

A STUDY OF PHYSICAL EXERCISE USING THE NINTENDO DS

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ABSTRACT

The DS was released for sale in countries around the world starting in 2004, and by March 2009, it was announced that total sales had topped 100 million units[2], an all-time first for a home video game console. It was announced that sales in Japan had topped 25 million as of January 2009[3]. Additionally, according to a June 2008 study by Benesse, the DS ownership ratio among elementary and junior high school students was over 80%, with four out of every five students of such age owning one. The time 5th to 9th graders spend playing video and hand-held games on school days is at approximately 40 to 50 minutes for boys and roughly 21 to 25 minutes for girls[3]. It is clear that the DS has firmly rooted itself in young people's daily lives. It is not unusual to see a group of children who, having gathered together with their DSs, are completely absorbed in their games and barely conversing with each other. Fundamentally, people have believed that their children were playing outside dynamically and with physical movement, and it is hard to accept that they are just standing around in the park playing their video games. Be that as it may, in order for children to remain viable in our advanced information society, it is also important that they do acquire media literacy.

Keywords: *DS, Physical Exercise*

1. INTRODUCTION

Recent years have seen a remarkable spread of the Nintendo DS and rapid progress in software development. The DS, a portable video game console whose name is an acronym for "Dual Screen," is called such because its foldable console is composed of two liquid crystal display screens[1]. The DS was released for sale in countries around the world starting in 2004, and by March 2009, it was announced that total sales had topped 100 million units[2], an all-time first for a home video game console. It was announced that sales in Japan had

topped 25 million as of January 2009[3]. Additionally, according to a June 2008 study by Benesse, the DS ownership ratio among elementary and junior high school students was over 80%, with four out of every five students of such age owning one. The time 5th to 9th graders spend playing video and hand-held games on school days is at approximately 40 to 50 minutes for boys and roughly 21 to 25 minutes for girls[3]. It is clear that the DS has firmly rooted itself in young people's daily lives. It is not unusual to see a group of children who, having gathered together with their DSs, are completely absorbed in their games and barely conversing with each other. Fundamentally, people have believed that their children were playing outside dynamically and with physical movement, and it is hard to accept that they are just standing around in the park playing their video games. Be that as it may, in order for children to remain viable in our advanced information society, it is also important that they do acquire media literacy.

If we think of the spread of practical-use information and communications technology (ICT), a category that includes the DS, the functions of the DS can be seen as ICT of the future. While the DS had its start as a game console, it incorporates many functions, such as internet capabilities, a PictoChat function, a voice-recognition function, and a photo function, and it is becoming more than just a simple plaything. Its software is diversifying, with traditional video games, language study games, brainpower games, kanji (Chinese character) games, rhythm games, and health management and exercise games. Learning games, in particular, have increased. Not only do we see children who are completely absorbed in their games as previously mentioned, it is clear that there are also children who cut a different figure altogether. These children can be seen using their DSs to play tag outdoors, using the PictoChat function[4]. They have taken the simple game of tag, which can be played in a park and requires no equipment, blended it with the DS, which has become one of their fundamental means of play, and thought up "DS Tag," a new, evolved game[4]. The sight of children manipulating their DSs while running through the park, engaged in a conception entirely befitting of children living in our modern society, is one that surpasses the imagination of adults. Looking at this from the physical standpoint, an increase in opportunities to run around outside has sprung out of these children's rich conception, with the possibility of encouraging their healthy development. Moreover, in light of the issue of the recent deterioration in children's physical strength, actively seeking practical uses of ICT and the possibility for its involvement with physical exertion is of potential assistance in a focus on children's future that raises healthy children, and even more, that builds their characters.

The Japanese release of the DS in 2004 corresponds to a time five years ago when today's 19 and 20 year-old college students were 14 and 15 year-old ninth graders. Before the DS, it was a model called the Game Boy. In seeking to grasp the actual state of students who have grown up with game consoles, we focus our search on ways in which game consoles can be linked with physical activity, both as an opportunity to find new possibilities in game consoles, and, looking ahead to children's future, as one way game consoles should improve.

With the concept of the Wii, released by Nintendo in 2006, video game software stepped compellingly onto the scene with the healthy image of family exercise. Assessing students' Wii ownership status, the image produced by the Wii's game software is that the Wii is a

game console to be fixed in place indoors, and that it has become widespread in its aspect as an indoor means of physical exercise.

Accordingly, we take it upon ourselves to investigate the potential for outdoor physical exercise using the portable DS.

2. METHODS

In this study, we obtained written responses from 152 second-year university students from the department of child psychology in June, 2009 regarding the Nintendo DS and its potential for involvement in physical exertion, and also about their ownership of the Nintendo Wii.

3. RESULTS AND DISCUSSION

Among the 152 second-year university students, 97 subjects, or 64% owned a DS. Those who did not own one numbered 55 subjects, or 36%. There were fewer DS owners than we had expected.

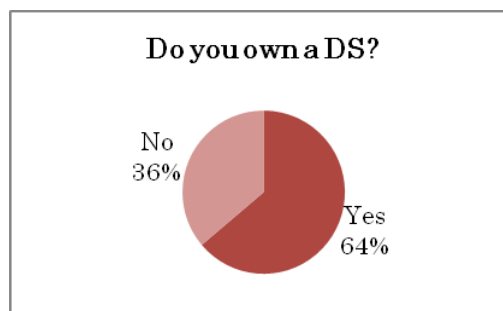


Figure 1: Do you own a DS?

Out of the 152 subjects, 31 subjects owned game software for the Wii, 29 of whom also owned a DS and 2 of whom did not. There were fewer Wii owners than we had expected.

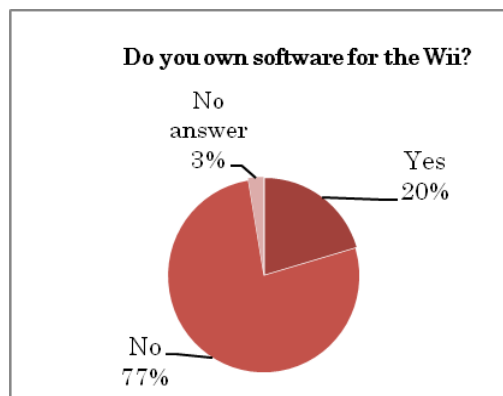


Figure 2: Do you own software for the Wii?

The relationship between DS and Wii ownership is as follows. Out of our 152 subjects, 31 subjects, or 20%, owned both consoles, 45% of the subjects owned only a DS, and 1% owned only a Wii. 34% of the subjects owned neither.

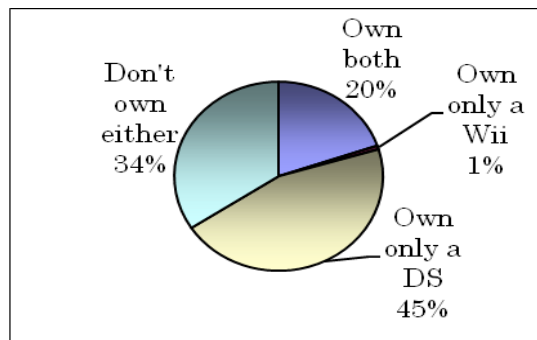


Figure 3: DS and Wii

4% of the DS software cartridges owned were traditional video games (70 subjects) 21% were brainpower games (43 subjects), 14% were rhythm games (29 subjects), 10% were language-study games (21 subjects), 10% were kanji (Chinese character) games (20 subjects), 2% were exercise games (4 subjects), and 9% were other types of games (19 subjects). Thirty-three subjects owned rhythm games and health management or exercise games, thinking that the games are related to body movement. The greatest number of subjects owned traditional video games, followed by brainpower games. It was seen that the university students had few exercise-related DS games.

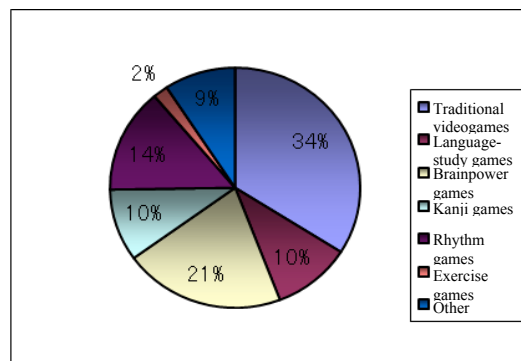


Figure 4: DS software

Table 1: Types of games owned

Traditional videogames	70
Language-study games	21
Brainpower games	43
Kanji games	20
Rhythm games	29
Exercise games	4
Other	19

The software for the Wii with the largest ownership was Wii Sports, with 17 owners. Next was Wii Fit, with 13 owners. Games related to physical exercise comprised over half of the

games owned. It became evident that a large number of subjects owned game software related to exercise, just as Nintendo had planned it.

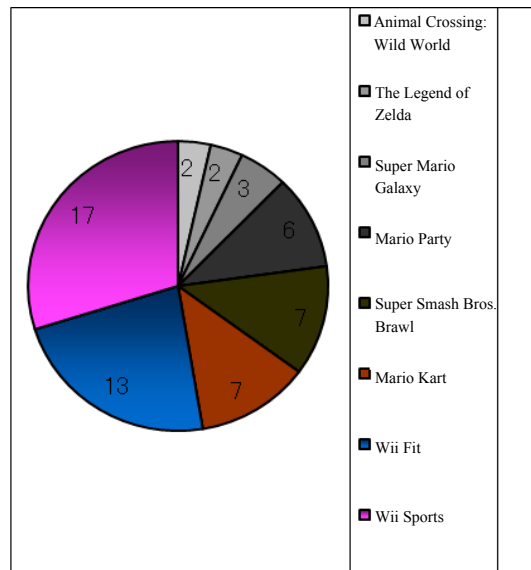


Figure 5: Wii software

When asked if they had ever played tag using their DSs, 149 of the 152 subjects, or 98% of them, responded that they had not.

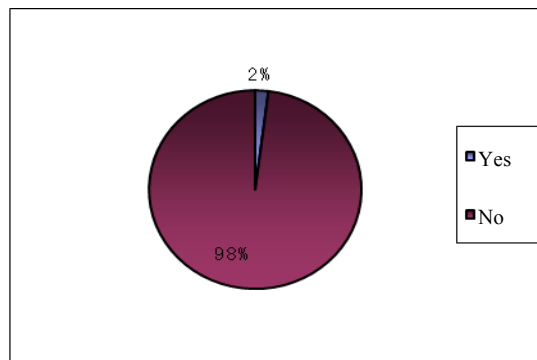


Figure 6: Have you ever played tag using your DS?

When asked if they had ever exercised using their DSs, 97%, or 148 of the 152 subjects responded that they had not. The lack of game software for physical exercise speaks to the difficulty of using the DS for physical exercise.

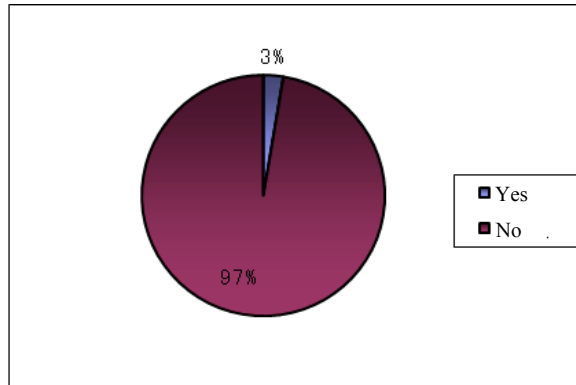


Figure 7: Have you ever exercised using your DS?

The responses to the question “What does your DS mean to you?” are shown in Figure 8. Many subjects (47 out of 152) answered that to them, the DS was a way to pass the time, and 4 subjects answered that the DS was a way to unwind. Four subjects answered that it was for fun, 3 answered that the DS was a tool to play with, 3 answered that it was a toy, and 2 subjects answered that it was just a game console. There were 2 subjects who said that it was for studying.

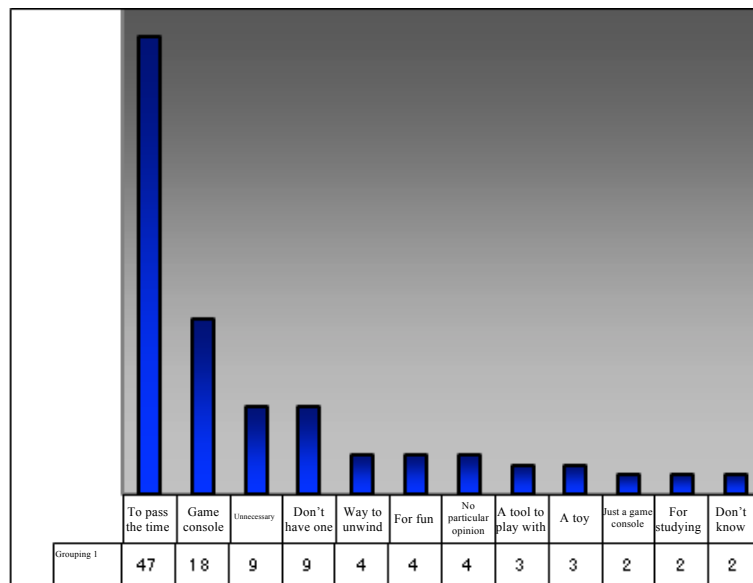


Figure 8: What does your DS mean to you?

Table 2 is a grouping of the positive opinions about the DS. Views expressing that the DS was “my baby,” a fun game console, and a fun tool to study with were of particular note. There were also notably positive opinions from subjects who did not own a DS but who said that they sometimes borrow one and that it is fun to play.

Table 2: Positive opinions about the DS

Positive Opinions
It's my baby.
It's a fun game console.
It's a fun tool to study with.
It seems like a fun console.
Sometimes
I sometimes borrow one and it's fun to play.
You can have a communications battle with it.
You've got to have one.
It's the best.
Everybody has one.
It's great for studying and for playing games.
Most people I know have one.
It's portable and convenient.
I don't have one, but it looks fun.
It helps strengthen friendships.

As for negative responses, subjects said that they do not use their DS, that it is better not to have one, or that it was not important. These opinions show a lack of interest.

Table 3: Negative opinions about the DS

Negative Opinions
I don't use mine.
It's not important.
It's better not to have one.

The following are ideas from the DS owners about possibilities for using the DS to exercise or to play with movement. Both opinions were close to 50%, with 51% taking a positive view of this and 47% taking a negative view. The DS does not bring forth the image of being linked to physical movement. One of the causes of this may be that there are not as many varieties of existing DS software with a connection to physical movement as there are for the Wii.

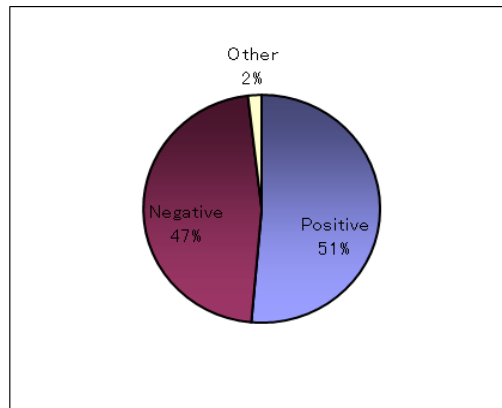


Figure 9: Opinions on using the DS to exercise

Table 4: Ideas

Pedometer	7
Encouragement to exercise while watching the screen	4
Hide and seek	3
Playing tag with the PictoChat function	3
Playing while swinging the DS around, etc.	2



Less prevalent ideas

It teaches you a workout menu.
You can manage your physique and check your balance.
I want to try it.
Exercise while holding the DS
Increase the variations
It could work if it were like Wii sports.
The game software for yoga lessons is good.
The ones connected to sports are fun.
It would be nice if it could create and guide you through a day's worth of exercise
Walk assist
It would be fun for kids too if it could record the exercise that's been done.
Illustrated exercise reference book

Game software for voice-assisted exercising
Go ghost hunting with the Ghostwire game software
It seems like you would be able to enjoy your surroundings while using functions like the writing function, the camera, and the communications function.
You can have fun while managing your body.
Playing games like soccer or basketball on the DS gives you knowledge that helps you when you actually play them in real life.
Survival games
If the DS had a gyro-sensor to tip the screen when you lean your body, it would make it easier to move around while playing.
I think it makes it easy to learn the rules of sports.
People might go outside if it had a solar-powered battery.
Playing that kind of game could be an attention-grabber.
If the game Taiko: Drum Master were more active, that would make it good exercise.
It's nice that the DS has features like a chart to manage your physique.
It would be nice if it were fun and easy to understand.
You can go for walks using the map that the DS can display.
There are stamp rallies that use the communication function.
You can also use the microphone, so that could be like movement...
Touching the screen in time with the beat
See how hard you can strike the screen.
If it were waterproof, you could use it with half of your body underwater.

Among DS owners, 62 subjects responded to the question, "What do you think about the potential for exercise and physical play using the DS?" Among these, the content of responses from 20 subjects showed that either they could not think of the potential for exercise with the DS or that they had a Wii and so it was unnecessary. The other 42 subjects did describe some manner of idea or opinion on the topic. In spite of not previously having thought of the fusion of their DSs and exercise, 42 subjects took on the potential for this fusion as a creative activity, responding as shown in Chart 4. The subjects expressed many ideas. The game software for some of these is already available in stores, while other ideas were about game software that the participants would like to use if it were to be developed. Additionally, some subjects thought of novel ways of using functions that the DS comes with. Game software does not end at the limit of game software; it generates a developable intellect and creativity, and it is also important to cultivate the richness of these sensibilities.

For the DS game console, so greatly popular among young people, to contribute to childhood growth and development, adding the Wii concept of family exercise and making optimum use of the convenient totability of the portable game console would mark a significant leap forward.

For young people, the DS, as shown in Nintendo[5], can be successful in the fields of intellectual development and education. It is used in classes at school, and is regarded as an authorized video game console. Its application in the field of education transcends that of common practice. This being the case, the DS should serve a purpose in children's growth and development. Although it is stated definitively that Nintendo is a video game company[5], it would not be a bad thing for Nintendo to think about the contribution it makes to children's development. As a way to make the Wii acceptable to mothers, its game software was developed to be welcomed into the family. Thus, if mothers feel that the DS is appropriate for their children's physical growth and development, it is likely to gain their approval.

These authors would like to see it become possible to incorporate the DS into physical movement, and for it to develop in the direction of outdoor, physical exercise. We welcome a change that would see children in the park, not motionless and absorbed in their videogames, but using their DSs and moving their bodies. Children who are, as previously stated, contriving ways to use their DS - such as using PictoChat to play tag - are a great inspiration, and we hope to see the number of these children increase. Additionally, we hope for DS game software that incorporates the movement of the body as a necessary aspect of its use.

4. CONCLUSION

Whether young people who own a DS see it as a plaything or as a study companion, one cannot help but notice them with it constantly at their sides, making use of it. An important issue in building better interactions between young people and their DSs is pursuing the expansive ways in which the DS can be used. In this, what we would ideally like to see is young people using the PictoChat function on their DSs to expand on games like tag, as previously mentioned, and being able to creatively devise physical exercise. However, DS will really be able to establish itself as something more meaningful to young people through the release of video game software that elicits physical exercise.

Whether physical exercise is entrusted to video games or whether it is devised as an included function in a game console, the spirit and the sensitivity that can help in the evolution of exercise are essential.

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