INTERACTIVE STORY DEVELOPMENT FOR THE UNIT OF TURKS ON THE SILK ROAD IN SOCIAL SCIENCES COURSE[i]

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Abstract:

With this study, creating interactive story that includes interaction factors was purposed in order to support teaching of the unit of Turks on the Silk Road in Social Sciences course of 6th grades. The research method was defined as Design and Development Research and ADDIE pattern that is one of the teaching design pattern was based while developing interactive story. In accordance with this purpose, subject was defined, acquirements were examined and story process was written a script in line with acquirements. Dubbing, background and animations were created after characters who play a part in the story had been designed. Interactive story was finalized thanks to Actionscript 2.0 language and Adobe Flash program. Expert opinion about created interactive story was taken from training technologies expert and social sciences teacher. Recommended arrangements in accordance with expert opinions were made. Material usage of the group with 28 6th grades students was made available. Interactive story was found remarkable and interesting by students. Thus, it was stated that it increases motivational feeling.

Keywords: digital storytelling, interactive story, interactive narrative, social sciences, computer aided story

1. Introduction

Recounting storytelling method to people by using digital tools or multimedia applications is called digital story. The difference of digital storytelling from traditional

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storytelling is to be open for interaction. Therefore, it is called "interactive story" or "interactive digital story" in some sources.

Storytelling provides simplified knowledge in a meaningful way to kids in concrete operational stage by concretizing complex and abstract situations. Telling an event with stories that is complex or imagination is necessary to be used makes available both to increase their motivation and to bring about meaningful learning by causing stimulation of senses in their fantastic world (Gökhen Turgut, 2015).

Kids of today grow by playing computer games. Therefore, dramatizing learning environments is important in terms of increasing students' motivation. According to Malone and Lepper (1987), computer games involves competition, curiosity, control and phantasy factors. They arouse curiosity by offering challenging activities to players. Thereby, player has the control and all those are given in a story mode. Studies showed that narrative games are quite effective in education (Lui, Chen, Tsai & Lin, 2014).

In many stories, reader has not got power to control events or character in story. These kinds of stories have usually introduction, development and conclusion. Traditional stories are like travelling to author's world. But, digital stories are different. They give opportunities to reader to control events and characters in the story by interacting with them. Digital interactive stories tell the reader "create your own story" instead of telling "take a look at and join the author's world". Digital stories can be used for both entertainment and education. Because well-designed digital stories contain motivational factors within themselves. By this way, they can make time spent to be used more efficiently by creating will of attendance to event for user (Green & Jenkins, 2014).

According to Herrera (2003), interactive stories give a chance for user to join and control the story with options-scenarios that were designed before (as cited in Soto, Aymerich & Romero 2014).

More than papers, pencils and puppets are necessary for students to create their own stories with rich visuality in traditional classes. Interactive environments can be created by using information technologies. Active attendance for education period can be performed both to present written stories and to gain power of controlling stories by benefiting from information technologies. Thus, education can be made enjoyable and entertaining by being used motivational factors.

Although interactive stories are used in mobile devices for kids' fun nowadays, researches that were made about reflection of this technology to educational environments are limited. This situation caused the need of creating interactive story with the educational purpose.

In the study, creating interactive story that involves interactive factors is purposed to help teaching the unit of "Turks on the Silk Road" in Social Sciences course.

2. Method

Design and Development Research have been used as a method in the study. According to Seels and Richey (1994), Design and Development Research is a study that education programs and processes and design, development and evaluation of products have been systematically done.

During the design researches, researcher and participators works together in real environment. Analyze, design, development, and implementation stages of educational applications that has been developed as a result of these collaborative studies can be completed (Wang & Haffin, 2005).

Design Development Research is a kind of research that a distinctive product may appear as a result of the research (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz, & Demirel, 2014).

ADDIE pattern that is one of the core teaching design patterns comprising of analyze, design, development, implementation and evaluation has been based while interactive story has been developed.

ADDIE pattern is a well-known sample of teaching design core patterns that also summarize the implementation process depending on conceptual components of teaching designs, while it is making explicit teaching design process. Teaching design process consists of five main stages in this pattern (Figure 1).
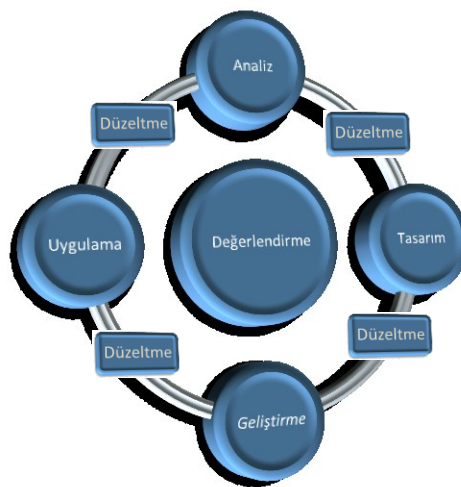

Figure 1: ADDIE Instructional Design

In analyze stage, he education needs of target group are determined, student qualifications are analyzed and supportive or inhibitory environment circumstances and educational purposes are determined.

In design stage, he choice and arrangement of educational content for material that will be developed are done and tools are prepared to evaluate product that appears as a result of implementation.

In development stage, aforesaid material is produced according to information that is gained and main frame that is created in analyze and design stages.

In implementation stage, it is implemented after preparation and arrangement of product, participators and environments. During and after the implementation, deficiencies of material and points that must be corrected are determined.

In evaluation stage, implemented material is tried and final test is done just before the material is completely ready after arrangements according to feedbacks. In this stage, operations that have been done in each stage according to ADDIE stages are stated while interactive story has been developed.

2.1 Analyze

Need analyze, content analyze, student analyze, environment analyze and media analyze have been done in analyze stage that is the first stage of interactive story development

In need analyze, the courses and the units of courses that students have difficulty in have been tried to be determined. With this purpose, interview has been had with teachers and students. In consequence of interviews, interactive story development has been determined for the reason that the unit "Turks on the Silk Road" of Social Sciences course is suitable to create a story.

In student analyze, students' proficiency of computer use, characteristics that effect learning, age groups and progressional characteristics have been determined.

Interactive story that will be developed is 6th grades subject. Two hours information technologies courses in a week have been in secondary school curriculum as from 5th grades. Therefore, target group has the required ability to use computer. Participators who will use interactive story are 6th grades students and they are at the age of 11- 12.

In content analyze, acquirements and concepts of the Silk Road subject that creates interactive story have been examined. While this research has been done, Social Sciences course 6th grades syllabus of Head Council of Education and Morality has been taken into consideration. Social Sciences teachers' opinions and suggestions have been also evaluated.

It was observed that analyzed environment met the minimum conditions that interactive story can be implemented. When it is considered that a computer lab exist in each elementary school, interactive story that will be developed can be also used in these computer labs. While interactive story has been developed, it was considered to be developed in the manner that it will meet the system features that computer labs have.

2.2 Design

Content, graphic and sound designs have been made in design stage that is the second stage of the process of interactive story development. It was decided to be develop through which platform in accordance with characteristics of environment where interactive story and teaching will be implemented. It was benefitted from expert opinions in every stage of design period.

Scenario of interactive story has been created by examining acquirements of the unit, Turks on the Silk Road and flow of events in scenario has been transferred to flow diagram. A section of flow diagram was shown in figure 2.
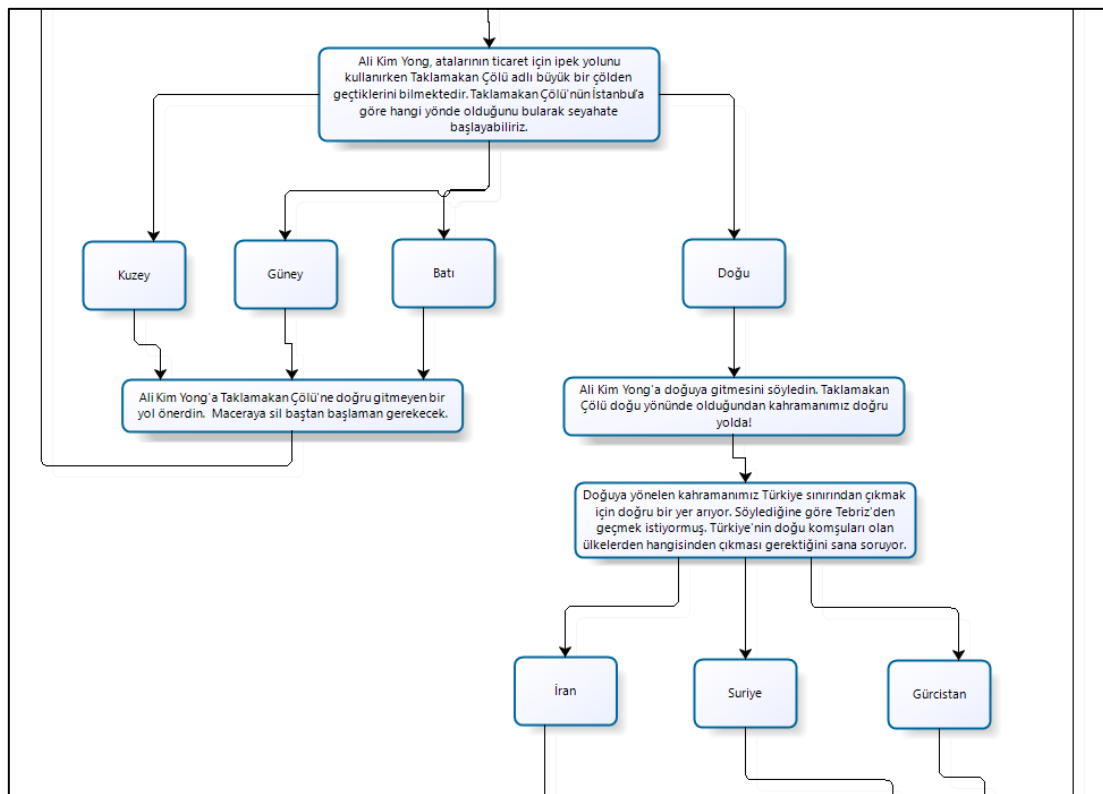

Figure 2: A Section of Flow of Event

Motivational factors have been also used to motivate students to learn. Factors that affect internal motivation have four main characteristics (Gottfriend, 1985; Ryan & Deci, 1998). These characteristics are as following:

1. Compulsory activities that enable learner to strive and success is not guaranteed must be.
2. Learners must feel that they have control about their learning.
3. Situations that surprise learner and sustain learner's attention must be.
4. Aesthetic and outstanding designs must be.
5. These factors that affect internal motivation have been provided to take place in interactive story.

According to Mayer & Moreno (2010), multimedia cognitive learning theory is adapted from cognitive load theory and involves principles of dual channel about data processing, limited capacity and processing effectively. Cognitive load theory is a hypothesis that considers memory theory (Moreno and Park, 2010). This theory involves cognitive load theory that is defined as a psychological experience that is derived from interaction of individual characteristics and teaching purposes' characteristics. While designing interactive story, the points of how content, transferred according to multimedia cognitive learning theory, will be designed and how cognitive load will be balanced were considered.

Created graphics was considered to be compatible to visual design factors and principles such as colour, stress, balance, form, integrity, closeness and alignment. How motivational factors should be used in graphics and background, animation and all the other pictographic factors will be created by using which software were decided.

According to the principle of dual channel of multimedia cognitive learning theory, sound factors are decided to be added to interactive story and these sound factors will be recorded, organized and integrated with program by using which devices and software have been designed.

2.3 Development

In the development stage, that is the third stage of the process of interactive story development; interactive story has been put into final form by extending design done in the second stage.

Actionscript 2.0 language has been used in interactive story that has been developed by being used CS4 version of Adobe Flash program. A character that is suitable for story theme has been created and character profile has been formed in the manner that it will be appropriate for culture and location of story. In the page that the character meets the user, a character that wants help from the user and has language to

communicate with the user to be able to count him/her in the event has been preferred (Figure3).

Button designs have been developed in a way to give clue and inform as well. For example; when you are on the button that has directions with the pointer, an image that shows direction has been provided to be appeared (Figure 4).

Figure 3: Meeting Page

Figure 4: Button Reminders

The same button shapes and alignments have been used in each page. The same type font, size and colour have been also used in each page. Points that are considered important have been emphasized by using different colour. Supportive feedback has been given to the user by using affirmative language at the end of each operation that the user has done.

When the user has chosen the way that has not reached the story's character's goal, by giving corrective feedback, it was determined that the user must restart the adventure (Figure 5). Informative and visual map and instructions have been given to draw itinerary of character and mark the place of character on the map (Figure 6).

Figure 5: Restart Notification

Figure 6: Map and Instructions

Just as corrective feedback has been given to the user in each wrong instruction, affirmative feedback has been given to the user for each correct answer, namely in each correct instruction and it was stated that the user's act has helped the character to go in the right direction by congratulating him/her (Figure 7). Situations that have not caused any change unlike differentiation of right and wrong way have been submitted to enable the user feel intensely the feeling of controlling story. As it is seen in the screenshot in figure 8, the user chooses the city that he/she wants to go. Thus, program does not control the user, but the user controls the program. The user's motivation has been purposed to be increased with this operation.

Figure 7: Corrective Feedback

Figure 8: City Selection

2.4 Implementation

Design Development Research is a kind of research that intrinsically requires to be used different kind of research and a distinctive product may emerge in the end. However, developing the product based upon implementation increases the potential of emergence of productive and profitable products (Büyüköztürk and others, 2014).

Expert opinions had been consulted before the usage of developed interactive story by students has been mentioned. A set of arrangement has been made in the interactive story that has been examined by teaching design experts and domain experts. Those are:

- to add arrows, colors and a set of instructions on maps used in interactive story,
- to develop character's movement more,
- to arrange the situation of sizing to screen on device that interactive story are displayed,
- to shorten the long statements that are written on buttons,
- to cancel the holding time screen when the wrong answer is given.

In the implementation stage, that is the fourth stage of the process, interactive story material that has been designed and taken its final form by being arranged in accordance with expert opinion has been provided to be used by students.

Circumstances that material is made operable in computer by arranging computer lab conditions and students can use the material without disturbing each other by wearing headphones have been created before starting to implement. Before the implementation, information about the use of material has been given to students by researcher.

28 students of 6th grades have used the material in two groups in computer lab of the school for a course time in 2015-2016 academic year. Throughout the implementation, observation has been done by researcher. Students' opinions about the material have been also asked at the end of the course time.

2.5 Evaluation

Expert opinion has been consulted throughout the development process of the material. It has been kept in touch with branch teacher in both selection of subject and continuation of the process. Material has been rearranged in accordance with suggestions by both teaching design and domain expert.

Necessary arrangements have been made by taking into consideration students' feedbacks about features such as colour, sound and type font. Meanwhile problematic sounds have been created again, more affective type font has been chosen and more compatible colours have been used.

The content of interactive story has been made suitable for level of students in accordance with feedback of branch teacher. Direction concepts that hadn't existed in the subject which the story had processed have been involved in content to contribute to students' learning.

3. Results

Each student's opinion has been asked after interactive story had been implemented to students. As a result of opinions:

- 100% of students have said that they want to see interactive story software more frequently in social sciences course and prefer that the teacher give homework in this way.
- 100% of them have said that they want to use interactive story in other courses as well. It was concluded that the most requested course is Turkish and the next one is Science and Technology.

- 86% of them have said that they prefer to learn subjects with such stories. The rest of them have stated to believe that they will learn well when they read from course book.

- 75% of them have said that they have no difficulty in questions and they enjoy in order that they help the character by answering questions. The rest of them have said that they have difficulty in questions in order that there are subjects that they have not learnt yet.

- 86% of them have stated that the character in the story is entertaining and interesting. The rest of them have said that the character movements can be better. According to this information, it can be said that when we need to attach student's attention to provide motivation, animated and entertaining factors like animation can be used.

- It was determined that 82% of them like colours used in the story and find them compatible. The rest of them have said that they do not like the character's hair colour or the colours should be livelier.

- It was determined that 82% of them like vocalization of the character in the story. The rest of them have said that the sound coming from headphones is low and it should be louder.

- 75% of them have stated that they have no difficulty while using the story. The rest of them said that they have difficulty because of the fact that they cannot understand the sound or they have difficulty to increase the sound.

- 89% of them have stated that readability of script in the story is appropriate. The rest of them have stated that script can be read but another type of font can be more appropriate.

- It was determined that factors that sustain the most attention are cities and sound of China. According to this information, it can be said that when attaching attention is necessary to provide motivation, animation and sound factors have been attached priority.

- 57% of them have stated that restarting of the story is an affirmative situation when they answer wrong. 14% of them have stated that they have never answered wrong. The rest of them have said that restarting is not a good idea.

- 89% of them have stated that they use audio buttons located at left top of the interactive story screen. The rest of them have said that they couldn't use them in order that they couldn't realize them.

- 50% of them have stated that background music should be constantly played in the background of the interactive story. The rest of them have stated that

background music is unnecessary because of the fact that the story is already interesting and this may cause distractibility.

- 54% of them have said that even if they create interactive story themselves they create the same story without changing anything. The rest of them have said that they will continue to travel, send the character to America and make the animation more detailed and entertaining.

According to Gottfriend (1985) and Ryen & Deci (1998), challenging activities that have never guaranteed should be in a story that provides internal motivation. Learners must feel that they have control on their learning. Also, situations that surprise learner and attract his/her attention and outstanding designs should be in the story.

Restarting of interactive story when the user answer the question wrong is a challenging feature and that success is not guaranteed for users. Most of the users have stated that this feature is an affirmative feature.

Participants who have used interactive story have stated that animations, graphics and sound factors of the character have drawn attention.

Participants who have used interactive story have stated in their comments about graphic-sound design that animations are entertaining and interesting and colours are aesthetic and compatible.

When these results are considered, it can be stated that digital story involves features related to internal motivation.

4. Conclusions and Suggestions

Interactive story that has been developed for the unit of "Turks on the Silk Road" in Social Sciences course has been found remarkable and interesting by students. Moreover, it was determined that it is a supportive material for teaching by being expressed to increase feeling of motivation.

Results show that learners have the feeling to control the course of event in the story thanks to interactive story. Learner feel that he/she has the control by answering questions correctly with the feeling of helping the character with the result that the character in the story needs the user to arrive at the end of the way. Students have perceived the story as a game with the "control" factor that is considered one of the game factors by Malone and Lepper (1987).

According to students' feedback, 15% of them have stated that the sound coming from the headphones is low. When students' opinions have been examined, it was realized that students' other opinions about program are also negative. According to

this information, when negativeness has been faced in any feature of software that affect student, this negativeness has been generalized for the other features.

It was determined that students have fun to help the character and their motivation increase and they are more willing to learn in order that they have fun. Animation, image and sound that have been used in interactive story were determined to be important factors and attract students' attention.

As a result, it can be said that interactive story that has been created with an effort to support teaching of the unit of Turks on the Silk Road in Social Sciences course has achieved its goal in the light of feedbacks from students and experts.

Following suggestions have been given to researchers and developers.

A. For researchers:

- Effectiveness of interactive stories can be researched by using experimental methods.
- Situation or action researches that focus on qualification of interactive stories can be done.

B. For developers:

- Interactive stories that can be used in all platforms (like Htm15) inclusive of mobile operating systems can be developed.
- Interactive stories that give more place for animations and are more animated can be designed.
- Interactive stories can be also designed for different subjects, different courses and different class levels.
- Opportunities can be provided for teachers to create interactive stories related to their own subjects by producing software to develop interactive story.

References

1. Büyüköztürk, Ş., Kılıç Çakmak, E., Akgün, Ö. E., Karadeniz, Ş., & Demirel, F. (2014). Bilimsel Araştırma Yöntemleri. Ankara: Pegem Akademi.
2. Gottfried, A. E. (1985). Academic intrinsic motivation in elementary and junior high school students. Journal of Educational Psychology, 77, 631–645.
3. Gökben Turgut, T. K. (2015). Bilgisayar Destekli Hikâye Anlatımı Yöntemi: Alanyazın Araştırması. Turkish Online Journal of Qualitative Inquiry, 98-99.
4. Green, M. C., & Jenkins, K. M. (2014). Interactive narratives: Processes and outcomes in user-directed stories. Journal of Communication, 64(3), 479-500.

5. Liu, C. C., Wu, L. Y., Chen, Z. M., Tsai, C. C., & Lin, H. M. (2014). The effect of story grammars on creative self-efficacy and digital storytelling. Journal of Computer Assisted Learning, 30(5), 450-464.

6. Malone, T. W., & Lepper, M. R. (1987). Making learning fun: A taxonomy of intrinsic motivations for learning. Aptitude, learning, and instruction, 3(1987), 223-253.

7. Mayer, R.E., & Moreno, R. (2010). Techniques that reduce extraneous cognitive load and manage intrinsic cognitive load during multimedia learning. J. L. Plass, R. Moreno & R. Brünken (Eds.), Cognitive Load Theory, (pp. 131 -152). New York, NY: Cambridge University Press.

8. Melanie C. Green, K. M. (2014). Interactive Narratives: Processes and. Journal of Communication, 479 - 480.

9. Moreno, R. & Park, B. (2010). Cognitive load theory: Historical development and relation to other theories. J. L. Plass, R. Moreno & R. Brünken (Eds.), Cognitive Load Theory, (pp. 9-28). New York, NY: Cambridge University Press.

10. Ryan, R. M., Connell, J. P. & Deci, E. L. (1985). A motivational analysis of self-determination and self-regulation in education. In C. Ames & R. Ames (Eds.), Research on motivation in education. Vol. 2: The classroom milieu (pp. 13-51). London: Academic Press.

11. Seels, B. B. ve Richey, R. C. (1994). Instructional technology: The definition and domains of the field. Washington, DC: Association for Educational Communications and Technology.

12. Soto-Sanfiel, M. T., Aymerich-Franch, L., & Romero, E. (2014). Personality in interaction: how the Big Five relate to the reception of interactive narratives.

13. Wang, F. Ve Hanaffin, M. (2005) Design-based research and technology-enhance learning environments. Educational Technology Research & Development.