

VIRTUAL EDUCATION GAME FOR ONCOLOGY CHILDREN USING  
MOBILE (VEGOC)

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## **Abstract**

Pusa Perubatan Universiti Malaya (PPUM) is using conventional method during learning process for oncology student such reading text book and exercise book. This is the reason why students are being demotivated and fell bored during learning process. Mostly hospital does not provide proper classes for oncology children, which is teacher need to approaches the student individually to the student because of student have weak antibody and cannot move easily. Their classes based on chemotherapy schedules, in other hands, they do not have fix schedule classes same as normal students. Because of this situation, student will waste their time and do nothing at hospital during waiting for their turn. Virtual Education Game for Oncology Using Mobile (VEGOC) is an online game application, where focusing on mathematic practice. This application is designed to oncology children that stayed in hospital for treatment for a long period. Thus it will help student do the mathematic practice besides having good time with friends. The concept for this online game application is answer the mathematic question in short time. Each student have their own avatar represent as a panda. To get the high scores, student need to answer correctly and faster, each correct answer will get extra speed to panda and gets 100 point for each question. Action script 3.0 will be used to develop this system and UMP Hosting as server will be used for database as well. Thus, this application will help to student to monitor their performance in term of solving mathematic problem. To test the user acceptance towards the developed VEGOC to get feedback towards the satisfaction after playing the application, all users are satisfied and clearly through the instruction.

## Abstract

Pusa Perubatan Universiti Malaya (PPUM) menggunakan kaedah konvensional semasa proses pembelajaran untuk pelajar onkologi seperti buku teks dan buku latihan. Ini menyebabkan pelajar menjadi bosan dan kurang bermotivasi. Pihak hospital tidak menyediakan kelas untuk pelajar onkologi, dimana guru perlu berjumpa dengan pelajar seorang demi seorang. Ini kerana, pelajar mempunyai antibody yang lemah dan tidak boleh bergerak dengan mudah. Jadual pembelajaran bergantung pada jadual themoterapi pelajar, Ini bermakna mereka tidak mempunyai jadual tetap seperti pelajar normal. Keadaan ini menyebabkan pelajar akan buang masa dan tidak melakukan sebarang aktiviti semasa menunggu kehadiran guru. Virtual Education Game for Oncology Using Mobile (VEGOC) adalah satu aplikasi atas talian, dimana ia fokus kepada latihan matematik sahaja. Aplikasi ini khusus untuk pelajar onkologi yang berumur 10-12 tahun dan tinggal dalam tempoh yang lama di hospital. Dengan itu ia pelajar membuat latihan matematik dalam masa yang sama mereka dapat meluangkan masa bersama rakan-rakan. Konsep untuk aplikasi ini adalah menjawab soalan mathematic dengan betul dan cepat. Untuk mendapat markah tertinggi pelajar perlu menjawab dengan pantas dan betul. Action script 3.0 digunakan untuk membangun aplikasi dan UMP Hosting digunakan untuk menyimpan data. Aplikasi ini untuk membantu pelajar untuk menambah baik dalam menyelesaikan masalah matematik. Untuk menguji penerimaan pengguna ke arah VEGOC maju untuk mendapatkan maklum balas terhadap kepuasan selepas bermain permohonan itu, semua pengguna berpuas hati dan jelas melalui arahan.

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## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 Introduction**

Oncology children is define of children who have tumours and cancers. Virtual Education Game for Oncology Children using mobile application (VEGOC) is an online mathematic practice application, where focusing on mathematical subject. This application is designed for oncology children where there are stays in long period at hospital. It will help student (children) do the mathematic practice besides having good time chat with friends. By providing online platform and user-friendly interface concept it will make the student easily access this application anytime and everywhere. In additional, special sound effect and attractive animation will give more fun and at the same time their will motivate them to compete with their friends.

The application is Mathematic practice based on student level which is have three levels that are module 4(10 years old), module 5 (11 years old) and module 6 (12 years old). The application will help student to improve their skill in problem solving and help student to monitor their performance.

The concept for this application is answer the mathematic questions. Each student have their own character represent as a panda. To get the high a score, student need to answer correctly and faster. Each correctness answer will get 100 points and the panda will move one step ahead.

Currently Pusat Perubatan Universiti Malaya (PPUM) is using conventional method during learning process for oncology student such as reading text book and exercise book. This is the reason why students are being demotivated and fell bored during learning process. Mostly hospital does not provide proper classes for oncology children, which is teacher need to approach student individually because of student have weak antibody and cannot move easily.

From the study, some student have communication problem and lost confident level. This is because of their sadness and pain. Their classes based on thermotherapy schedules, in other hands, they do not have fix schedule classes like normal students. Because of this situation, student will waste their time and do nothing at hospital during waiting for their teacher.

VEGOC as a mobile learning (M-learning) device. Nowadays, M-learning is set to be the next big wave in education. It offers a massive potential as a tool to be used in situations where learners are physically isolated, to promote collaboration learning, to engage learners with content, as an alternative to books or computers delivery of information (Tsai, et.al, 2010).

## 1.2 Problem statement

Based on the study, some problems that were recognised in the current method of education system for oncology student are:

- a. Student has communication problems and loss confident level with friends because of weak antibody and sadness.
- b. PPUM has lack of providing platform for communication activity between friends.
- c. Learning process using conventional method such like exercise book and text book will be make student fell bored.
- d. Teacher comes one by one to student (patients). So, student will waste their time for waiting the teacher.

## 1.3 Objective

In order to overcome the problem the objective of this research are:

- a. To develop an attractive online mobile application prototype of VEGOC
- b. To provide mathematic practice to help student learn interactive and monitor their performance in term of solving mathematic problem.
- c. To provide group chatroom for student to improve their self-confident and communication skills with their friends during their waiting period.

## 1.4 Scope

Scope of this research will consider on features of application prototype of resource of data and list of particular user that will use application.

a. System/Application:

- i. An attractive and exciting education game.
- ii. Able to communicate with friends (chatroom).
- iii. User friendly interface for mobile application.
- iv. Mathematic solution problem approaches.

b. Data:

- i. Refer the module from Malaysia Standard Education.
- ii. Get source from mathematic text book and exercise book.
- iii. 10 questions for each modules.

c. Target user for the application are:

- i. Children as primary user.
- ii. Teacher
- iii. Parent

## **1.5 Thesis organization**

This thesis consists of six (6) chapters:

### **Chapter 1: Introduction**

The purpose of this chapter is to introduce to the readers about the project that will be developed later. This chapter contains introduction, problem statement, objective, and scope and thesis organization.

### **Chapter 2: Literature review**

This chapter explain about the review for the chosen project. This chapter is divided into two sub reviews that require student to study to get complete information about the project.

### **Chapter 3: Methodology**

This chapter discusses the approach and framework for the project. Method, technique or approach that will be used while designing and implementing the project will be included in the content. Justification and of method on approach used and hardware and software necessary is stated here.

### **Chapter 4: Implementation**

This chapter acts top document all process that involve in the development of the project. Designed project development is explained here. The content of this project depend on the system. It contains information of database and tools used. Data in database is shown in this chapter.



**Chapter 5: Result and discussion**

The purpose of this system is to explain about the result and data analysis that had been acquired. Result analysis, project limitation and suggestion and project enhancement are contents for the chapter.

**Chapter 6: Conclusion**

This chapter explain briefly and summarizes the developed project.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

Mobile computing technologies are become more and more universal and affordable in our daily lives (Chen, et al.2008). Such technology is suitable for one-to-one and seamless learning, which enables learning anywhere and anytime. The principles for all personal, social and technology learning include:

- a. Making learning more reliable because children able to learn on the move so that their learning can be context-based. For example, in science education, when children learn the topic of animals, they might be able to also go for a fieldtrip to seek contextualized understanding of the habitats of animals. The children also can understand the kinds of environment the animals increases could lead to knowing why the animal has certain characteristics. This kind of learning is more engaging and motivating because children see the application of what they learn to their daily lives.
  
- b. Making learning more personal and meaningful because seamless learning refers to children centre learning besides having fun. Children have to think on their own, take initiatives, monitor their own progress, solving problems, and be more concern on how their new knowledge is develop and presented.

- c. Teamwork. By using mobile technologies, children able to search and make judgment of information and seek help through communicating with knowledgeable sources. This could be done through emails, chatting, and other resources in an appropriate manner. Mobile technology allows children to create their own artifacts and share it with others easily (Looi, et al. 2010).

## **2.2 Seamless Learning**

In general, researchers tend to express that formal learning is the learning that has been planned and happen in formal settings such as in classrooms. The formality is specified in most national or local curriculums. In hospital, there are documents used in the structure of teaching for example the assigned textbooks, student workbooks, and other curriculum materials.

On the other hand, informal learning refers to learning that might be unplanned and incidental without school and teacher involvement and happens out of formal settings. Unplanned and incidental learning can happen in formal settings such as school while informal learning may happen to be planned but not by school and teacher. Seamless learning connects formal and informal learning. When learners can bring technologies that are mobile and are able to learn outside what their school and teachers have planned for them, which will be seamless that may or may not be in connection to their school work. Such an understanding was not only a belief change, but also based on the observed studies that have been conducted over years (Looi, et al. 2009).

### **2.3 Mobile learning can be Entertaining for Children**

With the multiple features of mobile devices, these devices have become very attractive to the kids. Mobile learning takes advantage of the popularity of these devices between kids and with an entertaining multimedia content. This transforms young students learning from something that they need to do, into something that they like to do. One example of entertaining multimedia content for kids would be combining animation in learning (Marco, 2006).

### **2.4 Multimedia Principles for Mobile Learning**

Multimedia mixes multiple media elements like images, audio, video, text, animation, many more to provide more benefits for the student. Multimedia applications like animations, simulations and games are generating further learning possibilities. For example it is always safer and cheap to practice aircraft simulation in a computer-generated environment before experiencing it in the real life. Multimedia has the benefit that it can be adapted to different learning styles and preferences (Doolitti & Scheer, 2005).

### **2.5 Online Learning for Children**

E-learning is it use of electronic media, educational technology and information and communication technologies (ICT) in education. E-learning includes numerous types of media that deliver text, audio, images, animation, and streaming video. E-learning can occur in or out of the classroom. It is also suited to distance learning and flexible learning, but it can also be used in conjunction with face-to-face teaching, in which case the term blended learning is commonly used.

## **2.6 Generations and Technology**

People adopt the technologies as a shape information access and use as well as the ways of communication. The Baby Boomer Generation is a source for trends, research, comment and discussion of and by people born from 1946 - 1964. Baby Boomers grew up with transistor radios, supercomputers, 33 and 45 rpm records, and the touchtone telephone. Gen-Xers grew up in the era of CDs, personal computers, and electronic mail. Net Generation matures with MP3s, cell phones, and PDAs. They communicate via instant messaging, text messaging, and blogs (Garreau, 2002).

Technology has experienced its own sequence of generations. In computing, the link has shifted from the supercomputer to the minicomputer to the personal computer, and now to mobile devices. Computer and communication devices have radically decreased in size and increased in performance. Connectivity also has experienced a similar way of evolution across generations, from no connectivity to proprietary device-to-device cabling, to globally interconnected local area networks, and now to wireless.

Previously, the importance was given on processing numbers, then words. Later this has been joined by multimedia such as graphics, images, video, sound, and interactive games. The use of early computers was batch-processing-oriented and required programming skills and arcane commands. Today's graphical user interfaces and the Web make the operation of computers highly interactive and reachable by nearly anyone (Rheingold, 2002).

## **2.7 Child Reaction and Mobile Learning**

According to my research, the children enjoyed learning using their parent's cell phone. The participants also reported that their children's actions and behaviour showed positive signs. Parents noticed the children requesting to watch their favourite ones repeatedly. Some parents reported that the children preferred those with animations.

## 2.8 Universal Instructional Design (UID) Principles

The details lengthen an earlier analysis of universal instructional design principles in remoteness education by applying them to the design of mobile learning and online learning. Eight principles with exacting relevance for distance education are chosen, and their recommendations are discussed in relation to the design of educational resources. The problems and opportunities of mobile learning and online learning are discussed as is the need for educators to focus on content design issues rather than on searching for the next new technology.

UID principles have been developed to construct flexibility of utilize into both the instructional design and operating systems of educational materials so that it will be appropriate to the widest range of students (Connell, et al., 1997).

- a. Equitable use
- b. Flexible use
- c. Simple and intuitive
- d. Perceptible information
- e. Tolerance for error
- f. Low physical and technical effort
- g. Community of learners and support
- h. Instructional climate.

Even if it is not specifically construct for M-learning environments, these principles are evenly applicable to them. The applicable of almost all of these principles for designing inclusive E-learning is supplementary increased when designing inclusive M-learning.

Table 2.1: Comparison of the majority relevant recommendation arising from  
UID principles

UID Principles	E-Learning recommendations	M-learning recommendation
Equitable use	<ul style="list-style-type: none"> <li>- insert content online</li> <li>- - translate is provided</li> </ul>	<ul style="list-style-type: none"> <li>- convey information in the simplest potential format</li> <li>- Use cloud computing</li> </ul>
Flexible use	<ul style="list-style-type: none"> <li>- accept assignment</li> <li>- have an option with extra information</li> </ul>	<ul style="list-style-type: none"> <li>- Package content in small portion</li> <li>- Leave it to learn to illustrate and animate course</li> </ul>
Simple and intuitive	<ul style="list-style-type: none"> <li>- User friendly interface</li> <li>- Can using offline and read text-only</li> </ul>	<ul style="list-style-type: none"> <li>- Use code simple</li> <li>- Use open source software</li> </ul>
Perceptible information	<ul style="list-style-type: none"> <li>- Add caption, descriptors and transcriptions</li> </ul>	
Tolerance for error	<ul style="list-style-type: none"> <li>- Allow to edit post</li> <li>- Issue warning using sound and text</li> </ul>	<ul style="list-style-type: none"> <li>- Support situated learning methods</li> <li>- Allow user to edit post</li> <li>- Warning sign using sound and text</li> </ul>
Low physical and technical effort	<ul style="list-style-type: none"> <li>- Incorporate assistive technologies</li> <li>- Consider issue of physical effort</li> <li>- Check browser capabilities</li> </ul>	<ul style="list-style-type: none"> <li>- Use available readers and other mobile specific assistive technologies</li> </ul>
Community of learner and support	<ul style="list-style-type: none"> <li>- provide study groups</li> <li>- Easy to finding link to support service</li> </ul>	<ul style="list-style-type: none"> <li>- Provide many numerous methods of communication</li> </ul>
Instruction Climate	<ul style="list-style-type: none"> <li>- Provide reminder</li> </ul>	<ul style="list-style-type: none"> <li>- Pull in learner generated content</li> <li>- Provide regular reminders and questions to user</li> </ul>

Table 2.1 show the comparison of the majority relevant recommendation arising from UID principles with E-learning and M-learning. M-learning is simplest, this is because it use the cloud computing file storage and sharing site. It also have package content in small portion but should have meaningful function.

The developing using M-learning is more easy and faster where it is keeping code simple. There are many open source can used in M-learning. Furthermore, M-learning also can tolerance for error where their support situated learning methods and allow student to edit post, where it same goes with E-learning.

Last but not least, M-learning can use available readers and other mobile-specific assistive technologies. It also can have a good function is instruction climate where it can pull in learner-generated content and push in regular reminders and questions to student.