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POSSIBILITY OF USING SOMATOSENSORY VIDEOGAMES TO PROMOTE ZERO HOUR PHYSICAL EDUCATION IN ELEMENTARY SCHOOLS IN TAIWAN: A QUALITATIVE PERSPECTIVE

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ABSTRACT: The purpose of study is to explore how the somatosensory videogames effecting life-effectiveness and its influence on schoolchild' social networking on a zero hour physical education sessions in Taiwan. Participants in this study were students, teachers, and parents in two elementary schools in northern and central Taiwan. Students were voluntarily agreed to complete 30-minute Xbox 360 Kinect game one time a week for total of 4 weeks. Semi-structured interviews were conducted to collect information from participants regarding their subjective attitude and experience about life-effectiveness, team collaboration, and gaming pleasure during somatosensory videogame sessions. Participant observations were also conduct to understand their real behaviors, feelings and interactions during this zero hour physical education session. The results showed that using the somatosensory videogames could positively arouse their self-awareness and competitive attitudes. In addition, the scores in the somatosensory videogames could have equivocal effects on the team collaborations of students due to the social relations in their real life. The results of the study help us to understand how the somatosensory videogames is a tool to construct the social interactions and life-effectiveness on elementary school students in real life. It is worth to develop zero hour physical education classes in elementary schools in Taiwan.

Key words: Somatosensory videogames, zero hour physical education, Xbox 360 kinect

INTRODUCTION

Physical education (PE) in schools is one of the major opportunities to promote physical activities for children in school age. However, PE in elementary schools is not adequately playing this role in Taiwan. Teachers often have challenges to design physical education program to motivate students. Most of school administration and teachers focus on improving academic performances in examinations, such as English, history, and mathematic. This causes decreasing/eliminating children participating physical activities during the school day (Wilkins et al, 2003). Therefore, developing diverse PE programs and adding more health-related PE programs in school hours have are strongly needed in Taiwan. "Zero Hour Physical Education" (Zero Hour, PE) is a PE class before the first period of each school day begins. Researchers argued that students' reading comprehension can

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significantly improve 17% after participating long-term Zero Hour, PE (Ratey & Hagerman, 2009). Marashian and Khoraml (2012) also found that schoolchild could increase academic self-concept and reduced loneliness after one month and 45 minutes physical exercises in their early mornings.

With dramatic advances of technology, video game had changed from "static play" to "active play". Playing video game seems to have positive potentials for schoolchild. Ballaz, Robert, Lemay, and Prince (2011) used Wii Fit on aged 7-11 years old children with cerebral palsy (CP) and found that these children with CP had strong interests and showed similar responses than their healthy counterpart. In terms of social interaction, Chiang, Lee, Frey, McCormick (2004) used popular videogame "DDR" to train children with high-functioning autistic spectrum disorders (HFASDs) for 3-6 weeks and found that youth with HFASDs who were able to teach peers without HFASDs could improve some components of their friendship quality and peer recognition.

The incorporation of somatosensory videogames (SVG), such as Wii Fit, DDR, Xbox 360 Kinect, into physical education for schoolchild is believed to enhance individuals' motivation to join group activities. Marijke et al. (2008) presented that the multiplayer groups had more motivation to play interactive dance simulation video games than the home group. Peer-based playing is an important key in playing video games. According to Olson (2010), the major motivation of children playing videogames is not a variety of game designs but its opportunities for them to make friends. Staiano and Calvert (2011) also mentioned that playing exergame with peers could influence friendship selection, self-esteem, moods, and motivation. Most of the previous studies focus on physical or mental effects of videogame on students; however, there was a noticeable absence of research projects dealing with how SVG effecting life-effectiveness and its influence on children's social networking on a Zero Hour, PE. Thus, the purpose of this study is to understand their behaviors, feelings and interactions when playing SVG during zero hour, PE session.

METHODS

Participants

Sixty-two students enrolled in two northern and central elementary schools in Taiwan participate voluntarily. Twenty-seven students (44%) in central Taiwan were 5th graders and 35 students (56%) in northern Taiwan were 6th graders. In order to respect personal rights in making decision of their own, all experimental procedures were pre-approval and consented by their parents, instructors, and school authorities.

Procedures

Participants agreed to complete 4-week SVG programs one time per week, for 30 minutes during zero hour times. The study utilized "Xbox-360 Kinect" to be an interventional tool. Four games, Body clock, Balloon Buster, Car management exercise, Mouse mayhem were chosen games in "Dr. Kawashima's Body and Brain Exercise". Table 1 and figure 1-4 showed the SVG programs in this study.

Table 1. Intervention Program

Time	SVG program
Week1	Body clock
Week2	Balloon Buster
Week3	Car management exercise
Week4	Mouse mayhem

Figure 1. Body clock

Figure 2. Balloon Buster

Figure 3. Car management Exercice

Figure 4. Mouse Mayhem

MEASUREMENT

The sources of data included semi-structured interviews from 62 children, one parents and 3 teachers, daily observation of investigators, and stimulus recall reports of investigators. Individual interviews were conducted at the end of the 4-week SVG programs. An interview guide and recall reports contained open-ended questions, was developed by the research team. The specific questions that were conducted to collect information from participants regarding their subjective attitudes and experiences about life-effectiveness, team collaboration, and gaming pleasure during SVG sessions. Major questions from the interview guide are shown in Table 2.

Table 2. Guiding Questions

Subject	Question
Children (N = 62)	1. Please tell me how you feel about the SVG program? 2. How satisfied are you participating the SVG program? 3. Are there any other feedback or thoughts you what to share? 4. Describe how participating the SVG changed your peer relationship. 5. Describe how participating the SVG changed your life. 6. Tell me about which part of SVG game you like the most? 7. Do you want to take apart in this SVG again?
Parents (N = 1)	1. Please describe which part of the SVG makes you impressed? 2. Please describe your thoughts about the necessity of SVG. 3. Are there any other feedback or thoughts you what to share? 4. Please describe any behavior changes after your children participated in the SVG.
Teachers* (N = 3)	1. Please describe which part of the SVG makes you impressed? 2. Are there any other feedback or thoughts you what to share? 3. Please describe your thoughts about the necessity of SVG. 4. How satisfied are you participating the SVG? 5. Would you recommend the SVG to the schoolchild in elementary? 6. Do you discover any behavior changed from your student?
Investigators** (N = 3)	1. Please describe students' peer appraisal feedback. 2. Please describe the peer interaction when taking apart in the SVG program. 3. Please describe the students'emotional reactions when taking apart in the SVG program. And what is the major reasons result in this emotional reactions? 4. Please describe the impact of SVG to the students in elementary

* Three teachers are Guo (G), Wang (W) and Chen (C)
** Three investigators are Tsai (T), Fu (F), and Wu (W)

Data analysis

Qualitative data were analyzed by content analysis. In the process of analyzing the data, the study read through each response from students, teachers, parents and investigators. Then, the responses were categorized and conceptualized by the authors based on independent interpretation. Categorizations were then discussed in each recurring themes.

RESULTS AND FINDINGS

After analyzing the qualitative data, three knowledge categories emerged: (a) Life-Effectiveness, (b) Group cohesion, and (c) Game enjoyment. In addition, the findings of each categories are consisted of unique subsidiary categories. For instance, Life-Effectiveness can be divided into two subsidiary categories: Self-confidence and Social competence; Group cohesion can be divided into two subsidiary categories: Positive collaboration and Negative competition; Game enjoyment be divided into two subsidiary categories: Auditory or visual stimulation/immediate response and Satisfaction from their improvement of game scores The category structures are shown in Table 3.

Table 3. Category Structures

Category	Subsidiary categories
a. Life-Effectiveness	1. Self-confidence
	2. Social competence
b. Group cohesion	1. Positive collaboration
	2. Negative competition
c. Game enjoyment	1. Auditory or visual stimulation/immediate response
	2. Satisfaction from their improvement of game scores

Life-Effectiveness

Life-Effectiveness is a person's ability to adjust their behavior through the targeted intervention programs. Eight general measurements of Life-Effectiveness have been described in the literature, including time management, social competence, achievement motivation, intellectual flexibility, task leadership, emotional control, active initiative and self-confidence (Neill, Marsh, & Richards, 1997). During the evaluation of the responses, two subsidiary categories emerged. One related to the self-confidence concept that being expressed by interviewees:

"I consider that these young children not only understand how to finish their won mission in times but also strive themselves to be the best performance when playing Xbox...They seemed to pursue the applause from other classmates." (I_W)

"The students who have had lower academic performance improve their self-confidence and achievement after participating somatosensory videogame…Those kids have changed their attitude from rejecting to accepting toward this activity." (I_F)

Such comments would have been viewed as that schoolchild not only developed their life effectiveness skills after playing SVG but also improved their self-confidence to deal with everyday life. Our finding is compatible with Funk, Chan, Brouwer, & Curtiss (2006) research, which found that 17 fourth through sixth graders who were regular video game plyers indicated that they can gain positive psychology such as self-confidence, calm down, and fantasy involvement in the game characters.

On the other hand, the vast majority of the comments from students pointed out that their social relationship has been improved after 4-week intervention. Several examples include:

"I will definitely to take apart in this course again. I think that playing videogame can foster friendships so that I consider playing video is a good leisure activity." (S_1)

"The video game makes me and my classmates have more positive communication because we can share our experience with each other how to gain better scores of video game." (S_2)

Social competence is defined as that an individual has the ability to effectively interact with social peers. In the process of intervention, SVG can create communications platform for sharing experience, feeling, and common thought with peers at the school. The results are similar to Olson, Kutner, and Warner, (2008) studies, which implied that playing video game can help the young children to structure initial conversation with potential friends. Olson (2010) also described further that some young children exchanged "cheat codes" and sharing advice on competition game. A connection with peers through SVG could be built to interact with their social network.

Group cohesion

Group cohesion is a social process that members interact with each other and frost their group members to close together (Eisenberg, 2007). Group cohesion plays an important role in team success. A variety of factors may

directly influence group cohesion such as members' similarity, group size, external competition and threats (Eisenberg, 2007). Often, when the individual shares the common events with others, the stronger of group identification will be perceived for the group members. Almost every child reflected their feelings about that they become more collaboration to work with each other. The feedback of children seems compatible with responses of interviewees, parents, and teachers. The following comments can help enlighten us on this:

"I found that these kids are more willing to help each other." (T_C)

"I found that some of kids actively taught those kids, who need further help to play videogame." (P)

These results indicated that young children could share their experience and congregate their common interests to finish the group goals in order to gain the better outcomes. The finding appears to be consistent with Lieberman's notions. Lieberman (2006) argued that young adults could develop more friendships via SVG such as DDR and Wii Fit. Through playing SVG, group members believe their group goals and become willing to collaboration with each other in order to accomplish in groups.

On the other hand, the participants talked about that playing SVG with competitive contents might generate their negative emotions, such as derision and discrimination. As one student commented:

"Some students laughed in derision at error when particular students played this game. I think the behavior is inappropriate... " (S_3)

One investigator also talked about his observation regarding students' negative emotions:

"I think some kids only focus their scores of videogame…they not only continuously compared their scores with other peers but also mocked at the people whose score of videogame is lower than his…I believe that these kids had totally forgotten playing videogame with an innocent attitude. Finally, a portion of kids had become passive to play videogame just because they didn't want to be mocked and compared." (I_W)

Such findings reveal that some children classified overall ability with their score of videogame into good or bad rankings. For some young children, game skills are viewed as crucial factor to their self-esteem and self-confidence, especially when someone has lower success in the academic performance (Olson, 2010). Boys often try to beat other down by winning popular games in order to gain better social status among peers. Funk, Chan, Brouwer, & Curtiss (2006) also indicated that some children lose their social interactions with peers due to the lack of awareness of a world around them when playing the videogame.

Game enjoyment

A number of interesting findings emerged from the feedback of participants, but the study focus on two themes concerning the game enjoyment of the SVG: Auditory or visual stimulation/immediate response and satisfaction from their improvement of game scores. For examples:

"I think that somatosensory videogame not only contains of auditory and visual stimulation but also develop immediate responses in the every physical movement. These advantages can make kids realize thier reaction ability in time. Therefore, kids are able to revise their physical movement in order to gain the better results of scores." (I_W)

"These Kids look forward to playing videogame because they have the chances to break through the highest records. They feel satisfaction from their improvement of game scores." (T_G)

SVG that contained of a fun and entertaining way for young children have potential to enhance their motivations in participating physical activities. With technology advanced, gaming technology can receive players' single by gestures and total body movement. Xbox 360 Kinect that does not need to hold any controls and senses players' movements by using infra-red to detect players' actions. These reasons may explain why many young kids choose the SVG rather than traditional videogames. In Olson et al (2007) survey, they surveyed 7th and 8th grade students of 1254 participants and found that the top three reasons of why they play videogames are "it's just fun", "it's exciting", and "something to do when bored". We can realize that game enjoyment play a key in children's motivations for gaming.

CONCLUSION

Findings of this study show that using SVG to promote zero hour physical education is a viable way in elementary school. With light and sound stimulations, SVG that combine computer games and physical activities can motivate young children to interact within gaming situations. In the process of interventions,

making friends and improving self-confidence are the two major factors for increasing the life effectiveness. Also, young children can share their experience with the common platform to congregate the group cohesion. However, SVG may also cause negative effects to their peer relationships. An area of future promoting in elementary school should be considered in avoiding negative competitions and discriminations during playing SVG.

RECOMMENDATIONS

The study of qualitative response cannot be generalized to all young children. Further study in this area should consider more targeted qualitative studies or case study in order to construct the social interactions and life-effectiveness with SVG for students in elementary school. Besides, Future works could combine diverse programs, such as outdoor recreation and life education with SVG, to promote zero hour PE in elementary schools. While this study has its limitations, it is hoped that it can serve as a basis for further study in using SVG to promote zero hour PE in elementary schools.

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