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CHILD RIGHT BRAIN DEVELOPMENT THROUGH GAME BASED LEARNING.

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This report is submitted in partial fulfillment of the requirements for the Bachelor of Computer Science (Media Interactive)

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2008

DECLARATION

I hereby declare that this project report entitled

CHILD RIGHT BRAIN DEVELOPMENT THROUGHGAME BASED LEARNING

is written by me and is my own effort and that no part has been plagiarized

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ABSTRACT

The Adventure of Danny P. Brainy is a game based learning for preschool children to develop their right brain. Since research has been done for the Right Brain Education, it is not just imparting knowledge and skills but to create a well-balanced child who is creative, eager to learn and has the ability to maximize the use of his or her brain. This courseware is developed to keep the children's creative right brain active while they are playing. Children who play this game not only can have fun but also can stimulate their right brain development where according to Professor Dr. Shichida from Japan who famous with Shichida Method, the right brain is a genius brain than the left brain. This courseware comprises of three modules which are Under the Sea, Amazon Rainforest and Chocolate Cave. Each modul have a different elements that focusing into shapes and colour, numbering and alphabet recognition. All modules being represented through a game platform. The game was designed to have many graphic and animation to create a visual imagery in children right brain where the right brain usually learns through images. Other than that, this courseware using voiceover, sound effect, text animation and suitable effect to attract children's interest and attention. The methodology used while developing this project is ADDIE Model. The learning technique that use in this project is cognitive psychology. This game are develop mainly in platform Adobe Flash CS3 Professional.

ABSTRAK

"The Adventure of Danny P.Brainy" ialah sebuah permaian pembelajaran untuk kanak-kanak tadika bagi membantu perkembangan otak kanan mereka. Menerusi kajian yang telah dilakukan melalui Pembelajaran Otak Kanan, ianya bukan sahaja untuk menyampaikan pembelajaran and kemahiran tetapi juga untuk membantu membentuk kanak-kanak menjadi seorng yang kreative, mempunyai perasaan ingin belajar dan keupayaan untuk menggunakan minda secara keseluruhan. Perisian khusus ini dibangunkan adalah untuk menggalakkan otak kanak kanak-kanak aktif semasa bermain. Dengan terhasilnya permainan ini, kanak-kanak bukan sahaja mendapat keseronokan bermain tetapi dalam pada masa yang sama dapat merangsang penggunaan otak kanan mereka dengan lebih kerap. Menurut Professor Dr. Shichida daripada Jepun yang mengasaskan program Shichida, otak kanan adalah otak yang genius berbanding otak kiri. Perisian ini mengandungi tiga modul pembelajaran iaitu Under the Sea, Amazon Rainforest dan Choclate Cave. Setiap modul mengandungi element pembelajaran yang berbeza iaitu mengenal bentuk,warna,nombor dan huruf. Semua modul dipersembahkan dalam bentuk permainan. Perisian ini direka dengan penggunaan gambar dan animasi untuk membantu merangsang imaginasi minda kanan kanak-kanak dimana menerusi kajian yang dijalankan mengatakan penggunaan otak kanak adalah dengan melihat gambar. Selain itu, perisian ini mengandungi audio, animasi teks dan kesan-kesan khas yang sesuai untuk menarik minat kanak-kanak menggunakan perisian ini. Metodologi yang digunakan dalam perisian ini ialah Model ADDIE. Teknik pembelajaran yang digunakan adalah Psikologi Kognitive. Perisian ini dibangunkan menggunakan Adobe Flash CS3 Professional.

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LIST OF ABBREVIATION

GBL	Game Based Learning
CNS	Central Nervous System
PNS	Peripheral Nervous System

CHAPTER I

INTRODUCTION

1.1 Project Background

The implementation of this project is to stimulate and develop child right brain through Game Based Learning (GBL). Game-Based Learning (GBL) is a learning that is facilitated by the use of games specifically for an educational purpose which is combines motivating aspects of computer games with learning. Research has shown that learning is much more effective when the student has fun. Therefore, GBL uses competitive exercises; either the students competes against each other or getting them to challenge them in order to motivate them to learn better.

However, using GBL it is not only does the integration of learning with gaming but it also stimulates creative thinking and motivates children to learn from their mistakes. GBL often has a fantasy element that engages players in a learning activity through a storyline. Thus, children who play game like adventure and role-playing game, they must use the existing information and resources to solve the problems posed for that character. This can stimulate children's ability to enter into the adventures of others and recreate scenarios. These games often help heal a worry in a child where they need to force themselves to complete the mission if they want to know the ending of the game they have played.

Since right brain development is always been encourage by parents and teachers in early childhood years, this game can stimulate the usage of right brain. As we know, human brain has two very different ways of thinking which is right brain and left brain. The right brain of the brain focuses on the visual, and processes information in an intuitive and simultaneous way, looking first at the whole picture then the details, highly organized and enjoy touching and feeling actual objects(sensory input). While the left brain is verbal, focusing on words, symbols, numbers and processes information in an analytical and enjoy observing.

Usually, people who are more on using right brain are related to a creative thinking person. Creative thinking helps in all areas of life. Think in a creative ways can increase the creativity. Not all people have a creative thinking right after they are born. An early stage as a child is the best time to stimulate creative thinking. As children, they are not ready to learn in a heavy situation that can burden their mind like imagine something them not familiar with and lots of thing they need to learn. There is a way to get them involved in creative thinking which is not only making fun with playing but also can gain knowledge through GBL.

Therefore, building from the above concepts, this courseware will include the visual representation of a basic shape and colour; encounter the number one to twenty and the alphabet. The name of the object will be shown on screen together with auditory backing. Next the children need to differentiate the shape and the colour beyond the sea creatures that will cover in first game. Second game will be presented in a storytelling where children have to solve the problem consist of number to end the story. For the third game which cover alphabet, children need to find the required alphabet to win the game. A pedagogical animated character is used to create a friendly and interactive atmosphere to enhance the child's motivation.

1.2   Problem Statement(s)

Computer games have become a popular childhood spare-time activity. Children nowadays like to play computer game rather than reading. Usually children waste their time playing game just for joy without gains any knowledge and that can be useful for them. By developing GBL, children not only playing otherwise the game can effectively motivate them. Game can give innovations in creating learning environments for children that are interesting to play. Thus, children will spend more time with the program and encouraging them to use their right brain to solve the problem.

In other way round, for child 4 to 6 years they can read but not accurately know the meaning as well. They might imagine the different thing that can cause the misconceptions of the subject. Here game based learning offers a new way of learning. A computer game could get the preschool student attention for a significant time span, outside lesson time and present them with experiences based on the subject. This way the student is learning about the nature of the subject, correcting their misconceptions and not even realizes that they are learning.

Moreover, this game are develop because it is difficult to find game especially for child right brain development. Commonly, nowadays game style is for left brain developments which are game for mathematic, science and involves problem-solving using numbers. Parents usually learn how to raise a smarter child at early 6 month after their child are born. The development of child right brain is one of important brain developments that affects the way child's brain work and grow. Right brain is good in high level strategic and creative thinking.

Other than that, using computer game as one of learning equipment can expose preschool student using the technologies where we know nowadays technologies become most popular device. Playing computer game also plays a significant role in developing the effective use of IT-based information and interactive resources.

1.3   Objective

This project is developed mainly for the use of the children in encourage them to stimulate their right brain to benefit the whole brain so the main focus throughout the early years is on the right side of the brain. According to (Prof Makoto Shichida, 2005) the right side of children brain calls the genius brain as it develops first. Children who conquer the usability of right brain may excelled in many areas including, higher IQs, bilingual and multilingual, intuitive, musical abilities, artistic talents, emotional and personality traits and photographic memory. Therefore, the objectives of this project are:

- To carry a research to develop a GBL for preschool student that can helps develop their right brain
  This GBL motivate children to using their right brain and stimulate the natural right brain abilities through the game activities which are Under the Sea, Amazon Rainforest and Chocolate Cave.

- To carry a research on learning techniques to be used in the courseware
  This GBL is applying a cognitive leaning theory where creative thinking as the learning approach using technique storytelling for stimulating the idea production stage of creative thinking.

- To design and develop an educational courseware prototype on helping primary school children
  The subject matters covers in this courseware are shapes and colours; alphabet recognition and spelling; and numbering recognition limits to twenty and counting.

1.4   Scope

This game is developing for preschool student in 4 to 6 years to workouts their right brain through playing. The game is an adventure game that will have three modules which are three different places. Player can choose the place they want to discover. The places are under the sea, Chocolate cave and Amazon rainforest. Every place has different series of adventure where player assumes the role of a character in a situation about what they have to do to accomplish the mission. In addition they can learn new thing and make decisions to solve the problems that came out.

This game is using a storytelling technique that can stimulate the children to imagine. The game also has a technique role playing game which player adopt a character and collaborate with computer-controlled character to create a story. This can increase their creative thinking to choose the character and outcome of the experience playing the game. Beside, this game includes action and adventure where learner can explore the places they have chosen.

The first module which is Under the Sea, the subject matters cover in this game is colours and shape. Children can discover the under water world creatures and on the other hand they need to define the shape and colour as the key of the cage. They need to define the required shape and colours through the sea creatures.

The second module is Amazon rainforest which cover numbering that limits to twenty. This game required children to discover the best solution to find a treasure hunt. The problem encountering the usage of number where help children learn to remember the number. The last module is Chocolate cave which consist of alphabet learning. Children need to find the correct alphabet in order to make a correct spelling word. The learning content included in all three of these modules is developed based on the Cognitive Psychology Theory in Multimedia Learning that studies mental processes including how people think, perceive, remember, and learn.

1.5   Project Significance

This project will give benefit to preschool student in addition can increase their creativity thinking. It also helps teachers as one of education learning for their students. This game also can be one of products that help parents raise a smarter child and adequate brain growth that increase children IQ. Completing the game successfully requires a variety of skill including planning, counting, identifying colours and shapes, reading maps and spelling. Game can be one of the best learning equipment. It would be good to provide preschool student with an opportunity to find extra information for self study where playing game can motivated to learn about the content. Game based learning can offer great improvement in the effectiveness of content delivery. It can very well motivate player where the player can decide to repeat a lesson in the other hand, game maintain the engagement at the same time.

1.6   Conclusion

This chapter is an overview of what the game-based learning all about. Games are powerful educational tools if used appropriately. Increasingly games are being adapted for learning settings. They may have a strong motivating influence on children. This chapter determines the overall understanding of the game based learning and importance of it. Game based learning is an educational game that can help child right brain development. Playing an educational game can motivate children to learn and stimulate their creative thinking. Since children likes to play, this project is for preschool student to help them stimulate creative thinking in order to workouts their right brain. It also helping children recognize the computer functions and make them familiar using the technologies. The next chapter will cover literature review and project methodology.

CHAPTER II

LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1   Introduction

This chapter will discuss deeper about literature review and methodology of the project. A literature review is an evaluative report of information found in the literature related to the area of research. It is more than the search for information. According to researcher, literature review focused on the game based learning as the approach. In developing effective materials of educational software, application of principle of learning is needed. This chapter follows research regarding the aspects of the Cognitive Psychology in Multimedia Learning and a comparative view regarding the subject matter.

Cognitive Psychology in Multimedia Learning theory is a process of influence learning and how learning occurs from a change in mental state. It focuses on the mental structures. Cognitive can be describes the way individuals think, perceive and remember information, or their preferred approach to using such information to solve problems. Using cognitive learning theory, learner can easily acquired new information when they can associate it with things they have already learned. One of most popular cognitive learning style is creative thinking.

Methodology refers more than a simplest set of methods. It is includes concepts that is related to a particular discipline or field of inquiry. In other words, it is a collection of theories, concepts or ideas and comparative study of different approaches. From my research, game based learning is worthy using ADDIE Model.

2.2   Domain

This section will explain regarding learning aspect through GBL for children to develop their right brain. It is an overview of the theory behind right brain workouts to develop listening, attention and the abilities of right brain to visualize images and realization of those images physically. While the Cognitive Psychology Theory in Multimedia Learning explain how it best derived as well as the multimedia elements and a simple justification for its use in this project.

GBL is a branch of serious games that deals with applications that have defined learning outcomes. Generally they are designed in order to balance the subject matter with the game play and the ability of the player to retain and apply the subject matter to the real world. Playing game is a great way of freeing up minds and gathering new insights or idea to come in creative thinking. GBL or learns through play is a combination motivating aspects of computer games with electronic learning which is game and e-learning. It uses certain effective pedagogical technique to make learning more effective.

From computer game and e-learning concept, the combination of two concepts has become a GBL. A computer game has a well-structured beginning and end. It is a well-known structure for interactive experience. Through this avenue of game play, it can encourage children to become less distanced, to overcome their fear of contact with the devices and to begin to explore the possibilities of the space. Games often have a fantasy element that engages players in a learning activity through a storyline.

Game is an interactive, goal-oriented activity which features about problem solving, applying ingenuity and competition. Playing game from the intellectual challenge to the provision of multiple learning styles had an immediate part to play in learning. In cognitive games style, playing is about to learn and delightful to play and to share. Games have a number of advantages for learning environments. Primarily they can effectively motivate learners.

According to Juul (2003), a game is a rule-based formal system with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels attached to the outcome, and the consequences of the activity are optional and negotiable.

"Game has different terminologies being used by different groups. When games are defined as voluntary and free activity there is an emphasis upon using games for leisure purposes and to give time for relaxation or breaks between learning. In this way, definitions are formative for supporting the use of games in practice. An example of the myriad of definitions and terms associated with games is demonstrated in Table 2.1: Definitions and terms of games, and this is why it will be increasingly important for those engaged in producing games for learning, such as games developers and educational content developers including tutors and trainers, to begin to share some of the same definitions and approaches to the process of games development and implementation, Stephen Heppell (2006)."

Table 2.1: Definitions and terms of games

Term used	Related or synonymous terms	Descriptions & references
Educational games	Computer games; video games; serious games; game-based learning; instructional games	Games in general can be defined in surprisingly numerous ways, often changing the way games are used and perceived (Wittgenstein, 1958). Games as a series of choices or as rule based play are popular definitions. For the purposes of this report educational games for learning are defined as: applications using the characteristics of video and computer games to create engaging and immersive learning experiences for delivering specified learning goals, outcomes and