Web-based Assessment in Teaching and Learning Management System (e-ATLMS)

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Abstract

Web-based assessment is a general term which encompasses computer application and Internet in classroom assessment process. This paper reports the findings of a case study on the implementation of a Web-based Assessment in Teaching and Learning Management System (e-ATLMS). It presents an overview of the experience of teachers and students who used this system in the assessment of teaching and learning in the classroom. The system was developed with a purpose to help teachers to manage examination questions, provide questions and define student learning. This case study used data triangulation techniques involving different methods of data collection such as observations, interviews and document analysis to enhance the reliability and validity of data. The findings of this study give information about the strengths and the weaknesses of the system which should be taken into consideration when utilizing the system for specific subject. Although the scope of this study is limited, e-ATLMS can be used as an alternative tool for the implementation of school-based assessment.

Introduction

Assessment plays an important role in determining student achievement in the classroom. Web-based assessment is a general term which encompasses computer application and Internet in assessment process in teaching and learning. The term web-based assessment is extensive, covering a range of activities in which digital technologies are used in all activities including the planning and delivery of assessments, automatic marking and online tools, and all processes of reporting, storing and transferring of data associated with assessment at school level (JISC/QCA, 2007). Used web-based assessment allows teachers to design assessments, develop a question bank and provide formative or summative tests online (Liang & Creasy, 2004). This system gives opportunity for teachers to manage, organize, and upload instructional and assessment materials based onto the syllabus and students' requirement. Teachers and students can use the results that have been generated automatically to do a reflection in order to improve student achievement. This system also allows students to communicate online with teachers in relation to the subject taught and provide immediate feedback (Vendlinski & Stevens, 2002). Web-based assessment is the best way to identify the needs of students and to instil a desire to move forward if the teacher is able to link students to a good sources and references.

Purpose of the study

The purpose of this case study is to presents an overview of the experience of teachers and students who used the Web-based Assessment in Teaching and Learning Management System (e-ATLMS) in the assessment of teaching and learning in the classroom. The system was using Internet as a medium of teaching and learning assessment which helps teachers to manage and prepare test questions and assess student learning. The research, therefore, addressed the following questions:
1. How teachers implement e-ATLMS as an assessment tool to support learning process online?
2. What are the strengths and the weaknesses of e-ATLMS?

Literature Review

School based assessment (SBA) is now recognized as part of teaching and learning strategies in Malaysia, rather than as an additional task. Teaching, learning and assessment cannot be separated and cannot be seen or used in isolation. SBA is an on-going assessment of students' progress which occurs, throughout the year. SBA, an important part of the students' learning, allows teachers to give regular feedback to their students to help them learn better. It has been implemented with the intention of developing students' thought process thus developing their ability to solve problems. The main purpose of the assessment is to

help students to improve or enhance their learning, for teachers to improve teaching and overall, contribute to the achievement of learning objectives. SBA has two broad functions, assessment of learning (summative assessment) and assessment for learning (formative assessment). According to Stiggins (2002), both types of assessments play an equally important role in the school as the information obtained can provide feedback on the extent to which an outcome has been mastered. Therefore, teachers can find out about the weaknesses and strengths and potential of a student and take appropriate actions (Holmes & Gardner, 2008).

Assessment plays a vital role in education. When assessment is conducted on all aspects of education it will help to identify the current status and allows for further planning for educational improvement. In the classroom teaching and learning, assessment is used to determine whether teachers' teach and students' learn (Myran & Workman, 2002). According to Wiggins (1990) assessment is the process of identifying, obtaining and providing useful information for the decision to consider the options available to us. Some experts, such as Wiggins (1990), Kellough & Kellough (1999) and Martel & Calderon (2005) stated that the basis of assessment is a systematic decision-making process involving the identification, acquisition and interpretation of the information which is useful when considering options based on a decision learning objective. Therefore, according to Morgan & Watson (2002) through the assessment of teaching and learning, teachers, students, parents, administrators and education planners will have a sound basis for improving the effectiveness of teaching and learning. This information can be managed, recorded, interpreted and reported using a variety of methods, tools and techniques.

Research Design
The study employs a qualitative approach of case study as a method for data gathering. This utilizes the techniques of classroom observation, interview and document analysis. The participants were selected using purposive sampling. Since Moodle software used by the researcher in developing e-ATLMS is a new tool for the teachers, a Moodle user manual was developed to help participants to learn to use the system.

Two learning management system using the concept of Web-based learning have been developed by researchers as a medium for using e-ATLMS. A 20 hours training session was conducted with twenty teachers from a school. After four months, only two teachers actively used the system in the classroom. Another training session was conducted with twenty expert teachers from various subjects and schools but only one teacher actively used the system in the classroom. Since the purpose of this case study is to present an overview of the experience of teachers and students who used this system in the assessment of teaching and learning in the classroom, this case study used data triangulation techniques involving different methods of data collection such as observation, interviews and document analysis (Spradley, 1980, Merriam, 1988; Bogdan & Bilden, 1998) have been fully utilized. The use of various data collection techniques also ensure that researchers are not relying on one technique alone. This can strengthen the validity of the study design. To further strengthen the validity of the data, two students from each class had also been interviewed.

Findings
The result of the study is discussed with respect to the research questions.

How teachers implement e-ATLMS as an assessment tool to support learning process online?
Teachers are the main pillars in ensuring e-ATLMS can be carried out successfully, and to help improve the quality of assessment in teaching and learning. This section presents three cases, one for each teacher. Madam Ruby and Madam Nora both form SMKC and Madam Rozy from SMKS. Each case describes the experience of a teacher and her two students who used this system in the assessment of teaching and learning in their classroom.

Madam Ruby's Case
Madam Ruby is a Senior Teacher and Mathematics' Excellent Teacher aged 46 years old. She has taught mathematics for 20 years. She exposed to on-line learning since 2005 and had used this method of teaching and learning in her classroom. Madam Ruby has shown her readiness using e-ATLMS in her classroom. Obviously in her course online, it was recorded that she managed to prepare six assignments, conducted two forums, managed two quizzes and uploaded eleven resources.

The school has a complete infrastructure. Computer lab quite comfortable and clean. This lab is a classroom that was renovated into a computer lab. Equipment is more than adequate for small number of students. Desktop computer equipped with speakers, headphones, a stabilizer of 20 units of computers and teacher's computer also completed and connected to the LCD projector. There are all Internet connections in LAN and Wi-Fi. When checked the signal strength is very slow with 100Mbps speed. Samsung Laser Printer ML2251N model with all LAN connected to the computers. White screen already uprooted and teacher has to use whiteboard to transmit projector. A hub unit is still functioning well and a webcam placed at a corner of the lab.

Three observations made to see how she conducted assessment in teaching and learning online. She taught form 4 classes with 20 students (12 girls, 8 boys) in one class. She used computer lab for teaching if there was a need to hands on with the computer and Internet. Since the number of the computer same as the students, each students had computer to hands on. She has been exposed to web based learning before, but admitted that the system being used now more user-friendly, easily understood and used. Here are some statements related to Madam Ruby readiness of the assessment in terms of confidence, skills and usage:

> *Memang saya rasa sangat membantulah...multimedia dengan teknologini dalam mata pelajaran saya sebab dapat mempelbagaikan kaedah dan pengajaran dan dapat menarik minat pelajar-pelajar mempelajari subjek tersebut.*

> (Translation: Indeed I feel very helpful ... using multimedia technology in my subjects because the teaching methods can be diversify and can attract students studying these subjects.)

This statement is also agreed by Madam Ruby's students in interviews with them:

> *...online lebih mudah...terutama semasa guru nak menanda...tak perlu tanda satu-satu. Kalau kita jawab dan submit....boleh tahu apa kesalahan kita serta merta...*

> (Translation: ... Online is easy ... especially in teachers marking ... do not need to mark one by one. If we answer and submit .... can know what our mistakes immediately ...)

Document summary showing that Madam Ruby has a strong IT background, expertise in computer operations, word processing software, surf the Internet, and CD-ROM. During the training session, Madam Ruby had a full attendance record. Documentary evidence also shows how the students' work were recorded. Records show that Miss Ruby has successfully entered manually mark and comment on the essay questions by uploading a single file application. For the formative test of six questions were prepared by her which consisted of multiple choice questions, short answer and matching. Most questions are in the form of simple questions. However for the Revision Test, there were 40 multiple choice questions have been provided as a revision to the final examination.

Despite the Internet's problem, all students successfully completed the questions within the stipulated time. Observations on Madam Ruby's class shows how students attempt to discuss the answers but the questions are not in the same order and at the end of class, the Madam Ruby showed the students their achievement.

> *Kelebihannya yang rasa memang menakjubkan...pelajar memang seronok nak buat dan ingat soalantu sama....dia orang nak meniru...itu yang saya seronok tengok dia orang punya sikaplah...reaksi dia orang....dan kelebihannya kita dapat markah dan feedback dia on the spot....itu yang seronok.*

> (Translation: The advantages was amazing... students are excited and thought they be given the same questions .... they try to copy... I enjoying see the their reaction... and the advantages are can give marks and feedback on the spot .... it is fun.)

The most interesting answer the students answer the related question:

...tak boleh nak meniru kerana soalannya lain-lain...tetapi senang disemak...

(Translation: ... Can not copy because the questions are difference ... but easy to mark...)

Madam Nora's Case

Madam Nora is a Science Teacher aged 33 years old. She has taught science for 8 years. She never exposed to on-line learning before and had used this e-ATLMS in her teaching and learning in the classroom. She had prepared her online course for form two in 2009 and for form one in 2010. Madam Nora has shown her readiness using e-ATLMS in her classroom. Obviously in her course online, it was recorded that she managed to prepare five assignments for form two and two assignments for form one , conducted four forums for form two and eight forums for form one, managed eleven quizzes for form two and eight quizzes for form one and uploaded eighteen resources for form two and eleven resources for form one. She also able to conduct a chat room for form two and one. Since she in the same school with Madam Ruby, all the school's infrastructure are the same.

Madam Nora taught form 1 class with 22 students (16 girls, 6 boys) and form 2 class with 20 students (11 girls, 9 boys) in one class. She also used computer lab for teaching if there was a need to hands on with the computer and Internet. Since the number of the computer provided only 20 units, for form 1 students, two of them have to share. Three observations made for each of the course to see how she conducted assessment in teaching and learning online. In her opinion, the use of e-ATLMS will save paper and reduced work load, because she used to cut and pasted questions when prepared questions or assignments for students. She claims that e-ATLMS can provide various forms of exercise at one time. The system gives students the opportunity to learn according to their ability and capability respectively. For her, used e-ATLMS never disrupt the teaching syllabus but enhanced teaching and learning. She does not used the system all the time but integrated it with lab work and others. Number of exercise given to students depending on the student achievement in that class.

Madam Nora currently facing the problem of getting images from sofcopy. Therefore, researchers have explained how to get images of softcopy document using the print screen, web cam, Google image, hardcopy using the scanner. And now, she managed the course very well according to her creativity. Her statements from the interviews:

.... exercise pertamatu revision daripada apa yang saya dah ajar sebelum ini, pasal animal...kalau nak rizor.... itu satu dah....content actually tak banyak tapi dia lebih kepada pelbagai jenis exercise... and another thing...dalam forumtu saya up lagi soalan baru...paperless tu memang nampaklah. Budak dalam masa yang sama ada banyak benda yang dia boleh buat....dan budak ada yang slow, ada yang laju...jadi budak menjawab based on dia punya performance dia orang sendiri. Dia segi itu memang baiklah...tapi bila dikaitkan dengan kita punya Internet...itulah yang masalahnya. Technical problem yang mesti kita overcome.

(Translation: .... the first exercise was a revision of what I previously taught, it was about animals.....if you want rizor....thats it....the content actually not much but it was variety of exercises...and another thing ... in my forum I up more new questions ... that was paperless. Students in the same time there are many things they can do .... there were slow students, some were very fast ... so they answered based on their performance. At this terms it was good ... but when we connected with the Internet line ... that is the problem. Technical problems that we must overcome.)

Dari segi persediaan guru....samaje... kalau saya tak buat macamni....saya kena pergi rizor....potong dan tampal kertas jadi satu kerja...whatever....Cuma dia based on student...macam kelas satu lagi sebab kelas ini weak sikit, dengan menggunakan same topik 'plant' saya bawa kelas itu pergi round dulu satu sekolah buat on-field work....

(Translation: In terms of teachers' preparation .... just the same ... if I do not do that I

have to go for rizor....cut and paste question paper .... whatever...but it was based on students ... another class they were weeker, bybusing the same topic of 'plant' I take that class to go around the school compound for a field work ....)

Comments from Madam Nora's students regarding of teaching using e-ATLMS :

Lebih senang....daripada tengok buku teks je bosan juga! Kalau guna sistem...dia ada assignment lain-lain. Kalau tak tahu boleh search Internet....sebab cikgu ada bagi notes sekali.

(Translation: Easier...rather than used the textbooks .... it so bored too! If used the system ... there were various of assignments. If you do not know ..can search the Internet .... because teacher provided with notes.)

Cikgu ada cara dia....suasana lebih selesa...minat bertambah....pencapaian boleh tahan juga...Tapi kalau ada eksperimen...lebih baik hands on.

(Translation: Teacher has her own way.... More comfortable environment....interest improved.....performance not bad....but if got experiments...prefer to be hands-on).

Madam Rozy's Case

Madam Rozy is a Biology's Excellent Teacher aged 48 years old. She has taught biology for more than 20 years. She has been exposed to a lot of IT courses and on-line learning before and had used this e-ATLMS in her teaching and learning in the classroom. She had prepared four online courses for form 4 and 5, named Add-ons, Biology Form 4, Biology Form 5 and Bio A+. Madam Rozy has shown her interest using e-ATLMS in her classroom. Obviously in all of her course online, it was recorded that she managed to conduct twenty assignments which have been submitted and discussed in forums, prepared twenty resources but managed only one quiz consisted multiple choice and true/false questions. She also able to conduct a chat room for all the courses.

Madam Rozy had problem to use Internet in her school. So, she had to buy own broadband to use Internet in class. Since the school computer's lab have problems with all the computer, the students in the school have difficulty to hands-on with computer one-to-one. Feedback from the interview, only five computer can be used. It means that the students cannot hands-on in the classroom. Because of that, Madam Rozy have prepared all the assignment and resources for the students to do at home. Surprisingly, all the students participated actively in all the discussion and they also set up a chat room during holiday. Although they cannot hands-on in the classroom, but Madam Rozy did use all the discussion and upload assignment to discuss them in the classroom. Her statements from the interviews:

Saya suka guna forum...saya akan maklumkan kepada murid isu yang telah saya letakkan dalam portal dan mereka perlu respon...

(Translation: I like to use the forum ... I will inform the student that I have put the issue in the portal and they need to respond ...)

Dalam banyak-banyak aplikasi saya suka sangat forum sebab saya dapat lihat banyak feedback daripada pelajar...
(Translation: In many application I like forum because I can see a lot of feedback from students ...)

Students comment on e-ATLMS are:

Cikgu guna slide daripada Moodle...tapi kami kena hand-on di rumah.

(Translation: Teacher use of Moodle slide ... but we have to hand-on at home.)

Cikgu banyak beri isu untuk bincang...seronok sebab ada peluang buat assignment dan berbincang masa cuti sekolah.

(Translation: Teacher gave a lot of issues to discuss....fun because there is an opportunity for discussing the assignment during school holidays.)

What are the strengths and the weaknesses of e-ATLMS?
The participants were asked to comment on the strengths and the advantages this system has for teaching, learning and assessment. Their comments are divided into four categories: effectiveness, efficient, useable and appealing.

On the effective of the system, their comments are:
- *An interactive online system more effective for teaching and learning;*
- *Resources are more recent and interesting;*
- *Student can review assignments more easily.*

On the efficiency of the system, their comments are:
- *Teaching and learning can be done anywhere and at any time;*
- *It can be accessed from anywhere via the Internet;*
- *Teaching and learning resource can be constructed easily and can be downloaded in various forms such as video, power point et;.*
- *Test can be done at any time for questions is available all the time; facilitate effective communication between students and teachers, and easy to contact students during the holidays;*
- *Be accepted continuously or without teacher student attendance in class; user friendly; and etc.*

On the usability the system, their comments are:
- *Students who have computer & Internet at home more advantage;*
- *An online course teaching is very good, especially to attract students to learn;*
- *The teacher and students will stay connected in their learning problems; this method is very interesting and helpful, especially if teachers have other commitment or no teachers at the school;*
- *Students can make the training provided in phases and the level of its own in addition to repeat until he can answer correctly to all questions.*

Lastly on the system's appeal to learners, the comment is:
- *System attracts more students because the teachers use the technology with the times and conform to their tastes.*

However, no doubt each system has its disadvantages but e-ATLMS cannot be considered as weakness but more to challenges when used e-ATLMS. Clearly in the observation and interview is that the problem of forgotten passwords. Students have been forgotten, not only the password to access the portal but the school computers. This is because students like to change the password given to them, and finally they do not remember the password of their own created. These factors that can affect teaching and learning since teachers had to ensure that all students must be prepared to the portal. This observation is explained by Madam Ruby in an interview as follows:

.....masalahnya dia orang ni pelupa. ID dan kata laluan terlampau mombastik punya. Sebab nak masuk e-learning dan masuk komputer dia orang buat berbeza....itu masalahnya. Itu yang kadang-kadang kena refer pada ITC [untuk mendapatkan kata laluan komputer] dan pengkaji [untuk mendapatkan kata laluan portal] untuk mendapatkan ID dan kata laluan tersebut.

(Translation: ...but the problem is they are forgetful. ID and password too mombastic. Password for e-learning and computer were different. That why sometimes has to refer the ITC [to get a computer's password] and researchers [to get the portal's password] in oder to get the ID and password.)

Other significant problem observed during the observation was the server problem as was informed as follows:

Masalah server yang selalu down. Masalah elektrik disini selalu trip..selalu blackout..

(Translation: Server's problem which always down. The electrical problem here is always trip and blackout)

Conclusion

From the findings of the two research questions, it can be concluded that the e-ATLMS has many applications that can help facilitate the teachers in planning, organizing, preparing, administering, implementing assessment and to get instant feedback. Most importantly e-ATLMS allows students to collaborate with others and to reflect on their learning. Based on the evaluation, it appears that the system is able to provide facilities to teachers to manage evaluation of teaching and learning in the classroom or outside the classroom. Among the elements that can be formulated in the use of e-ATLMS is that e-ATLMS can help teachers in:

- involving students actively in learning objectives.
- providing opportunities for students to make self-assessment and reflection.
- delivering feedback to help students make self-correction.
- providing opportunities for feedback dialogue (between the peer and teacher-student).
- encouraging development of confidence, motivation and positive self-esteem.
- providing opportunities for students to explore new knowledge.
- providing opportunities for teachers to build teaching and assessment when appropriate.
- familiarizing students to answer questions within the stipulated assessment.
- ensuring that teaching and assessment provided taking into account the syllabus.
- involving pupils fully in all learning activities and assessments.

It is hoped that the e-ATLMS will bring awareness to the teachers who are not yet ready to accept change in order to move along with the time.

References

Holmes, B. & Gardner, J. (2008). *E-learning: concepts and practice.* London: Sage Publications.

Kellough, R.D. & Kellough, N.G. (1999). Secondary school teaching : A guide to methods and resources; planning for competence. In U. S. River. New Jersey: Prentice Hall.

Liang, X. & Creasy, K. (2004). Classroom assessment in web-based instructional environment: instructors' experience. *Practical Assessment, Research & Evaluation*, 9(7). Retrieved April 8, 2009 from http://PAREonline.net/getvn.asp?v=9&n=7.

Martell, K. & Calderon, T. (2005). Assessment of student learning in business schools: Best practices each step of the way. Tallahassee Florida: Association for Institutional Research.

Morgan, C. & Watson, A. . (2002). The interpretative nature of teacher's assessment of students' mathematics; Issues for equity. *Journal for research in mathematics education.*

Myran, S. & Workman, D. (2002). Elementary teachers' classroom assessment and grading practices. *Journal of Educational Research.*

Richey,R.C. & Klein,J.D. (2007). *Design and development research methods, strategies, and issues.* London: Lawrence Erlbaum Association.

Shambaugh, R.N. & Magliaro, S.G. (1997). *Mastering the possibilities: A proses approach to instructional design.* Massachusetts: Allyn and Bacon.

Stiggins (1998). *Classroom assessment for student success.* Washington: National Education Association.

Tessmer, M. (1993). *Planning and Conducting Formative Evaluation.* London: Kogan Page.

Vendlinski, T. & Stevens, R. (2002). Assessing student problem-solving skills with complex computer based tasks. *Journal of Technology, Learning and Assessment, 1(3)*. Retrieved November 20, 2008, from http://escholarship.bc.edu/jtla/vol1/3.

Wiggins, G. (1990). The case for authentic assessment. *Practical assessment research and evaluation.*