

Transforming the Game into Edutainment Learning Environment: The Romance of Three Kingdoms

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Abstract: The game “Romance of Three Kingdoms” is a very popular game in Chinese society for many years. Many school kids even college students just love it very much. Players would even exchange ideas or strategies of how to get marks or breakthrough the bottlenecks they encountered. And since the essence of the game is about the war, most players see it as great challenges when they want to win the battles which in turns would bring them great satisfactions of achievement.

However, the game is so complicated that it may take students a great deal of time on it even just learn how to play it at the beginning. As long as they are so into it, then students won't spend enough time on their own study. How to convert a sophisticated game with prosperous content knowledge of history into an edutainment tool or even an educational learning program to make students learn with fun? We see there are great chances to make this transformation.

In this paper, we firstly analyze the contents and functions of the “Romance of Three Kingdoms” game; find out the goods and bads of its educational implications. Secondly, we therefore design some components with specific functions to be integrated into this game to support historical knowledge acquisitions and articulate possible critical thinking strategies in the new environment. Thirdly, we conduct a pilot study to investigate the usability and effectiveness of our prototype design by asking high school students to field test and evaluate the design. Finally, we report our findings and propose design principles of the game-based knowledge constructing learning environment as well as facilitation strategies for teachers to adopt the game like “Romance of Three Kingdoms” in their teaching practice.

Keywords: “Romance of Three Kingdoms”, “edutainment”, “design”, “critical thinking”, “game-based”

Introduction

Computer games are already changing the way people learn (David W. S. et al.2004), the games are almost a required process to go through for most kids and students. Some researchers even considered that the games as one of the mainstream culture (Kirriemuir & Ceangal,2002) , because they create new social and cultural worlds: worlds that help people learn by integrating thinking, social interaction, and technology. Transforming the game into edutainment learning environment, we trust that might make students gain a lot of profit form it.

The game “Romance of Three Kingdoms” (RTK) is a very popular game in Chinese society for many years. The main purpose of this paper is trying to transform RTK into a journey of discovery, an exploratory learning system, a microworld, edutainment learning environment. A microworld would provide learners a learning environment which may develop their critical thinking capacity, enhance their creativity and imagination by its exploratory and discovery learning activities. A computer is an effective mindtool and cognition learning environment (Jonassen, 1996). After melting into the learning environment,

learners could wander at ease and learn in do in the RTK world self-directly and situatedly.

The game software is not designed for learning in the beginning but just for fun, there is a strong and well story structure in the period of Three Kingdoms(Three Kingdoms are Cao Wei, Sun Wu, Shu Han), however. The learners would actively play different roles based on their own favorites and prior knowledge, experiencing a series of scenes in the game to learn the history events, somebody’s characteristics and background, as well as the strategies and tactics in the period of Three Kingdoms. Besides interacting with the contents of the game, learners will develop their critical thinking capacity in the active learning process. Following analyzing the content and functions of RTK, moreover, we will represent our design and findings.

Contents of RTK

On account of the whole learning process that learners would stay at the RTK microworld, the construction, rules, contents of the game is very important for learners. Some instruction design also implied in the game, so the introducing the game first is necessary.

Scenario and protagonist

RTK Chinese version is the Taiwan KOEI company’s creative work. Being a history-simulation game, contents of RTK is not just based on the historiography “Records of Three Kingdoms” which was written by Chen Shou (A.D.233-297). What is more, RTK was designed based on a great Chinese historical novel “Romance of the Three Kingdoms” written by Luo Guanzhong (about 14th century) in the depicting of roles, events, and scenarios.

The main structure of RTK includes 7 scenarios, which called “1. Yellow Turban Rebellion”, “2. Tigers and Wolves are Coming”, “3. Rising Wind and Scudding Clouds”, “4. Battle of Guandu”, “5. Sleeping Dragon Fly: Battle of Red Cliffs”, “6. Three Kingdoms”, “7. Northern Expeditions”. (Figure 1)



Figure 1: *Seven scenarios*



Figure 2 : *Commendable roles*

RTK also provides players a list of “12 commendable roles” (Figure 2), all of these special roles are very important and active in the period of Three Kingdoms.

The game player has to choose one from 760 roles (which includes 650 historic and 110 self-login) to be the protagonist. The protagonist information list (Figure 3) will represent a brief biography and some parameters such as “age”, “status”, “reputation”, “leading ability”, “force”, “intelligence”, “political ability”, “fascination”,etc.



Figure 3 : Protagonist information list

According to design of RTK, there are 5 types of statuses in the game. The protagonist in different status would own different power for different incumbency. (See table 1)

Table 1: Five Types of Statuses in the Game

Status	Description
Potentate	Sovereign of one might, the chief of First Legion.
Governor	The chief of Legion, rules cities.
Prefecture chief	A mayor, governs a city.
Officer	Obeys orders, supports colleagues, tries to make dreams come true.
Out	Belong to no might, carves one’s own road in the future by oneself.

Each role has different special techniques in accordance with different characters. All roles’ techniques and characters are set by the characterization of the historical novel “Romance of the Three Kingdoms” in substance, and deficiency would be made up with the historiography “Records of Three Kingdoms”. So that could be high trustiness. Through different combination of techniques, one’s favorable or unfavorable turns in life might be very distinct from others. Different techniques would bring the protagonist different convenience in the fields such as politics, wars, or making friends, etc. Besides those innate techniques, the protagonist would learn new one through social intercourse or from friends. When the closeness between them is high enough (trust or intimate), the function “Learn From” would be started.

Environment settings

In Environment settings, parameters of “Degree of difficulty” are divided into “plain”, “high”, “super” in proper order. If the player never changes the settings, it would be “plain”. In case that “high” or “super” be chosen, the AI’s strategies or tactics could be more brilliant, and each role’s allegiance never shows out.



Figure 4: Environment settings

Parameters of “Mode” dimidiates “historic” and “ahistoric”. When “historic” be chosen, the character and interpersonal relationship in the game would be same as the historical novel

“Romance of the Three Kingdoms”, on the other hand, most historical events would not happen after “ahistoric” be chosen.

There are also 6 sub-parameters for regulation, such as “sanguinity”, “interpersonal relationship”, “aim-direction”, “allegiance”, “mind-taste”, “out-not on stage”. Sub-parameters of “Events” are “historical events” and “common events” for setting in the bargain.



Figure 5: Historical event “Sworn in Peach orchard” Shot A



Figure 6: Historical event “Sworn in Peach orchard” Shot B

For a new hand of RTK, there is a very clear operating illustration. Just turning on the button “Game instruction”, messages about new-hand-instruction would be represented in the process. Meanings of all words which show out in RTK are also able to be queried by clicking on the “question mark” on the right-top screen.

After New Hands of RTK finish the main list “Scenario Choosing”, “Protagonist Choosing”, “Environment Setting” in order, they will access into RTK successfully. In RTK, the background of “Strategy-making” of every city is pictured on the base of geography characteristics and climate changing of seasons at that time, so refined. That makes a player place oneself in to a Three Kingdom environment which is just-like-true.



Figure 7: Illustration of Battle



Figure 8: Illustration of Barrack



Figure 9: Illustration of Big Map

Designs

Instruction Design

Some researchers (Henderson et al., 2000, Lyman 1995) have discussed the roles of the teachers in constructing digital game-based learning experiences. This takes the form of structuring and framing the activity of the learner in digital game-based learning in achieving learning outcomes, integration of the digital game-based learning into instruction activities.

In addition, other authors (Lesley and Samuel, 2004) point out that an imaginative and well-produced game may be flexible and complex enough to offer a range of educational opportunities. In our tutoring experience, RTK indeed creates a suitable environment for facilitating learners' active learning. And instructors' preparation for the post-game discussion of scenarios should be taken in to consideration, it is very important.

Gredler (1994) have made a definition of "game": "any contest (play) among adversaries (players) operating under constraints (rules) for an objective (winning)". A game was described as a contest is to address the essence of the activity here. The definition of "game" seems to be still room for improvement and argument, but already sketch out a scheme of it. The constraints are viewed as rules of the game, just like the programs logics and limits of design; adversaries are players, protagonists who interact to AI roles, obey the rules to achieve specific goals. In RTK, the goal of the game directly perceived through the senses may be unification of the whole country. By means of integration of fit-learner instruction design and well structure of RTK, the goal of the game might be regulated along with the goal of learning, so that a fit-more learning environment and process could be created, however.

About history and geography

A new hand learner should play one from the list of "12 commendable roles" or potentate of specific might at first time. The learner has to complete the game in "historic mode" in order to be familiar with interface and operation of RTK. The goal of RTK may be set "unification of the whole country".

The learner needs to note down every important historical events (such as "Yellow Turban Rebellion"), distribution of all might, and the brief biography of the role who has contacted with the protagonist at all times, so that the relationship of the role would be understand (such as Liu, Guan, Zhang are adoptive brothers), and what changes would take place after important historical events (such as comparing of the differences of distribution of all might after the Battle of Guandu). In addition, what the learner has learned from work must be written down.

The learner also takes notes on what geography and landscape has been seen in each city the protagonist has traveled. The description of view changes with seasons should be put into the notes. The view in RTK is close to what described in the historical documents, and that would make fun for the learner's self-exploring in the microworld learning environment. As for choosing famous role, the learner would be more confident and interested in the game process on account of knowing the roles better. If the game has been finished once, different goals should be set. The reason why we choose "historic mode", is to draw an outline sketch and build the based knowledge of Three Kingdoms period for learners so as to explore, discovery, and rethink more profoundly.

Different viewpoints to history

"Records of Three Kingdoms" written by Chen Shou made the legitimacy for Kingdom

of Cao Wei. “Romance of the Three Kingdoms” written by Luo Guanzhong made the legitimacy for Kingdom of Shu Han, however. Different standpoints make different viewpoints. The learner play the role Liu Bei(Potentate of Shu Han) first, and then Cao Cao(Potentate of Cao Wei) and Sun Quan (Potentate of Sun Wu). In the situation of playing roles of different might, different strategies and decision thinking would come very naturally. If the goal is “unification of the whole country”, it is opposite on benefits for Liu Bei, Cao Cao, or Sun Quan, and what resources they own are also quite different. How to make reflection and run the game from different standpoints is a fine development for learners’ thinking. Learners also could check the notes against another from the roles of different standpoints and discuss with the instructor.

Difference to history documents

Besides running the game by the trace of history, possibility of “rewriting history” in RTK is still existed (such as Cao Cao wins the Battle of Red Cliffs). Learners should take notes and make a comparison of the differences between the rewriting process and history, and try to think what causes these outcomes.

What differences between the strategies that “Exhausting all resources to build up one's military power” or “developing production and bringing about prosperous economy” in a group of independent warlords who look at fiercely as tigers do? Can the protagonist Liu Bei win the Battle of Red Cliffs without Sun Quan’s help? If the battle starts in the wrong season, could the alliance of Liu Bei and Sun Quan “borrow east wind” successfully?

Actually, reversing a trend of victory or defeat in some important battles (such as the Battle of Red Cliffs or the Battle of Guandu) is very hard, most important historical events are difficult to turn over due to “historic mode”. For instance, in the Battle of Red Cliffs, Cao Cao enjoys numerical superiority in military in the beginning, a pestilence would rage in Cao Cao’s army a few days later so that the morale of the troops is sinking lower and soldiers decreasing in quantity. On the other hand, probability of success of fire attacks that the alliance of Liu Bei and Sun Quan make would rise up a lot with the wind direction changing.

Even Cao Cao has slim hopes on probability of winning, there is still an opportunity for changing the results of battle by strategy thinking of learners. If the learner play the role Cao Cao, the difficulty of winning in this battle would be much higher, that would provide a fine self-challenge. Different goals produce different strategies, learners should discuss with the instructor in a deepgoing way.

Design adjunction

E-tutor

E-tutor should be able to answer questions and guide directly (Papanikolaou, Grigoriadou, Magoulas, & Kornilakis, 2002). But there is no answer for the non-RTK word (non-RTK word means the word is not set into RTK function in advance). If learners want to understand key words (such as “Battle of Red Cliffs”) about Three Kingdoms period, they can just key in the word “Battle of Red Cliffs” in the dictionary, then the e-tutor shows up to explain what is the meaning of “Battle of Red Cliffs”. Key words are showed in color purplish red. There are other key words (sub-key words)such as “Cao Cao”, “Liu Bei”, “Sun Quan” in the writing of explanation are presented in color blackish green and base line. Click the sub-key word, a block would show up to explain the meaning of it. (Figure 10, 11, 12)



Figure 10: Key in the word “Battle of Red Cliffs” in the dictionary



Figure 11: E-tutor shows up to explain what is the meaning of “Battle of Red Cliffs”



Figure 12: A block shows up to explain the meaning of sub-key word “Cao Cao”

“Self-setting Dialogue” and “Meeting”

We design the function of conversation “Self-setting Dialogue” for both sides, and “Meeting” for more learners. Learners can put any what they want to say into the conversation block by using the function “Self-setting Dialogue”. If the other accepts an invitation for conversation, the conversation blocks would show up on both sides. The requirement of conversation is that both sides must be in the same city, same facility, and not controlled by AI.



Figure 13: Zhuge Liang starts “Self-setting Dialogue”



Figure 14: Zhuge Jen accepts the invitation of “Self-setting Dialogue”

“Meeting” has to be run in the “Palace” in “Strategy-making” scene or the “Battlefield” in “Battle” scene. “Meeting” can be open by anyone in the palace or battlefield. Learners can decide to take part in it or not by themselves, a meeting block would show up when they attend the meeting, they can key in sentences in it for discussing. All process of “Self-setting Dialogue” and “Meeting” can be recorded or not by learners’ decision, that would be important documents for evaluation of self-learning process.



Figure 15: Palace “Meeting”



Figure 16: Battle “Meeting”

Chronological table and scores

Chronological table can trace back the learners’ learning footsteps, record important events which the protagonist has experienced in RTK. That would be a reference for evaluation of learning process. “Scores” shows up after running the Training Mode, the score report is given by calculating the task performance in the battle.



Figure 17: Chronological table for Zhuge Liang



Figure 17: Scores

How students think

We conduct a pilot study to investigate the usability and effectiveness of our prototype design by asking 11 high school students to field test and evaluate the design. These students have experienced RTK, and tell us their impressions and suggestions of the game and instruction design.

Content of RTK

Illustration

With the complicated structure of RTK, it takes students time to learn the rules. But there is a very clear operating illustration; most students think that it’s easy and comfortable to catch the key into the gate of RTK.

The operating illustration is as common as an old shoe; it is so clear that releases me a lot from the nervousness of xenophobia to RTK. (F5)

That (operating illustration) brings me a chance to be familiar with the game more before I get into RTK. That would give me more confidence. (M2)

Painting

The great painting in RTK is so excellent that students can enjoy the game very much. That causes them try to think and pay attention to the background of the city where the protagonist move or live in or even the terrain and its features of the battle field. It makes them combine concepts of history and geography more tightly and easily.

The painting is so beautiful. It can attract your attention very easily. The mountains, the rivers, you would like to find a map or a text book to check where is it, how it looks like, or what name the mountain or river is. (M4)

I am glad to learn in such a fine game. The world seems to be built by several beautiful elements. For instance, the painting of the game is very charming. When I read books such as history or geography, I would think about the scenes of the game. It looks like forming a special combination for me to learn even not only history or geography. It is not only a new way for learning but also for thinking. (M3)

Designs

Instruction design

The instruction design is melt into RTK, most students think that is interesting and exciting to them, and they can explore or discovery the world on their own. Most of them even want to learn more about events about Three Kingdoms.

It is very excited to explore in the world, just like I am really in the world, I am really the genius strategist Zhuge Liang, I argue heatedly with a group of learned men in Sun Wu. For this, I try to find some information about Zhuge Liang such as his writings, biography. It seems to make me want to understand more about Three Kingdoms period. (M1)

I don't think that I am studying or playing. But it exactly makes me learn a lot. Although it is just a game, it seems to be not just a game. It is a world that you are able to interact to one who you can only read in the history books. You will want to learn and learn more, and you will get it. The instruction and game seem to be in perfect harmony. Learning looks like to be easy. (F4)

Design Adjunction

(A)With regard to E-tutor, most students think that is very important and convenient for them to learn about Three Kingdoms period because RTK does not provide this function for players. E-tutor would assist students to catch some they need to know or want to know at any time when they are involved in RTK worlds. In addition, some students tell about the design should not disturb the game process.

This design (E-tutor) is suitable for learners who want to know something happened in the period. I think that it is very convenient for me. If there is the function in RTK, I think that would be better. (M2)

Not bad. The design (E-tutor) seem not to disturb the scene and the game process, I am satisfied with it. (M1)

(B)Towards “Self-setting Dialogue” and “Meeting”, a lot of students think that is in need for group learning. The designs are suitable and match RTK. Some of them mention that an extra design in the game should be in harmony, or it would be a little strange to players. Others tell about their experiences in on-line games. Social interaction in Internet occupies a great situation for students. Learners flocked to play a game may be more interesting and exciting than alone, but some disturbing should be avoided.

It (“Self-setting Dialogue” and “Meeting”) is not abrupt in the game; that is very important for players' feeling for coherence in the game. I think that is suitable and

convenient for a group of learners, on the other hand, talking to AI or the human brings very different interaction and fun. Group may be a riot of color, but alone would be at ease or free from trammels. (F2)

On-line games often give you a lot of chance to make new friends, and you can exchange information and learn a lot from them. So I trust that the design of “Self-setting Dialogue” and “Meeting” is necessary for group learning. You know. Cooperating with some people in doing something is very exciting and interesting, although a few unwelcome people will come; or some accident may occur. But it is all right on whole. (M6)

(C)Chronological table and scores could be apparent to the eye for tracing back students’ learning process in RTK. It is able to play a supporting role with notes learners take in the game at all times in RTK. A full record of learning process can be presented for preserving and discussion, these materials would be important for improving and self-examine.

It is very clear for me to see what I have done in RTK; that is very interesting to make a comparison of different protagonists’ life. And you can check the notes you taken before, some memory and thinking would recur to your mind. (F1)

It is easy to check your life in RTK. You can examine yourself after your learning, we sometimes may forget something important in the game, but it call for your memory. I think it is convenient and useful for me. (M3)

Conclusion

Transforming the game into edutainment learning environment is a worthwhile goal. Games already change the way many people learn. Unfortunately, some experiences are not so positive. Kirriemuir (2002) has pointed out “when gaming-oriented entertainment and learning or educational material are combined the result has often been disappointing; the educational value is debatable or irrelevant, and the gaming and engagement qualities compare poorly to those of pure games”.

But a fine combination may be created in some situation. According to the study outcomes, we put some suggestions here.

Self-identity, an extended commitment for oneself may facilitate a deeper learning process. Learners would invest more after taking a new identity they trust and enjoy, just like the protagonist “Zhuge Liang”, the learner would take on a new role more actively.

Well-ordered or appropriate problems should be put into instruction. That would make students be more confident or interested than frustrated or bored. Through problem solving process, they can have a sound grip of the problem and even try to learn more.

Well-structured and powerful data base for E-tutor, since E-tutor is important and convenient for students to learn in RTK. The information E-tutor could provide should be carry weight certainly.

Moreover, “Self-setting Dialogue” and “Meeting” is in need for a group learning environment. Students may bring their experiences of on-line games into viewing the design, if RTK is put on line, the design would be a suitable communication channel for learners.

However, the game program logics of single or on-line version is totally different, that should be adjusted in a deepgoing way. We just give a advisement here.

James (2005) pointed out that suitable distribution of learning tasks for learners brings better affects. Learners have to make decisions on their own in learning process, so that they become active learners. At same time, learners should try to decide new learning tasks.

Learners access in to the digital culture world through games (Begoña, 2003), a popular game may produce an effect on different fields in today's society. In this case, we try to put forward a proposal for transforming the game RTK into edutainment learning environment. When the transformation is being done, suitable instruction design is essential. We trust that the integration is in more perfect harmony, the satisfaction and motivation would be kept more long time. Continuing into the development of the model to educational application is our hope of further research.

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