MOBILE GAME APPLICATION ; PERMUTATION AND COMBINAT ION

(THE WARRIOR)

FATIN ALIAH BINTI YAHYA

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

MOBILE GAME APPLICATION ; PERMUTATION AND COMBINATION (THE WARRIOR)

FATIN ALIAH BINTI YAHYA

This report is submitted in partial fulfilment of the requirement for the Bachelor of Computer Science (Media Interactive) With Honours

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JUDUL: PERMUTATION COMBINATION MOBILE GAME APPLICATION

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(TANDA TANGAN PENYELIA)

DR. IBRAHIM BIN AHMAD
Pensyarah Kanan
Jabatan Media Interaktif
Fakulti Teknologi Maklumat & Komunikasi
Universiti Teknikal Malaysia Melaka (UTeM)

Alamat tetap : BATU 25 ½
KAMPUNG CHABAU,
77100 ASAHAN,
MELAKA.

Nama Penyelia:
DR. IBRAHIM BIN AHMAD

Tarikh : 23.08.2017

Tarikh : 23.08.2017.

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I hereby declare that I have read this project report and found this project report is sufficient in term of the scope and quality for the award of Bachelor of Computer Science (Interactive Media) With Honours.

SUPERVISOR: _____ DATE: 23.08.2017

(DR IBRAHIM AHMAD)

DR. IBRAHIM BIN AHMAD
Pensyarah Kanan
Jabatan Media Interaktif
Fakulti Teknologi Maklumat & Komunikasi
Universiti Teknikal Malaysia Melaka (UTeM)

DEDICATION

I dedicate this project to my family who never miss to give me mental and physical support from behind and always give me attention whenever I need. Besides, this project is dedicated to my supervisor, D Ibrahim bin Ahmad who supervise me from beginning until the end and always provide anything that I need to learn and never miss to give feedback on what have I done for my project. Apart from that, i would like to dedicate to all other lecturer who also gave me comments and feedback over my project and last but not least to all my friend who always help and support me to finish up this project.

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ABSTRACT

The aim of this project is to develop a mobile game application which is able to provide a platform for students to practice their permutaitons and combinations and to evaluate the views of the users and experts toward educational mobile game application. This game might be able to contribute to the education system in future if it is given chances to be developed. This project disscussed about mobile game application which developed for educational purposes which had been build for Mathematics subject named Permutations and Combinations. This subject is include in topic of probability which students usually refuse to practice as the question always come in the form of statements. Nowadays mobile had become the impoertannt tool that every people use in daily life especially for communication. Thus, over this situation, mobile game application for education is developed to enhance the learning style or help student to feel fun while practising mathematics. The method used to develop this project is by uing PIE instructional model design. Apart from that, the sample is divided into 2 group which is user and expert. For collection of data, questionnaires, evalution form and interview is used. Finding and disscussion shown that the user and expert is agree with those interface sedign, information, interaction, content, and technical of this mobile game.to be conclude, user and expert is agreed with this mobile game application for mathematic of permutation and combination.

ABSTRAK

Tujuan projek ini adalah unutk membangunkan aplikasi permainan mudah alih yang mampu memberikan platfiorm kepada pelajar untuk berlatih permutasi kombinasi dan juga untuk menilai pandangan pengguna dan pakar terhadap aplikasi permainan mudah alih yang dibangunkan. Permainan ini mungkin mampu memberikan sumbangan terhadap sistem pendidikan pada masa akan datang jika ia diberi pleuang unutk dibangunkan. Laporan ini membincangkan tentang aplikasi permainan mudah alih yang dibangunkan bertujuan unutk pendidikanyang telah dibangunkan untuk permutasi dan kombinasi dalam matapelajran Matematik. Sub topik ini juga termasuk didalam topik kebarangkalian di mana pelajar sering menolak untuk melakukan latihan untuk topik ini kerana kebanyakan soalannya adalah di dalam bentuk ayat. Pada masa kini, aplikasi mudah alih telah menjadi alat yang penting yang orang gunakan di dalam kehidupan seharian terutama sekali untuk komunikasi. Oleh kerana itu, di dalam situasi ini, permainan aplikasi mudah alih untuk pendidikan dibangunkan untuk meningkatkan cara pembelajaran atau membantu pelajar berasa seronok ketika berlatih Matematik. Kaedah yang telah digunakan bagi membangunkan projek ini adalah dengan menggunakan model PIE. Selain daripada itu, sampel terbahagi kepada dua kumpulan iaitu pengguna dan juga pakar. Untuk penggumpulan data, soal selidik, borang penilaian dan jugak temu bual digunakan. Pencarian dan perbincangan menunjukkan pengguna dan pakar bersetuju dengan reka bentuk antara muka, informasi, interaksi, kandungan, dan juga teknikal untuk permainan mudah alih ini. Secara keseluruhan, pengguna dan pakar bersetuju dengan permainan aplikasi mudah alih unutk matapelajar permutasi dan kombinasi di dalam matematik.

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CHAPTER I

INTRODUCTION

1.1 Introduction

Qualifications are very important to get a better career and to be success in this current stage of life, so that education become the most important thing to be considered. (Bradley, H., & Ingram, N. , 2013). Thus, every students are resposible to be educated in their own field that they chosed.

Students tend to use most of their time on computer games than instructional method (Tobias, S., Fletcher, J. D., & Wind, A. P. ,2014). According to Ebner, Martin, and Andreas Holzinger (2007), games based learning can give a positive impact to a learner. There is a positive effect caused by Game Based Learning because the learners enjoyed playing the game during their learning process. Using video game in learning or practising process able to help student in their learning process. The affect of flow, engagement and immersion on learning in game-based learning environment has been investigated and educational video games can viably lock in students in a learning environment. The use of video game for students positively affected their learning. (Hamari, J. Et al., 2016).

Mathematic is a standout among the most critical subjects of our life. Regardless of to which field you have a place with, its utilization is all over the place. That is the reason it is important to have a decent comprehend of the subject. Despite the fact that the nuts and bolts of arithmetic begin from school however its use proceeds till we progress toward becoming grown-ups and hence one might say that maths has turned into a necessary part.

Permutation and combination is one of the sub topics from probability subject in Mathematics. Basically the questions will come out in the form of phrases or statements. However, students are less interest towards this topic as they need to understand the questions by reading all the statements provided. To avoid them to be bored while learning this subject, this mobile game application is developed to give them the element of inteactivity and to increase thier passion when answering the question. This can help the learner feel fun when answering the questions.

1.2 Project Background

Permutation and combination in mathematics is one of the topic which most of the students do not like to answer this question. This is because most of the questions will came out in the form of statement and the students will easily get bored while answering the questions. Therefore this mobile game application is developed to help students to practise their knowledge in permutation and combination in more interactive way which is game. According to Ebner, Martin, and Andreas Holzinger (2007), games based learning can give a positive impact to a learner. There is a positive effect caused by Game Based Learning because the learners enjoyed playing the game during their learning process.

1.3 Problem Statement

Current method style is not effective for students who wants to learnt Permutation & Combinations in mathematics. In this topic, student need to read and understand before they can answer the question. Usually, the question for this sub topic in mathematics will be in a statement form which students have to read and analyse the statement.

According to Dabbagh, N., & Kitsantas, A. (2012), most learning experiences are a blend of both formal and informal learning, while social media is also inherently enabling informal learning experiences in higher education. in this case, learning by using game is including in informal learning. Informal learning is learning that rests fundamentally in the hands of the learner and occurs through perception, experimentation, requesting help, talking with others, tuning in to stories, thinking about a day's events, or invigorated by general interests while Formal learning is described as learning that is institutionally sponsored or highly structured, as example learning that happens in courses, classrooms, and schools, resulting in learners receiving grades, degrees, diplomas, and certificates.

1.4 Objective

The aim of this study is to design and develop mobile game and to get the view of the product from sample project which will be discussed in Chapter 3.

Specifically this study has the following objectives:

1. To investigate the element of game based learning in helping student learning style.
2. To develop a mobile game application for mathematics which is permutations & combinations.
3. To identify the opinions from the users and experts towards mobile game design.

1.5 Scope

This mobile game application is a game-based learning which developed for user who taking mathematics subject and learning the permutation and combination in probability. To be more specific, the range of players' age are betweet 18 to 26 years old. The user of this mobile game applicaton must have basic knowledge about this subject so that they can easily understand the questions in this game.

1.6 Project significant

This mobile game application is developed to help students to improve their current learning style. Students might easily be bored is they are not changhing this tradisional learning style. Since mobile game application is more beneficial as students nowadays have their own smarts phone. By installing this game into their mobile phone, the can learn and practise this subject by answering the questions while playing the game.This may replace or upgrade students' learning style which is limited and not convenient if they are not in the class or they are not with the books.

1.7 Summary

To summarize, this chapter state the overview of this project of mobile game application which can attract the student to play while improve thier skil in answering mathematic. The propose of this game is to make student attract to learn mathematic in interactive way. This game basically is developed for anyone who are learning this subject. This game based learning is developed to help anyone who are low interest with fomal learning style. Then in the scope section, there are explanations about target user and contents of this project. For the next chapter, the literature review for this chapter will be discussed as well as the comparison of existing game.

CHAPTER II

LITERATURE REVIEW AND METHODOLOGY

2.1 Introduction

In this section, the literature review and project methodology will be carried out and discussed. The range of research in this part will include the game design, educational game, and comparison between the proposed project and the existing game. Toward to the finish of this section, the process of producing this game will be disscussed.

2.2 Game Design

The definition of game is a physical or mental challenge with an objective or target, played by a system or principles which figured out what a player can and can not do inside a diversion world (Baranowski, T. et al., 2008; Mz, N. A., & Sy, W., 2008). According to Tan, P. H. Et al. (2007) based on some criteria which satisfy the

requirement and needs of the target learners able to create an appropriate game. Aside from learner part, game design is another part that game designers should consider when creating an educational games.

Their investigation of the existing models uncovers that a well designed game-based learning environment should comprise of components, for example, the story, challenge, goals and objectives. It ought to likewise give input and result to help students selfexplain their learning process. Every one of these elements could help students in boosting up inspirations and fulfillment. In this, all in all, the previously mentioned components could significantly encourage the learning process, are expected to help game designers in developing educational games. The game must be uniquely intended for the target students so that they can easily understand the game.

2.3 Educational Game

Eductional game is the domain of this project which should be included in literature review. In this part, the learning principle in discussed including the model used for educational game.

2.3.1 GBL Model

Figure 2.1 shows the model of game based learing which implemented in this mobile games.

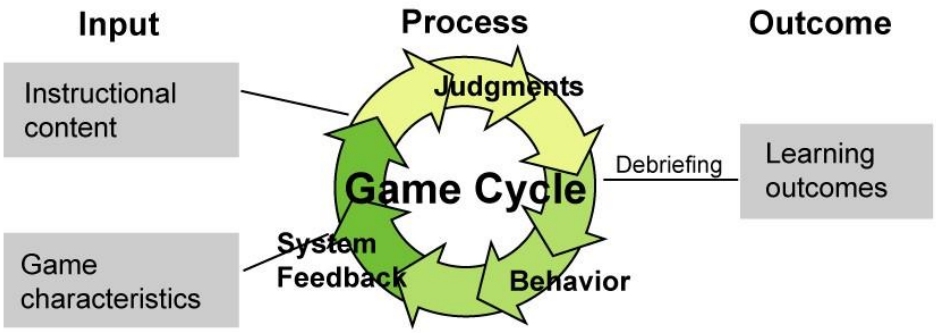

Figure 2.1 Game based Learning Model

According to Ahmad, I., & Jaafar, A. (2012). The combination of computer games in the learning process require to be seen from a positive point. designing computer games inserted with learning components is not a simple task in any case, is an approach seen to help students comprehend their assignments effortlessly. Other than pleasure, students can pick up cognitive and affective elements through problem solving, making decisions, making conclusions and working cooperatively with their fellows. students not only learn about the subject matter but they also build up their own personality. Thus, some of the elements in game based learning is implemented in this project which will be discussed in other chapter. According to Roslina and Nazli (2008) in Ahmad, I., & Jaafar, A. (2012), combinations of 16 different learning principles is done in order to produce a good computer games. The principles are introduction, interaction, production, risk taking, specialization, agent, problem prepared in orderly manner, challenges and reinforcement, suitable time and demands, meaningful situation, loosing but entertaining, system for thinking, exploring, smart equipment and spreading of knowledge, multitaks groups and pre competent achievements. In Chapter 4, the learning priciples used in this educational games will be discussed in detailes:

- Interactions: Pupils must interact to the optimum so that they can fully experience the learning process.
- *Challenges and reinforcement:* A good game offers a set of problems and allows pupils to solve them. In schools, weaker students are often deprived of reinforcement activities while good students face limited challenges in solving problems
- *Risk taking:* Games must encourage pupils to be brave in making decision and prepare them in risks taking.
- *Specialization:* Games must be of different levels so as to enable pupils of different levels to play according to their capability
- *Exploring, lateral thinking and thinking of the objectives:* through games, players are urged to investigate in view of their decisions, move at a normal pace, think along the side to accomplish a target.

It is notable that a computer games other than video games is a present pattern among the more youthful era. Studies have demonstrated that the utilization of computer games not just played by youngsters but even up to adulthood. Mix and usage of computer games into the classroom is likewise observed to help understudies learn with more fun and compelling. Thus, this platform is chosen as it is the most popular thing that people currently used in daily life (Ahmad, I., & Jaafar, A., 2012),. Educational mobile game is the domain for this project. This game is design to help student who weak in subtopic Permutation and Combination in Mathematics. This game is developed to encourage the player to practice the questions provided related to the subtopic. By playing this game, the player will be able to enhance thier skill in this subject.

2.4 Existing System

There are numerous type of educational game had been produced time to time. For this section, four existing educational games with different types of platform is selected. Those platform are computer game platfrom which play using personal computer and install in it, web browser platform which the user play when access to browser using internet, and mobile applications platform which user can install in their mobile devices. Each system will be explained below :

i. Play Math Leaper (web browser platform)

The first platform that had been selected is a Web Browser game. The name for this web browser game is Math Leaper. Math Leaper is a fun free Mathematics game that created for kid's ages from grade 1 to grade 8. This game can enhance mathematics skills by answering the question provided. The interactive interface will enhance kids to playing the game happily. It consists of different level which suitable for different grade. The level of difficulties will selected by player is depends on their grades and interest to answer the question.

The flow of game is simple. The player need to get the high score of length of wall by answering the correct question. The player will move across the two wall and climbing it if the answer is right. While moving to another wall, there will be a bunch of candy will fall from upper side of screen. The game have 1 minute and 30 second to complete the game. The player have only 2 lives. If the answer is wrong, the water from below will rise. After 2 wrong answer, the water will touch the player and the is game over. Through this game, the player have to control the mouse to choose the correct answer. The game can only be played when connected to the internet. Figure 2.2 shows the interface of Math Leaper.

Figure 2.2 Interface of Math Leaper

ii. Math Rabbit Gameplay (Computer Game Platform)

The second existing game which will be discussed is Math Rabbit. Computer game is the platform for this game which built on 1986 and can be downloaded to PC for free, and playing without using Internet connection. Math Rabbit is game that based on circus and the player will play by answering the question given. This game is suit for age 4-8 years old and this game can help kids to learn how to calculate simple

calculation of mathematics. This will improved the player's mathematical abilities throughout the game.

This game take place in circus and teach addition, subtraction, multiplication and counting in four different games. Each of these games have their own difficulty. The first part of the game is called Clown's Counting Games. In this game, the player is need to count with a number as a guide to pitch the tone of the musical instrument. The second part is Tightrope game which the player need to help Reader Rabbit match a picture of objects with a displaying number. Then the player need to discard the picture that do not match. The third part is Circus Train Game. The player has to complete a sequence of numbers each being added to a particular number and the last game is Mystery Matching Game. This game required player to match turn over cards and find matching pictures of items and corresponding numbers. Figure 2.3 shows the interface of Math Rabbit.

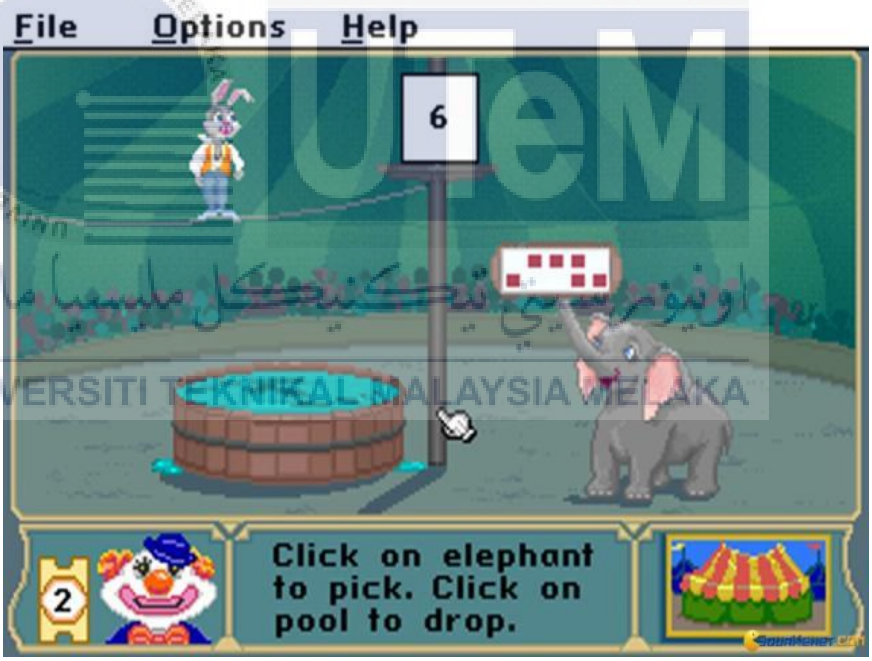

Figure 2.3 Interface of Math Rabbit

iii. Times Tables Game Multiplication (Mobile Applicatoin Platform)

The third platform of existing game is mobile game application named by Times Tables. This is a mobile application that can freely be downloaded online. This

game has three different game modes. One of the mode is Normal. The player need to play any table and even multiple tables mixed. The player need to answer as many as question correct as possible, and the score will be more if the player answering the question fast.

Next mode is Challenge. The player need to play against the clock by answering all questions perfectly within a challenging time and the player will get rewarded with a trophy. The 1 star level has 20 questions in sequential order. To beat the 2 star level, the player need to answer more than 30 questions in random. The highest 3 star level has 40 questions to be answered in random order. The last mode is Correction. The faults question in the other two mode, can be played again to correct them. Figure 2.4 shows the interface of Times Tables.

Figure 2.4 Interface of Times Tables

iv. Algebra Games with Linear Equations (Mobile Applicatoin Platform)

The fourth existing game is Algebra Game with Linear Equations which uses the mobile application as a platform to play. This game is a simple game which is the player need to answer the algebra, multiplication and division questions in time