THE IMPACT OF VIDEO GAMES IN EDUCATION: A FRAMEWORK

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Abstract
The aim of this research is to identify the impact of video games in education. This paper proposes a framework to identify the impact of video games. In order to achieve this aim, the proposed framework identifies the advantages of video games in education, as well as the disadvantages of video games in education. As a result, the study reveals the significance of video games in education. This paper is also expected to act as preliminary information on the effects of video games in education.
Keywords: Video games, education, skills, health, computer video games

1. Introduction

One of tool for entertaining is video games. The video games existed despite of technology and people easy can plays it either using computer or mobile device. This situation makes video games turn out as a one of trend around a world. According to Adachi, 2017, video games to be continue popular among youth with 97% of U.S boys and girls playing these games. Video games can be defined as any of various interactive games played using a specialized electronic gaming or a computer or mobile device and a television or other display screen along with a means to control graphic images (Dictionary.com). As a known, the most popular population that plays video games is the teenagers. The rate of internet usage are increased has led to different changes in our daily lives than ever before. The rise in internet usage has also resulted in a growing population of video games. Video games are games that can be played virtually through computers or other gadgets such as mobile phones that require internet connection to access them. Video games that use the internet require a high speed limit to access the game's connection. Video game hardware such as Xbox and Play stations are required to connect to the internet. The 3-D animation graphic and also the exceptional sound effects in video games have a strong appeal towards the players in addicted to playing video games. There are many researches that have been conducted to study the lifestyle and behavior of video gamers especially among children and adolescents. However, video games receive more negative opinions than positive opinions as video games are more closely related to entertainment and social. This situation has conducted much research that related to education and the impact for adolescents.

In this research, we had identified some of the issue on the video games in education. There is countless research regarding video games such as affect-based adaptation of applied video games for educational purposes by Bontchev (2017) and social argumentation in online synchronous communities by Alagoz (2013). However,

there is limited study focus on impact of video games in education. Besides that, it is difficult to gain information about the advantages of video games in education because half of research studies focus more to disadvantages of video games. This issue has supported by Adachi (2017), where he said that 'although many studies have examined the impact of video games on negative outcomes such as aggression and addiction, fewer studies have investigated potential positive outcomes'.

The aim of this research is to identify the impact of video games in education. In order to achieve this aim, the proposed framework identifies the advantages of video games in education, as well as the disadvantages of video games in education. The remainder of this paper is organized as follows. Section 2 is literature review. Proposed framework is in Section 3. Final section contains some concluding remarks.

2. Literature Review

This research is expected to identify the impact of video games used in an education, which had come out with two variables; advantages and disadvantages in education. For the advantages of video games in education, we had found two keys which are develop a skill and emotion of players, which are very useful to help the students from different level of education in their studies development. Meanwhile, for the disadvantages of video games in education, we found another three keys which are health, behavior and academic performance.

2.1 Advantages of video games in education

According to Adanchi and Wiloughby(2017), playing video games may enhance problem solving by encourage players to stop, examine their situation and consider different strategies before continue. This situation had taught students to think first and find strategies before they solve the problem. Next, according to Alagoz(2013), they also develop twenty first century skills likes argumentation, collaboration and soft skills. Based on article Frydenberg(2015), video games can develop student a digital literacy skills because students need to know a programming of video games, the content and etc to create a new games and automatically showed their skill and level of understanding in digital literacy. Besides that, several author mention about skill that related on information literacy skill that students get possess from video games. Waelchi(2008) he said and 'describes a project where instruction librarians at the University of Dubuque used analogies from fantasy football to introduce athletes to the information literacy skills they already had'. The successful of students depends on skills that they had and this is proof by Noguiera et al (2013), the most significant effect on the achievement of immersion in video games is accomplished by keeping a balance between challenges and skills.

Game researchers apply various techniques for recognition of human emotions, such as the analysis of players' responses, self-reports, emotional inference based on facial or gesture expressions and measurement of changes in player's psychophysiological (Kivikangas *et al.*, 2011). The game developer need to control player emotion that can make players able to increase attention, interest and sense of satisfaction. In the article Bontchev and Vassileva (2017), those both focus on method

using facial expressions. They also introduce Rush for Gold as a method to judgment of task and performance through facial expression. 'Rush for Gold was specially conceived as an action video game aiming at implicit recognition of PS using player metrics, intended to be used further for style-based adaptation of educational maze games (Bontchev, 2015)'. Rush for God was introduced by two ways of adaption which are player performance and player effect. Besides that, in the article Adachi and Willoughby (2017), they used self- determination theory (SDT) to examined player performance and emotion. SDT was applied to video games with students to examine their satisfied that related to emotional. SDT also examined how playing video games related to self-exploration.

2.2 Disadvantages of video games in education

According to Bright & Bringhurst, (1992), the side effects of impressive played of video games is closely related to the effects of health problems such as physical pain. Health problems such as joint pain, muscular tissue and skin problems are negative affected of video games that argued by Gunawardhana & Palaniappan, (2015) and also supported by Loftus & Loftus, (1993). Health problems such as "Nintendinitis" or Nintendo thumb problems can also come over how often to play video games (Brasington, 1990; Siegal, 1991) and also argued by Gunawardhana & Palaniappan, (2015). Lastly, video game also gives bad effect to ears and this fact is argued by Pettersson, (2012). He said his experiments found that video game player mostly will experienced to face hearing problems because the experiments were made that students could not clearly hear instructions from their lecturers after played video games because their hearing was still focused on instructions from the video game.

A video game created a big effect on behavior. According to (Colwell & Payne, 2000; Funk, Buchanan & Germann, 2000; Colwell and Kato, 2003; Gentile, Lynch, Linder & Walsh, 2004; Krahe & Moller, 2004; Anderson, Gentile & Buckley, 2007), various studies have been conducted and among them is the percentage of children being the highest level of video game impact on their aggressive behavior after often playing violent video games. Meanwhile, Boyce et al, (2012) also came out with the same point that is the violent video game is closely linked to the aggressive behavior enhancement among children and adolescents. Based on Gunawardhana & Palaniappan's argument, (2015), he has revealed that there are 90% of video games in the market have elements of violence. Video games with this element of violence can imply personal children and adolescents towards bad personalities. Additionally, the concept of hostility also exists when children and teens are often browsed video games that are themed by this gossip. Last but not least, the fact that played violent video games can affect a person act aggressively or abusively (Rahman, 2016).

Academic achievement can also be interpreted as the degree of achievement for students in educational institutions either in the short or long term. (McLean & Griffiths, 2013; Anand, 2007), pointed out that the growing use of video games among college students, has declined the academic performance of college students in the US. Meanwhile, (Anand, 2007; Anderson & Dill, 2000; Anderson, et al 2007; Gentile, et al, 2014) also come out with the same opinion that playing video games is also also greatly

affect students' achievement in school. According to the Pettersson, (2012), he said that there was a student advisor known as Vince Repesh at the University of Minnesota Duluth, and he said that, at least five students in a year would come to his office, due to their academic problems as a result of playing video games. He stated that there were students who successfully to achieve great 'A' in academics and at the end of his academic he got a grade 'F' in their academic achievement and this is effects of playing a video game called World of Warcraft (Somaiya, 2009; Lee et al, 2007; Yee, 2002). Last but not least, playing violent video games among students will affect the students` academic performance and profession if no further actions taken to minimize or prevent this from happening (Rahman, 2016).

Table 1. Analysis of review.

Authors	Advantages of video games in education	Disadvantages of video games in education
Aaron Boyce … [et al.] (2012)		Behavior
Adachi, Paul J.C. & Wiloughby, Teena. (2017)	• Develop a skills • Emotion of player	
Anand, (2007)		Academic Performance
Anderson & Dill, (2000)		Academic Performance
Bontchev, B & Vassileva, D. (2017)	• Develop a skills • Emotion of player	
Bright & Bringhurst, (1992)		Health
Broussard, Mary J. Snyder (2012)	Develop a skills	
Frydenberg, Mark (2015)	Develop a skills	
Gentile, et al, (2014)		Academic Performance
K. Pulasthi & Sellappan, (2015)		• Health • Behavior
Khandaker, (2016)		• Behavior • Academic Performance
Lavinia & Mark, (2013)		• Health • Behavior • Academic Performance
Lee et al, (2007)		Academic Performance
Loftus & Loftus, (1993)		Health
Martin, Crystle & Martinez, Ryan (2016)	Develop a skills	
Pettersson, (2012)		• Health

		• Academic Performance
Somaiya, (2009)		Academic Performance

3. Proposed framework

As known dependent variable is a variable that depends on other parts mean whiles independent variable that stand alone and it does not change by other variable. From the framework design below, it is the result from analysis of the literature review based on our topic title The Impact of Video Games in Education. The Impact of Video Games in Education is a dependent variable and there are two of independent variable that consist of benefit and disadvantages of video games in education.
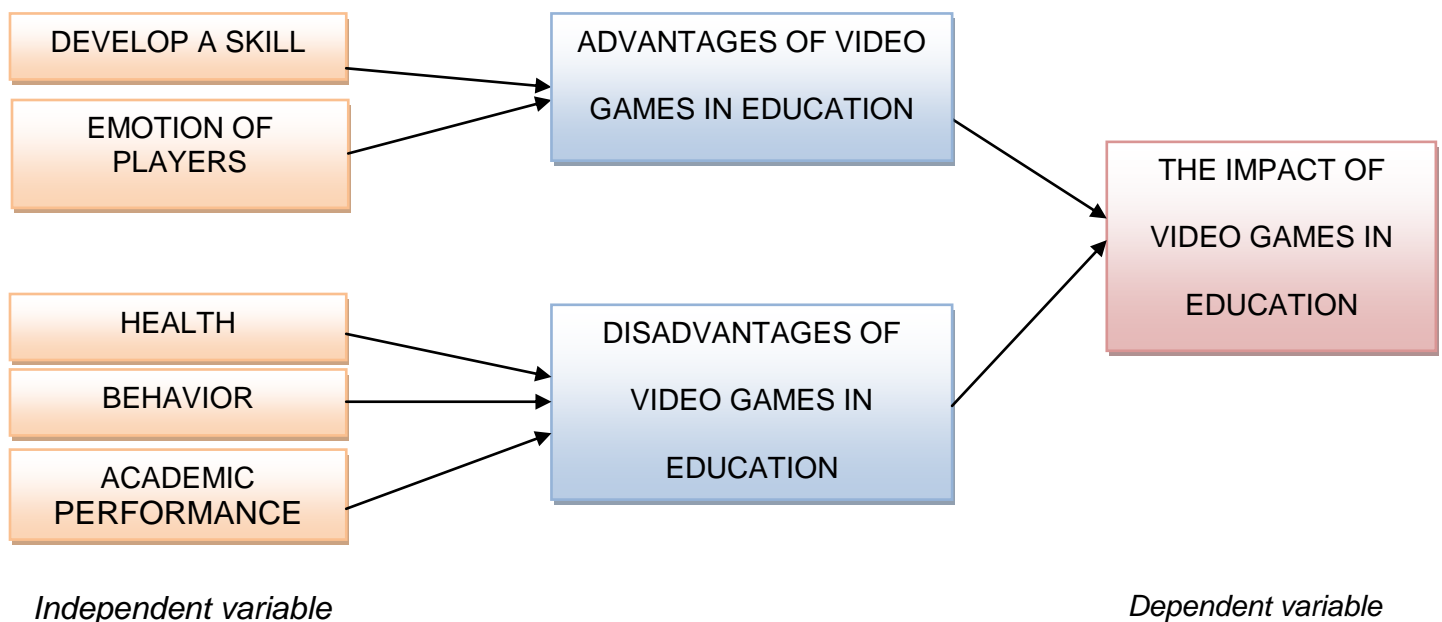
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DEVELOP A SKILL          ADVANTAGES OF VIDEO
                         GAMES IN EDUCATION
EMOTION OF                                          THE IMPACT OF
PLAYERS                                             VIDEO GAMES IN
                                                    EDUCATION
HEALTH                   DISADVANTAGES OF
                         VIDEO GAMES IN
BEHAVIOR                 EDUCATION

ACADEMIC
PERFORMANCE
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Independent variable   *Dependent variable*

Figure 1. Conceptual Framework on the impact of video games in education.

4. Conclusion

There are had benefit that we can get from video games even though many studies have showed negative impacts. The previous studies had mentioned that video games are not just a tool in education but we can learn something from it such as develop or improve skills. The studies also give opportunities to us to get the information and understanding more about video games. The author also point out and suggest some example online games to us. As Charsky (2010), there is no formula for good educational games, as games come in such a plethora of form. Video games

cannot be destroyed, but can be controlled if they do not require having a negative impact on education. In addition to the effects of video games, the issue of addicted to video games is the concern of many parties and this has led to wasting of money and free time (McLean & Griffiths, 2013). According to Gunawardhana & Palaniappan, (2015), they state that there are good and bad effects of the new technological advances in this modern era. However, he said that video games will have a good impact on various aspects if the use is also used in the right manner. Meanwhile, Rahman, (2016), also supported the statement that is video game having their own well and bad effects to the player but he said there is no 100% authentic data or evidence that played a violent video game will encouraged players to engaged in crime.

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