STRATEGIES FOR COPING WITH UNEXPECTED UPTAKE OF CBA

Stuart Hepplestone and Paul Helm

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Stuart Hepplestone and Paul Helm
Sheffield Hallam University
Learning and Teaching Institute
Howard Street
Sheffield Hallam University
S1 1WB

s.j.hepplestone@shu.ac.uk

Abstract

Sheffield Hallam University (SHU) has used the virtual learning environment (VLE), Blackboard since February 2001. The academic year of 2002-03 has seen an unexpected growth in the use of online assessments. The University's Learning, Teaching and Assessment strategy seeks to actively encourage the appropriate use of C&IT in teaching and learning in order to provide flexible learning opportunities for a diverse student population. Whilst SHU's assessment guidance permits the use of computer-based examinations, there are no explicit procedures and code of practice for staff to follow should they wish to introduce Computer Based Assessment (CBA) into their course design. This paper will explore the issues that arise when unexpectedly large numbers of staff avail themselves of an easy to use virtual learning environment with a built-in assessment system. There are both tensions and opportunities in this situation and we will describe successes as well as things which could have gone better.

Introduction

Computer Based Assessment (CBA) at SHU has its roots in fairly widespread use of optical mark reader technology for multiple choice questionnaires and surveys. The previous Virtual Learning Environment (VLE), Top Class did not offer much CBA functionality, and a small number of staff have experimented with Question Mark for Windows.

A web site (Computer Aided Assessment Practical Guidance, 2000) was produced based on a literature review undertaken by the Learning and Teaching Institute (LTI) at SHU. This practical guidance offers a 'way in' to some of the main areas related to the implementation of CBA for staff.

Since the introduction of Blackboard 5.5, we believe that staff perceive CBA as a natural progression of their developing use of information technology (C&IT) in learning and teaching. The growth of Blackboard as an integral part of staff e-learning strategies has coincided for many with new course validations and module revalidations, and has thus led staff to begin to consider the appropriateness of CBA for particular assessments. CBA is being integrated alongside existing assessment strategies and embedded

within courses. Reduction in timetabled contact hours and the time available for tutorial based activities are other factors motivating staff to introduce independent study activities, a factor which has led to a growth in diagnostic and formative CBA.

There are currently over 18,000 students and almost 1,300 staff using Blackboard at SHU. And we believe that over half these staff are using CBA with their students.

CBA in Blackboard

Blackboard's built-in assessment tools provide the Instructor (Blackboard terminology for a tutor) with two types of assessment. A quiz allows the Instructor to assign point values to each question. On submitting their answers, students receive immediate feedback, and the results are recorded under each student entry in the Gradebook. The survey option creates assessments that record answers anonymously. This can be used to perform opinion polls or course evaluations. These results are non-graded, anonymous and cannot give user feedback. Both quizzes and surveys can be drawn from question pools which offer the Instructor the opportunity to export questions for archival purposes or for future use, import questions from other Blackboard sites, share questions among colleagues who are using Blackboard, and provide randomisation in quizzes.

Blackboard uses a 'wizard' type interface to guide the Instructor through the step-by-step process of creating assessments, which makes it an easy tool for staff to use. Instructors can choose from seven question types, which can all be enhanced with HTML formatting, multimedia attachments and direct links to web pages:

- Multiple Choice
- Multiple Answer
- True/False
- Matching
- Ordering
- Fill-in-the-Blank
- Short Answer/Essay

Our main pedagogical approach was to encourage the use of Blackboard's assessment feature to support the use of formative assessment. However, some staff clearly felt Blackboard had the potential to delivery summative assessments online.

CBA at SHU

Until recently, CBA had been restricted to large student groups where automated marking and feedback was considered to save staff time in setting and marking assessments. We now find widespread use with smaller groups of students where advantages over paper-based assessments. These include:

- the ability to incorporate digital images, video, and other multimedia;
- assisting in reducing potential biases that surround the marking process;
- providing a different test page for each student, drawing off a bank of questions;
- In many instances, existing assessment methods are not being replaced, but extra learning opportunities are being provided for students.

At SHU, CBA has been integrated into Blackboard courses in a variety of ways, both formatively and summatively:

- to assist student learning and progression by providing feedback which leads to further materials and resources;
- to track student performance and identify students or topics where students are performing less well, providing an opportunity to take remedial action;
- to assist students with exam preparation, familiarising students with exam content and/or question types to be used if summative to be used online;
- to assist with tutorial preparation, motivating students to do the reading;
- to test students prior to placement practice;
- a series of regular tests taken throughout the module contributing marks towards a final coursework grade;
- summative assessment with formative feedback;
- formative feedback to students on their progress - taken once within a set time period and made open access at the end of the revision period

It is not unusual to find an overlap between the different types of online assessment, with some contributing towards a final grade, others providing feedback on progress, and some purely for revision. Assessments that contribute towards a final coursework grade are often made available for a set period of time with only one attempt allowed, they are then made open access during the revision period. Alternatively, students are permitted to have multiple attempts at particular assessments in order to achieve full marks which will then contribute towards a small proportion of a final coursework grade. Most of these assessments use a variety of question types.

One of the biggest uses of online assessment at SHU is in the School of Health and Social Care. CBA was introduced into the Learning, Teaching and Assessment Strategy of the Diagnostic Radiography Course in 2001 to test students prior to placement in order "to ensure appropriate levels of knowledge and understanding, and consequently reducing the burden on supervising radiographers" (Best, 2002). This use of CBA goes beyond the use of multiple choice questions, and includes only free-text response type questions (Fill-in-the-Blank and Short Answer/Essay questions) which are illustrated with real medical images, as "opposed to line drawings used previously in paper-based examinations" (Best, 2002). In addition to testing the students' knowledge and understanding, students begin to develop the necessary C&IT skills that are required by radiographers in relation to the growing utilisation of digital imaging and manipulation in the profession.

CBA is embedded within the programme of independent study for languages. Assessments, using a variety of question types including free-text responses support reading and listening activities. Questions are enhanced by photographs and links to websites to provide visual stimulation and "a more authentic cultural dimension to the task" (Lyne, et al. 2002). Audio and video clips also form key components of questions. Unlike a traditional exam setting, students are able to take complete control over the playback, replaying the whole or individual parts of the clip as often as they wish. Students are able to simultaneously listen to or watch to the recording, while viewing and answering questions.

CBA is often implemented into modules which are graded on the basis of 100 per cent continuous assessment. For example, a first year physics module has ten tests set with a timescale of ten to 14 days allowed for completion of the test. Multiple attempts are allowed as students must eventually gain full marks on each test for it to contribute to the overall Blackboard assessed score, which forms 20 per cent of the total module mark. The use of Blackboard enables the students to engage with a significant course component during independent study time and gives a degree of flexibility to the students who are able to access the tests at a time suitable to them, and as often as they are able within the allowed timescale.

Another common reason for using Blackboard quizzes is to provide formative feedback to students on their progress. A first year sports science group, for example, are provided with a quiz every four weeks directly linked to parts of the curriculum, in order to give students some benchmark information in terms of where they currently are in the learning process and also where they need to go. Even though the material is very factual, they do contain interpretative questions usually in association with graphical material and calculations. Students are only permitted to take the quizzes once within the set time period, but are then made open access at the end of the course during the revision period.

Staff and students' expectations and experiences

Informal and formal feedback from staff show that their experiences of using CBA have, by and large, met their expectations. Some issues have also been raised which are discussed at the end of this paper. Staff have benefited from:

- marking large numbers of assessments quickly, accurately and consistently, without adding to their marking load;
- Blackboard's ability to perform evaluative statistical analyses of students' performances, identifying topics where students are doing less well and taking remedial action;
- the repeatability and re-usability of questions and entire assessments;
- the use of question pools to provide a different test page for each student;
- taking direct control of the assessment questions, rather than relying on commercially available CBA packages from publishers and the like.

Staff comment that students are positive and constructive about using Blackboard quizzes formatively. Blackboard case studies, part of the two year e-learning research currently being conducted at SHU, underpin this. This research also explores the student perspective of the appropriateness of e-learning including CBA. Results indicate that CBA helps motivates the students, it allows them to work independently and at a time convenient to them. Above all, they appreciate the immediate scoring, the timely feedback and finding out the correct answers straight away.

It is also worth noting that the most popular student tool within Blackboard is the View Grades option which allows students to check grades, view their attempt and read feedback for any assessment which they have completed.

Supporting CBA at SHU

Our dissemination strategy for good practice in using Computer Based Assessment (CBA) takes place through dedicated assessment events and 'Show and Tell' sessions where members of academic staff share their rationale for assessing online, describing the benefits and issues in relation to their experiences. A week long 'Focus on Assessment' event held in 2002 is an example of the increasing attention being paid to the development of Assessment and Feedback strategies at SHU.

As the uptake increases, the support structure is having to change to ensure that it is appropriate. Often support only becomes an issue for staff once that have become involved in building or delivering an online assessment and hit an obstacle.

Our support strategy for staff includes a User's Forum which staff can elect to join. Timely information, support and guidance is provided, along with a discussion forum for staff to post e-learning questions and experiences. A major part of this offers good practice and practical guidance relating the design and online delivery of formative assessments, with particular reference to the use of CBA in Blackboard, and draws on the current British Standard code of practice for the use of information technology in the delivery of assessments. Other timely information is disseminated through the e-learning newsletter, *Newsflash*, which is published at regular intervals. These have a dedicated theme, and an 'assessment special' was published in November 2001 in response to the first wave of summative assessments delivered through Blackboard.

Recently a series of e-learning essentials, *Better Your Blackboard Basics* pamphlets have been produced on a number of topics, including CBA. They are intended to introduce the CBA concept to staff, discuss the benefits of, and how Blackboard can support, CBA.

The e-learning advisers offer a one-to-one support service, visiting academics in their own office, to help with their Blackboard and e-learning queries. This allows staff to be consulted on their experiences of using online assessments, be given advice about question and test design, be offered suggestions based upon other staff experiences, and provide guidance on enhancing the accessibility and usability of the assessment.

Issues arising

Staff have raised a number of issues, around their first hand experience of delivering assessments online at SHU. Staff are generally aware of the need to design a valid and equitable assessment at the appropriate level (i.e. that online delivery does not affect the validity of the assessment, that it enables the students to meet the learning outcomes, and that it genuinely assess what it purports to do) as well as ensuring that it is fair, easy to use and takes into consideration usability requirements, and that where marks are attached to formative assessments that all students have the same opportunity to undertake the assessment. Staff are also keen to ensure students are provided with appropriate support and training, and to ensure their performance is not inhibited by fear or inexperience with the technology, often provide demonstrations of the software and question types or provide appropriate practice tests.

A major concern is the high investment in staff time in getting staff up to speed with using the assessment tool in Blackboard and staff are often reliant on others (e.g. Courseware Developers) to handle this technical side. Equally they are concerned about the amount of time it takes to create and sustain pools of questions, and write meaningful feedback which helps students develop. We therefore encouraged staff to collaborate and share this work among colleagues. Staff are also unsure about how much time to allow students to complete a Blackboard test.

Staff using free-text responses in assessments find online marking burdensome. Short Answer/Essays cannot be marked by Blackboard and require the tutor to read and grade each response to such questions. This often has implications for subject areas that operate anonymous marking policies, as this cannot easily be achieved with Blackboard. Similarly, as Fill-in-the-Blank type questions are evaluated based on spelling and letter patterns, these need manually reviewing as this may reveal a number of unforeseen answers that would normally be given credit in a traditional exam, and there is a mandatory requirement to manually review such responses from students known to be dyslexic.

Along with an increase in formative assessment, staff are becoming increasingly confident in Blackboard and keen to assess online at a summative level. Currently, there are no formal contingency procedures exist for computer, server or network failure during an online summative assessment, or guidance to follow for a student losing an assessment 'in progress', which is a concern shared among staff. Although this hasn't happened, we ask staff to consider what they would do if such a situation arose. In supporting staff, we recommend that a paper copy is available (for photocopying in an emergency), and spare mice and keyboards can easily be obtained from nearby computer helpdesks.

There are currently no dedicated laboratories for students taken CBA summatively, and staff feel standard computer classrooms are substandard compared to the accommodation provided for paper-based examinations. Among the issues associated with CBA that are raised by staff include the closeness of candidates, that students are distracted by the noise from keyboards and disadvantaged by glare from windows. Staff also find booking computer classrooms in mid-semester difficult, and often have to agree to use back to back sessions or rooms in split venues, particularly for large student groups (in some cases involving up to 350 students).

The use of exam invigilators for summative CBA can sometimes cost as much as four times that for traditional exam setting. Using external invigilators has also caused problems as they are not familiar with the software. Tutors, along with e-learning advisers and IT support personnel, are having to assist with the invigilation, thus ultimately saving very little of their time. This additional support in invigilating negates a large proportion of cost saving.

We discourage staff from using the time limit option, as this can be controlled by invigilators and any time delays can be taken into consideration. This helps to deal with students with disabilities who require extra time as Blackboard does not allow an assessment to be set with different time limits for individual students and therefore a separate assessment would need to be made available for each different amount of time required.

Concerns over security for summative assessments have been addressed by the development of a 'secure browser' which can only access Blackboard. In this environment, students are unable to launch any other software, visit other websites, print, save, refresh or go back within the browser, apart from changing the text size. Security is further enhanced by suggesting the assessment is only made available once the students are in the exam room, and that the assessment is linked to from the Blackboard site's 'Announcement' page, in order to disable all other content areas, communication and student tools for the duration of the assessment. Where a takes place as 'back-to-back' sessions, we advise staff to use the password option, changing it once the first group have started the assessment to prevent students conveying this to others outside the room. We recommend to staff that students do not leave the exam room until the invigilator or tutor writes down their score from the computer the student was using; this ensures a backup of all scores and ensures that the student submitted their attempt correctly. To prevent against students from reading others' screens, assessments are frequently made secure by the use of question pools and either presenting the same questions in a different order, or a random selection of questions for each student from different pools.

Staff are now beginning to see the benefit of allowing electronic submission of essays and assignments. Blackboard has a 'drop-box' tool allowing files to be sent between a student and the Blackboard Instructor, and with the introduction of Blackboard 6 at SHU and its 'assignment manager' feature in July 2003 there are sure to be issues surrounding its use. This will allow Instructors to set and students to submit completed assignment files, with comments, within the course content areas of Blackboard. The Instructor can download, grade and provide feedback to students' work through Blackboard's Gradebook.

Conclusion

The issues around summative assessment need to be addressed by the institution. The uptake of formative CBA at SHU has shown that if you give a simple tool to staff, many of them manage to perform complex tasks if their approach is based on the pedagogical concerns and not on the functionality of a given piece of software.

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