

The Use of SMS Quiz System as an Alternative in Teaching and Learning

Abstract

This concept paper discusses the development of a system using SMS (short messaging system) to facilitate learning and also as a new method in the evaluation of teaching and learning. The design of a system that uses SMS for the quiz is proposed as an alternative for formative assessment of teaching and learning for courses at institutions of higher learning in Malaysia. The fundamental idea of the SMS assessment system is based on the SMS function which is the basic feature of the normal mobile phone to receive and send text messages at anytime and anywhere. This will allow the formative assessment to be done in a course with a more flexible approach. The fact that not every student can afford expensive mobile phone or smart phone which is the main obstacle in the integration of mobile phone use in teaching and learning in Malaysia of which this study aims to overcome. This gives room for the need to provide a simple system for lecturers and students using a normal mobile phone as a tool in the evaluation of teaching and learning. This article offers a new alternative for lecturers, teachers and students in the implementation of formative assessment quizzes via SMS.

Introduction

Various new technologies have been introduced to facilitate and improve the effectiveness of teaching and learning. Learning process which involves SMS (short messaging system) can be regarded as one of the latest innovation to support teaching and learning. Several researches have been conducted to explore the potential of teaching and learning involving the use of mobile devices (eg, Ally, 2009, Ford & Leinonen, 2009 & Gregson & Jordaan 2009). These researches were carried out in various areas. The use of mobile technology in the education sector in developed countries is increasing and the study using mobile devices in teaching and learning have also shown an increase in Malaysia. A number of researchers have tried to use the SMS function to communicate in their courses such as sending a note and sending information or notification (e.g. Tina, Mansor & Norziati, 2011). However, there are fewer researches that focus on the method of two-way communication between lecturers and students and as well as assessment system based on SMS. Currently, most research only focuses on one-way interaction between lecturers and students for example a lecturer send a note via SMS to their students by Munirah et. al (2009). Many researches are still at an early stage where SMS is sent only from the lecturer to students, not vice versa. Although the SMS technology is the same technology that can be obtained through the use of mobile devices, to develop evaluation systems that use SMS is quite complicated because it includes the character limit, consumer credit, special instructions and common problems in mobile system such as mobile coverage and SMS providers bulk limit (delayed response).

This article proposes a new method that uses SMS mobile technology to optimize the use of mobile technology and the Internet. Although e-learning is seen as a platform ready to be used in any field of education, it cannot be fully utilised in certain countries such as Malaysia because of the limited Internet coverage. Therefore, learning using mobile devices through mobile phones is considered as a potential new method of teaching and learning. According to the Malaysian Communications and Multimedia Commission (2009), the statistics report on Phone Subscribers in Malaysia, stated that;

"The penetration rate for mobile phones is expected to exceed 100.0% in the first quarter of 2009. Penetration rate refers to the number of subscriptions divided by the

total population and multiplied by 100. More than 100% penetration rate may occur because of the use of more than one device by a user."

The report shows that mobile phone subscriptions in Malaysia increased in early 2010 and is expected to increase from time to time.

The use of mobile phones among students in universities and colleges has become a necessity. Briggs (2006) suggested that a text message, also known as short message service or SMS has changed the landscape of communication in the university campuses. Norbayah & Norazah Mohd Suki (2007), in their study, suggested that 98 percent of the respondents in their study aged between 17 to 30 years old have their own cell phone while the remaining have a PDA / pocket PC / palmtop or smart phone in Malaysia. In the study by Munirah Rosli et al (2010), it was found that the use of SMS as a medium of communication in teaching and learning for distance education courses at a university in Malaysia is useful to support the learning needs of the students. However, the biggest constraint found in their study is the difficulty for students to access the course content through mobile phones. This is because the system offered only caters for one-way communication method and does not provide students the access to the contents published by them after the information is sent via SMS.

In this study, the researchers plan to explore the use of SMS in the evaluation of teaching and learning using the quiz via SMS. A quiz via SMS system will be designed to implement the evaluation which can be conducted anywhere without the limitation of time and place. The construction of the quiz via SMS is expected to be able to offer:

- Access at any time, any place for a quiz-based assessment of various courses.
- Flexibility in terms of time for the assessment on quiz based teaching and learning, and
- Support learning and continuous assessment by experts to students

Mobile Learning and Electronic Learning

This article will explore the methods of teaching, learning and assessment of learning which attempt to highlight the concept of portable (mobile) learning compared to the electronic learning environment (e-learning) to achieve educational objectives. Laouris & Eteokleous (2005) suggested that e-learning is a platform to be strengthened by the following elements namely multimedia, interactive, links, and media diversity. However, there are lecturers who are reluctant to offer online learning for various reasons such as reduction in human interaction, failure of technology, the efficiency of technology to change students and the increased workload in the faculty (Beard & Harper 2002). William & Black (1998) suggested that the measure of students' ability to answer each questions is not only based on their understanding of only the topics studied, but it is also based on their response to a variety of other features such as language, the context of the questions, or the pupils level tiredness at that time. Moura and Carvalho () suggested that mobile learning

Therefore, this study attempts to offer the use of teaching and learning methods involving the use of mobile phone platform to enable the delivery of the course assessment in a more flexible way according to the needs of the students. However, Attewell (2004) cautioned that it is important to realise that mobile phone is an individual's 'personal space' and the use of that space as a means of teaching and learning may be considered as invading the personal space.

Quiz as a Method of Assessment in Teaching and Learning

There are various methods of evaluation of teaching and learning either through formal or informal methods. Quizzes can be viewed as one of the formative evaluation method in which it is usually done in stages or continuous manner for the assessment of a particular topic or subject. This is not something new despite the various terms used to describe formative evaluation. The difference between formative assessment methods are the way it is conducted and the approaches it used. Quiz as a method of formative assessment has been through various methods of implementation from pen and paper method to the online quiz. Feedback from formative assessments allows students to better understand the expectations of teachers, and it also allows teachers to modify the course work to address better the needs of students (Rolfe & McPherson, 1995). Peat & Franklin (2002) in their study stated that their students think that the best aspect of the quiz assessment is when they get immediate feedback, the quiz is in (options/choice/selection) format and quiz can be completed quickly. Normally, evaluation done through quiz approach is by giving a certain percentage for students to increase their motivation to do the quiz. The study of Kibble (2007) found that by offering (credits/marks) for online quizzes, it will increase the participation among students. Kibble (2010) found that students' participation in the quiz which was held as one of the formative evaluations will assist them in achieving consistency in the subjects taken.

Research Objectives

The objective of this study is to design and develop an integrated platform that enables the implementation of student quiz. The system aims to:

- Optimize the collaboration and assessment methods for university courses that utilise this system.
- Implement, analyze and evaluate the quiz application via SMS and web portal.
- Identify usability and openness of users in using the SMS system in the evaluation of learning and assessment.

Research Methods

This study will be conducted gradually. The research phase is elaborated as follows:

Curriculum Requirements and Analysis

Curriculum requirements and analysis was carried out to determine the scope and content of the SMS system used for this study. This section will identify the appropriate courses to test the applications developed for the SMS quiz system in order to determine the development of the design of the SMS system. The information about the content is needed to carry out the analysis of the needs of current strategy and innovation for teaching so that new design achieves the maximum learning and teaching effect. The design stage which includes the involvement of researchers and experts in mobile device helps to develop the best system for the purpose of research.

The course chosen will determine the respondents of the survey. Quantitative and qualitative methods for data analysis are conducted to address the objectives and hypotheses of this study. It is also to enable the researchers in identifying the strengths and weaknesses of the design of the first phase of the SMS system for the study. In an effort to identify an SMS users' level of openness in embracing the students' learning and assessment system, the quantitative data and qualitative data collected from the lecturers will be used to identify the usability of SMS applications in the quiz.

SMS Design System for the Quiz

Quiz in the form of "objective questions" is proposed as it is deemed as more suitable to support the first phase of this research. The main reason for this because the "objective questions" (multiple choice questions) are easier than quizzes in the form of essay questions. It is also suggested that the question and answer type of evaluation is used and explored in the design phase of the study. The application of the question answer design is the early part of the application of research forum where students can discuss their views with the other groups and this occurs through the medium of SMS discussion.

The concept of this study is learning activities through text and mobile web portal (to store / organize activities).

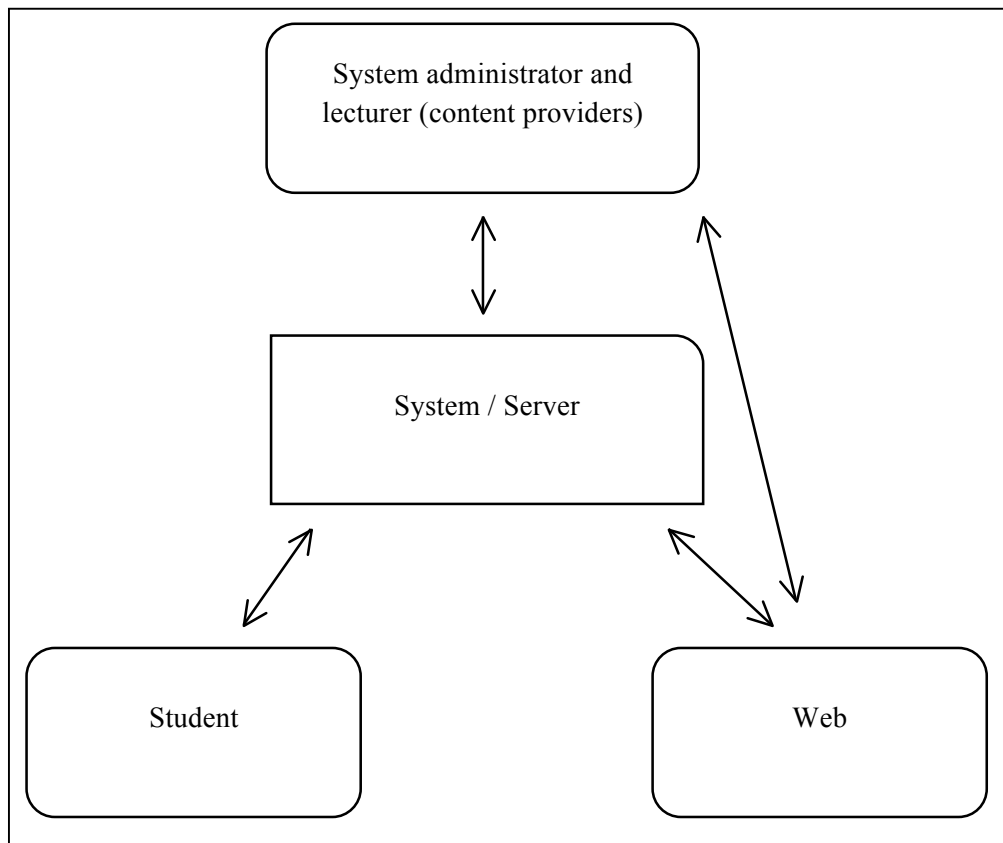


Figure 1: System quiz via SMS

In Figure 1 (above), the flow of activities is as follows:

1. Administrator of the SMS system / lecturer will send the SMS quiz in the form of questions to be answered by the students through the server / SMS system.
2. Server / SMS system will send SMS to the students and the web portal.
 - a. Students will receive a quiz / questions in their mobile phone
 - b. The website will automatically store and organize quizzes / questions in the web portal.

When students receive questions and then answer the questions, the information will be sent to the server / SMS system. The server system, SMS / mobile will process responses and

displays them on a website and store it in the portal. Lecturers will be able to access the website to enable them to look at the entire quiz (questions and answers).

In the design of this study, it is suggested that the time limit is given for students to answer the questions. If the student answers the questions beyond the time limit given, it is proposed that:

- SMS notification is sent to notify that they will no longer be allowed to submit any answer because the time limit has expired.
- OR the website portal indicates that the SMS is sent and the lecturers will be able to know the time of the answer was sent then consider whether to accept the answers of the students who submit late or otherwise.

The database for the SMS server system will also process the message in the system and identify whether it is a multiple choice quiz or a module of questions and answers. Quiz application will be designed according to the lecturers' needs, while the question and answer forum will be more flexible in terms of interaction between lecturers and students.

The development of the quiz via SMS

The SMS quiz system is being developed by the researchers through certain stages. The main tool used in the development of this system is a server that operates on *Microsoft Windows Server 2008* and SMS modem that is supported by 4 SIM slot. Each development process will go through the process of testing and system stability to ensure that the system will work properly during the actual research. The development of the system via SMS quiz used the ASP & PHP programme in which the quiz will be uploaded to the system using the Microsoft Access and Microsoft Excel programmes. Lecturers are asked to provide a 'bank' of questions in which the data from the 'bank' of question is then programmed to be drawn randomly by the system. Students will receive quiz questions which is randomly selected from the system to ensure reliability in conducting the quiz at anytime and anywhere outside the classroom.

The figure below shows the quiz delivery process to students via the SMS quiz system developed by the researchers.

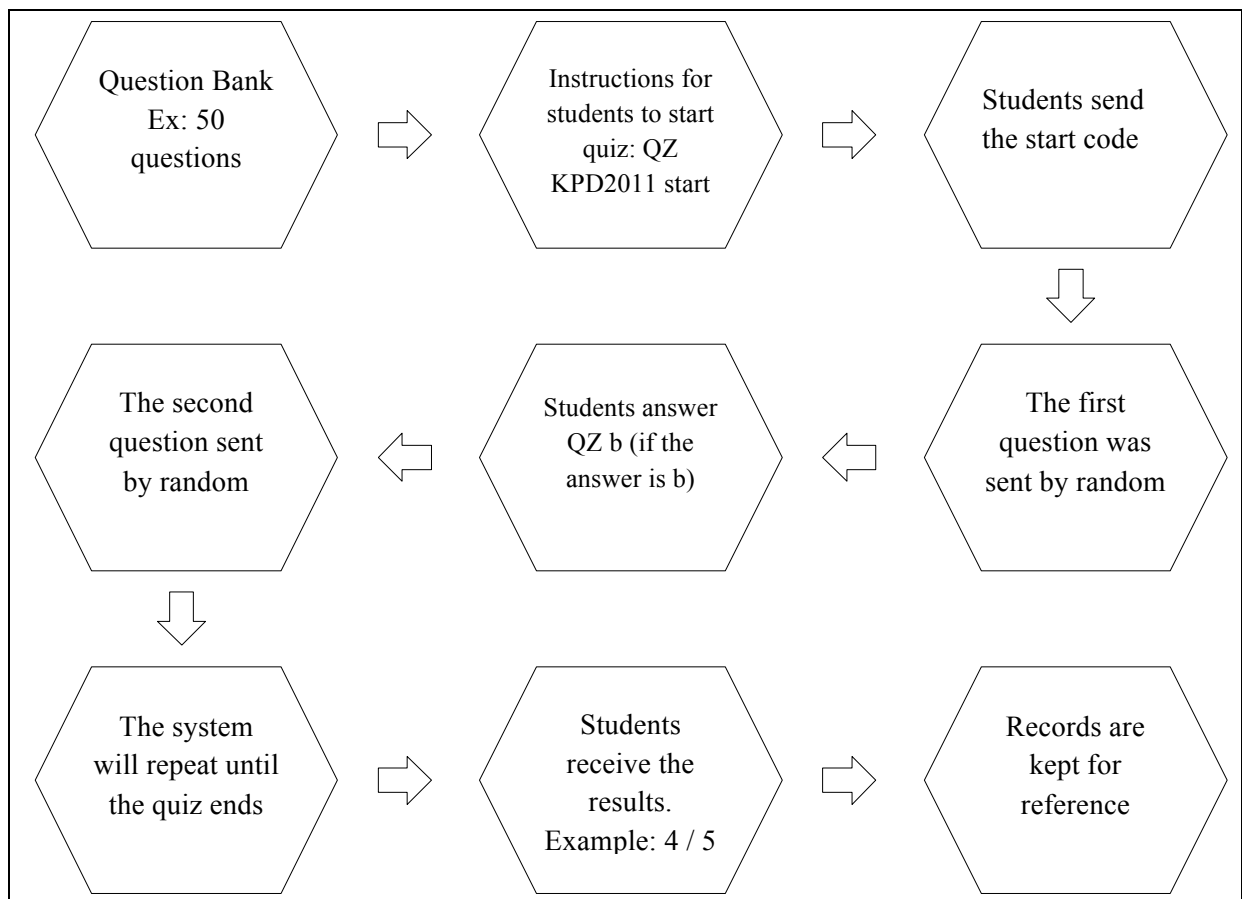


Figure 2: Flow chart of the SMS application process

In developing the quiz system via SMS, user information such as name, phone number and e-mail address is registered into the system either through the manual registration (performed by the System Manager) or automatic registration which can be done by the user on the website provided. After all the user's information has been entered into the system, the users will register on their own for a specific subject using a unique course code, for example KPD3333, for the course taken. The quiz configuration process will be conducted by the System Manager or the lecturer to determine the date and time the quiz will be conducted for the course.

The early Stage of System Testing

In the initial test of this quiz system via SMS, researchers found that there are some constraints and issues in the operation of this system that needs to be addressed before the system can be utilized optimally. These constraints and issues are divided into three levels of issues involving the system, the issues involving the users / students and general issues. The issues in the technical matters of the system to be considered during the development of this

quiz system via SMS are the issue of an unstable modem, the modem does not work (hang) and others.

The main issue in the early system development involves users who are students as they are the main users of this quiz system via SMS. In the early stage of testing this quiz system via SMS, tests were conducted on 100 students to examine the stability and usability of this system in general. When the system sent the wrong command to start the quiz, it was found that it was difficult for the students to understand the instructions to start the quiz. For example, when the students were asked to start the quiz by sending a simple SMS command: *To start the quiz, please send "QZ KPD3333 START" to 0122345678*. The students were confused over technical matters such as where to put the space between the codes, the need to use small or capital letters and send thank you after receiving instructions. Such issues have made it difficult for the students to do the quiz. Confusion also caused students to answer the quiz questions not according to the prescribed instructions. There are also student who answered the quiz question twice, most likely to correct the previous answer.

Recommendations to ensure smooth delivery of the system via SMS quiz.

To ensure an efficient system for process-based assessment quiz via SMS, the system and database must be monitored to ensure that students can answer the entire quiz. A problematic system might lead to students becoming bored and not motivated to continue the quiz until the end. The results from the pilot studies have also found that there are students who tried the quiz for a few times because they felt very excited with the ability of the system to supply the quiz questions and answers instantly via SMS. Online help is important to get feedback and to help students if there are any problems during the quiz. To get cheap and affordable costs for the students, it is recommended that the service providers (telcos) used is the same as the students' mobile phone service providers. A balanced distribution of the service provider will also ensure a smooth delivery of the SMS system.

Through the initial test of the SMS quiz system which is still being developed by the researchers, it was found that the system is appropriate and can be used efficiently by 100 students in four hours. At the initial test, a quiz containing five questions was properly carried out by the SMS quiz system developed by the researchers. However, it is recommended that the system has a backup system to ensure the smooth running of the quiz if the main system breaks down.

Conclusion

Although the process of design and development of system evaluation quiz via SMS is still in its early stage, it is predicted that this system will be able to attract the attention of lecturers and students in the Higher Learning Institutions to engage in a more flexible teaching and learning process. In general, it is expected that this study could provide substantial benefits to lecturers and students, particularly in maximizing the use of mobile phones in teaching and learning. Furthermore, this study will help lecturers in improving the quality of education in

two ways; 1) to improve and increase access to education and educational assessment anywhere and at any time 2) to promote new methods of teaching, learning and assessment process that can be accessed by students without relying on computers and the Internet. The concept of this quiz via SMS is seen as a method of evaluation that meets the demands of teaching and learning without borders. By using the SMS feature available in the mobile phone, the system is expected to help lecturers in the evaluation system that can be done outside of class time in a simple and quick manner.

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