UNIVERSITI MALAYSIA SARAWAK

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Faculty of Cognitive Science and Human Development

THE EFFECTS OF COMPUTER SIMULATION BASED GAME (THE SIMS) ON COGNITIVE ABILITIES IN ADOLESCENCE.

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Bachelor of Science with Honours
(Cognitive Science)
2006

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This report is submitted in partial fulfillment of the requirements for the degree of Bachelor of Science with Honours
(Cognitive Sciences)

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2006

BORANG PENGESAHAN STATUS TESIS

JUDUL : THE EFFECT OF COMPUTER SIMULATION BASED GAMES (THE SIMS) ON COGNITIVE ABILITIES IN ADOLESCENCE

SESI PENGAJIAN : 03/06

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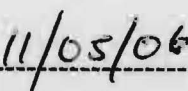
Project entitled 'The effects of computer simulation based game (The Sims) on cognitive abilities in adolescences' has been prepared by Khatiahazmim bt Rusdi and submitted to the Faculty of Cognitive Sciences and Human Development in partial fulfillment of the requirements for the degree of Bachelor of Science with Honours (Cognitive Sciences).

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ACKNOWLEDGEMENT

I would like to express my deepest acknowledgement and gratitude to my project supervisor, Madam Kartini bt Abdul Ghani for her invaluable guidance, encouragement and dedication in the execution and completion of this study and for her patient and assistance that she gave during the preparation of this thesis.

Besides that, I would like to thank the students of University of Malaysia Sarawak(UNIMAS) who was willing to participate in this study. My sincere gratitude to my friends and colleagues for their understanding and helping me in one way or another. My deepest appreciation and love to my parents Mr Rusdi b Shaharuddin and Mrs. Ramlah bt Judin and also my family for their encouragement and support for all this while.

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ABSTRACT

THE EFFECTS OF COMPUTER SIMULATION BASED GAME (THE SIMS) ON COGNITIVE ABILITIES IN ADOLESCENCE

Khatiahazmim bt Rusdi

The study aimed to investigate the difference in cognitive abilities between computer simulation- based game (The Sims) player and non- player. Cognitive abilities that were studied in this research were problem solving, hand eye coordination and spatial abilities. This study was an experimental quantitative study and 30 respondents were involved. The respondents consist of 30 UNIMAS students, age between 19-21 years old. They were assigned into 2 different groups with 15 respondents each. One group was the experimental group and another was the control group. Experimental group only consist of students who had experienced in playing The Sims and the control group consist of those who had no experienced playing The Sims. The experimental group was given treatment for 10 minutes and then only they were measured. However, no treatment was given to the control group as they were directly measured. The instruments that were used for this study differ according to the cognitive abilities type. For problem solving, a computer game entitled Cannibals was used which contained element of problem solving. The hand eye coordination was measured using the Throwing Pie Game. Meanwhile, the spatial ability was measured using the Mental Rotation test from an established book entitled Coglab on a Cd. The data was analyzed using independent sample t-test from the SPSS. The result from the data analysis showed that there is a significant difference in terms of spatial ability and problem solving between player and non-player. However, no significant difference was indicated in terms of hand-eye coordination between player and non-player.

ABSTRAK

KESAN PERMAINAN SIMULASI BERKOMPUTER (THE SIMS) TERHADAP KEBOLEHAN KOGNITIF DI KALANGAN REMAJA.

Khatiahazmim bt Rusdi

Kajian ini bertujuan untuk mengenalpasti perbezaan kebolehan kognitif di antara pemain permainan simulasi berkomputer (The Sims) dengan bukan pemain. Di antara kebolehan kognitif yang dikaji ialah penyelesaian masalah, koordinasi mata dan tangan dan kebolehan 'spatial'. Kajian ini merupakan kajian kuantitatif eksperimental dan sebanyak 30 orang responden telah terlibat dalam kajian ini. Responden-responden kajian merupakan pelajar UNIMAS yang berusia antara 19-21 tahun. 30 orang responden ini telah diagihkan kepada 2 kumpulan, iaitu kumpulan eksperimen dan kumpulan kawalan. Setiap kumpulan terdiri daripada 15 orang pelajar. Kumpulan eksperimen ialah kumpulan yang mempunyai pengalaman bermain 'The Sims' manakala kumpulan kawalan terdiri daripada para pelajar yang tidak pernah bermain 'The Sims'. Kumpulan eksperimen telah diberi fasa latihan selama 10 minit iaitu dengan bermain The Sims dan kemudiannya melalui fasa ujian. Sebaliknya, kumpulan kawalan tidak diberi fasa latihan dan terus diuji. Instrumen yang digunakan dalam kajian ini adalah berbeza mengikut jenis kebolehan kognitif. Bagi keupayaan menyelesaikan masalah instrumen yang digunakan ialah satu permainan komputer berjudul 'Cannibals' yang menguji kebolehan penyelesaian masalah seseorang. Koordinasi mata dan tangan pula diuji menggunakan satu permainan berkomputer 'Throwing Pie Game" manakala keupayaan 'spatial' diuji dengan menggunakan ujian dari Coglab iaitu Mental Rotation Test (MRT). Data telah dianalisis menggunakan ujian t sampel tidak bersandar yang diperolehi daripada buku berjudul "Coglab on a Cd". Hasil analisis menunjukkan terdapatnya perbezaan yang signifikan dari segi keupayaan 'spatial' dan penyelesaian masalah antara pemain dan bukan pemain. Manakala koordinasi tangan dan mata tidak menunjukkan perbezaan yang signifikan.

CHAPTER 1
INTRODUCTION

1.0   Introduction

According to Berger (2005), the history of games began thousand of years ago, throughout history and around the world people have used sticks to draw simple game board on ground, making up rules that incorporate stones or other common objects of playing pieces. About 5000 years ago people began to make more permanent game board from sun dried mud or wood.

One of the earliest games, called 'Senet' was played in ancient Egypt. Like many earlier games, 'Senet' had religious significance. Pictures on the board's square represented different parts of the journey that ancient Egyptians believed the soul made after the death.

Some of the oldest board games may have evolved from methods of divination or fortune telling.

The game of *'Go'*, which many experts regard as the finest example of a pure strategy game, may have evolved from a method of divination practiced in China more than 3000 years ago, in which black and white pieces were cast onto a square board marked with symbols of various significance. 'Go' also involved black and white pieces on board, but players deliberately placed them on intersections of lines while trying to surround more territory than the opponent.

Many modern games evolved over centuries. As games spread to different geographic regions, people experimented with rules, creating variants and often changing the original games forever. The name *Mancala* applies to a group of ancient Egyptian mathematical games in which pebbles, seeds or other objects are moved around pits scooped out of dirt or woods. As the games spread through Asia, Africa and the Americas, players developed local variations that are still played today. Two such variations are *Sungka* from the Philippines and *Mweso* from Uganda.

For most of human history, a game could not gain much popularity unless it was fairly easy for players to make their own equipment. The invention of printing (which occurred in the mid-1400s in the West) did not made this process easier, but it was not until the 18th century Industrial Revolution that it became possible to mass produce many new varieties of games.

However, how do we classify these activities as a game? Generally, to be considered a game, an activity must include several basic characteristics. The activity is usually a contest of physical or mental skills and strengths, requiring the participants to follow a specific set of rules in order to attain a goal. Games may involve an element of chance or fantasy .A game involves competing with others or with a computer. Games can be instructional or not, they can be interactive or not and they can be computer-based or not (Bright & Harvey, 1984;Dempsey et al., 1994;Malone, 1980).

Recently, in this ICT era, as the computer evolved, computers are no longer being used as helping tools for human but there is also some entertainments element in it. Improvement of CDs (compact disc) and other aspects of computer technology make games possible to be played using PCs (Personal Computers). Each year, the usage of computer games expands and become more sophisticated. As time pass, computer games have gain attention from many people in different age level.

Thus, nowadays there are many types and genres of game that has risen in the market such as strategy games, role playing games, sports games and etc. Games are classified into numerous, often overlapping categories. Example includes: adventure games, simulation games, competition games, cooperation games, programming games, puzzle games and business management games (Dempsey et al., 1993;Jacob & Dempsey, 1993). It is common for a game to fit into more than one group. By this time games become more and more realistic and complex in a sense that the players have more control over the characters they played, and the

characters in the games has taken a more realistic look as well. Apart from that, the realization of the storyline in a game has also become more believable in the eyes of the player.

As the usage of computer games expand, it automatically lead to many research been carried out about the effect of the computer games on the players itself. There were numbers of research done whether on games beneficial effect or its disadvantages. However, research done on certain genre of games and its effect on human cognitive abilities has not been plentiful. Most of the study has been carried out on children and it is rare to find studies done on computer games, which involves adolescence as the respondents. Apart from that, most of the previous study was done in European country. Research done on the effect of specific genre of computer games on human cognitive abilities in Malaysia is rarely to be found. Moreover, even if there were many studies been carried out on computer games and many new findings were found, there might be some difference if it is applied on different population. Therefore, this study ascertained the effect of computer simulation games (specifically The Sims) on cognitive abilities in adolescence.

1.1   Problem Statement

The usage of computer games in the country keep on expanding, and the effects of computer games on the player is a hot issue to debate. Therefore, the study aimed and tried to ascertain the effects of computer simulation based games specifically The Sims on cognitive abilities in adolescences.

1.2   Objectives

This study investigates the effects of simulation-based games on cognitive abilities. The simulation game that was studied is The Sims. Meanwhile, the cognitive abilities that were studied were problem solving skills, hand-eye coordination and spatial abilities.

1.2.1. Specific Objectives

The specific objectives were as follow:

1.   To investigate whether the Sims have positive effect on cognitive abilities such as problem solving skills, hand eye coordination and spatial abilities in adolescence.

2.   To investigate which types of cognitive abilities that might be enhanced by playing The Sims games in adolescence.

3.   To investigate whether The Sims could help to improve these three cognitive abilities.

1.3   Research Question

The research questions were as followed:

1.   Is there any difference in terms of problem solving skills between player and non- player?

2.   Is there any difference in terms of hand-eye coordination between player and non- player?

3.   Is there any difference in terms of spatial abilities between player and non- player?
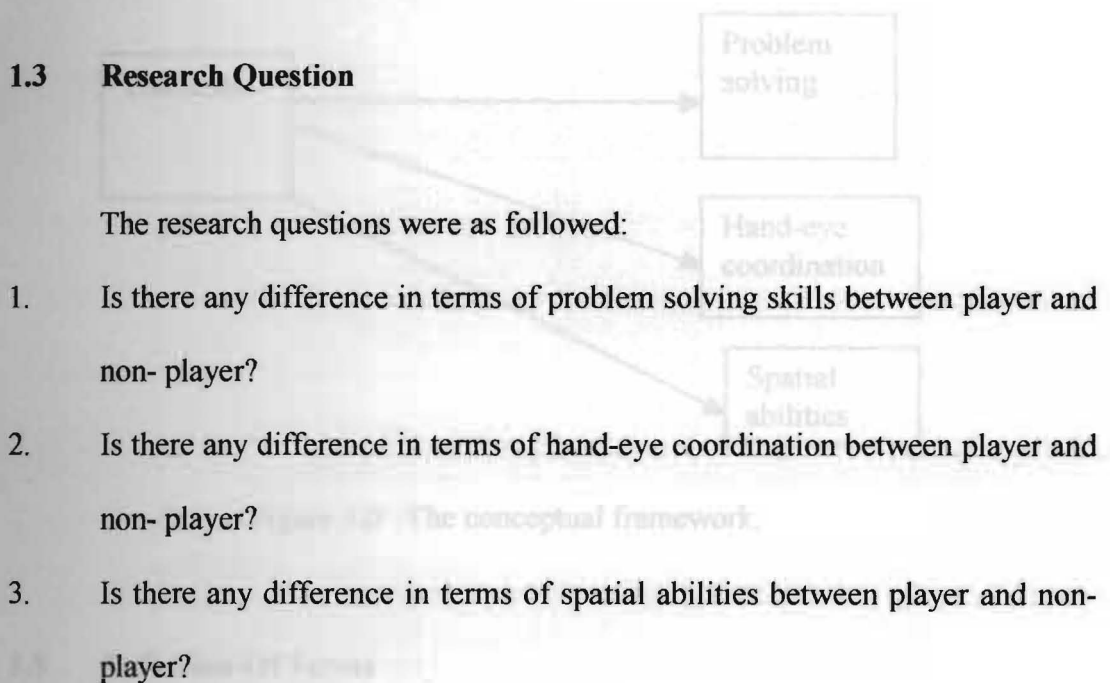
1.4   Conceptual Framework

Figure 1.0 below show the conceptual framework that was used in this study. The independent variable is The Sims. While the dependent variables are cognitive abilities such as problem solving, spatial abilities and hand-eye coordination.

INDEPENDENT VARIABLES   DEPENDENT VARIABLES

The Sims

Problem solving

Hand-eye coordination

Spatial abilities

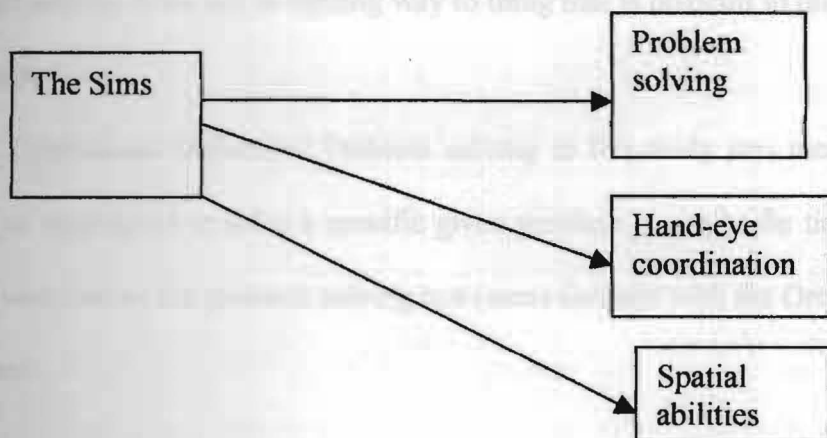Figure 1.0   The conceptual framework.

1.5   Definition Of Terms

1.5.1   Simulation Based Games

Literal Definition: According to Randel (1999), simulation based games usually models a process or mechanism in a simplified "reality" and can be designed so that it differs little from its real-world counterpart.

Operational definition: Simulation based game that was used in this study is The Sims.

1.5.2   Problem Solving

Literal Definition: According to Oxford Advanced Learner's Dictionary problem solving is the act of finding way to thing that is difficult to understand or to deal with.

Operational Definition: Problem solving in this study was measured by the ability of respondent to solve a specific given problem in a specific time. Cannibals Game was used as the problem solving test (same concept with the Orcs and Hobbits Problem).

1.5.3.   Hand-eye coordination

Literal definition: the process of coordinating movements of the eyes and hand or arm so that they move toward the same target or the interaction and feedback mechanism between eye and hand. (Crawford, D).

Operational definition: The hand eye coordination was measured using the "Throwing Pie" game.

1.5.4   Spatial Abilities

Literal Definition: The ability to deal with things relating to space and position. (Oxford Advanced Learner's Dictionary).

Operational Definition: The spatial abilities of respondent were measured by respondents' performance in the Mental Rotation Test.

1.6   Justification of Study

This study was done since there were lacks of emphasis from previous studies on specific genre of games on cognitive abilities.

Besides that, previous studies only conducted in overseas, mainly in European country therefore there might be difference if the study conducted is in different population such as Asian population.

1.7   Limitation of study

The study was only conducted to UNIMAS population therefore there might be different result if it is applied in different situation. Moreover, the study was only conducted to simulation-based games therefore there might be different result if it is applied in different genre of computer games.

CHAPTER 2
LITERATURE REVIEW

2.0   Introduction

This chapter includes studies done by past researcher, which investigate the effects of computer games on cognitive abilities.

2.1   Computer Games

According to Wikipedia.com, formally computer game is a game composed of computer controlled virtual universe that players may interact with, in order to achieve goal. (Or set of goal) However, in common usage "computer games" refers to games played on personal computer. In this study the Sims that test was played on computer. Besides that, keyboard and mouse were use as the devices.

2.2   The Sims

Accoding to Wikipedia.com, The Sims is a computer simulation game which was created by Will Wright and published by Maxis.It was first released in January 2000 and with over 6 million copies sold worldwide, it is heralded as the best-selling PC game in history. The Sims is sometimes described as a "god game".A game where the player create and control the lives of virtual people. As with previous Maxis games, The Sims is a departure from most previous computer games, which tend to have a definite goal or objective. Instead, the game focuses entirely on virtual people called "Sims", placing the player in control of a "virtual dollhouse", controlling their daily activities such as sleeping, eating, cooking and bathing, to name a few. Will Wright the game's designer likes to refer to it as a "digital toy". Instead of objectives, the player is encouraged to make their own choices and engage fully in an interactive environment. The only real objective of the game is to organize the time of their Sims to help them reach personal advancement goals.

Sims have a certain amount of free will, and although the player can instruct them to do something, they may decide that something else needs to be done first, or even outright ignore the player's commands. The player must make decisions and solved certain problem about time spent in personal development, such as exercise, reading, creativity, and logic, by adding activities to the daily agenda of the Sims. Daily maintenance requirements must also be scheduled, such as personal hygiene, eating, and sleep.In order to this,the game required the player to have strategies to

achive victory. If the simulated humans do not receive the proper amount of maintenance, they will be sick and die. Furthermore, Sims need to have fun in their lives; if they don't, the fun level bar eventually lowers and they become depressed, but however depressed they become, they are unable to commit suicide (as they are not programmed to). They are, however, able to be nasty to other Sim characters by insulting them, slapping them and even attacking them. Financial health is simulated by the need to send the sims to find jobs, go to work, pay bills, and take advantage of personal development and social contacts to succeed in their jobs. In order to advanced the financial of The Sims the player should think of how to spend money and how to get income for their Sims.

There are some limitations to The Sims, most notably that children never grow up to become adults, though babies do eventually become children. Also adult Sims never age, and there is no concept of a weekend. For example, the adult Sims go to work every day and the child Sims go to school every day. The presentation of the game's artificial intelligence is very advanced, and the sims will respond to outside conditions by themselves, They are unable to take certain actions without specific commands from the player, such as paying their bills. Thus if left alone without any player supervision, the Sims will eventually develop overdue bills and have their property repossessed.

Sims are directed totally on the basis of instructing them to interact with another object, be that a television set, a radio, or another Sim. Sims may receive house guests, which are actually based on the Sims of other game files. The player

cannot control 'visiting' Sims, although it is important for Sims to interact with one another in order to develop a healthy social life. In order to achieved a healthy social life, player must also think of a strategies to build the social relationship between one Sims with another Sims.

Whilst there is no eventual objective to the game, a state of failure does exist as Sims may die. The types of death include starvation, drowning, perished in a fire, electrocution and by virus (contracted from a pet guinea pig, which can happen when its cage is left dirty). In addition, child Sims can be sent to military school if their school grades remain at F for several consecutive days. When sent to military school, children never return to the family. Although considered a state of failure, many players occasionally deliberately mistreat their Sims to observe the reactions. This can be done with no consequences if the game state is not saved.

In addition, the game includes a very advanced architecture system. In fact, the game was originally designed as an architecture simulation alone, with the Sims only there to evaluate the houses. During development it was decided that the Sims are more interesting than the houses and a legacy was born. The inner structure of the game is actually an agent based artificial life program. Therefore, player required to choose between building their own house for their Sims or choose to buy any houses which have been build in the game itself. After that, the player could also designed their own house with their desired furnitures. Automatically, this element required the player to manipulate the space in the virtual environment or dealing