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**EDUCATIONAL USE OF GAMES: A MOBILE SERIOUS GAME  
FOR HISTORY EDUCATION**

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**Abstract**

Digital media devices and use of Internet have become indispensable parts of our daily lives. We are getting more dependent to use of these technologies and new cohorts are born into digital world. Turkey is populated 79 million, and according to the January 2016 report of “We Are Social Research Institute”, 71 Million mobile phones are in active use. The 56% of mobile phones are smart phones and the average duration spent on Internet via smart phones is 2 hours and 35 minutes. In the literature, negative effects of digital media and Internet use on children such as cyber-bullying and addiction were frequently reported. However, it is not reasonable or possible to raise our youngsters in isolated environments. In Turkey, it was reported that 48.5 % of children under age of 10 use Internet for searching educational materials, playing games and chatting. So it is obvious that, in general adults and in special the educators should focus on adaptive uses of digital media in daily lives of children. In the current study, based on the analysis of Internet and digital media use of children specifically in Turkey, a model mobile game on history education was introduced. Educational implications on use of this history-themed serious game were discussed.

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**Keywords:** History Education; Children; Digital Media; Serious Games; Mobile Games.

## 1. Introduction

Digital media devices and use of Internet have become indispensable parts of our daily lives. We are getting more dependent to these technologies and new cohorts are born into the digital world. People



read, write, learn, communicate, and meet new people by use of Internet in a rapid and easy fashion. Therefore, many countries put into practice new policies supporting and enhancing e-state applications, digital media literacy and the use of Internet and digital media in schools (Karakuş, Çağiltay, Kaşıkçı, Kurşuncu, & Ogan, 2014). Although, there has been an inequality of opportunities in accessing to Information and Communication Technologies (ICT) in terms of age, gender, educational level and geographical regions etc. (Öztürk, 2005); recently we have been surrounded by digital revolution.

### **1.1. The Current Situation in Turkey**

As for the case of Turkey, access to and use of ICT have been increasing in the last decade. The onset age of Internet use is mostly 7-10 (45,9%), which is similar to European Union. On the other hand, the percentage of children who start using Internet earlier than age 7 is nearly five times higher in Europe (13, 3 %) compared to Turkey (2,6 %) (Karakuş et al., 2014). Besides, for the 36,2% of children the average time spent on Internet is one hour daily. In Europe the number of children reporting use of Internet more than 2 hours is about three times higher than Turkey.

Parallel to this, according to the “Digital in 2016” January Report, in Turkey, populated 79 million, 86% of the population (71 million) has mobile phones and %56 of the mobile phones are smart phones the average duration spent on Internet via smart phones is 2 hours and 35 minutes. Besides, % 11 of the population own tablet PCs eligible for Internet access.

In the light of the same report, in Turkey, the number of users of Internet is 46,3 million that is the 58% of the population. The number of people who use mobile Internet is 40.5 million (51% of the population). As for the using habits, it was reported that the 77% of the population of Turkey access Internet everyday and the major share belongs to social media use. Forty two million people, who are the 53 % of the population, are social media users. About 19% of social media users are youngsters who are aged between 13 and 19. The mostly used social media application is facebook and 32 % of social media users in Turkey have active facebook accounts. Additionally, 28% of social media users report playing games on mobile devices.

The increase in ICT use is an expected situation in the digital age we live. Accordingly in the last decade Internet use has become a daily routine of Turkish children (Karakuş et al., 2014). In this respect, children deserve special attention for their ICT preferences. In Turkey, it was declared that 48.5 % of children under age of 10 use Internet for searching educational materials, playing games and chatting (Karakuş et al., 2014). In Istanbul, 219 elementary school children reported that on average they spend 2,5 hours daily on playing computer games (Şar, 2012).

Computer games are significant sources of entertainment and today they are accessible for many even by use of mobile devices. Although, children reported they preferred computer games as a form of playing, excessive use of computer games was associated with health problems (headache, fatigue etc.), psychosocial issues such as depression, social isolation and self-esteem concerns (Mitchell & Savill-Smith, 2004). Besides, in the literature, some negative effects of non-educative computer games, such as game addiction, attention deficits, violence vulnerability and cyber bullying have been reported (Anderson & Bushman, 2001; Bartholow & Anderson, 2002; Ferguson, 2007, 2013; Gentile, Lynch, Linder, & Walsh, 2004).

Difficulties in regulating the amount of time spent while playing games (Ogletree & Drake, 2007) was also reported as another negative effect of digital computer games. However, it is not reasonable or possible to try to raise youngsters in isolated environments. Therefore, focusing on the adaptive uses of digital media –specifically games- in lives of children becomes a vital issue. It may be possible to change or at least manage the current situation by designing computer games that will be both entertaining and educative (Kavaklı, Akçura, & Thorne, 2004).

In the last decade, use of computer games for educational purposes became very popular. Two categories of computer games were used for supporting learning. The first group is commercial entertainment games and the second group is serious games (SG) (Sousa et al., 2016). The second group of games is primarily designed for educational purposes, in playing those games the player is expected to achieve learning tasks through a fun experience. The fun experience motivates the players to engage and suspend in playing computer games. So, SGs by several factors like storyboard, graphics, usability, collaboration/competition mechanisms and interaction devices, keep the players on the game. At the same time, by structuring the educational content and organizing its presentation they facilitate content learning (Mortara et al., 2014).

In the light of increasing rates of Internet use among youngsters in Turkey, our aim is to discuss the possibility of making advantage of educational computer games in history education and introduce a model serious game that has been generated as a part of a larger history education project. In the following we discussed the use of educational computer games in history education and introduced the model game named “History Guards”.

## **2. Computer Games and History Education**

Previously, we mentioned that the literature is cautious on the negative effects of computer games (Ferguson, 2007). Besides, some scholars argue that there are barriers to do research on how games are actually used in teaching. The technological restrictions, physical conditions (classroom size, lesson duration etc.), computer skills of users and the hesitations of teachers, parents, school principles and students to adapt recreational games may limit the practical use of games in educational settings (Backlund, & Hendrix, 2013).

Notwithstanding, educational computer games have been used as effective educational tools for years (Egenfeldt-Nielsen, Smith, & Tosca, 2016). Modern theories of learning suggest that learning is most effective when it is active, experiential, situated, problem-based and providing immediate feedback. Games seem to have these suggested features of learning by modern theories. That is, in games learning is active, experiential, situated, problem-based and provides immediate feedback to the player (Boyle, Connolly & Hainey, 2011 as cited in Connolly, Boyle, MacArthur, Hainey & Boyle, 2012).

There are promising findings related to the positive effects of computer games (Granic, Lobel, & Engels, 2014). In a systematic literature review of 129 studies it is concluded that playing computer games had perceptual, cognitive, behavioral, affective and motivational impacts and outcomes. According to the most frequently reported finding, playing computer games influenced knowledge acquisition/content understanding and affective and motivational outcomes (Connolly et al., 2012). Pillay (2003) states that playing entertaining computer games may have positive effects on computer-based

educational task performance of children. For example, linear cause-and-effect games may help students to learn to use means-end analysis strategy effectively, whereas playing adventure games may facilitate inferential and proactive thinking. As for the subjects that have abstract curriculum content such as math, exploratory interactive games were useful. Interactive games were used to facilitate the critical thinking and creativity of college students (Mitchell & Savill-Smith, 2004).

History-themed games and simulations have been used in classroom context for a long time yet over the last few decades history-themed video games have developed continuously (McCall, 2016). In the recent years besides the classroom applications, educational games including history-themed games have become available in mobile platforms. Therefore, active learning with fun has been facilitated. Mobile games are “embedded, downloaded, or networked games conducted in handled devices” (Jeong & Kim, 2009, p. 290). These mobile devices are smartphones, tablet PCs, personal digital assistants (PDA) etc. (Jeong & Kim, 2009).

The use of mobile games has become very common depending on the mobility, accessibility, networkability, and simplicity of the mobile devices (Jeong & Kim, 2009). Mobile games can be played in anytime and anywhere. This feature of mobile games is very desirable for history education. In real life historical places are everywhere and any historical place such as museums, ancient ruins etc. may become learning and fun areas. In a quasi-experimental study (Huizenga, Admiraal, Akkerman, & ten Dam, 2009) conducted with 458 pupils in the first year of secondary education, pupils who played a history-themed mobile game were significantly more engaged and gained more knowledge about medieval Amsterdam than pupils who received regular project-based instruction. Yet the groups did not differ with respect to motivation for History or the Middle Ages.

In the games on history, children learn cultures, economies, politics and social systems from even small details in games, such as clothing or eating habits. Walking in a street familiarizes the player to the public life, commerce, and culture at the historical period of the game (Spring, 2015). For instance, an experimental game, called Walden, brings player to the time period between 1845 and 1847 and the player imitates the experiences of Henry David Thoreau during his time at Walden Pond. The player lives as him aiming to survive in an aesthetic country life. The activities of daily life are the script of game play, when the player survives; the game directs him/her to construct an aesthetic and contemplative life (Spring, 2015).

In history education, ‘how learning is influenced by use of computer games?’ is an important question. Squire (2004) revealed that the game itself was not the most important variable when evaluating the role of gameplay experience in learning about world history. Rather, the most important thing was how game playing fostered learning activities and group interactions on learning. When a game is used for learning, not the game itself but the discussions, critiques, inquiries over the game were the most influential factor in learning. The game was not the only means to help students learn about history; instead it initiated the investigations of students by using other means such as asking questions on history and geography.

Similarly, the third-generation approach in educational use of computer games argues that instead concentrating on the objectives of an individual game, gaming use should be considered as a broader process. In the social context of learning the content of the game is less important. What important is the students’ engagement with the game and how they learn in process. The role of the teacher is mediating

students on connecting the game objectives and real school activities, asking the right questions and going to right places (Egenfeldt-Nielsen, 2007).

In the following, we introduced a history-themed mobile game that has been designed for secondary school children. This game has been generated as a part of larger project, aiming to investigate alternative educational and digital tools available in history education for secondary school curriculum. In accordance with the third-generation approach, the game focuses on the history learning process of children and assigns mediator role to the teachers.

### **3. A Model Mobile Game: History Guards**

This is a mobile serious game and available in different mobile platforms. The aim of the game is teaching students historical facts by assigning them duties in real life environments, primarily on historical sites. The game, since it is a mobile and interactive game, can be played both in classroom and in historical places.

As a pilot module, the game has been generated for 6th grade children in selected historical sites in Istanbul. The role of the player is to fulfill the assigned duties. Teachers take part in the game as mediators, they decide on the duties corresponding to curriculum and learning objectives.

Initially the students under the supervision of teachers download the game to personal mobile devices. In Turkey, the Ministry of Education has supported the use of tablet PCs in education and by a countrywide project students had free access to tablet PCs. Therefore, the students can freely access and use personal mobile devices. For playing the game, the role of teachers and the book used in history education is critical. Teachers help students to effectively use the book and correctly understand the instructions for a duty.

To start playing the game, students use Quick Response Codes (QRC) of a museum, monument etc. on their books. Activation of QR code means the duty is assigned. Since then teachers can monitor students and professionally help them when needed.

#### **3.1. Characters**

In developing a game for learning, relevant historical narrative must be the main focus and the historical facts must come before game mechanics (Spring, 2015). This game is a serious game that it is educative and entertaining at the same time. In designing a game the perspective of the player is the most important factor and the player should have fun during the game (Schell, 2008). Therefore, in designing the game the students have been expected to have fun and learn about both historical facts and how to preserve the historical sites including museums. The characters in the game were chosen according to these purposes. The characters are:

thieves: people who want to steal historical pieces

vandals: people who want to destroy historical pieces in purpose

clumsies: people who may destroy historical pieces since they are careless

visitors: people who want to learn about historical pieces

experts: people who are knowledgeable about history and help the visitors when asked

### 3.2 Bonuses

While designing a game the designer should ask ‘What experience do I want the player to have?’ ‘What is essential to that experience?’ and ‘How can my game capture that essence?’ (Schell, 2008, p.21). In *History Guards*, the general aim of the player is to learn historical facts and keeping historical sites safe from thieves, vandals or clumsies. To achieve this aim three kinds of bonuses were defined in the game.

1. Money: When a player gets money bonus, it can be used for asking a question to an expert or paying for any need of the historical place/piece
2. Catching Nest: used to catch thieves and vandals
3. Warning Token: used to warn clumsies

In the beginning of the game all players have a pre-determined amounts of each bonuses. During the game, the players win bonuses when they catch a thief, stop a vandal or warn a clumsy. The players get a money bonus when they answered an expert question correctly or solved a puzzle. Players use money bonus to consult an expert, after consulting, in turn the expert asks players a new question. If they know the answer, they earn doubled bonus. The money bonus is also used for the needs of the historical sites such as new inventory, physical reservation needs etc.

This model mobile game has been generated for secondary school children. It is part of a larger project, aiming to investigate alternative educational and digital tools available in history education for secondary school curriculum. Although the pilot work has been doing for 6<sup>th</sup> graders attending a public school in Istanbul, the findings are not conclusive yet.

### 4. Conclusions

Playing online or offline games daily is a regular activity for most of the school age children. In the literature negative effects of excessive use of computer games have been reported for years (Ferguson, 2013). However, there are finding related to effective uses of computer games in education (Backlund & Hendrix, 2013; Koutromanos & Avraamidou, 2014). Using digital technology, specifically the games in education, supports learning by entertaining. Besides, digital devices are becoming indispensable in our daily lives, so especially for children, adults should supervise them on using digital media in adaptive ways such as playing a serious game or searching on the Internet for a school project.

The study drawing a current picture of Turkey on digital media use, aimed to propose a model mobile game in history education. In education mobile technologies have a couple of advantages such as mobility, information management capacity and beaming capability to share information instantly and in real time (Kim, Mims, & Holmes, 2006; cited in Koutromanos & Avraamidou, 2014).

From a macro point of view, in Turkey, the primary responsibility to alleviate inequality of opportunities in access to digital media technologies in terms of age, gender, educational level and geographical regions etc. belongs to the governmental policies. In microsystemic reality, teachers may work as access agents by using digital media in their instructional practices. Beside teachers using mobile wireless devices for managing their schedules, reviewing student marks, accessing central school data,

attendance reporting, and providing course material; they may also use these technologies, to refine the quality of teaching and learning (Koutromanos & Avraamidou, 2014).

“*History Guards*” is a micro level initiative to use mobile technologies in history education in daily practice of secondary school teachers. It has been generated as part of a larger project, aiming to investigate adaptive educational and digital tools in history education for secondary school curriculum. In learning history, games must be considered separately than the other media such as films or texts. The reason that in games the historical agent (the player/the student), similar to real life, has a choice. Both in real life and in the game that choice may affect the story and consequences. “...This is an important part of teaching history... Accordingly, high quality historical games, with their focus on choice and consequence can be an important part of teaching history.” (McCall, 2016, p.8).

According to that, finally, in designing a high quality serious game, multidisciplinary collaboration of experts is a necessity. Experts such as educators, art directors, game designers, scriptwriters, software developers, graphic and sound designers have specific competences, skills and roles, which are crucial in designing a serious game (Mortara et al., 2014). By the help of effective collaborations, the final version of a serious game would be technically and pedagogically robust.

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