Development of Game-Based Courseware in Learning

Pendidikan Sivik : M-Master

By

Siti Nabilah bte Abdul Raman

Dissertation submitted in partial fulfilment of

the requirements for the

Bachelor of Technology (Hons)

(Information and Communication Technology)

JANUARY 2011

Universiti Teknologi PETRONAS
Bandar Seri Iskandar
31750 Tronoh
Perak Darul Ridzuan
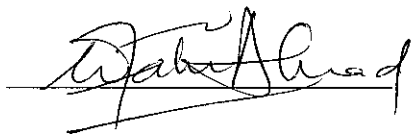
CERTIFICATION OF APPROVAL

DEVELOPMENT OF GAME-BASED COURSEWARE IN LEARNING PENDIDIKAN SIVIK: M-MASTER

by

Siti Nabilah Bte Abdul Raman

A project dissertation submitted to the

Computer and Information Science Programme

Universiti Teknologi PETRONAS

in partial fulfillment of the requirement for the

BACHELOR OF TECHNOLOGY (Hons)

(INFORMATION AND COMMUNICATION TECHNOLOGY)

Approved:

Assoc. Prof. Dr. Wan Fatimah Wan Ahmad
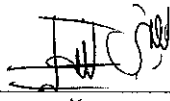
Project Supervisor

UNIVERSITI TEKNOLOGI PETRONAS

TRONOH, PERAK

January 2011

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

SITI NABILAH BTE ABDUL RAMAN

ABSTRACT

Pendidikan Sivik learns about Malaysia. The subject is compulsory taken for the primaru school students whom are in Standard 4, Standard 4 and Standard 6. The rapid development of the technology which are formally known as Information and Communication Technology (ICT) has changed the methodology of teaching and learning. Current trends of gaming will help to attract students in a way of transferring knowledge from the educator to students. In *Pendidikan Sivik*, there are a lot of facts to be memorized and as the consequence, there are trend of declining on interest in learning *Pendidikan Sivik* nowadays and there are an increasing numbers of student produce with exam-oriented. The purpose of the research is to research on a suitable type of games for learning geography, develop an interactive game to be used as teaching materials in *Pendidikan Sivik* subject and assess the usability of the courseware. The courseware will be developed using Adobe Flash CS4 and Adobe Photoshop CS4. This ongoing research also will explore the area of which games benefiting the player who can be the students or others in acquisition of skill, knowledge and in medium as a practical platform for them to learn knowledge. Through the result and discussion, this courseware receives positive feedback from the students. This courseware provide the student with fun learning style and it is capable to help them to bring back the enjoyment and excitement in education system rather than have a lecture for a long time.

ACKNOWLEDGEMENT

First and foremost, I would like to express my heartiest gratitude to Allah the Almighty, for that without His grace and mercy, I would not be able to make it through this journey until the very end line.

I also would like to express my utmost appreciation to my Supervisor, Assoc. Prof. Dr. Wan Fatimah binti Wan Ahmad, Lecturer of Universiti Teknologi PETRONAS for the great support, encouragement, guidance and the trust he had given me. Without whom, I will not be able to gain as much knowledge and success as I had been able now. My sincere gratitude also goes to Ms. Siti Rokhmah, lecturer of Universiti Teknologi PETRONAS and our instructor for Final Year Project and also other dedicated personnel for managing and facilitating us in completing this Final Year Project.

Million thanks are especially dedicated to all my friends for being very supportive and helpful. Million thanks to my both parents, Mr. Abdul Raman Ismail and Mrs. Siti Zainab Majid for their greatest support and trust they have in me, for the prayers to ease my journey.

Thank you.

LIST OF FIGURES

LIST OF TABLE

TABLE OF CONTENT

CHAPTER 1

INTRODUCTION

1. Introduction

1.1 Background of Study

Pendidikan Sivik is a subject which learns about Malaysia. This subject gives a clear view on the Malaysia looks, capitals and many more. The purpose of the creation of this subject is to produce students with full of love and loyal towards our country. Deeply caring and proud to be part of Malaysian is important in order for us to live happily and together even though in different taught and religion. This subject is being taught during primary school students whom are in standard 4, standard 5 and standard 6. *Pendidikan Sivik* also is a kick-start subject for the student for them who will take Geography and History subject when in Secondary school. Even though this subject will not been tested in Ujian Penilaian Sekolah Rendah (UPSR), this does not mean that students can take for granted about this subject. Usually, every school have final-term examination to test student on all subjects that students learn at school.

Nowadays is an era of technology. The rapid development of the technology which are formally known as Information and Communication Technology (ICT) has changed the methodology of teaching and learning *Pendidikan Sivik* in primary schools. Interactive and innovative design may improve the learning process of the student. It is important to suite all types of learning methods which are visual learning, auditory learning and kinaesthetic learning. Innovative software should be produced to match with all type of learners. In conclusion, most of students, agree to have new tools innovative software that can help to make the learning process in the classroom more interesting.

1.2 Problem Statement

In *Pendidikan Sivik*, there are a lot of facts to be memorized. Almost every chapter require them to remember facts. Begin from the map, continued with the unique of each country and then the content on each country. Students can easily feel bored when the educators dump a lot of theory or fact in one class. The interest to continue study will decline from time to time which may lead to poor performance of the students, teachers and school. Current environment of having an entertainment can be added up to the learning process to bring back the fullness of enjoy during learning or studying.
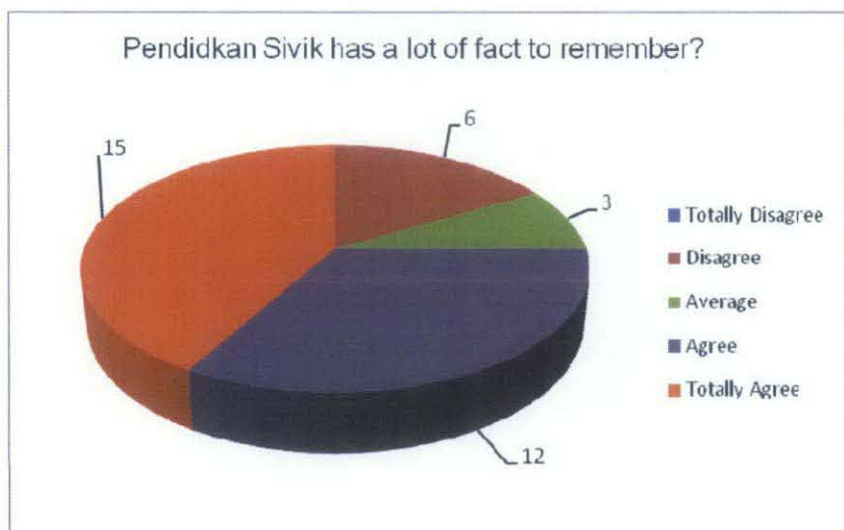
Figure 1.1: Result on the opinion of students about the subject

Summarization from the Figure 1.1 above is 12 of the total students agree and 15 students totally agree that *Pendidikan Sivik* has a lot of fact to remember. Only a few which is 6 of them disagree while another 3 is average. Almost all of the chapters in *Pendidikan Sivik* requires student to remember facts such as the look of flag in each state, the beauty of each state and many more. Students have to learn *Pendidikan Sivik* for three years in order to pass in the final examination

which usually held at the end of each year. That is mean, one years of fact for them to absorb in order to success.
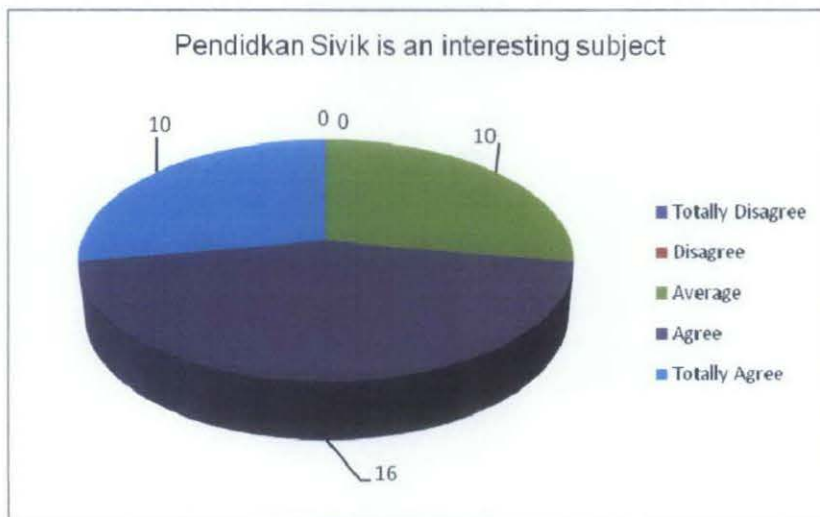
Figure 1.2: Result of the students feel about the subject

The consequence of the declining student interest in learning *Pendidikan Sivik* made the teaching and learning process has become more challenging. The student said that the subject is interesting, but do not really agree to have traditional methods of delivering the inputs. From the graph showed above (Figure 1.2), 16 of the total student agree and 10 of them totally aggree to say that *Pendidikan Sivik* is one of an interesting subject to be learnt while another 10 was in average. The student eager to know the advantages and looks of each country. Students believed that each country have their own intresting places and capabilities. Students also believed that it is good for them to know.

Educators need to find or introduce a new effective method for capturing and maintaining the attention from the student so that the student will not feel boring during the period of transferring knowledge. Too many exposures on the exciting

entertainment out there whether visually such as play games or physically such as going for vacation, every moment was the main factors that lead students to easily get bored while learning. There will be no improvement can be seen if educators still continue the traditional method which some of the student cannot accept it. The result of the student is still the same as shown below.
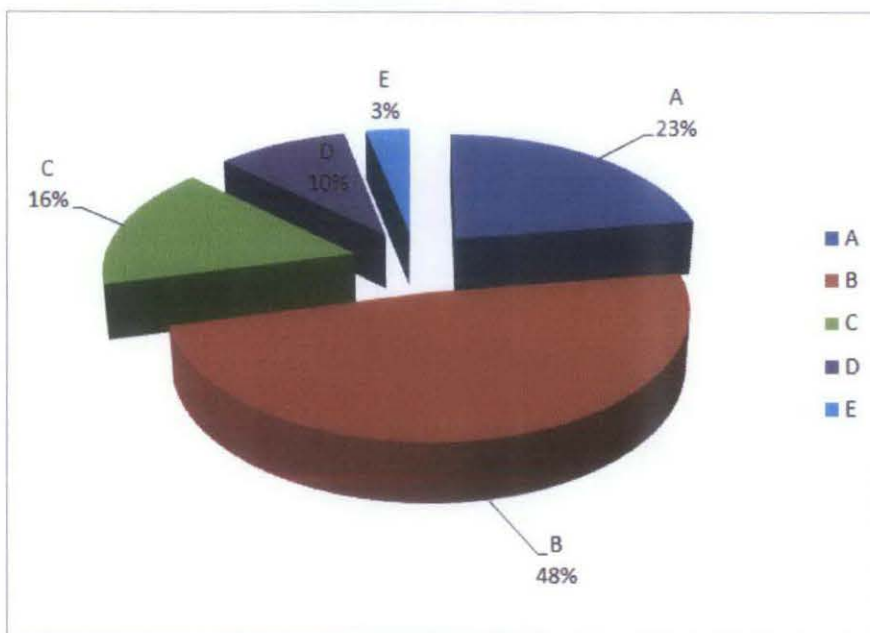
Figure 1.3 : Percentage of students score

Figure 1.3 above shows the percentage of mid-semester examination students' score at Sekolah Kebangsaan Tronoh. Extracting from the pie chart, it shows that 48% of the total students manage to get B in the examination. Followed by 23% of them scores A, 16% of them scores C, 10% scores an D and 3% scores E in the past examination. In the conclusion of the pie chart is majority of them was in a cluster of B and C. Only a few of them score A. Seems most of them score B and C; it shows that *Pendidikan Sivik* some kinds can be a hard subject to score an A in examination. Students have to study hard in order to get a good mark. By looking at the pie chart, the educators need to have some alternative way to make

4

the learning process of *Pendidikan Sivik* subject much more interesting to attract the student interest to learn. Otherwise, students will maintain the bad result in the examination.

As the result, there are an increasing numbers of student produce with exam-oriented because of the declining interest and ineffective teaching method. The aim of education is not only to see the good result of the students but to see their students' success in real life out there by applying all the teaching value that the students gain from what they have learnt. Due to this problem, the educators realize the important of technology which now suite with their generation in the learning process. The idea of the game application is to help educators enhance the student learning experience and to be more competitive with what the entertainment industry offer which is fun without losing the real objective of the education system.

From the pie chart below, shown most of students agree to have a new method of exercise which is in simple game-based in order to help them in accepting the facts given in the class. Usually, in game there will be two-way communication so that the student can interact well with the machines well. The way of the game delivering the facts in such attractive interface and bright colours may increase student interest to learn. Youngers nowadays really love to play game. The big number of percentages shows that there are most likely game-based courseware in *Pendidikan Sivik* will be good in future investment. There are 3 of them totally disagree, 2 disagree, 5 was in average, 13 agree and another 11 totally agree that exercising *Pendidikan Sivik* in game will increase the interest of most student. In order to ensure that, the study on how to make game suite and attractive to them should be conducted.
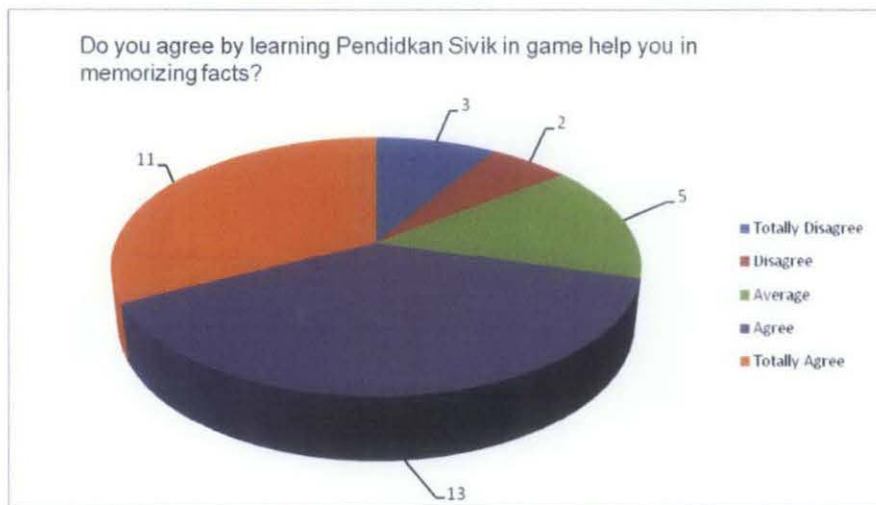
Figure 1.4: Student opinion on having game-based courseware

1.3 Objective

This research is on how the gamings's improved and affect the learning process of the student. The outcome of research will provide information on better games integration into class environment. It is to:

a) To research on a suitable type of games for learning *Pendidikan Sivik*

b) To develop an interactive games to be used as a teaching materials in *Pendidikan Sivik* subject

1.4 Project Scope

M-Master is purposely designed to bring back the enjoyment of learning in the classroom. Below is the detail of the project scope, which is:

a) Chapter   : Malaysia

b) Syllabus   : Standard 4, Primary School

1.5 Expected Outcome / Benefits of the Project

With the help of game and technology, there still a hope to bring back the joy of learning in class. By playing games, the potential of the student getting bored is much lesser than before. The excitement in playing education games will make the student accept the theories and facts given naturally without being forced to do so. The educators can use the method by alternate within the lecture and game exercise. This kind of approach will help the educators to keep track the difficulties faced by the student as soon as the lecture of the topics end. It is hard to heal the difficulties faced by the student when it comes to the end of the year. What actually it means is, it is hard to explain from the beginning of the whole topics when the time come at the end of the year which usually near to the final exam.

The student will be assessed upon a completion of the challenge either completing within the time limit and the number of question answered correctly. The marks showed to them at the end of the game will be a good indicator for the teacher as well to monitor the student performance. A thorough analysis of class performance can be made in advance so that the teacher can track in what particular sections the student find difficulties. Current method of teaching where the teachers mark the work of student can be applied to advice of the correct answer. In fact, in the education game software, the teacher also can be the computer itself.

Student may form their own team to develop teamwork personal skills or play individually for personal assessment while playing M-Master. Working in group is a good exposure for now as it will slowly develop the interpersonal skills of the student. The group of students can have a discussion among them if they find the difficulties while solving the problems in M-Master. Most of the people believe that the learning through the discussion among the peer group will help to ease the process of accepting the concept by the individual.

1.6 Challenges

There are a lot of study need to conduct in order to develop games for educational purposes. It cannot simply be made as it could lead to the failure of the project.

Research on the educators and students need to be assess first especially on how both pasrties can adapt the new development and learning process. Several questions are expected to arise are:

a) Whether both parties can accept the new technology?

b) Is it parallel with the education system purpose?

These are the example of the crucial questions which need to think of. As the educator and the student are from different generation, the study of acceptance need to be made. The educators also who probably from difference generation from the student who are google generation may found a little but hard for them to adapt the new technology.

Next is the needs for finding on how the gaming effect towards the learning and teaching methods. In order to develop a good game which parallel to the purpose of the education, there are need to find the suitable game component that give impact on the learning process. As the consequence, the educator or Minister of Education will not feel hesitate to implement the game courseware as part of learning. Too much addicted to the game also can be considered as negative impact of the game development even though for educational purposes. The positive impact can be considereed if the student shows the willingness and effort to know the fact by solving problems in M-Master.

CHAPTER 2

LITERATURE REVIEW

2. Literature Review

Education is a process where the student can learn something either by instruction, teaching or learning. It is important to have an education in order to survive on this new era. What is happening before independence make the people realize on the important of education. Instruction is purposely done to facilitate the learners so that the objectives delivered at the end. Teaching is a real live action of the educators to convey learning to the. Teaching can be considered as a hard phase whereby the educators need to ensure that the student get the objectives delivered. According to Smith (1996), he outlines the fundamental principles of learning via the acronym 'NO LIMIT': kNow the about the brain and how it works; remain Open and relaxed and therefore receptive to new information and ideas; develop Learning to capacity through challenging teaching in a supportive environment; Input information by way of visual, auditory and kinaesthetic means (VAK); adopt strategies to access Multiple Intelligences; Invest in learning by developing self-belief and self-esteem; Try out and test new knowledge and skills. What is actually Smith mean is that there are needs to develop challenging tools that adapt to support the current technolog environment for learning puposes in a various way of inputting such as visually, auditory and kinaesthetic.

According to Kramer (2000), every activity that gives happiness or brings pleasure to the people is a game. Game is an activity which is developed for the purposes of pleasure without aware of any purpose such as people dance, play

with dolls and play music instruments. Difference to nowadays situation where most of the games developed are in purpose such as to master in language which is scrabble, master in mathematics such as monopoly and many more. Basic key components needed in developing games are skills, goals, rules, challenges and interaction. That makes the game sound familiar and nearer to the people especially children and youngsters. Games are usually creating more for enjoyment. There are study confirms the existence of a small group of addicted on gamers which are (3%), representing about 1.5% of all children aged 13–16 years (Rooij, Schoenmakers, Vermulst, Eijnden, and Van De Mheen). There are believed that the number will be grown up from time to time.

Games which are purposely designed to teach people about something or certain subject are usually called educational games. It usually assists students in learning the skill while playing. Education game is a type of serious game because it has a specific purpose to be achieved rather than other entertainment which the purpose only to have fun and pleasure such as teach certain subject, expand concept, reinforce development or understand an historical event or culture. Students rated game elements such as logic, memory, visualisation and problem solving as the most important game elements. By understanding the relationship between educational needs and game elements will allow us to develop educational games that include visualisation and problem solving skills (Amory, A., Naicker, K., Vincent, J. and Adams, C. (1999)). Most of the scholars agree that educational games can help to change the problem faced by the students. It was proven by Muijs & Reynolds (2001) that many school improvement and school reform initiatives have focussed on changing school-level factors, all the evidence suggests that if we want to make a real difference to students we need to concentrate on those factors that are closest to them. Based on Hativa & Becker (1996) the achievement increases when students utilise computer technology in the classroom because it individualises the educational process and uses constructivist learning strategies that accommodate individual needs, interests and learning.

Pendidikan Sivik is basically the study about Malaysia land such as the houses, flags, capitals, natural resources and landmark. It is interesting to know as it is difference from one place to one place. Recognising the differences in terms of the cultures, economies, landscape and environment across the country make the *Pendidikan Sivik* important to be learnt. Students always wondered on the important of studying *Pendidikan Sivik* which this subject is the kick-start for every student who are compulsory to take Geography and History subject later during Secondary school. It is good to learn basic properly so that the student will not feel shocked as the subject is much tougher. The effective management of natural resources is one of the key problems studied by geographers, economists and planners. Professor Mitchell (2001) discusses how resource analysis has been influenced by, and has had an influence upon, recent developments in *Pendidikan Sivik*.

Kozma & Croninger (1992) described several ways in which technology may help to address cognitive, motivational and social needs of so-called "at-risk" students. Research has shown that geographic maps can be used as cognitive tools to increase the recall of related texts (Kulhavy & Stock, 1996). The used of pictures is important in order to help student recall all relatec facts. One way of effective teaching method for *Pendidikan Sivik* is by map interpretor. M-Master will be developed using adobe flash so that the animation map will be used as a teaching tools. According to Habibah and Arumugam (2005) students who were exposed to animated maps outperformed students exposed to static maps. There are proved that the animated maps give more impacts rather than static maps. Maps provided in the books is the closest example of the static maps which is not really give impct to the student as it requires to read more on the maps while the animated used all the visuan and auditory of the students on the maps. This style of learning did not force the students to remember all the facts but by the animation and action showed whereas the adaptation of the fact will be naturally accept by the student itself. The easy adaptation of the student with the game also was shown by the movie of Sherlock Holmes (2009) which in the story itself there are the detective who solves the problem by looking at the land that the detective find

weird at the place of murdered case. By analyzing the type of land, only then the detective know from where the murder come and who actually the murderer are. It sounds interestiong and it shows how the important of *Pendidikan Sivik*. The style of the author interpret the storyline had attracted most of the student.
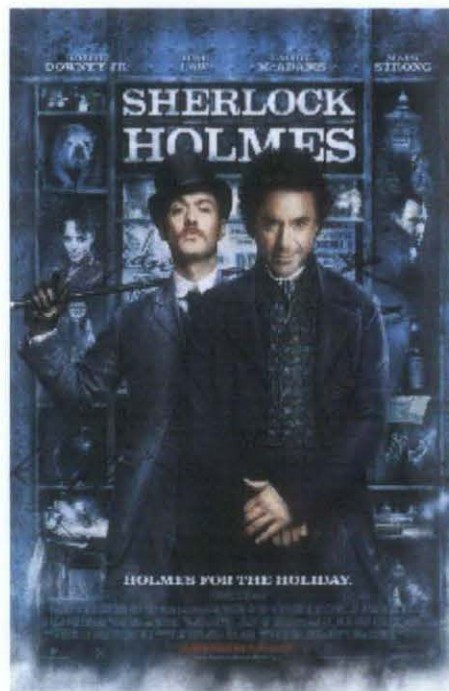
Figure 2.1: Sherlock Holmes movie (2009)

Games can be categorized by the genre that used to developed the games. The differences of gaming genres is important for different purposes. As the game developer, it is good to choose the suitable types of genre of the games. Games can be categorized into several types including car racing games, sports games, action games, role-playing games, strategy games, simulated games and so forth. Among which, only role-playing games, strategy games and simulated games have more educational elements in them (Ju-Ling Shih, Chien-Wen Chuang, Jia-Jiun Tseng, Bai-Jiun Shih (2010)). According to them, role playing games consists of map (maze), free actions (movements) and adventures. Adding to it is

the nice storyline with the character development to solve the problem given. Strategy games required the main player to have enough resource management, planning and strategic deployment while simulation games are games that replicate the real life activities for the purposes of training, analysis and prediction. Nearest example for the gamers are war games, business games and role-play simulation. Table 2.2 below is the study of the scholar's shows that each genre have their own purpose and advantages. As for educational purpose games, it is good to use whether First-Person Shooter, Role-Playing Game or Strategy (Frazer, Argles & Wills (2008)).

	First-Person Shooter			RPG/Adventure			Puzzle			Strategy		
	1	2	3	1	2	3	1	2	3	1	2	3
Conversation	X	X	X									
New knowledge	X	X	X	X	X	X			X	X	X	X
World creation	X	X						X				
World exploration	X	X	X	X	X	X					X	X
Useful feedback		X	X	X		X				X	X	X
Balance difficulty						X				X		
Clear goals		X	X		X	X	X	X	X			X
Contextualisation	X	X	X		X	X	X	X	X			X
Provoke curiosity	X			X	X	X						
Immersion	X	X	X	X	X	X	X	X	X			
Offer rewards	X	X	X	X	X	X			X	X	X	X
Unite resources				X	X	X				X	X	X
Blended support									X	X	X	X
Full pedagogy												
Standards	X	X						X				

Table 2.1: The affordance offered by each investigated game (Frazer, Argles & Wills (2008))

2.1 Advantage and Disadvantage of games in education

Introducing educational game as a method of learning can help in developing social value by having a great discussion about the topic with their friends. Once the student interest was successfully gained, the process of transferring

13

the knowledge between two parties is much easier as the student always feel like want to know more about the subject.

Money is a greatest concern where the Ministry of Education have to spend a lot to provide proper tools and equipments to the school. Other than that, government also need to spend some of the cost to send educators for training in order for them to master on how to use the software and it consumes times. By having educational games embedded in the learning process may discourage socialization between students. It will isolate and reduce social interaction among the individual as the students are working alone at each time.

CHAPTER 3

METHODOLOGY

3. Methodology

3.1 Introduction

There are a lot of different methods can be utilized in order to have a better understanding of the concept and to gain a useful picture of the research in Development of Game-Based Courseware in *Pendidikan Sivik*: M-Master. In this chapter, the focus will be to elaborate more on the methodology which will be used to develop good software.

3.2 Data Analysis Models

There are two different methods are choose in order to have a better understanding of the concept and to gain a useful picture of the research in development of M-Master which are:

3.2.1 Research

Research is important and such an easy way to search whether the proposed research title has been done before or not. If there exist, it can be as a benchmarking and in the future to make a comparison between the two to find the SWOT analysis between the two materials.

3.2.2 Survey/Questionnaire

Survey method used is some kind of simple questionnaire given to both educators and students to evaluate the current method of studying with the M-Master learning system. Chapter will be chosen right after the questionnaire done depends on the rate of difficulties put by selected students of Sekolah Kebangsaan Tronoh.

3.3 System Development Model

3.3.1 Waterfalls Model
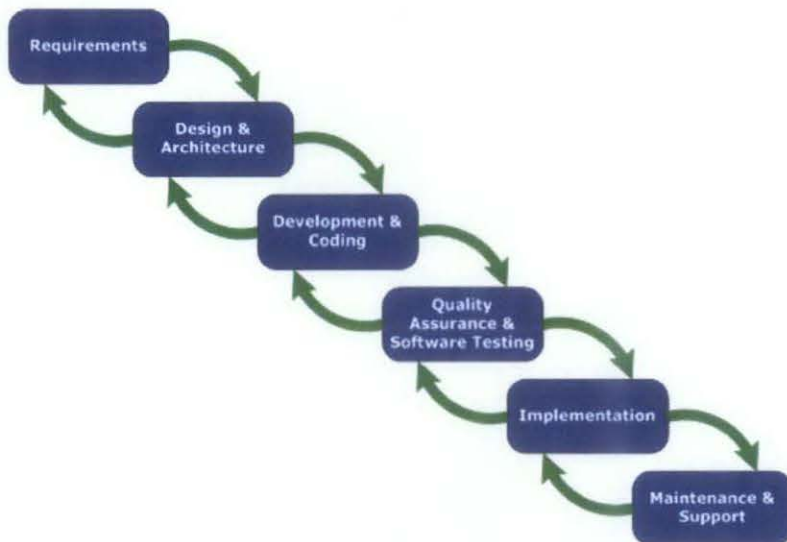
Figure 3.1: Waterfall models

Figure 3.1 shows the new waterfall models process. The waterfall model is among the classical model of system development life cycle. In order to develop M-Master, waterfall model of methodology had been chosen. Waterfall model describes a development method that is linear and sequential. It has distinct goals in each of the phase of the development that need to be achieved. Once a phase of development is completed, the development proceeds to the next phase and there is a way of turning back. The storyline of the game should be finalised

before move on to the next step otherwise, it will little bit costly to the client as well as the developer. It will not applicable to make changes in later because it will consume a lot of time and budget to redo from the beginning. Clarify is the important key before starts with the new development process.

3.3.2   Project Activities

Requirement

In this phase, the entire requirement from the user will be gathered by using several methods. The requirement will be analyzed so that the validity and possibility of the requirements to be incorporate with the future developed software. The software will not totally change the current learning process but the game is just an added exercise so that the user will not lose their interest in learning the subject.

The requirement of the project had been gathered by using interview, questionnaire and observation method. Sekolah Kebangsaan Tronoh had been chosen as the research area for this project. The result of the interview with the teacher there, they have no such any courseware using at this moment. Practically, they use book exercise in order to access the level of understanding about the topics.

Design & Architecture

The software will be designed first before create it using Adobe Flash CS4 software. The requirements that had been studied earlier before were help a lot on preparation of software design. The software design will be draft on paper first so that it will be easier to make changes. The draft will be shown to the user first before proceed to next phase to

17

ensure it meet user requirements. In this phase also storyboard of the software will be designed. The story board will consists of the flow of the courseware, the character that will be using, functionality of the software and interface of each unit.
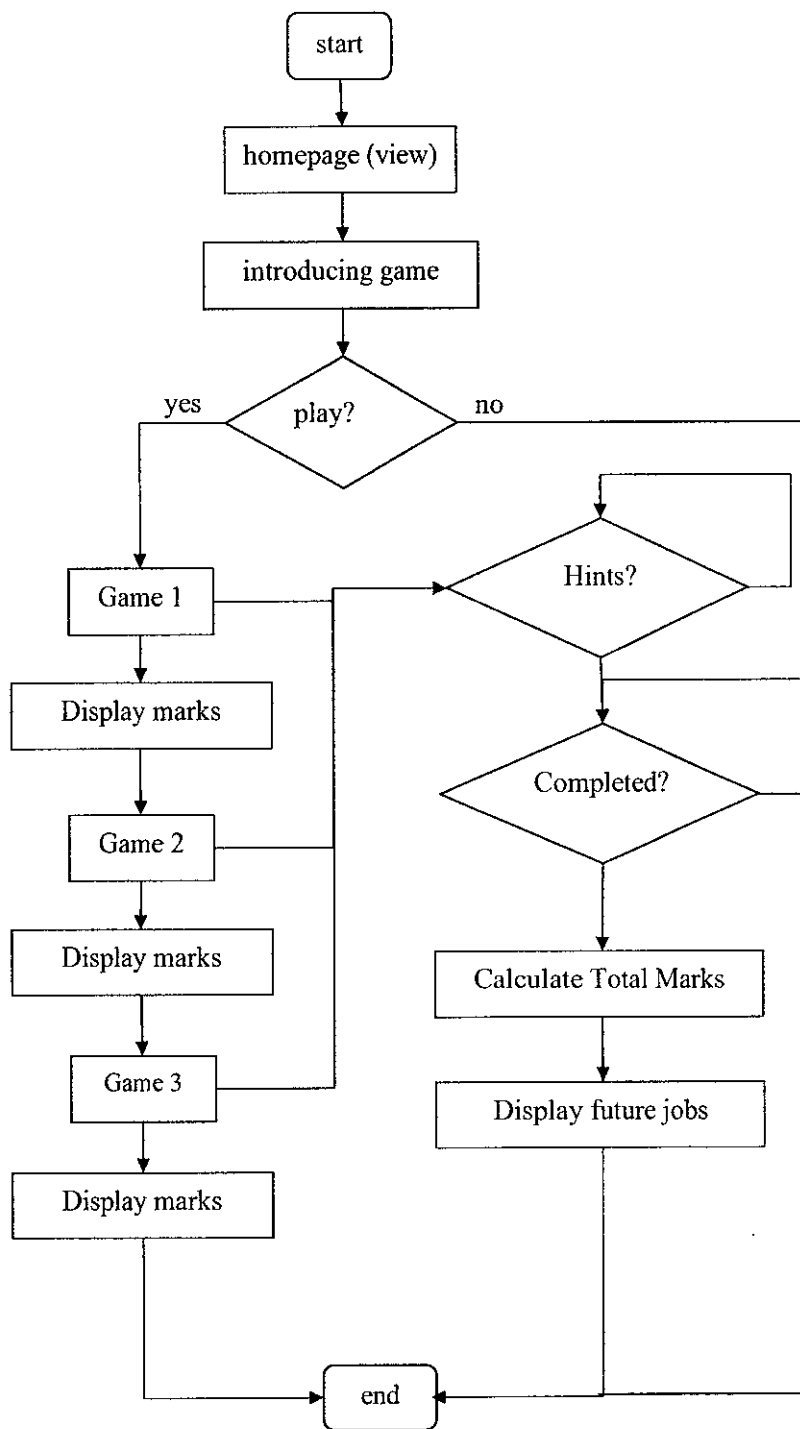
Below is the flowchart of the software:

—

Figure 3.2: Flowchart of the software

19

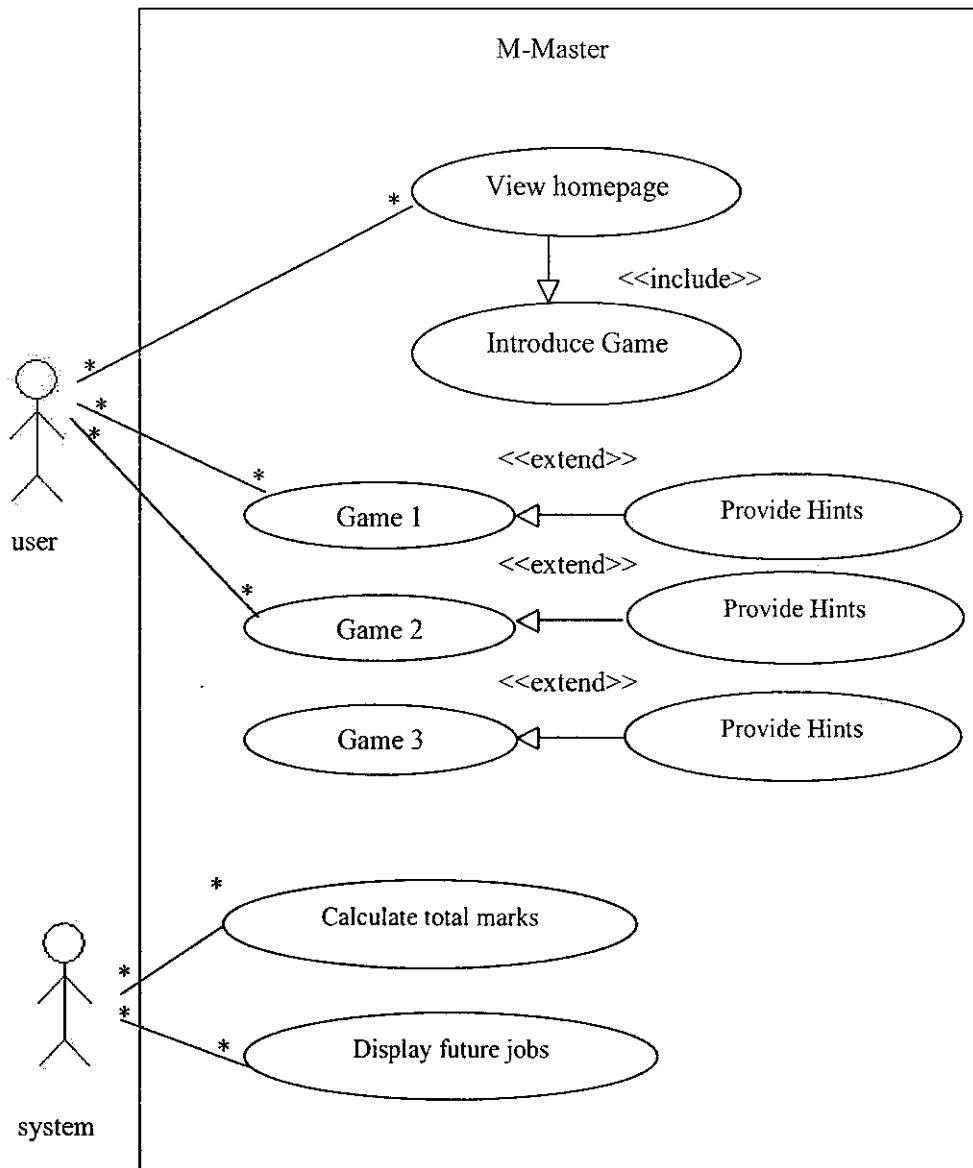Next is the use case diagram of the software:

Figure 3.3: Use Case Diagram

Development & Coding

Development process immediately started when the flow of the software had been identified. The code writing should be easier as the developer know and have the idea on how the system will be after this. Within the time given, the software should be done developed so that the quality assurance and testing can be measured of.

Quality Assurance & Software Testing

It is important to ensure the quality of the software before delivering to the user. The first impression of the user is important in order to bring the good image of the company or developer itself. The level of difficulties also must meet the students. It should not be too easy or too difficult to the user. The software also must meet the expectation of the user so that they will not blame to the courseware developed.

Implementation

For this phase, after the draft had been approved by user, the software will be design using Adobe Flash CS4 based on the draft. The software is first developed in small programs called units, which are integrated in the next phase. Each game will be created separately then integrated it on the next phase. Each unit is developed and tested for its functionality which referred as Unit Testing. Each of the modules will be called as unit. In this software there will be several units such as homepage, game one, game two, marks calculation and etc. All the units will be developing separately and will be integrating on the next phase which it will be tested first before proceed to the integration level.

Maintenance & Support

Sometimes there are errors which not be found during the development and testing phase. Usually is runtime error. Any fixation, modification and future enhancement will be changed during this process. This process has no time limit as it is continuous from time to time.

3.4 Tools and Materials

   3.4.1   Software

         a) Adobe Flash CS4

            Adobe Flash CS4 is a newer version of Adobe Flash Professional. This software will be used to create a game. The required skill in order to develop M-Master is creativity.

         b) Adobe Photoshop

            Adobe Photoshop is one of the software that can be used to design or edit pictures. It is like GNU Image Manipulation Program tools for editing but only a difference is Adobe Photoshop is not a free tool.

         c) Windows Vista

            It is the platform that Adobe been installed currently. It is also being used in my personal laptop current platform. Windows Vista is more preferable rather than the new introduced Windows 7 because it compatible with all types of software and easy to use.

3.5 Gantt chart

No	Activities	Year									
		2010					2011				
		Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
1	Planning	▓	▓								
	Choose topic	▓									
	Preliminary research on topic	▓									
	Specify scope		▓								
2	Analysis		▓								
	Requirements gathering		▓								
3	Design			▓							
	Design interface			▓							
	Design storyboard			▓							
4	Development				▓	▓	▓				
5	Testing						▓	▓	▓	▓	
6	Implementation									▓	▓

Figure 3.4: Gantt Chart

CHAPTER 4

RESULT AND DISCUSSION

4. Finding

    4.1 Questionnaire

A survey of questionnaire had been done on 28th of September 2010 at Sekolah Kebangsaan Tronoh for new student in Standard 4. Total of 36 students involved in this survey. The reason to choose them as the experiment is because this is a new exposure to this subject. This school categorized as the potential school and there are consists of student chosen from Yayasan Selangor. There are a total of three sections and 10 questions for overall questionnaires. Questions that are being highlighted are believed to be the most crucial and direct the design of the software later on.

Several question had been set in order to conduct survey for students at the secondary school in order to have a better view on how students think or feel about *Pendidikan Sivik* subject. As the conclusion from the survey conducted, most of them agree that Pendidikan Sivik is one of the interesting subject to be learnt. Students also agree to embed such a new exercise method through their learning process. But, students do not want to diminished the traditional method of teaching and learning process. Students are willing to try M-Master to icompare whether the courseware improve them better or not.

4.2 Design

4.2.1 Genre of M-Master

Educational and puzzle were chosen in order to develop M-Master. Basically, educational games are designed purposely to teach. Learning process still can be conducted even though interpreted in the forms of games. According to Marc (2001) that this medium of learning is not impossible will change the learning in future. It also often works well in blended learning situations, making it a strong candidate to enhance current, information-heavy teaching styles. The game could easily be played alongside a traditional, instructor-led session, with its efficiency at displaying rich, dense information being a strong replacement for the textbook Frazer, Argles & Wills (2008). The game has a clear provision of goals to ensure the information contextualize well to the student. Puzzle genre of games has been chosen in order to explaining important concepts to the student.

This game will make use of three approaches in delivering the facts to the student in this puzzle games which are extra information, colours and pictures. There are three games which used three different approaches that stated before. These approaches is aimed to achieve the goal of learning this subject as it stated clearly to make the student easily get the facts that have been studied at school.

4.2.2 Design of M-Master

Figure 4.1 below shows the headline of M-Master. The game named M-Master will be introduced as a new development tools to learn *Pendidikan Sivik*. The interface of M-Master should be designed attractively as it will give the first impression from the audience towards the games. First impression is important because usually it determine on the success of the project. When the student feel impress with M-Master, it will increase the

eagerness to try the new things. When the student starts to try, they will feel excited and it may lead them to try to score highest mark when they start on comparing marks with their friends.
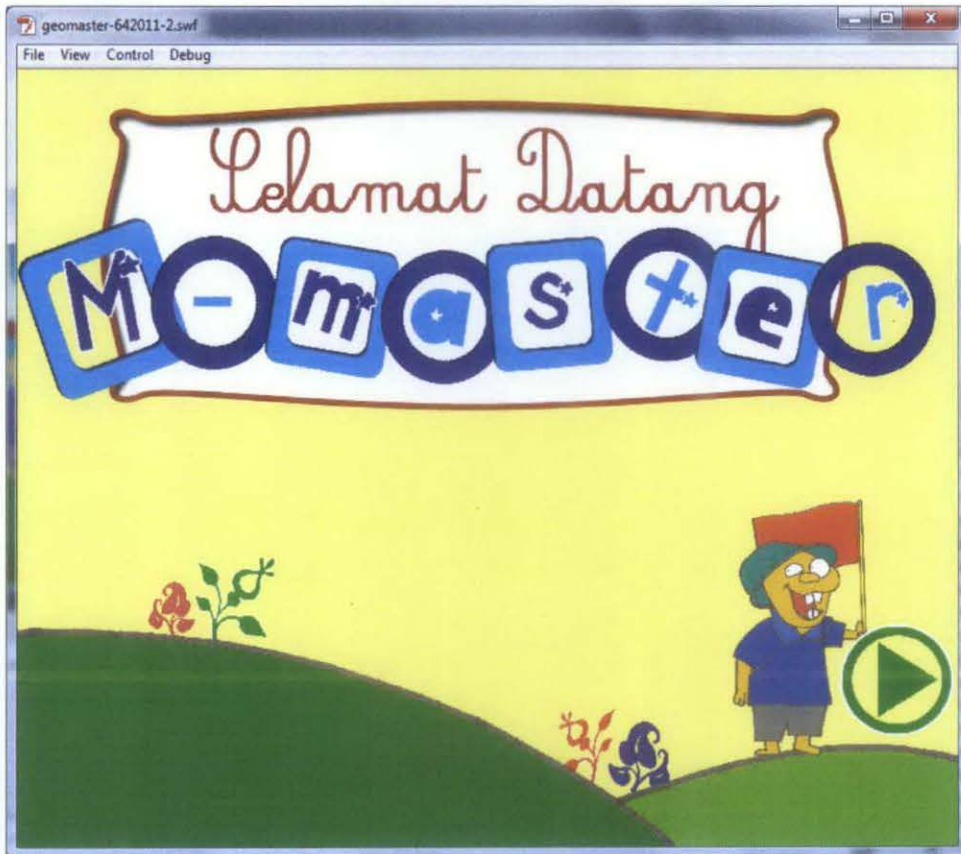

Figure 4.1 : Introducing Game

M-Master is designed in Bahasa Melayu because this subject is being taught in Malay language at school. Changes in English may make them difficult to learn and understand. The aimed in order to make the student easily get the facts and information might be a little difficult if we change to the language that students are not familiar with.
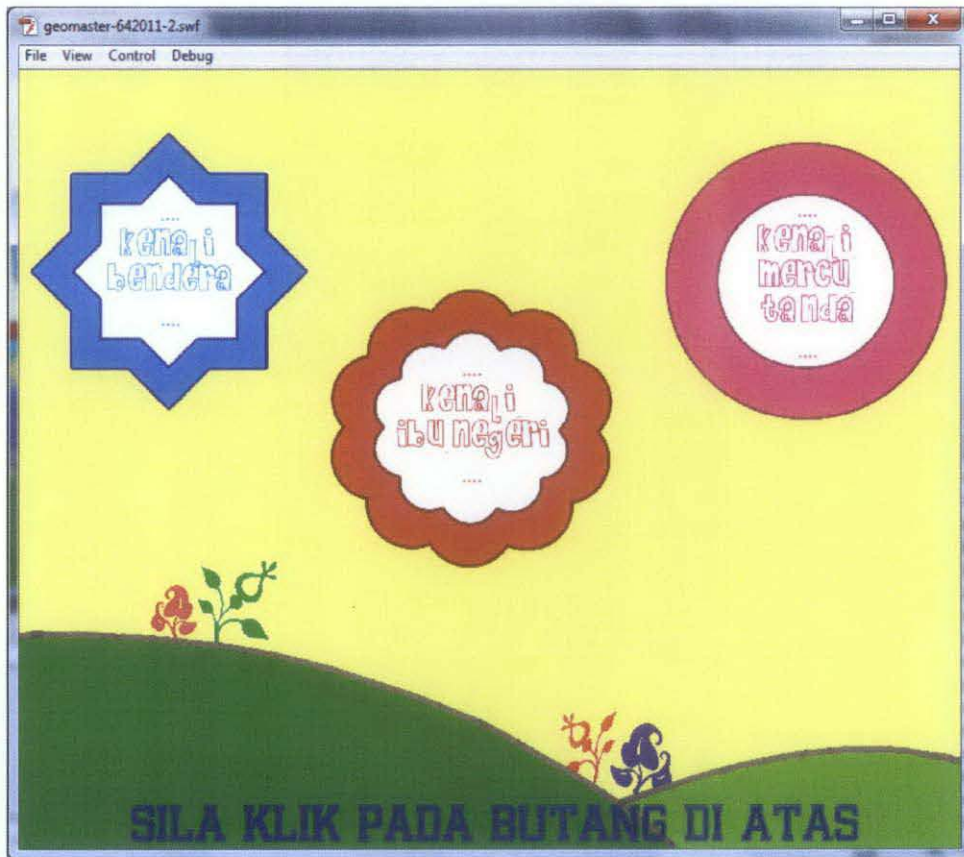
Figure 4.2: Menu of the game

Picture above as shown in figure 4.2 is menus of the game. There are three games which are; (1) *Kenali Bendera*; (2) *Kenali Ibu Negeri*; and (3) *Kenali Mercu Tanda*. There are three games where the students can choose and click on it when they feel want to play it. The games are not restricted on the game that they should play, as for example like student have to play game 1 before move on to the game 2. The reason behind this is because students can freely choose on what topics that students weak on. Students may easily get bored and fed up when they have to play from the start while the intention is to play only the last game. It gave difficulties to the student as well. In order to avoid that kind of problem, there is no restriction for the student to play their preferable game.

27

Recognizing the locations and flags of each state was taught as important key to the students as it is consider as a basic about our country. It is a shamed and ruined image of the country if the citizen of the country itself does not know where such places are located, either in south, north, east or west of Malaysia. People will look these people who do not know about the country as the non-lover to the country.
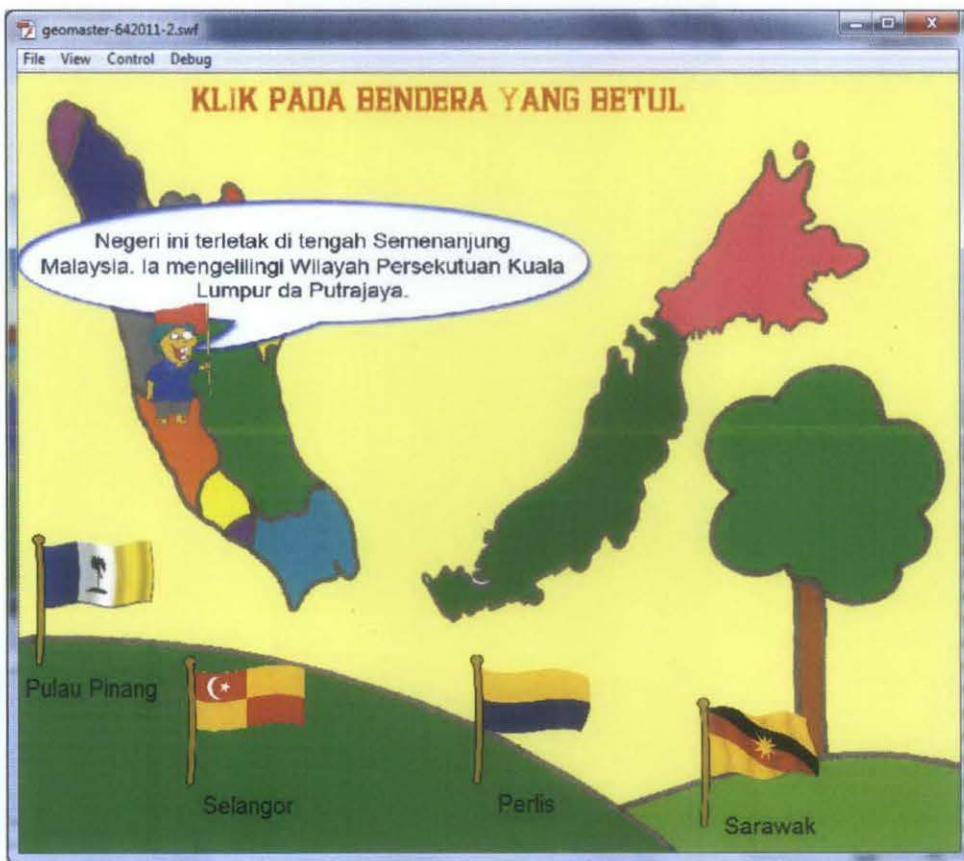

Figure 4.3: Flag of Malaysia

Game 1 - Figure 4.3 as shown above is the first game. M-Master begins with simple but attractive games. As the student is in standard 4, it indicates they are new in this topic. Research had shown that it is

important for them to recognize the map of Malaysia and its identity in order to produce students with a high spirit of nationality. The game called *Kenali Bendera* or Know the Flag. Level 1 is a little bit easy to play.

First approach which is additional interesting extra information is used in order to deliver the facts to the students. The purpose of using this approach is to make the students able to recall and relate the additional information which students might know to the looks of the flag. The student just has to click on the correct flag that appear below the map. There are two difference sound appears indicates whether the answer given by the student is right or wrong.

In this level 1 game, there are no timing require. This is just only to warm up the student and to make them familiar and recognize the flag well. The score on each level will be shown to the player after done with the entire question provided as in Figure 4.4. By having this, the student can analyze themselves on which category that they belong to. Benchmarking of themselves will help them to make them become better and improving from time to time.

Figure 4.4: Scoreboard for game 1

Mastery learning approach had been embedded in this courseware which the student needs to pass the minimum requirement which being stated. Students can go to the next stage if they passed the minimum standard which has been standardized. If not, students have to play again the previous game until the student really master on it.
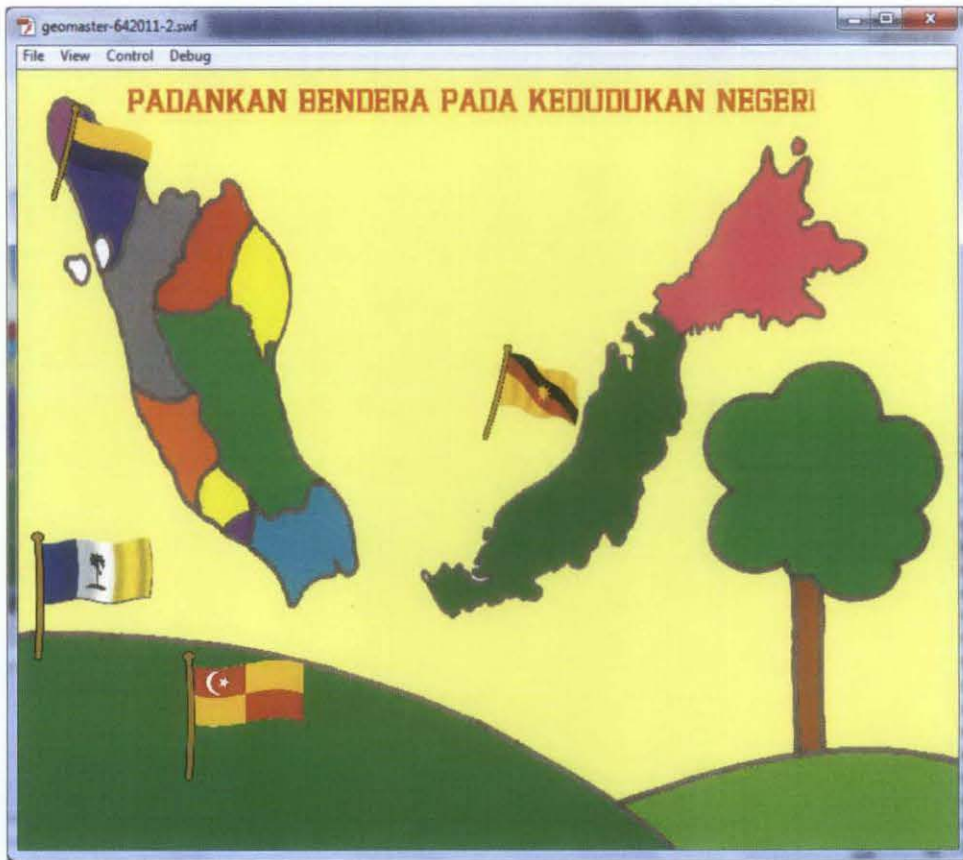
Figure 4.5: Flag of Malaysia Level 2

Figure 4.5 - This is a level 2 game. This game is a bit harder than before. Within the 60 seconds, the student needs to identify the locations of the state without any hint given to them. Students should be a bit more familiar since the first game given a lot of hint about the state and the look of the flag itself. The picture above shows two positions of flags. Originally, it will be at the land. If it dragged correctly, than it may stay there otherwise, it will going back to the original place. When the time is up, the score of the students will be shown up so that the student can analyze their level by looking at the answer marks. The score on each level will be shown such as for example out of 15 questions, 8 answers are right and the rest the student had answered wrongly.

Game 2 - The second games will be 'Kenali Ibu Negeri' shown in the figure 4.6 below. In this game, the student has to point open and memorize the location and the name of the state and the capital that they had opened. The time will be recorded to see how much time that the student takes in completing the task. Lesser time is better. If they got correct match the card will be disappeared, otherwise it will be flip back to the original card.
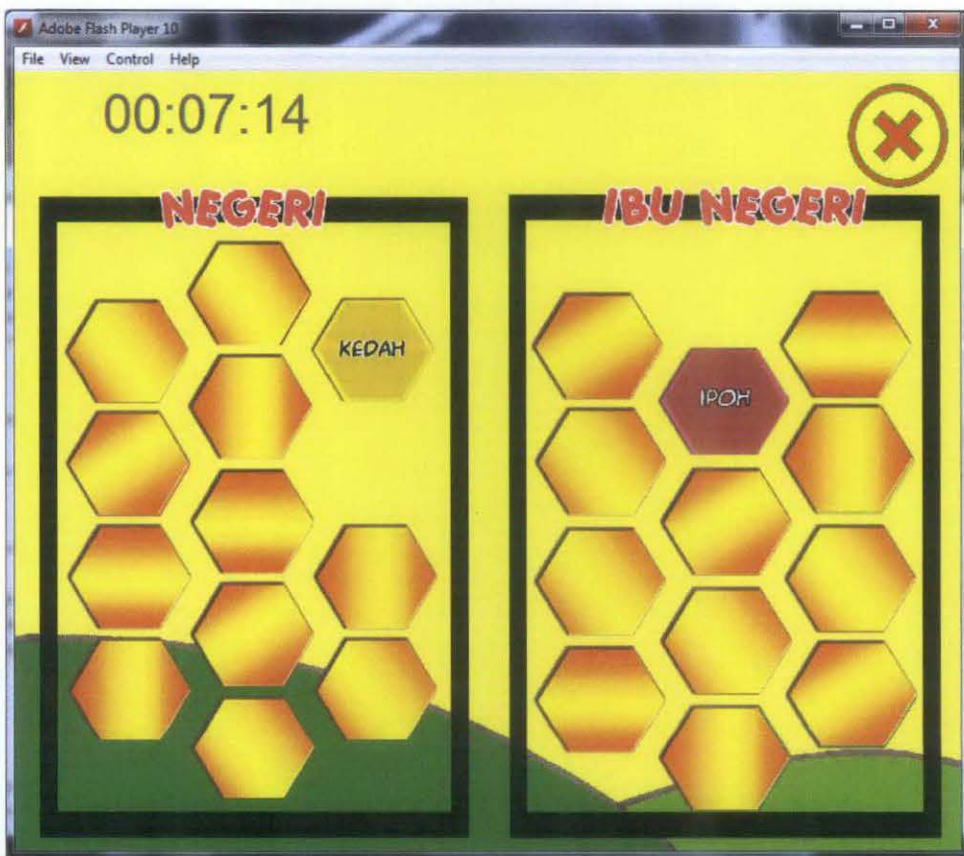
Figure 4.6: Kenali Ibu Negeri

This game can be called as a Memory Game. Colour approached had been used in order to deliver the facts and knowledge to the user. Usually,

people can easily get the idea when they recall the colour that they have been seen while playing this game. Instead of having a long sentences at the text books stated that this is the capital of this state, the student can easily get bored.
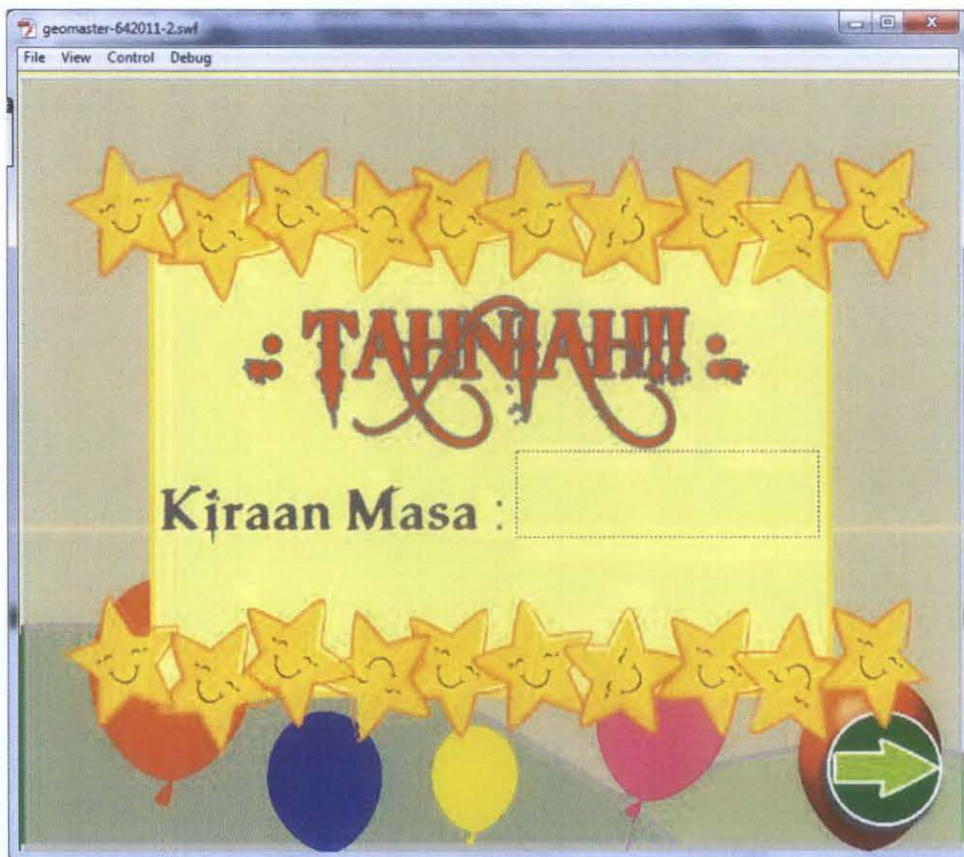
Figure 4.7: Scoreboard for game 2

Figure 4.7 shows the scoreboard for game 2 which is memory colour game. The purpose to use this method compared to others is to find total time students taken in order to complete the game. After all both cards of the state and capitals had opened, it consider as completed. The lesser the time taken, it consider as good.

Figure 4.8 shows the last game provided in M-Master. This game used the method of pictures in order to make user familiar with the looks of the landmark as well as the name. There are four lives given to the student. Only when students have remaining lives, then they can continue playing. But, is the student got correct answer 3 in rows, M-Master will give one extra lives as an appreciation to the student.

Figure 4.8: Kenali Mercu Tanda

4.2.3 How M-Master Helps

There are three approaches of delivering the facts and knowledge to the end-user which are additional information, colours and pictures. The potential of

helping the students in getting the information that the teachers want to is high such as:

a) Additional Information

The purpose of using this method is to be able to relate the facts that the student might know or familiar with the fact about Malaysia.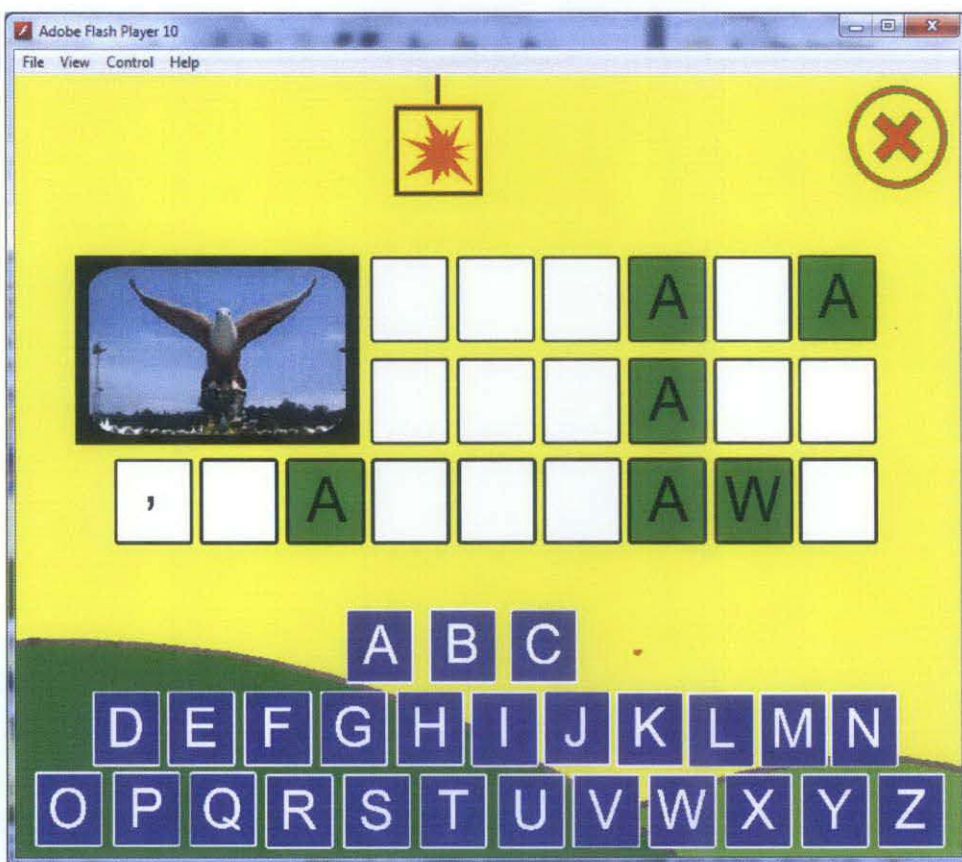 Students might know some information about the state from their parents, friends or media. It is good if students can relate and recall extra attractive information about such places with the facts that the subject tried to expose to the student. It will ease the process of accepting the knowledge.

b) Colours

Through colours also will help the student to memorize facts better. There are several of colour choices. The used of brighter colours will grab student attention more than usual. It will also grab the feeling of learning from the student compared to only reading the textbook with only black and white wordings may lead to dropping interest and mood. Colour has been found to increase a person's interest as it will make the interface look interesting and attracting. Assuming that the effect of coloured game may have good feedback on the student memory retention.

c) Picture

Picture may help student recall better. The picture will help the student to recall on what they had learnt previously in class. Usually student will memorize pictures more rather than sentences which will be wrote in black and white.

This game was designed to be more relaxing games. The games do not require the student to properly sit and focus in order to score. The student can pose with what they suitable with to play the game. The flexibility of the game will help to increase the interest of the student to learn. The student will learn to accept the fact by themselves without being forced only when the student feel interested to know about the subject. Most of the people do not

like to be forced. Flexibility is the key point to determine success as the game need to point and drag-and-put while playing.

Animation is a second key point that may attract the student. If the game designed plain or static, it is just the same as the book. The impact of the learning process is the same like conventional teaching method. By having the animation of the pictures and maps make the memorization of the facts become easier. There are tendencies for the student to forget the facts during the examination due to the nervousness. But, with the help of the pictures and animation sometimes it helps the student to recall back. That is the power of picture and animation.

4.3 Functionality Test

Case	Functionality Being Tested	Input Details	Expected Result	Actual Result
1	Introduction Pages	Enter Button, Game Movie clip	Go to next page when hit Enter Button	Successfully
2	Menu Pages	Menus Button	Go to specified pages after hit Menu Button	Successfully
3	Instruction of first game	Next Button, Back Button	Go and play game; go back to the menu	Successfully
4	First Game (Kenali Bendera – Level 1)	Flag Button	Can be click on	Successfully

5	First Game (Kenali Bendera – Level1)	Sound of correct and wrong	Sounds appear correctly according to the answer given by the user	Successfully
6	Scoreboard	Dynamic Text	Number of question answered correctly or wrongly appear	Successfully
7	First Game (Kenali Bendera – Level2)	Flag Movie Clip; Maps Movie Clip	Flag can be dropped at the specified places	Successfully
8	Second Game (Kenali Ibu Negeri – Level1)	Card Movie Clip	Can be opened. If correct, it disappear, otherwise flip back	Successfully
9	Second Game (Kenali Ibu Negeri – Level1)	Timer (Count up)	Count total time that the user take to complete	Successfully
10	Third Game (Kenali Mercu Tanda – Level1)	Alphabet Button	Can be clicked on	Successfully
11	Third Game (Kenali Mercu Tanda – Level1)	Mirror Movie Clip	Mirror contain the same alphabet as hit will be flipped out	Successfully

Table 4.1: Functionality Test

4.4 User Acceptance Testing

User Acceptance Testing (UAT) has been conducted at Sekolah Kebangsaan Tronoh. The purpose of this testing is to whether the courseware created meets the user

37

requirements and accomplish the objectives. This questionnaire, involve three sections which are the overall look of the courseware, the content and overall reaction of the student towards the courseware. The feedback from this survey will help to the improvement of the courseware.

Below is the result which got from the User Acceptance Testing (UAT)

Questions	Students Rating									
	1	2	3	4	5	6	7	8	9	10
1	4	3	5	4	3	4	3	5	4	4
2	3	5	3	2	4	3	4	4	3	5
3	4	3	4	5	5	4	4	3	5	5
4	5	4	5	5	5	5	4	5	4	5
5	3	5	4	5	5	4	5	5	5	5
6	5	5	3	3	5	4	3	3	3	4
7	5	5	5	5	5	5	4	4	4	5
8	5	4	4	4	3	4	3	4	5	4
9	5	3	5	3	5	3	3	3	3	5
10	4	5	5	3	5	4	4	4	3	5
11	5	4	4	3	3	3	3	5	5	5
12	5	4	4	5	4	4	4	4	4	5
13	5	5	5	5	5	4	5	4	5	5

Table 4.2: Respondent Rating

Questions	Students Rating					
	Sum	Min	Max	Mean	Standard Deviation	Percentage
1	39	3	5	3.9	0.74	78
2	36	2	5	3.6	0.97	72
3	42	3	5	4.2	0.79	84

4	47	4	5	4.7	0.48	94
5	46	3	5	4.6	0.7	92
6	38	3	5	3.8	0.92	76
7	47	4	5	4.7	0.48	94
8	40	3	5	4	0.67	80
9	38	3	5	3.8	1.03	76
10	42	3	5	4.2	0.79	84
11	40	3	5	4	0.94	80
12	43	4	5	4.3	0.48	86
13	48	4	5	4.8	0.42	96

Table 4.3: UAT Analysis Result

Below is the guideline in order to determine the mean score result.

Mean >= 4.5	Excellent
Mean < 4.5	Good
Mean <= 3.5	Average
Mean <= 2.5	Poor

Table 4.4: Guideline for result

Below is the result based to the rating score given by the students.

Questions	Students Rating	
	Mean	Result
1	3.9	Good
2	3.6	Good
3	4.2	Good
4	4.7	Excellent
5	4.6	Excellent
6	3.8	Good
7	4.7	Good

8	4	Good
9	3.8	Good
10	4.2	Good
11	4	Good
12	4.3	Good
13	4.8	Excellent

Table 4.5: Result of mean score

Based on the UAT score, it can be concluded that students and teachers agreed with the usage of appropriate and interesting images and animations to be used in the courseware which can be embedded as part of the learning process. This courseware also will be a good platform to help the student in master on the subject. During the session, students feel so excited to play the game. Students seem eager to know the answer for every question given. Positive feedbacks also retrieved from the teacher who thought Pendidikan Sivik subject which is, the method of giving them an extra additional method and pictures is good. This is because it can open the mind of student so that student will not only know the facts that given in the text book only. Students may recall and relate the fact that student actually know maybe through their vacation as for example, with the fact that students learn in class.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Recommendation

As for recommendation, step by step instructions on how to play the games can be added as the guideline for user. Hint button also can be added so that they can play without feel boring and fed up after several time tries. The database also should be created so that it will store the marks of the students. It is to give advantages for both educators and students. Educators can monitor students' performance from the database whether it is in increase or decrease graph.

In order to attract the students to keep on using the courseware in the future, 3D based learning can be done as the enhancement in the future. As the technology fast growing, the user will be expecting high in the next few times. Upgrading in creating and making the game more adventure and difficult is important to ensure that the student will not feel bored after few times playing M-Master.

5.2 Conclusion

'M-Master' is to address the learning process for the student in Standard 4 who still new to the subject of *Pendidikan Sivik*. Because the students are new, the educators have to find an alternative method to bring the joy ness and excitement of learning *Pendidikan Sivik* in the class. The advantage of catching up their interest from the beginning is to ensure or lead them to keep up until the end of the subject and to

avoid the problem at the end of the course. Using a visual aids, sounds and animation are purposely to make the learning process more interactive and effective. With these objectives in mind, software that is specifically designed for this subject is to be developed. Upon the completion of this project, it is hoped that the project is able to benefit and students, teachers, and parents.

REFERENCES

Amory, A., Naicker, K., Vincent, J. and Adams, C. (1999), The use of computer games as an educational tool: identification of appropriate game types and game elements. British Journal of Educational Technology, 30: 311–321. doi: 10.1111/1467-8535.00121 Retrieved October 11,2010, Available at http://onlinelibrary.wiley.com/doi/10.1111/1467-8535.00121/citedby

Frazer, A., Argles, D. & Wills, G. (2008) *The Same, But Different: The Educational Affordances of Different Gaming Genres* Retrieved September 18,2010 Available online

http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=4561861

Habibah Hj. Lateh and Arumugam Raman (2005). A Study on the Use of Interactive Web-Base Maps in the Learning and Teaching of Geography. Vol. 2, No.3, pp   99-105   Retrieved   September   22,2010   Available   Online http://pppjj.usm.my/mojit/articles/pdf/Dec05/12%20-%20A_STUDY_ON_THE_USE_OF_INTERACTIVE_WEB_BASED_1-final.pdf

Hativa, N. and Becker, H. (1994). Computer-based integrated learning softwares: research and theory International Journal of Educational Research,21(1), 1-119.

Jeanne S., Rachel M. (2006). Learning objects (LO) aligning different learning styles. Retreived October 4, 2010, from https://uhdspace.uhasselt.be/dspace/handle/1942/1397?language=de

Ju-Ling Shih, Chien-Wen Chuang, Jia-Jiun Tseng& Bai-Jiun Shih (2010) *Designing a Role-Play Game for Learning Taiwan History and Geography* Retrieved September 18,2010 Available online

http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5463742

Kozma, R. and Chroninger, R. (1992). Technology and the fate of at-risk students. Education and Urban Society, 24(4), 440-453.

Kulhavy, R. and Stock, W. (1996). How cognitive maps are learned and remembered. Annals of the Association of American Geographers, 86(1), 123-145. Retrieved September 10,2010. Available Online http://www.informaworld.com/smpp/35861579-89547094/content~db=all~content=a788968837~frm=abslink

Lan Rowlands, David Nicholas, Peter Williams, Paul Huntington, Maggie Fieldhouse, Barrie Gunter, Richard Withey, Hamid R. Jamali, Tom Dobrowolski, Carol Tenopir, (2008) *"The Google generation: the information behaviour of the researcher of the future"*, Aslib Proceedings, Vol. 60 Iss: 4, pp.290 – 310 Available Online http://www.emeraldinsight.com/journals.htm?articleid=1733495&show=abstract

Mitchell,B (2001). Geography and resource analysis. Longman Group Limited,New York.Retrieved by September,19 2010, at http://www.alibris.com/search/books/qwork/2564842/used/Pendidikan Sivik%20and%20resource%20analysis

Muijis, D, and Raynolds (2001) Changing Classroom Learning, Retrieved by September 15,2010, Available at http://www.springerlink.com/content/p27mm40880j47512/

Pfeiffer,William S. (2003). Technical communication: a practical approach. Ramapo College, New Jersey.

Presley, C., Austin, S.B. and Jacobs, J. (2000). Higher education center-selecting the right tool. Availble Online http://www.edc.org/hec/pubs/selecting-right-tool.html

Smith, A. (1996) *Accelerated learning in the classroom*. Stafford: Network Educational Press. Retrieved on October 19,2010 Available at http://www.highlandschools-virtualib.org.uk/ltt/flexible/accelerated.htm

Van Rooij, A. J., Schoenmakers, T. M., Vermulst, A. A., Van Den Eijnden, R. J. and Van De Mheen, D. , Online video game addiction: identification of addicted adolescent gamers. Addiction, no. doi: 10.1111/j.1360-0443.2010.03104.x Retrieved October 11,2010, Available at http://onlinelibrary.wiley.com/doi/10.1111/j.13600443.2010.03104.x/abstract

Wolfgang K. (2000). A Magazine About Boardgames. *What is a game?*. Retreived August 12, 2010, Available online http://www.thegamesjournal.com/articles/WhatIsaGame.shtml

Zaibon, S.B. , Shiratuddin, N. (2009) *Towards Developing Mobile Game-Based Learning Engineering Model* Retrieved September 18,2010 Available online http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=4631730

Zin, N.A.M. , Wong Seng Yue (2009) *History educational games design* Retrieved September 18,2010 Available online

http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=5254775&q ueryText%3Dgame+design.%26openedRefinements%3D*%26searchField% 3DSearch+All

45