. Usability testing was required to select real users and execute the representative tasks in a real environment. In the process of testing, users were recorded by the camera and assessment to the system of the game should be fulfilled. After the usability testing, test results regarding the sense of immersion had been presented. Considering that the students are the main target group of MMORPG game, six informants from group of students were selected and interviewed during the whole user studies, two women and four men. Some of informants used to play MMORPG game, and some of them have no MMORPG experience. However, all of them have experience to video game. In the course of formulating my testing tasks, the whole process of game experience for players had been considered. The first task starts from the player clicking Huaxia Online icon to successfully create character and enter into the game. In the task, the player needs to conduct game server selection, login, and create a character. By observing the whole process of creating a new character, I found problems existing in the game. The second task is to observe whether the player in the game could able to conduct the most basic interaction operations, and to comprehend first feelings and impressions of players to the game. In addition, I need to observe a variety of interface elements, map, navigation bar, and functional NPC to be used in the process of playing the game, and find possible issues. The third task is to allow players to play games without disturbing players' own circumstances, and inspect players' time

awareness. Questionnaire is a research instrument consisting of a series of questions and other prompts for the purpose of gathering information from respondents.” (Wikipedia) The researchers will compile the research questions into a question form answered by the respondents so as to understand respondents’ subjective views and comments to the questions. Among the various questionnaires, whether the results meet the purpose and requirements of the survey as well as the degree of reliability depends on the level of the questionnaire. It can be said that an effective questionnaire is the foundation for successful research. In the usability studies, questionnaire can be used to understand user satisfaction and encountered problems. The content of questionnaire has almost covered every indicator in the usability measurements because many of these indicators related to players’ emotion and subjective wishes. For these items, Likert scale can be a good way to collect relevant data. From the results questionnaire, one can observe the scores of every usability indicators as well as the average for Huaxia Online. Analyzing the specific performance in all aspects could help us to find out the issues of immersion existing in the game.

Results

As mentioned above, there are three conditions that are necessary to achieve the flow state. Based on that, the outcomes being presented refers to clear set of goals, clear and immediate feedback, and balance between the perceive challenges of the task at hand and his or her own perceived skills.

Clear set of goals

Clear set of goals is considered to be the significant for both players and game design. Purpose for setting Clear set of goals is to conduct player’s behavior and control the players’ emotion in the game. The testing for the goal of the game had been performed at the initial phase during the heuristic evaluation. Throughout the Assessment, the entire evaluation process involved a total of three evaluators. We chose net café to access Huaxia Online from angle of noob (new player). First of all, each of evaluators evaluated the game respectively and independently. At the same time, we recorded identified problems. Finally, all evaluators aggregate and analyze the problems found during the heuristic evaluation. After the heuristic evaluation, two of my friend and I found that the goal of MMORPG huaxia online was not very clearly presented since we can’t find the background of game. Due to many unknowns to the background of the game and characters, we all felt disappointed and our behaviors in the game were just a blind attempt. After entering the game, our characters appear on the map without a guide NPC or goal NPC around us. There are questions being raised of what we should do or what the tasks should accomplish. Taking the questions at hand, we were trying to find a game NPC around. As far as I know, for many MMORPG games, the position of guide NPC was usually displayed on the map of game with a question mark or other signs. How unfortunate for us that we could not able to find the NPC around

or on the map with a question mark. Thus we decided to go out the town of game and see if we can find the guide NPC there. Finally, we find the NPC outside the town. Actually, finding guide NPC took us more than 20min. one can make an assumption if a new player start the game without clarification of the clear set of goals in the game, they probably will quite the game soon.



Figure 1, The pictures is captured from the video I made for refining the design

Based on the outcomes from testing, the video sketches had been created to introduce the game background and characters, present the clear set of goals of the game. It had been posited at the beginning of the game start. After being tested again, the images of clear set of goals come to mind before the game start. Because the video being constructed is very terrific, the informants would like to step into the game without confusion. However, another problem had been raised of how to present the entire goals in a concise and short video. If the video being demonstrated is too long in the MMORPG game, the players will no patient to keep going. I was thinking that perhaps the guide NPC was an ideally constructed to guide game playing.

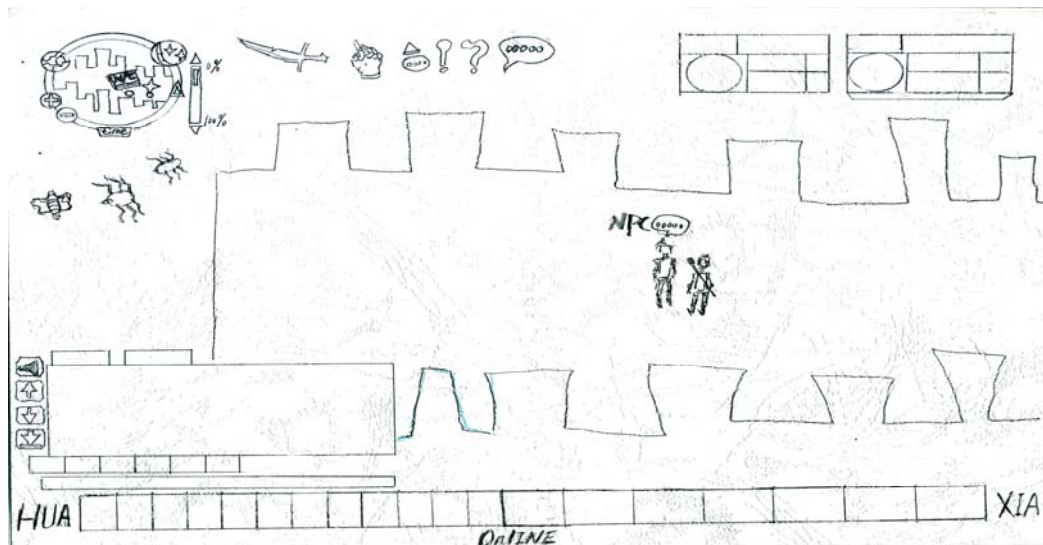


Figure 2, the sketches shows that the guide NPC is communicating with players on the user interface.

As you saw the figure 2, the guide NPC was clearly presented on the user interface with a sign above head. The purpose of establishing a sign on above NPC' head is to distinguish the NPC with other characters in the game. Taking look at the top left corner, a very tiny book with a name NPC on it shows the exactly position of NPC on the map. If players have some concerns to the set of goals of the game, the only thing they need to do is simply click the NPC on the map. The system will take the players to the place where the NPC stand. It is very straightforward way to find NPC in order to comprehending goal of the game. By refining the design, outcome reflects that the players could able to find the NPC in a very convenient manner and goal NPC can be good ways to guide players accomplish the game without arguish. When we got a clear and concise goal from NPC, we could like to spend much time on the game in order to finish the goal.

Clear and immediate feedback

The results of the user studies manifested that the MMORPG game, Huaxia online exist the problems of information feedback. A clear and immediate feedback is core element for the game design. The task at hand must have clear and immediate feedback. This helps the person negotiate any changing demands and allows him or her to adjust his or her performance to maintain the flow state.

(Csikszentmihalyi, Abuhamdeh, and Nakamura, 2005) Firstly, Outcomes being presented shows that there is not even a feedback in same important tackle. In the initial phase of usability testing, the button for deleting the characters was inevitably been clicked by a tester. However, the appropriate feedback has not been set up at the important sectors. Thus, the sketches of information feedback had been created in order to refine the design and the design had been tested to have revised the problem mentioned above.

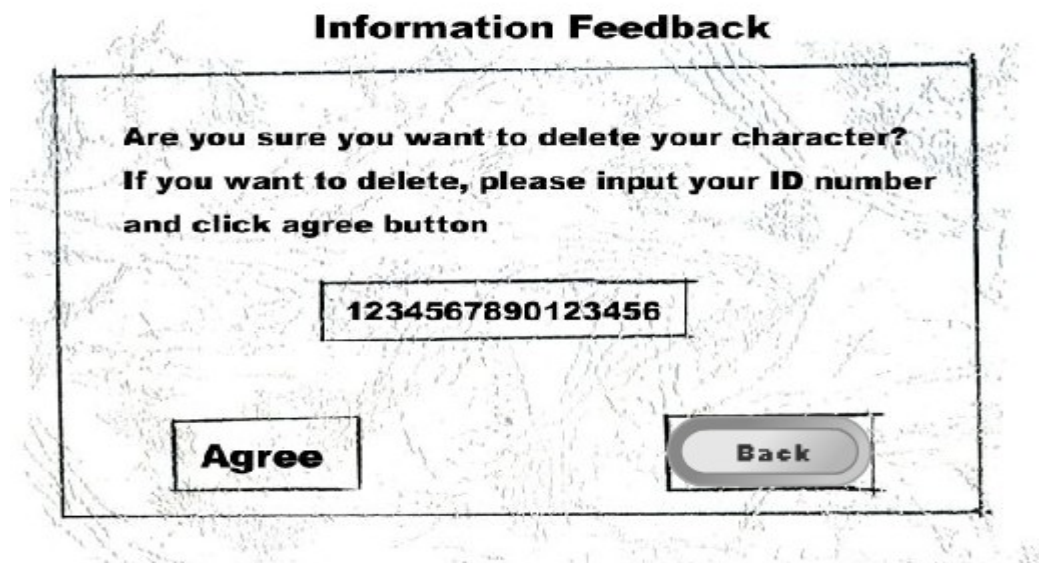


Figure 3, information feedback

Taking look at the figure 3, the result being said was solved through a simple information feedback. If players want to delete their character in the game, they have to input their ID number after click the character-deleting button. If they intended not to delete, they can have an option to go back. Beside, the outcomes concerning the feedback also manifested that length of feedback can not be either long or short based on my own observations and evaluation. During the testing, I found frequently pop-up feedback table will influence the players' sense of immersion in the game. Players have to close the feedback table again and again. What if the length of feedback is too short? By observation, short feedback will lead to the problems that information can not be viewed completely by the players. Through plenty of experimentation, I found 2-2.5sec for information feedback turn out to be an appropriate feedback time.

Balance between the perceive challenges of the task at hand and his or her own perceived skills

Challenge is the core element of the MMORPG game. The gamers will try their best to enhance their abilities to overcome the challenges presented by the system of the game, unless the challenges of the game and players' skills are balanced. As mentioned above, six informants were selected very strict and they are divided into two categories. One has experienced MMORPG games, and the other as a category has not experienced MMORPG games before. However, all players taking the testing have not played the games that would be tested. The result showed that the informants with MMORPG experience spent average 4.01min in completing the task. However, non-MMORPG players spent average 8.25min in

completing the task. By analyzing data taken from the task, we can formulated that MMORPG Players spent less time than non-MMORPG player. In other words, Different players have various degrees of skills to operate the game. It seems like the fingerprint. If the challenges in the game have been far beyond a player's skills, he or she might easily produce emotional anxiousness due to an unconquerable challenge; oppositely, the boredom has a chance to develop if the challenges in the game are far below a player's skills. The example will be taken from the evaluation of MMORPG game huaxia online to explain why the equilibrium between the level of challenge and personal skill is significant aspect for the sense of immersion of MMORPG game experience. During the testing, the simplest operation such as PK, moving forward, or purchasing productions can be a very difficult to handle for some informants, and it can be very straightforward for others. Finally, the tests showed that the informants with very low abilities had to quit the game because the challenge of the game is daunting for them. At this point, one can make assumption that the MMORPG game should provide a wider range of challenges for those who are free to choose appropriate challenges according to their own skills.

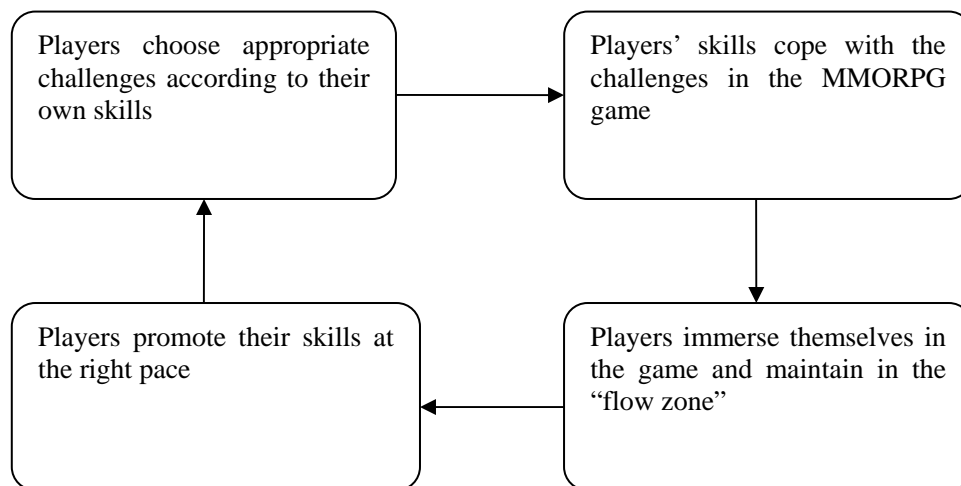


Figure 4, my thought

Thus, based on my own findings being presented, I came up the idea of rich mapping system. Many maps with different challenging were constructed for players with various levels.

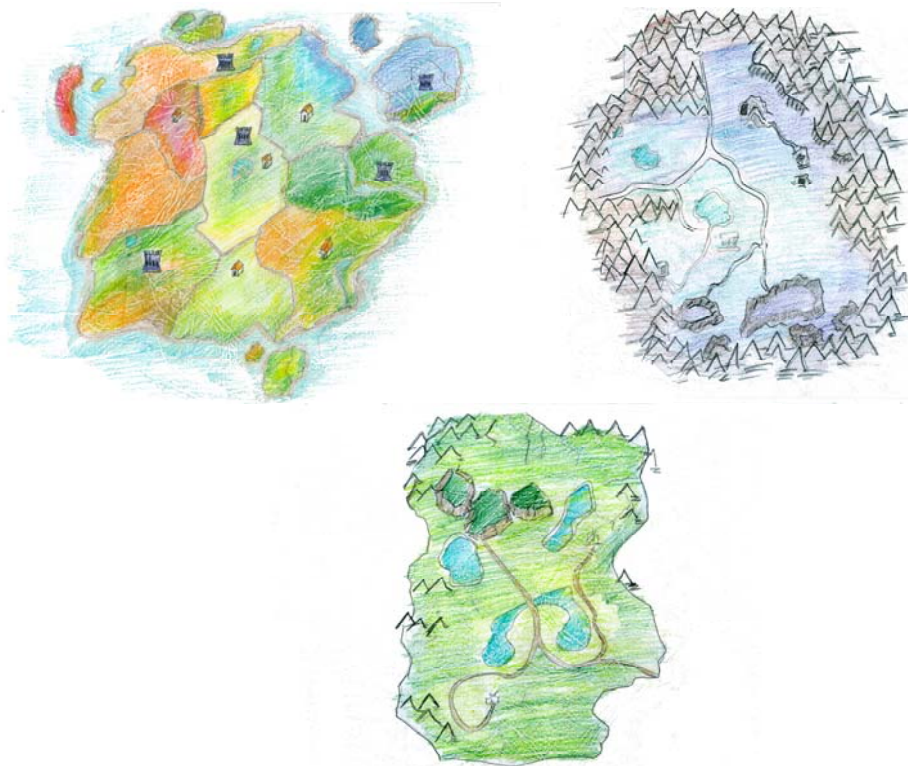


Figure 5, maps with different challenging

After the testing, Outcome being presented showed that players selecting maps with different challenging base on their own abilities is considered to be the efficient method to balance the level of challenge and personal skill. Taking the figure 5 as an example, the map on the top left corner is suitable for characters of level one to level five. The map on the top right corner is appropriate for characters of level five to level fifteen. However, sometimes the rich mapping system turns out to be an inadvisable way. There is question being raised of how can we know the abilities of players prior to playing? The rich mapping system can only be used on the premise of that game designers understand abilities of target groups. What if the players of game don't know how to PK with monsters on the map? I guess the rich mapping system can not help with it. The players can still break the sense of immersion in the game. Thus, I came up with another idea. The system of dynamic regulation of the challenges in the MMORPG game is constructed based on the previous research by Jenova Chen. As discussed above, Jenova Chen in his paper flow in game discussed the implementation of immersion in the game and methodology of player-oriented dynamic regulation of the challenges in the game. He pointed out the system can be created through the feedback from player themselves and it will enhance players' sense of immersion in the game. In the early design process, design of dynamic regulation of the challenges was divided into three phases which are monitoring the player's operating in the MMORPG game (monitoring phase), analyzing the player's operating (analyzing phase), and dynamically regulate the challenges in the game according to data analysis (phase of dynamic regulation).

Monitoring phase

Finneran and Zhang (2003) proposed a component-based model that consists of person (P), artifact (A), and task (T), as well as the interactions of these components. The model, named the PAT model, is developed by understanding the original flow theory, reviewing existing empirical flow studies within computer-mediated environments, and analyzing the characteristics of computer-mediated environments. Thus, the monitoring in the game can be achieved from the following three aspects: Players - artifact - task.

- **Players**

Monitoring players' physical and psychological changes in terms of eye tracking and body movement tracking between games

There are two main types of eye movements: saccades and fixation. Saccades are the fast movements that redirect the eye to a new part of the surroundings. Fixations are the intervals between saccades in which gaze is held almost stationary (Jennett, 2008). Land (2006) explains that it is during fixation that people take information in: during saccades we are effectively blind. Measures of fixation include two attributes: the fixation duration (i.e. the time spent investigating a local area of the visual field) and the number of fixations (i.e. the number of time the eye stops on a certain area of the visual field). The research has shown that the number of fixations per second reduces and the length of fixation duration increases when people spent more time on interpreting or processing a target (Toet, 2006). To be more specific, when players pay more attention on the game, the movement of eyes will reduce. In addition, the biological sensors can be used to test the level of stress for players. Testing in this way can more accurately review the player's mental state, but this approach is merely applied in the game because the technical conditions are immature in this domain.

- **Task**

Information monitoring provided by the game tasks include the number of death of game characters, the position where the game characters locate, the time players spend in the game tasks, the frequency of using the help information and so on.

One can assume that if players spend short time in accomplishing the game, it specifies that the challenges of the game are not enough for players. Oppositely, if players spend a plenty of time in completing the game or utilizing help information have become more and more frequent with the rapid development of the game task, it manifest that the challenges of the game might be extremely difficult and players may be in a state of great agitation and frustration. Another important factor is to monitor the smoothness of communication between players and the game NPC because the function of the game NPC will visualize the players' invisible requirements. When these entire invisible requirements are met

by the game, players can concentrate on the game (Ma, 2009).

- Tool

The game tools refer to mouse, keyboards, game pads, joysticks, pedals that players utilize in the game and mouse and keyboard is the most commonly used in during games. If players can handle challenges of the game, their operating must maintain higher efficiency. Contrary, if their operating skills are not enough to respond to the challenges of the game, a large number of invalid operations appear under the influence of anxiety. So, the mouse located in the blind spot of the game or blindly type on the keyboard illustrate that the challenges of the game is too high. Therefore, the frequency of invalid operation can also be used as a monitoring factor.

(2) Analyzing phase

If the data analysis shows that the current challenge of the game is too easy, the next challenge presented in the game must be increased, otherwise the players may quit the game because of boredom. Conversely, if the data analysis specifies that the challenges in the game are too difficult, the game should reduce the challenge in the game and represents more help information, otherwise the increasing challenges will make the players lose confidence and they may quit the game due to anxiety. Figure 6 illustrate the dynamic regulation of the challenges in the game.



Figure 6: Illustration of the dynamic regulation of the challenges in the game.

When the system of the dynamic regulation of the challenges had been applied in the game Huxia Online, all the players can able to find appropriate challenging which could cope with their ability.

Issues of game immersion

This investigation has mainly been focusing on outcomes of the case being described. This being said there are several general aspects influencing the game immersion, which can be found during the analysis of the case. When discussing the issues of the game immersion, the three conditions influencing the achievement of sense of immersion of MMORPG game design will be more clearly defined and encapsulated. These issues are discussed and the thoughts of promoting the sense of immersion of MMORPG game design are presented below.

A clear set of goals

Issue of clear goal had been reflected obviously in the huaxia online. In initial phase, the MMORPG game did not indicate what tasks the player should do, or what goal the player should achieve. The evaluators could not able to find clear goal of the game so some of them chose to quit the game. One can assume that the reason why the players can not fully immersed into the game is because they created a feeling of confusion to the set of goals of the game. For a successful and amazing MMORPG game, the game designer usually design a concise video introducing the background, the main tasks, the characters and the goal the player need to accomplish. The video is normally put in front of the MMORPG and it takes 3-5min to watch. The beneficiate for creating the video is that players are comprehensible to the short-term goals and long-term goals. And the goals will indicate players to accomplish their tasks without any confusion or frustration. Thus, making the video for telling the player the goal in Antecedent phase is very crucial for sense of immersion of MMORPG game design. According to the MMORPG game, huaxia online lack of clear goal, a very short video had been created especially for the game huaxia online. After retested, I found that they can complete the tasks smoothly without doubting what they should do or not to do. In addition, the design of goal NPC can be the other way to solve the issue of clear goal. When players don't know what the goal is, they can ask for help form the goal NPC around them. The goal NPC is responsible answering the questions and ensures the fluency of gaming. The goal NPC, of course, will be updating regularly by the game designer in order to meet the players' requirement. Thus, the goal NPC should be tested frequently. With the assistance from the goal NPC, all the issue concerning the goal will be solved successfully.

Clear and immediate feedback

Issue of immediate feedback could be found during the usability testing. In the MMORPG game, players relentless interact with the game through the keyboard and mouse. The Player input the information to the game, the appropriate and immediate feedback will be given by the system. Based on the feedback, the player will have a vivid understanding to their behavior or decision-making in the game. The feedback in the game indicates how to continue the game and how to execute the tasks. One can make assumption that if the system does not provide the timely feedback or no feedback after information input, the player will not concentrate on the game. Thus the player will not have the sense of immersion. Afterward, I will specifically discusses the issue of immediate feedback existing in the MMORPG game,Huaxia online. Firstly, the system forgets to setup the feedback in a very significant tache. I still remembered that one tester clicked the character delete button by accident. The matter is that the system did not provide the feedback and instead they just delete the character. The player was feeling so

frustrated and depressed. I totally understood his feeling because he had already got level 10. Finally he decided to quit the game. Actually, the MMORPG game without immediate feedback or no feedback is considered to be extremely serious problems in the game. It will profoundly affect the sense of immersion of game design. Secondly, frequent feedback in some situation in the game is unacceptable by the players. Actually, successful feedback will promote the sense of immersion of game design and satisfy as many appetences as possible. Conversely, if system pops up the feedback table each time in some tache, the player will have the feeling that the system is fussy and inconvenient. It will break players' the sense of immersion. Finally, the length of feedback also plays an important role in sense of immersion in the MMORPG game design. According to the previous evaluating, the length of feedback for MMORPG game, huaxia online is almost 3-4 sec. the player has to close the pop up feedback due to the length of feedback is too long. It will accidently disrupt the operation in the game, and It will affect the achievement of sense of immersion of MMORPG game design. Nevertheless, the length of feedback can not be too short. If the length of feedback is too short-living, the player do not have enough time to observe the information feedback and they can not distinguish whether the feedback is a useful indicator or not. Thus, the MMORPG game design should test and setup an appropriate length of feedback and code (timing out, sign out). Players can clearly notice the content, at the same time the player doesn't have to close the pop up feedback.

A good balance between the perceived challenges of the task at hand and his or her own perceived skills

Issue of equilibrium between the level of challenge and personal skill during the user tests is something highly debated when it comes to MMORPG game design. In order to discuss my outcomes in relation to previous research and theory on the sense of immersion, it is necessary to comprehend the balance between challenges and skills in flow theory

The balance between challenges and skills in flow theory

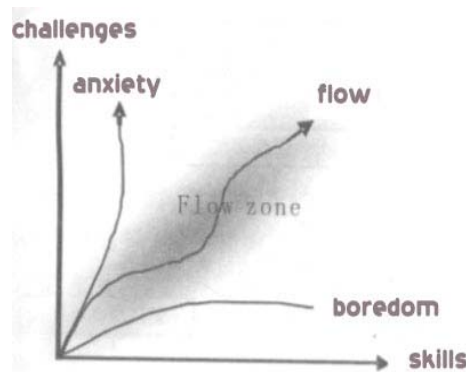


Figure 7: Illustration of the balance between challenges and skills in flow theory

Looking at the line graph (Figure7), I note that y-axis represents the challenges in the game, and x-axis represents a play's skills. Intermediate curve represents a player's flow experience. Grey area is the "flow zone" which is an acceptable and accessible area for players. In the "flow zone", the challenges in the game balance with a player's skills. Although some parts of the challenges in the game may make a player feel a little more difficult or easy than their expectations, the situation still can be acceptable by players. Thus, his or her gaming experience can still be maintained in the "Flow Zone". When in the flow state, players shift into a common mode of experience when they become absorbed in their activity. This mode is characterized by a narrowing of the focus of awareness, so that irrelevant perception and thoughts are filtered out; by loss of self-consciousness; by responsiveness to clear goals and unambiguous feedback; and by a sense of control over the environment... it is this common flow experience that people adduce as the main reason for performing the activity (Csikszentmihalyi, 1977). As the gray area shows that this is the region without anxiety and boredom. Two arches beside the "flow zone" in the Figure 1 represents that a player's gaming experience deviated from the "flow zone". It will lead to the negative effects in terms of anxiety and boredom which will break a player's sense of immersion. To be more specific, if the challenges in the game have been far beyond a player's skills, he or she might easily produce emotional anxiousness due to an unconquerable challenge; oppositely, the boredom has a chance to develop if the challenges in the game are far below a player's skills. It seems like the fingerprint. Different players have various degrees of skills, and the flow state varies from person to person. Therefore, one can assume that it is difficult for all the MMORPG players find their flow state easily and involve in the process of game experience. Actually, the previous results of the study had shown that the sense of immersion within the game is determined by various aspects. The balance between challenges and skills in the MMORPG game can be one important factor affecting the design of the game immersion. Different players have various skill levels and a player's skill level is not fixed. Therefore, the balance between

challenges and skills in the MMORPG game should be dynamic. As discussed, the outcomes show that the design of dynamic regulation of challenges is explicit and effective. In addition, the dynamic regulation of challenges not only can make the game more flexible and elastic, but also will help different levels of the players immerse themselves in the game. However, the problem is whether the objective monitoring and data analysis is reliable? Can it be a true reflection of the current state of the players? One can assume that if some of players run around wildly in the game, although there are a large number of invalid operations, those players also immerse themselves in the game. Then inappropriate adjustments can break players' the sense of immersion instead. In fact, this is a very special example that players immerse themselves in the surface of the game environment and do not acquire effective game experience. For such a case, players should be give timely guidance. Therefore, improving the database monitoring and game system analysis should be emphasized and achieve the purpose of detecting player's current state and make a correct regulation and guidance. The ideal for dynamic regulation of the MMORPG game challenges is that the challenges of the game shift smoothly according to players' skills. However, to achieve this goal need maturity and improvement of database monitoring system.

Conclusion

To sum up, in the research various problems have been discussed to explore the sense of immersion of MMORPG game design through three condition of flow that are necessary to achieve the flow state. Moreover, relevant thoughts and sketches regarding the game immersion had been presented. Promoting the sense of immersion of MMORPG game is an abstract and crucial issue for the MMORPG game design. I hope the MMORPG game designer could not only search for the problems concerning the sense of immersion in the MMORPG game by using the methods being presented, but also get the inspiration from the sketches and thought in the paper. Besides, In order to continue and develop these methods and ideas within this interesting area, more studies and research is needed.

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