Chapter 17

Impact of Kinect Exergame on Mental Computation Speed and Achievement

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ABSTRACT

The aim of this study was to investigate the effects of kinesthetic educational game on students’ mental computation speed and achievement. The participants were 63 students. The working group was divided into two separate groups as experimental and control groups. The pre-test developed by the researchers was applied to measure prior knowledge of the students in the beginning of the experimental process. In the following eight weeks, computer-based and kinesthetic educational games were applied to the experimental and control group. During playing the games, number of correct answers and completion time were recorded and the post-test was applied. According to results, the mathematical performance and mental computation speed of the experimental group is higher than the performance and speed of the control group. When the findings about the game completion time of experimental group evaluated, the time of the first game is longer than the time of the last game. And also, the scores of the last game is higher than the scores of the first game.

INTRODUCTION

Today’s children have grown up with the opportunities of the internet and digital technology. They have new technological tools such as podcasts, cell phones, iPods, skype and iPads. We begin to understand that processing information, learning, socializing and playing games of this generation meeting technology at an early age are different from our generation. The student generation called “Digital Natives” or “The N Generation” finds technological tools such as developing video games and the internet engaging (Prensky, 2001). In the last decade, computer and video games have been popular especially among
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children and young people. According to surveys performed with young people in various countries, it is revealed that children expend most of their time in media (Blumberg, Blades, & Oates, 2013). Chen (2007) reveals that the annual income of video game industry containing game playing population with 10-34 years old people is as high as 15 billion in the United States. In the study conducted by Rideout, Foehr, and Roberts (2010), they state that average time of playing video game is about 1.15 hours among the American young people between 8 and 18 years old and the time period used for playing game has been rising recently; 24 min. in 1999, 49 min. 2004 and 73 min. in 2009. Vandercammen and Vandenbrande (2011) reported that the time per day spent for game by Belgian youngsters is about 1.20 hour while the time is 1.61 for Dutch youngsters. Gentile et al., 2011 stated that 83% of adolescents and children play game at least time to time in Singapore in 2011. In addition, it was revealed that online games were played by more than half of junior high school Taiwanese students (Tarng & Tsai, 2010). On the other hand, a rapid increase in the number of digital player profile is observed in Turkey.

Game-Based Learning

For hundred years, people around the world have enjoyed all kinds of games from the simplest one to the most difficult game and they are successful in terms of being appealing, entertaining and attractive for our attention. A game can be described as ‘a mental or physical contest or activity with rules which people play for entertainment (Merriam-Webster, 2015). As simply defined, games are specified as mental or physical activities with their own rules which function for success of player. Popularity of games among people attracted the attention of researchers and government offices and the usability of games for educational and instructional purposes became a subject of research. This led to the development of serious games (Davis & Whittinghill, 2011). Serious games can be defined as ‘a game played for the purposes of instruction, training, education and other practical issues rather than complete entertainment objectives’ (Susi, Johannesson & Backland, 2007). The first educational use of digital games was seen in 1971 when the game The Oregon Trail was created by three Carleton College students and the game was then put on the market in the state and general public by the Minnesota Educational Computer Consortium (MECC). Other classic games including Lemonade Stand (1973, 1979), Snooper Troops (1982), Where in the World is Carmen Sandiego (1985), Math Blaster (1986), and Jumpstart (1994) displayed the alternative choices for learning instead of laboratory activities and traditional classroom lectures (Cheng, 2014).

Many studies are conducted about how the efficiency of educational computer games will be when they are used as a learning tool. The results of the studies reveal that using games in learning increases learners’ motivation, engagement, interest, higher order thinking skills, achievement and learning (Ketelhut, et al., 2006; Prensky & Thiagarajan, 2007). Playing a game does not only charm us but also needs skills such as time management, critical thinking, solving a problem and other educational activities due to the rules placed in games (Gee, 2008; Prensky, 2007). Gee (2003) suggests that students already have these abilities and thus they require being located in a game platform. Even if students have these skills, they do not demonstrate them in a traditional classroom learning environment at schools. The students having no interest in classroom and no willing to learn can play the games that are cognitively challenging and exhausting for hours outside school (Gee, 2003; Prensky, 2007).

Well then, although students can be eagerly absorbed with high level cognitive processing during game playing, why can’t they do this in classroom environment? Marc Prensky (2007) explains this situation in detail like that games fascinate us because they are different, interactive, entertaining, obtain open
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