



Production E-Glossary as Mobile Learning (M-Learning) among the Students of Polytechnic

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Abstract: Education nowadays centered more on mobile learning (mobile learning). Mobile learning or m-learning is self-learning method using mobile devices such as smart phones, personal digital assistant (PDA), tablet and other learning tools. Electronic book or e-book is a digital reading material used to replace the conventional textbooks that uses paper. E-book is a program or software which can be installed in mobile devices as a means of self-study. The combination between mobile devices and electronic books formed an E-Glossary Dictionary of Environmental Science using Macromedia Flash 8 as m-learning. Innovation in teaching and learning process which has been produced is to help improve the academic performance of students in polytechnics. Course CP103; Environmental Science from the Urban and Regional Planning Program at Polytechnic Sultan Abdul Halim Muadzam has been used as a subjects to test the effectiveness of E-Glossary of Environmental Science as m-learning with the aims of increasing the quality of students in polytechnics. Comparison of the examination's results of students who used E-Glossary of Environmental Science and those who did not used the glossary has been made as the methods or techniques to fulfill this research. Findings show that there are significant differences in terms of the passing percentage of students who use E-Glossary of Environmental Science as m-learning. Findings also show that students who use E-Glossary achieved 100% percentage compared with the students who did not use the E-Glossary. Similarly, in terms of quality the students which use E-Glossary attain better grades than those who did not use the glossary. In conclusion, the use of E-Glossary should be expanded among the students of polytechnic to improve the quality of graduates. Moreover the uses of mobile phones as a medium of m-learning among polytechnic students are normal. It is a waste if such opportunities are not used by the lecturers to diversify the teaching and learning methods in the classroom.

Keywords: E-Glossary Dictionary of Environmental Science, Mobile Learning (M-Learning), Polytechnic Students

1. Introduction

The world today is witnessing rapid development and change in the field of information and communication technologies. Various innovations have been developed to allow communication and human interaction to be faster which had overcome the limitations of time and place. Inclusion of information technology and communication has resulted in the acceleration of the development of advanced technology that brings the world into the new century based on information technology. Nowadays modern telecommunications devices including telephone, internet, 3G, Wi-Fi and other more medium sophisticated tools are being used to send, transmit and receive information clearly.

Malaysia's position in the field of telecommunications and information technology are becoming apparent at the international level. Recognition by the International

Telecommunication Union (ITU), shows that the position of Malaysia has jumped from 34th place in 2009 to 23rd place in the world in the year 2010. Certainly, the role of telecommunications is very important and greatly influences the daily lives of Malaysians. Therefore, the government continues to focus on the development of the telecommunications infrastructure in the country which benefits all community regardless of their location or socio-economic status.

The development of information technology is a special contribution to the world of education. The task of educating has been made easy, fast and effective with the usage of information technology. The whole world seems to have become an electronic valley with this technology. The ability to send, receive and process information has been greatly expanded. Receiving of knowledge is no longer through only between the teachers and student's interaction, the usage of technologies in the classrooms had eliminated the bounded

bricks and wood of a classroom replacing it with cyberspace. Today's educational settings are geared toward information technology. E book or electronic books are digital concept to replace the conventional text book. Apart presented with interesting text and images, video, animation and simulation of an e-book can be used by the users.

In addition, the rapid development of the information technology has move towards the mobile and wireless technology. The development of wireless technology and mobile communication devices have also contributed to the use of mobile devices in education [1].

2. Issues / Problems of Research

The uses of smart phones are increasingly popular among Malaysians. Smartphone refers to mobile phones with advanced computing and connectivity features as compared with ordinary mobile phones. Smart phones allow users to install applications in which high-end platform based phones such as Symbian, Android, iOS or Windows Phone. In addition, the smart phone also uses operating system that provides a platform for the development of new application. This study was conducted to produce a courseware that can be used as m-learning for polytechnic students. This are intended to address the following issues: -

2.1. Polytechnic Student's Difficulty to Remember Things or Terms in the Teaching and Learning Process

God bestows intelligence mind different to humans. Students who are smart and have a strong memory, adequate teaching and learning in the class only and can capture anything with a good knowledge. Normally, students need to review repeatedly to achieve something new. According to Ab Fatah Hasan, he interpreted the memory as processing the information received in the brain, stores and releases [2]. The memory is a form of storing information means to be an experience in the future [3]. In conclusion, the memory is a process of human ability to receive process and store it in the brain, then remove it when needed.

Mok Soon Sang found that learning materials that are too easy, progress in the early stages of moving very quickly, but quickly retreated in a short time. This is because the less challenging learning materials, interest in learning cannot be raised. Thus his memory will not last long [4]. For learning material that is too hard, there is no progress at all due to lack of ability to learn. For materials that have difficulty learning affordable it difficulty can be overcome with hard effort, progress can be maintained on an ongoing basis. According to Azizi Yahaya showed that learning these words mean is much easier than a set of syllables that does not mean [5]. In other words, meaningful learning materials are easier to be remembered by students compared to the instructional materials which are meaningless.

2.2. Lack of Mobile Learning (M-Learning) Module as a Teaching Aid at Polytechnics

In contrast to the concept of e-learning, which is limited to

teaching and learning that goes on in the classroom or the physical infrastructure available, while the m-learning enables teaching and learning process occur at anytime and anywhere continuous. Hence, the learning remains happen even where the student resides, or wherever their destination regardless of time, there is an advantage of m-learning. M-learning has begun to play an important role in the learning process. The existence of wireless mobile technology has made it a reality. Freedom of students to learn and obtain information to make m-learning is very popular. With leading technology and affordability of mobile devices, m-learning is not difficult to perform in Malaysia.

In polytechnic, m-learning is odd. Only E-learning is applied by the lecturers to the students. This is very detrimental to students, as every student now has his own cell phone. According to the Malaysian Communications and Multimedia Commission 2009, shows that teenagers are the second largest consumer of mobile phones by 20.9% after which the adults of 66.8%. It would be a loss if the opportunity was not taken by lecturers to improve the academic performance of polytechnics through the m-learning process.

Table 1. Percentage Use of Mobile Phone By Age Level.

Age Categories	2005	2006	2007
Teenagers (<19 years)	13.1%	20.6%	20.9%
Adults (20 – 49 years)	78.2%	66.8%	66.8%
Elderly (50 +)	8.7%	12.6%	12.3%

3. Purpose of Product Innovation M-Learning

Develop a program E-Glossary Dictionary of Environmental Science to serve as material for m-learning among polytechnic students to remember the terms. There are two (2) objectives has been develop to achieve the goal of the research. These objectives are: -

- Generate E-Glossary Dictionary of Environmental Science using Macromedia Flash 8 software that can be installed in mobile phones as m-learning.
- Analyze the performance of students using E-Glossary Dictionary of Environmental Science as a reference.

3.1. Use of Macromedia Flash as M-Learning Applications

Macromedia Flash is software that is able to deliver audio-visual message clearly to the students. Through Macromedia Flash, the concept of learning combined with audio-visual technology to generate new features that can be used in education. It can be used to attract students to a variety of animated images that can stimulate the minds of students to achieve the learning objectives.

Macromedia Flash 8.0 has an advantage compared to other programs that are similar [6], such as:

- Someone who still new in the world of design and animation can learn and understand the Macromedia Flash 8.0 with easy and simple without the need for in-depth knowledge.

- b) User of Macromedia Flash 8.0 program can easily and free to be creative to create animations with free movement in accordance with the desired flow animation scene .
- c) Macromedia Flash 8.0 can generate a file with a smaller size. This is because 'Flash', vector animation with the base, and also the size of a small 'Flash' files can be used on a mobile phone without the need for a long loading time to open.

Therefore, the use of Macromedia Flash as software to produce mobile applications for education is very appropriate, especially for 'e-glossary'.

3.2. M-Learning as Tool of Teaching Aid

The concept of mobile learning is introduced as an alternative to learning activities inside and outside the classroom. Learning using mobile technology has great potential to be integrated in the pedagogy of teaching and learning.

Mobile learning refers to the provision of teaching and learning through the use of wireless mobile devices such as PDAs, mobile phones and other devices [7]. It emphasizes the ability to facilitate the transfer of learning process independent of the physical location where the learning process takes place [8]. Mobile learning is also the use of wireless devices to enable learning occurring at anytime and anywhere [9].

In research conducted by Saran, Cagility and Seferoglu, found that m-learning using mobile devices have increased the proficiency of students in English through the use of multimedia form [10]. In the study also found that the use of MMS and SMS can enhance students' vocabulary. This clearly shows that M-learning is very effective in the process of teaching and learning. It's because the learning process is no longer concentrated in one platform or confined in a classroom but, m-learning process happen just in time, on the move and on demand [11].

4. Research Methodology

This study is divided into two parts, the first production E-Glossary Dictionary of Environmental Science and secondly, analyzing the performance of students using E-Glossary such as m-learning. For the production of E-Glossary of Environmental Dictionary, the software used is Macromedia Flash 8. The descriptive method used for analyzing student performance through the end of semester examination results.

4.1. Method of Production E Glossary Dictionary of Environmental Science Using Macromedia Flash 8

Within Macromedia Flash 8, there are 3 main sections which are conducive to the production of E-Glossary. The sections are stage, timeline and toolbar.

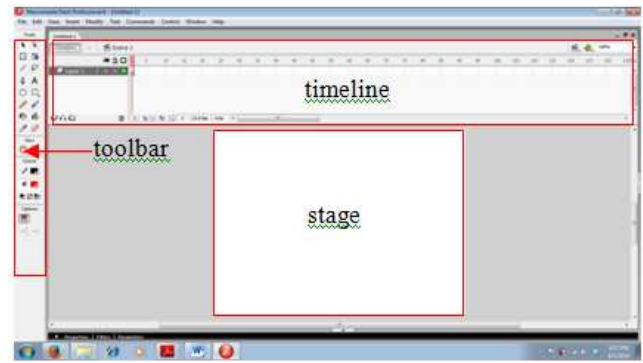


Figure 1. Screen Display of Macromedia Flash 8.

4.1.1. Stage

In production of E- Glossary, the stage is the place to paint or create the program. In the middle stage, there is a square that is home to design E-Glossary.

4.1.2. Timeline

This timeline is to define the application of E-Glossary function properly. To ensure that an application works, we need to use the timeline. In the timeline, there should be 4 layers, namely: -

- 1) Background - to set background of the program.
- 2) Contents - parts of which are included in the program.
- 3) Label - the parts that will be connected from the main menu.
- 4) Button - to create buttons that are connected to the proper exposure.
- 5) Action - ensure that the program can work in accordance with what is required.

4.1.3. Toolbar

There are several tools used in the production of this application E-Glossary. Among the tools that can be used as selective tool, free transform tool, text tool, paint bucket tool, paint tool, line tool and so on.

4.2. Descriptive Method

Environmental Science CP103 's students from the course Urban and Regional Planning Program (DPW), Polytechnic Sultan Abdul Halim Muadzam Shah, Jitra Kedah was used as a sample to represent the whole student Polytechnic Sultan Abdul Halim Muadzam Shah, to see the use of E-Glossary of Environmental Science as m-learning in the classroom. This study uses the method of comparison with reference to the results of examinations for the course CP103 Environmental Science Session in December 2013 to June 2013. The results of the examination session in December 2013 is referred to as the student has been using E-Glossary as m-learning in teaching and learning process compared to students session in June 2013 that do not use the E-Glossary.

5. Findings

The findings of study are divided into two parts:-

- a) Method to produce E-Glossary of Environmental

Science and

- b) Descriptive analysis to explain the performance of students using the program as m-learning among the students of polytechnic

5.1. Sections in the E Glossary of Environmental Science

E-Glossary of Environmental Science was developed using Macromedia Flash 8. There are four main sections in the program is the intro, terminology, profile and help.

5.1.1. Introduction

In this section, it explains the purpose of the production of E-Glossary of Environmental Science to students of polytechnics.

5.1.2. Terminology

Terminology is the main foundation for the production of E-Glossary of Environmental Science. The terms contained in the E-Glossary is arranged in alphabetical order along with a description of the term.

5.1.3. Profile

It is the part that describes the profile of the lecturers together with advisors who produce E-Glossary of terms for Environmental Science Environmental Science courses CP103.

5.1.4. Help

This section describes the functions of the buttons available in the E-Glossary of Environmental Science. In addition, it also explains how to use E-Glossary of Environmental Science.

In total, there are 182 terms included in the E-Glossary of Environmental Science. It is divided into 26 sections in alphabetical order. There are 4 characters that do not have a term in the dictionary. Alphabet are J, K, X and Y. This is because the alphabet has a vocabulary of less either in dictionaries, or a dictionary term.

For the production of E-Glossary of Environmental Science, a dictionary term adviser of Senior Lecturer of Urban Planning Program has been appointed to ensure the description of a preferred term to meet the desired requirements. The lecturer was Mr. Uzairi Saidin PPPT DH52 who had been teaching for over 25 years in the field of urban and regional planning.

5.2. Display Interface E Glossary of Environmental Science

In briefly, the program E-Glossary of Environmental Science is one of the m-learning quick and easy to install in a mobile phone. It just requires additional program Flash Player which every smart phone has now been completed on time in order to ensure that existing E-Glossary of Environmental Science is to function properly. Figure 2 below shows the display interface in the E-Glossary of Environmental Science along with a description.



E-Glossary displays. Users must click on the button "enter" to go to the main menu page program.



The main menu of E-Glossary display. It's has four buttons of the "intro", the "terminology", the "profile" and the "help". Users must click on the buttons provided.



Interface displays of the "intro". It is an introduction to the program E-Glossary page.



Interface displays of the "terminology". There are 26 alphabets were prepared to allow users to search for the term required. Users only need to click the button on the alphabet to view terms.



Interface displays of the terminologies. Users need to pull down "scroll bar" to find the meaning of a term.



Interface displays the page "profile". On this page it displays the individuals who are responsible for producing this E-Glossary.



Interface display the page "help". This page describes the guide to use E-Glossary.

Figure 2. Display Interface E Glossary of Environmental Science.

5.3. Analysis of Student Academic Achievement

Two (2) aspects that were analyzed to see the performance of students using E-Glossary as m-learning and who do not use E-Glossary. These aspects are: -

- a) The percentage of students passing rates and
- b) Rate of grades obtained by students

5.3.1. Percentage of Student Passing Rates

According to Table 1 below, it was found that students in December Session 2013, the pass rate of 100% compared with June Session 2013. Students in session June 2013 from DPW1A were 7.7%, DPW1B were 4.7% and DPW1C were 14% of students have failed CP103 for Environmental Science courses.

Table 2. Percentage of students failed in course CP103 Environmental Science.

Session / Classes		% Students Failed
Dec 2013	Class A	Nil
June 2013	Class A	7.5
	Class B	4.7
	Class C	14

It can be concluded here that the use of E-Glossary as m-learning can provide a positive impact to the polytechnic students.

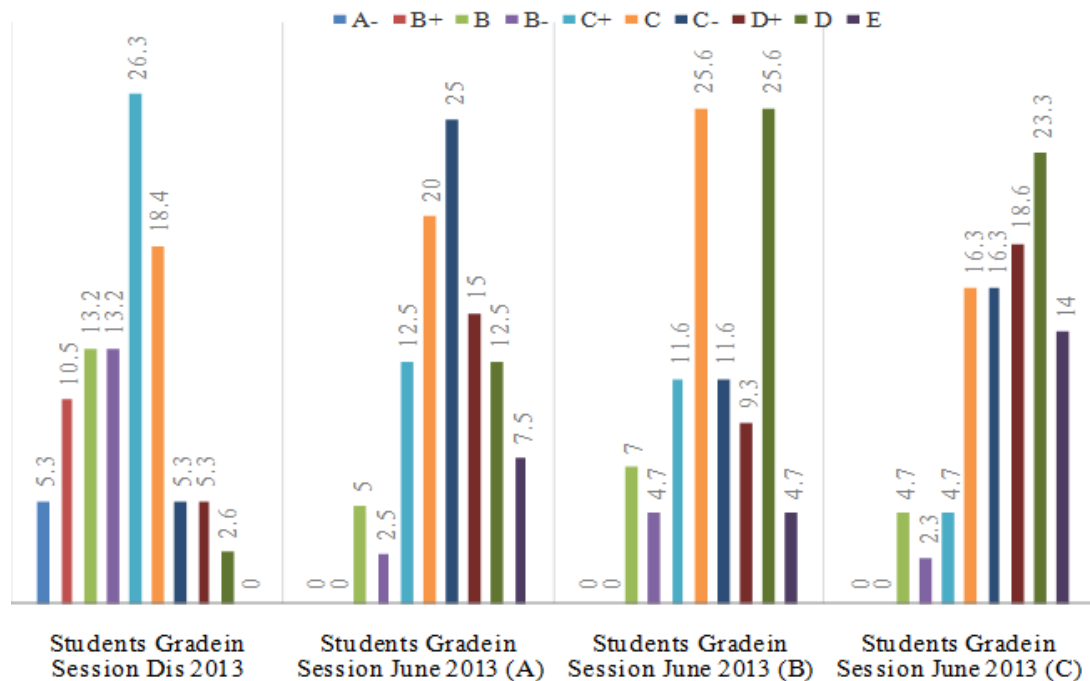
5.3.2. Grades Obtained by Students

According to Chart 1, it was found that the students in December Session 2013 obtains a grade better than the students of the session in June 2013. The results of the analysis found that, 5.3% of students from a session in December 2013 succeeded in obtaining a grade of A- compared with the June 2013 session of the students from the

three classes no one is getting A- grade.

Similarly, the grade of B +, session in December 2013 recorded a 10.5% of students who obtained grade B + compared with students from a session in June 2013 in which no one is entitled to a B + grade from all three classes. For grade B, the same results are obtained, where students from the December 2013 session recorded a higher percentage of students who obtained grade B as compared to June 2013 session. 13.2% of students from a session in December 2013 succeeded in obtaining a grade B compared to June 2013 session, that only gets 5% of the students of class DPW1A, 7% of students from DPW1B and 4.7% students from DPW1C.

Clearly shows that the quality of students' grades session in December 2013 was an improvement over June 2013 session. Indirectly, the use of m-learning can play a very important role in improving the quality of polytechnic student graduation exam if used as a teaching aid.

**Chart 1.** Grade Obtained by Students.

6. Discussion

From the findings, it is clear that the use of E-Glossary of Environmental Science as m-learning may increase the academic performance of students in terms of the percentage of approvals and also the quality of the grades obtained. This is because E-Glossary of Environmental Science is using words or referred to as a term that has meaning. This shows that the learning of word meaning is much easier than a set of do not meaningless [5]. In other words, the use of E-Learning Glossary as significant material is easier to remember than the learning materials that are not meaningful. On a positive side, the E-Glossary can improve cognitive skills (thinking and remembering) among polytechnic students.

Furthermore, the current use of mobile devices makes learning easier happen at any time and any place compared to the use of notebook perishable and non-durable [9]. This situation shows that mobile device such as mobile phones and other feature advantages of conventional materials.

Thus, it was shown that m-learning is suitable to be implemented in polytechnics as well as to seize the opportunities that exist to produce students who are competitive and able to master cognitive skills that should be in every school level students as early as yet.

In conclusion, there are significant differences in terms of the passing percentage of the student who uses the E-Glossary as m-learning. M-learning can increase the passing grade of the students in polytechnic. The researchers are hoping that the management of the polytechnic can

increase its efforts to introduce modules that are appropriate to serve as m-learning among the students of polytechnic.

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