WCES 2012

Graphic design on educational computer games

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Abstract

This study includes the study of implementation and analysis; there is an emphasis on the necessity of two dimensional computer games, which is both entertaining and educational for the children between 8 and 10. Therefore, for the study of implementation, to increase the sensitivity of children on global warming as one of the daily subject, an educational platform game that is designed with aesthetic approach is used and this study of education is examined; the process of the game is explained by dealing game elements one by one which is determined in this review.

Keywords: Graphic design, interface design, educational computer game, children, flash game;

1. Introduction

Today, as we enter a technology-oriented bright era, the production of computer games is increasing and becoming a major economic market as a result of the development of computers and related technologies. As computer games become more popular, their use is also increasing. Especially in recent years, computer games have been used as training material in the traditional education system. By using children's interest in computer games for learning, game-based learning system is becoming widespread. With this system, students can learn with fun and find a chance to reinforce what they learn with games.

Interface designs of computer games developed for children are very important. The first thing that the users see in computer games is game's interface designs. Well planned interface designs draw the attention of children and enrich their imagination and can be more motivating. The nature of the upper value of visual and audio elements of the game both within themselves and also in terms of their unity is very important. The good quality of visual, auditory and kinesthetic elements can provide the user to interact with the game much more.

2. Computer Games

Computer games are element and application areas in which disciplines (systems) such as graphic design, software, sound, music and scenario are used together in harmony, which can be in interaction with the user, and can be used for different purposes such as entertainment, education and leisure activity. Computer games requiring a combination of different disciplines do not consist of only software or visual design. Graphic design that determines the identity of the game is also very important as well as the music used in it, the scenario, the subject and the software that allows the game to be published.

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From the perspective of economics, computer game is one of the fastest growing sectors of the cultural industry. Entertainment Software Association of America (The U.S. Entertainment Association) has stated that 221 million games had been sold in 2002 and annual profits of this industry was increasing even more with each passing year (Buckingham et al, 2006). In 2009, computer and video game sales in the U.S. reached $ 10.5 billion. The mean age of people playing computer games in America is 34 and they have been playing games for the last 12 years. In 2010, 26% of Americans over age 50 were found to play a computer game.[†]

Today, professional restructuring have started in the process of production of computer games. For example, many game development studios named Blizzard Entertainment, Sega and Electronic Arts Games were founded. Most computer games abroad are created as a result of the team work of professions such as graphics designer, software and audio engineers. Day after day, new professions about game design started to emerge. Professions in areas such as game music, programming, testing have begun to emerge as well as environment, level, character design, modeling or animation.

It is hard to say that computer game industry in Turkey is as productive as other developed countries (Binark and Bayraktutan, 2008). The reasons for this can be high cost game production process, lack of public incentive policies on game software, scarcity of experienced labor force, bootleg of games and licensing problems. Especially due to limited academic research and the lack of Turkish sources on graphic design of computer games, it can be stated that it is necessary to do research on this subject.

3. Educational Computer Games

The games developed for educational purposes are designed to reinforce teaching and the things learned. Educational games show similarity to other game types; however this type of a game can be considered as another kind in itself because it covers education. (Pedersen, 2002).

According to Moyles (Transmitting: Binark et al, 2009) conventional and digital games are similar in terms of educational function. In many researches the function of games in child development and maturation is being expressed: It is suggested that games are effective tools that support creativity, emotional and intellectual development and give the children the habit of being happy. As conventional games directly or indirectly have educational functions, digital games can also have such a function.

As examples for the most well-known educational games, even that can be called boring, text exercise or gap-filling games can be given. The dullness in this kind of games can turn into a fun state when they are supported with different designs; the students can be ensured to answer the questions correctly and keep the given information in mind (Pedersen, 2009). It can be said that the constructive influence of the graphic design language of the developed educational games on children is supportive of this idea. The children's imaginary world can be expanded by the introduction of designs that enrich their visual world and the information desired to be given can be reinforced at the same time through games.

4. Game (Environmental Heros)

This game, developed as an educational game providing information on global warming for children ages 8-10, tells about the effects of global warming to the world and what must be considered in this connection. During the design stage of the game, characters, location, user interface and level design and their compliance processes with the software language were considered in accordance with the scenario. For the game to be easily accessible during the applications it was planned to be broadcasted on the web. Adobe Flash CS5, which is one of the most appropriate software for this game to be published on the the web, was selected. In this software, interfaces of the game were prepared as a two-dimensional and software language ActionScript 3 was used (Figure 1).

In the scope of this study, the game developed for children was not only planned for entertainment, but also to be educational due to its social content of global warming, because today as there are many violent games, it is thought

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[†] http://www.theesa.com/facts/index.asp

that developing designs of games which are both fun and educational for children is more important. Careful attention was paid that the developed game is created taking into consideration the characteristics of children between the determined ages, without any content of violence, and with aesthetic approaches.

For the reason that these games having both entertaining and educational qualities so-called "eğitlence[‡]" (educaintment) in Turkey are very scarce, it was intended to develop a game of this type during the application work. The need for the production of these types of games is increasing in Turkey since most of these games published on the Internet which have the educator/entertainer quality are of foreign origin.

The adventure game which was designed in two-dimensional nature as an application work was created in platform (side-scrolling, platformer) type. In these types of games, since the user has the feeling of progression on some place on a constantly floating screen, he/she can find the opportunity to explore new places. At this point, the type of platform game is thought to be useful and suitable for children. Because the children can discover new places and can take pleasure from this by moving the game character to the right, left, up and down in the space.

Figure 1: Interface designs of the game.

As specified earlier, three levels were created during application work:

1.1. Level 1: Ice Island

The ice island considered as the first level of the game is an environment where everywhere is covered with snow, and where there are polar animals affected by global warming. Including the planes that the character will walk on and the background images, everywhere in this environment was thought to be covered with snow (Figure 2).
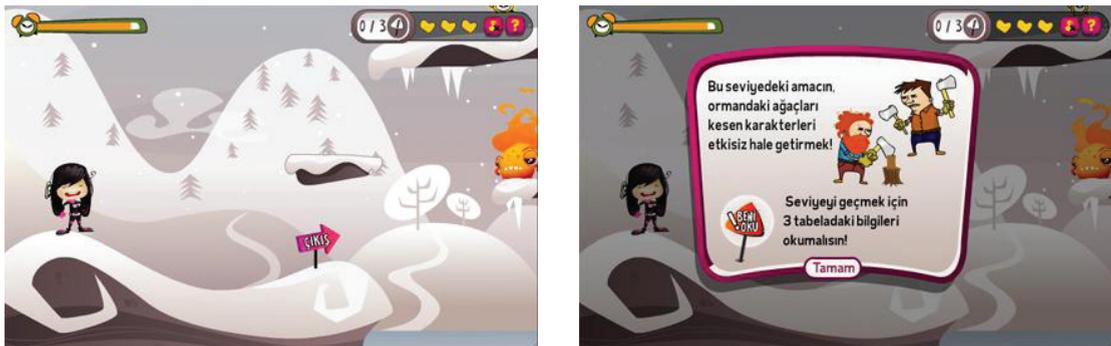

Figure 2: Interface design of the first level.

[‡] http://bote.hacettepe.edu.tr/wiki/index.php/Eğitlence.

1.2. Level 2: Smoke Island

The smoke island considered as the second level of the game is a city where greenhouse gases are intense, and there are animals affected by this issue. In this environment, a place has been created where polluted air, machines, toxic wastes and buildings are intense on the planes that the character will walk on, and on the background images. Due to the fact that the appearance of the polluted city could not be created as required in earlier draft works, space drafts were re-created (Figure 3).

Figure 3: Interface design of second level.

1.3. Level 3: Green Island

On the green island considered as the third level of the game there are woodmen that cut the trees and cause the destruction of forests and animals affected by this problem. At this level, an environment has been created where there are faded hills remained treeless, and woodmen that cut the trees. By considering that the planes on which the character walks on are kept green, it has been desired to draw attention that the trees being cut in the background impaired this image. Unlike the faded hills in the background a more vivid image is attempted to be created. Space drafts were re-created due to the lack of background images and supportive elements of the message desired to be given in the earlier draft applications (Figure 4).

Figure 4: Interface design of third level.

5. Result

After the software process of the application work had been completed, testing process with children was performed to resolve the possible bugs and errors. The testing process of the game was conducted on a total of 30 people through second, third and fourth year students from primary school. As a result of the test performed, it has been noticed that supporting the given information with illustrations has been more interesting for children. It has

been identified that the children who has tested the game mostly read the information supported with illustrations. This situation has shown that illustrations attract the children's attention much more.

In line with the analysis and research made in this study, a Flash game, which is both fun and educational for children, has been developed. By addressing a social issue such as global warming, an application with educational quality has been introduced. Today, as there are many violent games, it is thought that developing designs of games, which are both fun and educational for children, is more important. Game interfaces have been designed in the game producing process with aesthetic approaches taking into consideration the characteristics of children between the determined ages. The game has been developed for users to have easy access as that can be broadcasted via Internet.

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