IMPLEMENTING ONLINE ASSESSMENT IN ELECTRONIC ENGINEERING COURSE FOR UNDERGRADUATE STUDENT IN UTHM

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Implementing Online Assessment in Electronic Engineering Course for Undergraduate Students in UTHM

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Abstract

A new approach of academic assessment has been implemented in electronic engineering course in Universiti Tun Hussein Onn Malaysia (UTHM). The online assessment method is used as an alternative to conventional assessment method used for years. Unlike the conventional approach, the online assessment does not require the students and lecturer to be face-to-face during the assessment and it also gives more flexibility for students to choose the assessment time. Given the case in implementing this type of assessment, it still maintains high quality of questions given to students. At the end of the assessment period, it does attain the objective of the assessment and it also reflects the understanding of students towards the intended topic of the assessment. We conclude that the implementation of this assessment approach is a success to gauge the performance of students and it also can serve as an effective complement to conventional assessment approach.

Keywords: online assessment; alternative assessment approach

1. Introduction

The concept of e-learning has been implemented for years and it is common to see the instructional materials are delivered through this approach especially in higher education level. The system itself does not intended to replace the conventional way to deliver the subject content to students but to enhance and vary the way the material is presented. Nevertheless, many academicians still shy away from using online system as an assessment tool.

Online system is often seen to compromise the standard of question in an assessment. This is due to the perception that online system will only tests the must-know material. But the fact is that online can actually match, if not better, the standard of paper assessment [1]. The same approach does provide an effective measurement of the students' practical skills by comparing student performance in a variety of scenarios [2].

Besides, the online assessment could provide an effective formative assessment tool for students on regular basis and permitting them to evaluate their knowledge independently throughout the semester calendar [3]. The online system also has been reported could help students to study more consistently and improve the study habit in their preparation [4], [5], [6]. It shows that this system has positive effect towards students to gain better grades in succeeding assessment. The same scenario on students' performance is also seen with the aid of self-directed assessment modules [7].

On the other hand, the online system offers more flexibility to both lecturers and students. Students have flexible means in attempting the assessment and receiving feedback of the assessment whereas the lecturer has the option to automatically grading the assessment [1], [8]. Thus, this is an obvious advantage of online assessment over the paper assessment.

In order to maintain the quality of the online assessment, a benchmarking procedure on this type of assessment has been proposed and at the same time, the benchmark should be transparent to students in terms of the behaviour and expectations [9]. In this paper, we present our first attempt in implementing the online assessment on the first year students in electronic engineering course and followed by the analysis on the result of the assessment.

2. Blackboard as an Assessment Tool

In case of UTHM, *Blackboard Learning System (Blackboard)* has been chosen as the platform to establish the e-learning system. It is a common sight the lecturer utilizing *Blackboard* as part of teaching and learning activity throughout the semester. However, its capability to assess the students is not fully utilise. The lecturers tend to limit *Blackboard* as a platform to present the subject content only.

Therefore, we decided to do the assessment via the *Blackboard* and to see the effectiveness on the

student performance. Fig. 1 shows the front page of *Blackboard* after user has login to the system.
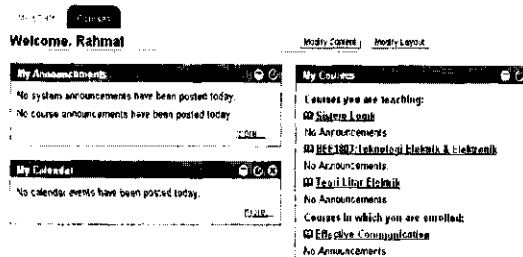

Fig. 1. Front page of Blackboard system.

Blackboard provides a tool for lecturer as a mean to appraise the performance of students from time to time. The assessment can be made in objective or subjective questions. Multiple-choice questions, true/false and fill in the blank are examples of objective questions whereas essay and structured questions, are examples of subjective questions. Obviously, lecturer can choose the type of questions that is suit to their subject content. The process is almost the same as preparing normal assessment. The following is a general steps on how a lecturer prepares an assessment in *Blackboard*:

1. : Create a pool of questions that will be used in an assessment. Decide the type of question.
2. : Each question must be accompanied by its correct answer.
3. : The question pool is considered complete if the number of questions is sufficient enough for the particular evaluation.
4. : Create an assessment and import the question from the pool created earlier.
5. : Assessment must be configured such as the duration, none of questions and what the system should display to the user at the end of assessment.
6. : Test marks will be accumulated and arranged in Grade book in the system. Lecturer may reset any particular score and allow for retest.

3. Developing an Assessment

The process of developing an assessment starts with creating a pool of questions in the system. There are several type of questions can be made such multiple choice questions, essays and fill in the blank. We decided to prepare a pool of questions for an online quiz for the electronic engineering students. This quiz covers the fundamental topic in electronic circuit and circuit analysis. We chose the multiple choice question for the quiz since the students is seldom assessed with this type of question in undergraduate level. However, the challenge is to create a simple, comprehensive question and yet the

options of the answer should look fuzzy to the students. Fig. 2 shows the capture in the first step to create the pool of questions that starts with writing the instructions to the students before attempting the quiz.
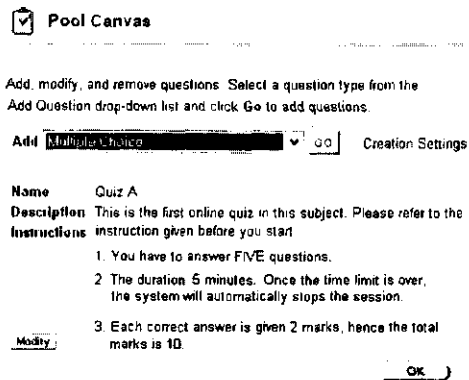

Fig. 2. Creating a pool of questions.

The process to build the pool consumes a lot of time since it determines the level of questions that will appear in the assessment. Depending on the weight of the assessment, the level of difficulties will be changed accordingly. In this case, we managed to develop a total of 200 questions in the pool. Since this is our first attempt to implement an online quiz, thus the result of this quiz will be used as a benchmark for online assessment in the future in term of its effectiveness and response of the students.

Fig. 3 shows some of the questions created in the pool. Each of the questions is followed by the correct answer that will be used by the system to mark the answer of students. Besides, each of the questions can be edited and removed as well
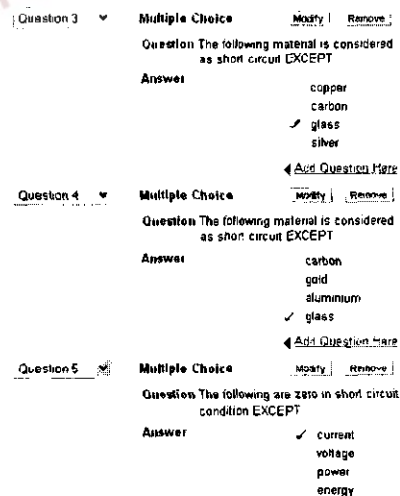

Fig. 3. An example of questions created in a pool.

Finally, we saved the question pool in the *Pool Manager* in order to complete the process of creating the pool. Fig. 4 shows the capture when the question pool has been saved in the system. Next, all of these questions are ready to be deployed in the intended quiz.
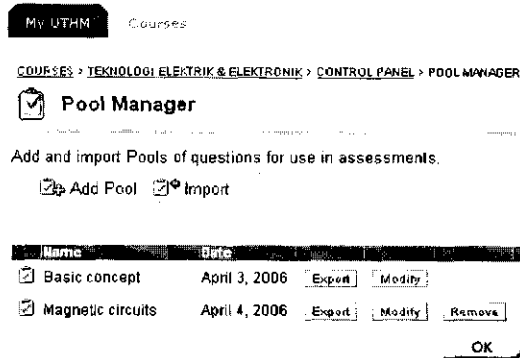

Fig. 4. Question pool saved in the system.

Once the pool of question is ready, the next step is to create an assessment in *Test Manager*. Creating an assessment is very simple once a question pool has been developed and saved in the *Pool Manager*. In this case, we have created the quiz in the *Test Manager*. Fig. 5 shows the capture of the quiz that has been created in the system. Next, we need to configure the quiz.
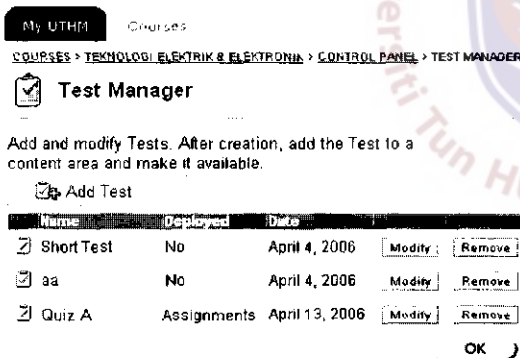
Fig. 5. Creating intended assessment.

The assessment configuration will determine the length of the assessment, number of questions and also the marks given for each correct answer. We decided that each student has to answer five questions in five minutes and each correct will be given two marks. The system will pick five different questions in random each time a student log into the system. Fig. 6 shows the capture of configuration of this assessment.

Since there are about 200 questions in the pool, this configuration will give about 40 different set of questions to the students. Thus, we expect that each student will have different set of questions although a

group of them log into the system simultaneously. This is important since they are not invigilated during the quiz. The students have the flexibility to do the quiz at their own time but it must be done within 24 hours after the quiz has been uploaded into the system.
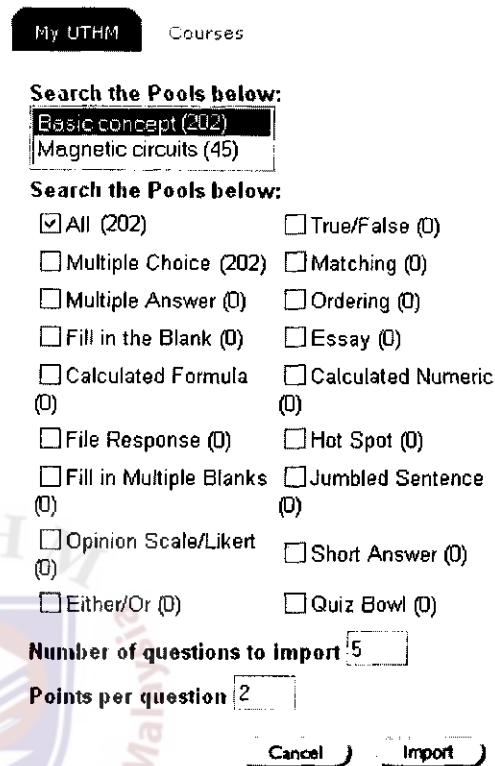

Fig. 6. Configuration of the quiz.

An obvious advantage of this online quiz is the flexibility in terms of time and place of the assessment. The students are free to do the assessment anytime within the time frame given and at any place as long as there is an Internet connection. Furthermore, the lecturers also have fewer burdens to mark the answer since the system will automatically do the marking task according to the uploaded correct answer. The student is able to view the result of the quiz upon completing the quiz as shown in Fig. 7.
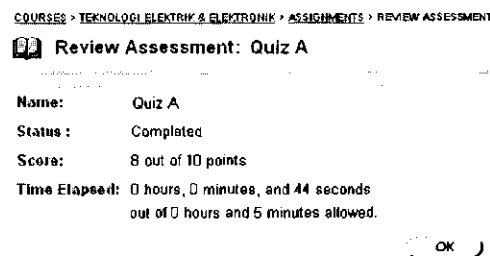

Fig. 7. Sample view upon completing the quiz.

After the 24-hour time frame is over, the quiz will be automatically hidden in the system and cannot be accessed by the students. The lecturer can view the result of all students in grade book as shown in Fig. 8. The marks of our students are then imported from the system in the form of Excel file as illustrated in Fig. 9.

Fig. 8. Result saved in the grade book.

Fig. 9. Grade book imported in form of Excel file format.

We are able check the performance of each of our students as shown in Fig. 10 just like in the normal assessment. Each of questions answered by the students is clearly marked and the correct answer is given as well. As far as the online assessment is concerned, the process is already completed. The lecturer may prepare the questions for the next assessment.

Fig. 10. A sample view of student performance in the quiz.

4. Observation and Discussion

The observation of this quiz can be made on several points; which are the difficulties of the given questions, the ability of the system to pick question from the pool randomly and the overall result of the students.

In general, the difficulty level of the online quiz compared to normal assessment is almost similar. The range of difficulty lies within the level 1 to 4 of the Taxonomy Bloom. Even though the questions are in form of multiple choices, it does not necessarily reflect the questions are easy and straightforward as assumed by most of people. In fact, the multiple choice question is one of the toughest types of question in determining the correct answer provided the choice of answer is very close. However, due to time constraint in preparing the question pool, about two third of total questions have low level of difficulty. The questions are also lack of review from other lecturers and hence the suitability and the structure of the questions could be improved in the future assessment. The quiz can be improved further by adding more questions with higher level of difficulty and hence make it more challenging to the students. However, it does attain the objective of the assessment to test the understanding of students in the fundamental of this subject since the given questions cover all the key topics.

After reviewing the performance of each student, it is apparent that some questions are frequently picked by the system. This causes many students got at least one same questions in their 5-question quiz. This problem could be due to the size of the question pool is not large enough to enable the system to provide totally different set of questions for each student. However, since the majority of students are attempting the quiz very quickly, they could not memorise the exact questions that they have

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attempted. Nevertheless, this flaw could be improved by providing a large number of questions in the pool in order for the system to provide a different set of question from one student to another.

A total of 140 students have taken this quiz as part of their assessment. The result shows that the majority of them, about 65%, managed to get at least 80% of total marks. Another 25 % managed to score 60% and the rest of them only afford to have less than 60% of the total marks. Fig. 11 shows the plot of the result from this online assessment. This result is compared to another quiz that had been done in class a few weeks before. The online quiz result perform much better compared to result of the quiz especially in the group of getting marks in the range of 6 – 10. However, this online result could be affected by early preparation of students since they had been notified a week before the online quiz. The students also might have discussed among themselves during the quiz.
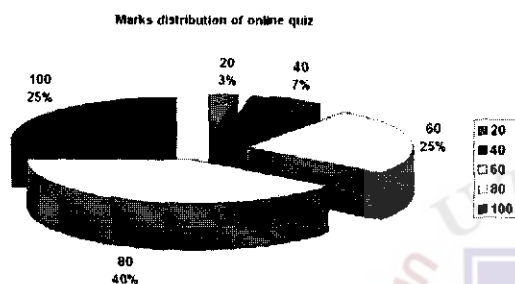
Marks distribution of online quiz

Fig. 11. Marks distribution of the quiz.

5. Conclusion

The online assessments in this paper prove that it can be used as an alternative channel to assess the performance of students. It does not intended to replace the conventional approach that had been used for decades but it adds the variety of ways to hold an assessment. The question in this online quiz shows some flaws in terms of the implementation and the selection of questions but it becomes as the basis to improve the method of preparing an online assessment in the future. Apart from the level of quality of questions given, online assessment is actually has successfully performed well to assess the performance of students. It also gave flexibility to students in terms of the assessment time and at the same time it has reduced the burden of the lecturer to

mark the assessment. Another advantage of the online assessment is that the lecturer is able to reconfigure another assessment provided that the question pool is already created in the system. In general, the online assessment is successfully managed to gauge the performance of students and it helps lecturer to vary the method to hold an assessment.

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