



## ***JISC RSC Scotland South & West Case Study @ the University of the West of Scotland***

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### **Title**

Embedding eAssessment in module delivery using Assessment21's Assess By Computer: Considering the potential of ABC to enhance the student experience of learning and assessment

### **Summary**

This case study examines the experience of embedding Assessment21's Assess By Computer dedicated online assessment system in module delivery on the CertHE Social Studies programme at the University of the West of Scotland. It outlines some of the central pedagogical and logistical benefits of employing ABC within a framework that focuses on the potential of the system to enhance the student experience of learning and assessment. It considers the potential of ABC to deliver and stimulate feedback through the mechanisms of formative assessment in a way that encourages self-regulated learning. It also identifies the benefits that ABC can offer students and teaching staff in the delivery and marking of high-stakes summative assessments.

### **About the Institution**

The University of the West of Scotland is a multi-campus Higher Education institution with campuses in Paisley, Hamilton, Ayr and Dumfries. The University has three academic faculties: The Faculty of Business and Creative Industries, the Faculty of Education, Health and Social Sciences, and the Faculty of Science and Technology. Within these three faculties are eight schools: Business and Creative & Cultural Industries, Education, Health, Nursing & Midwifery and Social Sciences, Science, Engineering and Computing.

### **The Challenge**

1. To enhance the student experience of learning and assessment by embedding Assessment21's Assess By Computer in module delivery: both as a vehicle for ongoing formative assessment and as a tool for the delivery of the end of module high-stakes summative examination.
2. To enable and encourage ongoing self-assessment and self-evaluation and promote student self-regulation through the production of an extended and enriched formal and informal feedback matrix.
3. To harness the potential benefits for students and teaching staff of online assessment in the delivery and marking of a high-stakes end of module assessment.

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## The Activity

### *Background*

Prior to the start of session 2010/11, the University of the West of Scotland (UWS) announced that it was to take part in a pilot trial of Assessment21's Assess By Computer (ABC) dedicated online assessment system. Assessment21 state that the ABC system can provide a number of pedagogical and logistical benefits and offers a "genuine 21st century approach to assessment and marking" (Assessment21, 2010). After discussion with representatives from Assessment21 and UWS's Centre for Academic and Professional Development (CAPD), it was agreed that the pilot would include the Introduction to Sociology module, a core module on the CertHE Social Studies programme (SCQF level 7). The introduction of the ABC pilot was somewhat serendipitous as it coincided with an unprecedented rise in the number of students on the Social Studies programme. In previous years, ongoing formative assessment on this module had largely been delivered during lectures and seminars using Turning Point Audience Response System ('clickers' as the system is commonly known). However, lack of clicker units at this time meant that this approach to developing feedback was not possible (student numbers had gone from 44 to 92 and access to clicker units was limited to 64). With an ongoing focus on improving the quality of feedback, the introduction of ABC offered the opportunity to reconsider the way in which students engaged with the matrix of formal and informal feedback that flowed through module engagement. ABC was identified not merely as a replacement for clickers, but as an alternative approach to feedback generation in and outside lecture and seminar classes: an approach that could create different forms of opportunity for students to self-assess and self-evaluate. The potential of ABC to enhance both the student and staff experience of the end-of-module high-stakes examination further influenced the decision to pilot the system. The pilot went ahead with a central focus placed on embracing the potential pedagogical and logistical benefits of embedding ABC in module delivery and assessment by way of enhancing the student experience of learning and assessment.

The initial challenge in the introduction of ABC lay in staff development. As part of the pilot, Assessment21 provided an introductory staff development session. This was followed up by discussion and piloting of the system by staff involved in the project. Assessment21 have focused on the accessibility, stability and security of ABC, which means that the interface the student encounters is intuitive and easily navigable. However, preparation for the construction and delivery of assessments required a significant amount of staff development time at the individual level. Nonetheless, this time was not prohibitive and the impact of this initial requirement can be lessened in the future by harnessing the expertise of staff with experience of using the system. A representative from Assessment21 was available to provide assistance throughout the pilot and responded to any queries quickly and concisely. She also monitored staff engagement with the system remotely and offered advice at each stage of the process.

### *The ABC system*

The ABC system operates across platforms and in all the major browsers. Assessment and feedback are delivered online but authored and marked offline using ABC's setting and marking tools. Assessment timing can be closed or open and feedback provided synchronously or asynchronously. ABC also contains an invigilation tool that facilitates multi-site invigilation. This tool can be used to identify any system issues or any questionable behavior by candidates on-site or from any remote site with Internet access. This allows for robust and secure multi-site delivery of assessment.

### *Employment of ABC*

ABC was firstly introduced in the Introduction to Sociology seminar classes as a formative mechanism that allowed students to reflect on their understanding of lecture material and wider reading using a series of multiple choice questions (MCQs) (Fig. 1) and 'fill in the blank' slotted questions. Feedback was written into the questions and provided automatically to the student on completion of the assessment (Fig. 2). These tests were delivered at the start

of seminar sessions and the outcomes used by the seminar tutor to focus discussion on the areas where student understanding was less clear or confused. Students were also encouraged to discuss questions with each other prior to and following completion of the test. In this way an informal economy of feedback was created prior to wider seminar discussion. Students were not required to reveal their scores but to use them as a guide to understanding and further reading. The formal feedback system was often used to direct students to particular reading from the central text used on the module.

Following on from the formative use of ABC in the classroom, the tests were made available for students to access outside the seminar setting. Students were asked to retake the tests and re-assess their performance. In this way they were encouraged to map progress in their understanding of module material and to develop a continuous cycle of self-assessment and evaluation by way of encouraging self-regulation. Prior to the end of module summative assessment, students were also given a mock exam. This allowed them to experience using ABC under the time conditions of summative examination.

Following completion of the module, a high-stakes summative assessment (consisting of 40 MCQs & 10 slotted questions) was delivered to 87 students over six computer labs on two floors of the main building of UWS's Hamilton campus. A member of staff was assigned to invigilate each computer lab. This invigilation took the standard form but each invigilator also had access to the invigilation screen for that room. The ABC invigilation screen highlights and records any system issues and any online deviation from appropriate behavior. A representative from Assessment21 also invigilated the examination centrally. In this case the central invigilation took place on site but it could equally have been carried out remotely. The invigilation tool allowed for online synchronous communication between the central invigilator and each member of the invigilation team.

Following the examination, the completed assessments were downloaded to the marking tool, which automatically marked the assessment (Fig. 3). Marks were then exported to a spreadsheet and entered into the UWS student information system.

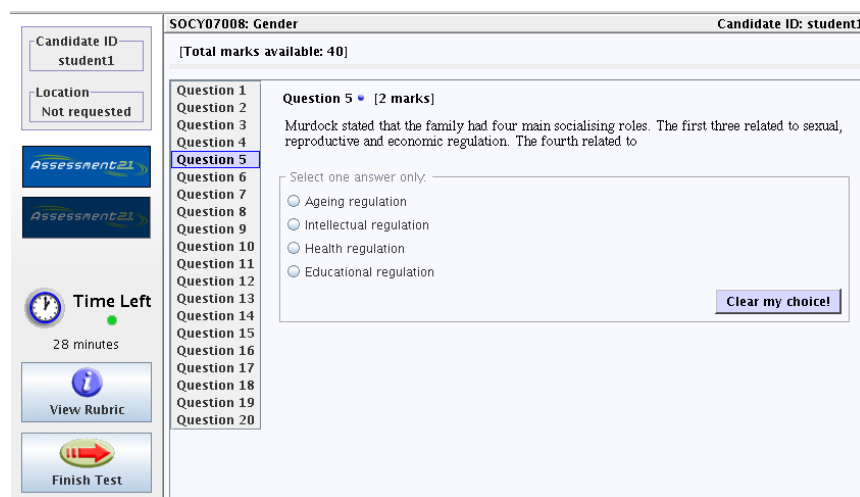


Fig 1. Student view of a MCQ in ABC

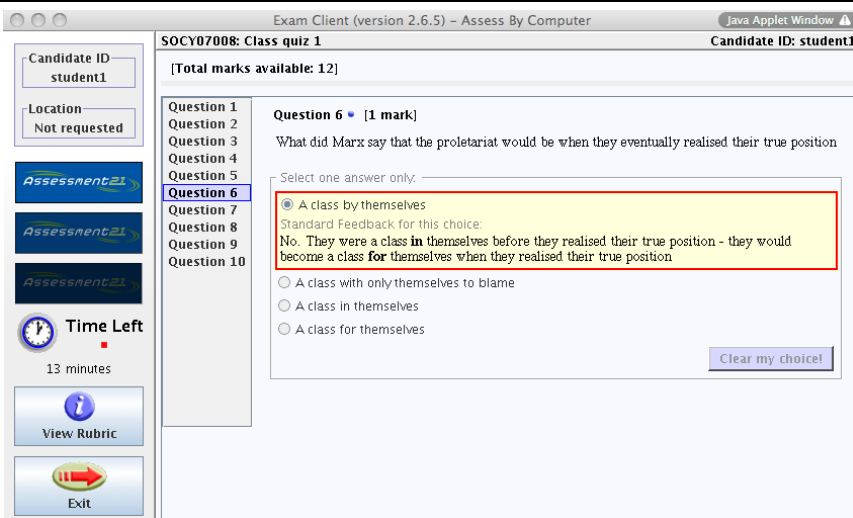


Fig 2. Student view of feedback on a MCQ in ABC

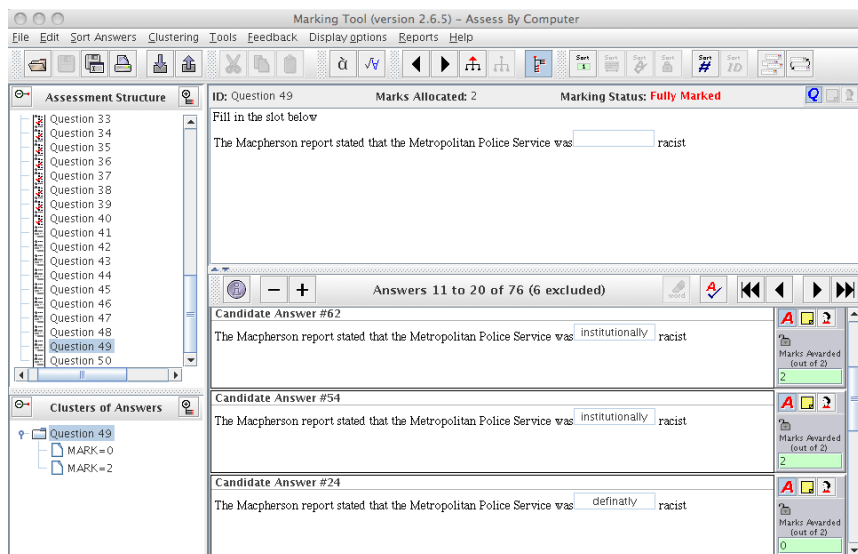


Fig 3. The ABC marking tool

## The Outcomes

### Formative assessment, feedback and self-regulation using ABC

Introducing the Re-Engineering Assessment in Higher Education (REAP) website is a quote from Prof David Nicol, which states, “Assessment and feedback practices should be designed to enable students to become self-regulated learners, able to monitor and evaluate the quality and impact of their own work and that of others” (REAP 2011). Taking this view as a point of departure, the potential of the ABC system to enhance the student experience of feedback and to empower students to become self-regulated learners can be considered by mapping the feedback matrix produced through the use of ABC on the Introduction to Sociology module against the seven principles of good feedback outlined by Nicol & McFarlane-Dick (2006) as part of the REAP project.

1. Through the on-going use of the ABC system to deliver formative assessment in seminar classes and beyond, students were able to develop a clear understanding of the criteria, goals and standards required in the assessment of their understanding of module material and the assessment process.

2. As a result of the feedback provided within the system, but also in part due to the informal economy of feedback produced by students discussing questions and answers with peers, ABC encouraged and helped develop strategies for self-assessment.
3. Through the automated delivery of feedback, and the potential to retake the assessment, students were empowered to self-correct any misunderstanding.
4. Through the synchronous discussion of results of assessments in the classroom, the seminar tutor was able to focus feedback dialogue in the areas where student understanding was limited, opening up the space for both tutor-student and student-student dialogue.
5. Through the reaffirmation of understanding and progress, identifiable in increased performance, ABC fostered positive self-esteem and stimulated motivation through the rewards of engagement and the identification of progress.
6. This potential was extended by the possibility for students to retake assessments at their convenience and to act on the feedback received. This encouraged continual engagement with feedback with the reward lying in improvement of performance.
7. And, significantly, the feedback matrix produced by the use of ABC on the module provided a rich vein of feedback for the teaching staff responsible for constructing assessments and formal feedback. Through its use in the classroom, and through the monitoring of student performance, ABC provides teaching staff with tools that can actively be mobilised to close the gap between staff and student understanding of student comprehension of module material, feedback and assessment. This goes a long way to making the pedagogical underpinnings of the assessment process visible and accessible to students and motivates staff in their own self-regulation when constructing assessments and assessment feedback.

Through the use of ABC, students were encouraged to self-regulate their engagement with the module through continuous interaction with assessment and feedback. They regarded the introduction of ABC as in keeping with contemporary use of electronic technologies. This is reflected in feedback provided by students:

*"I liked how the ABC system gave me feedback when using practice questions during seminar classes"*

*"It was easy to use and a more modern way of examining"*

While a number of the outcomes above could have been achieved by other means, what is important is that ABC can be used to develop the potential of feedback along each of the principles outlined by Nicol & McFarlane-Dick (2006).

#### *ABC and the summative assessment*

With the success of the use of ABC as a tool for the delivery of formative assessment, any initial concerns about employing the system in the summative exam were dissipated. However, there were some additional steps that had to be addressed prior to delivery of the exam. Firstly, the UWS examinations office stated that the invigilators they employed had no experience of online examination and could not provide invigilation. As a result, members of staff had to be recruited to invigilate. Seven members of staff with an interest in the use of electronic technologies in teaching and learning volunteered to assist. With the growing potential for the electronic delivery of high-stakes assessment, the related invigilation requirements are something that must be considered and addressed at an institutional level with some haste. On the day, the invigilators were all provided with a brief discussion of the process prior to the exam and reassured that the module coordinator would provide assistance if any issues arose. Secondly, in order to ensure that there would be no unannounced updates or any system downtime during the examination, the CAPD representative on the pilot contacted the UWS Information, Communications and Technology (ICT) department in advance and advised them of the timing and location of the exam. The ICT department noted this and made sure

that the university network was operating as it should throughout the exam, and that there was no disruption to connection to the Internet. Thirdly, in order to ensure that there were no problems with individual computers, students were asked to turn up 30 minutes prior to the exam start time in order to login to the ABC system (the system allows for login but blocks starting the exam until the appropriate time, when the invigilator can release the exam questions – in each room or centrally). A spare computer lab had also been booked to allow for any lab specific problems. In this time, a few students found that their computers did not have access to the Internet. These students were relocated to another lab and all were in place and logged into the ABC system well in advance of the start time.

The exam delivery went smoothly with no issues arising. Following completion of the exam by the last student, the papers were available for the marker to download and mark. The multiple-choice questions were marked automatically and the marks totaled automatically. The slotted questions were also marked automatically. However, before totaling the final marks for these questions, the marker checked all 'wrong' answers too see if there were any that would be acceptable. One of the advantages of the ABC system is that the marker is able to cluster answers and when a wrong answer is deemed as in fact correct or partially correct (possibly a spelling mistake or an answer very close to the desired response), the marker can award a full or partial mark and all similar answers will be automatically marked accordingly. Within two hours of the end of the exam, all submissions had been marked and moderated and the marks entered in the UWS student information system. The efficiency, security and reliability of marking were major positives in the use of the ABC system: both for teaching staff and for students.

Having used the ABC system in seminar classes and outside of the university, students were comfortable using the system in the final examination and no issues other than the initial login problem experienced by a few students were mentioned in student feedback. Indeed, feedback was positive with all students who provided feedback agreeing that use of the system in class made them comfortable using it during the exam. The general consensus (from over 90% of the 36 students who provided detailed feedback) was that the system was navigable and that students had confidence in the security of the system, the accuracy of marking, the automatic backing up of answers (answers are automatically backed up every 3 minutes) and the electronic invigilation process (detailed explanation and demonstration of the electronic invigilation system had been provided to students to allay any fears that it constituted a threat to them). Students also felt their experience of using the ABC system in class and at home meant that the exam held no worries beyond those usually associated with summative assessment.

## Lessons Learnt

The formative use of Assess By Computer allows and encourages those using it to improve the quality and potential of feedback, and to encourage and develop student engagement with the feedback process. While it is not the only online technology to do this, the scope of its potential to influence the student learning experience is impressive. Furthermore, the student experience of the system was extremely positive with the majority of students expressing a desire to use the system in future examinations: not only in multiple choice style examinations but also written examinations. Student comments included the following:

“sitting at a computer to carry out an exam did not feel quite as daunting”

“Everything was clearly laid out, made it easier to make decisions, overall really liked using it”

“[ABC is] very well made and easy to use, much more comfortable for young people to use (in my opinion) as we would rather be on a pc than writing it out”

“It had a very "easy-to-use" interface which allowed for everyone, computer literate or not, to complete the exam easily and efficiently.”

“its idiot proof! easy and straightforward way to take an exam”

“I liked how simple and easy the system was to use. I would definitely recommend this site for future use in sitting exams.”

For staff, while there is an initial set up cost in terms of time required to learn the system and to set formative and summative assessments, there are tangible rewards in terms of the feedback matrix that can be produced and the time saved in marking summative assessments. It should be pointed out that while ABC does not automatically mark essay style answers, it provides a number of tools that can be used to assist the marker, such as answer clustering and answer ordering, which can cut the time in marking considerably. These tools also provide the potential to improve consistency of marking. As Assessment21 state, “the machine does the time-consuming routine tasks while the human assessor makes the all important value judgments, staying fully in control of the eventual outcome” (Assessment21, 2011)

However, perhaps the greatest value in using ABC, is the feedback it provides for teaching staff. It is a powerful tool with which teaching staff can actively close the gap between their expectations of students in relation to learning and assessment and students’ understanding of these expectations. The data produced by ABC exists as a window for teaching staff onto the world of both student and staff misunderstandings and misconceptions. It produces an accessible and easily organised database from which teaching staff can learn. It enhances the potential of feedback to stimulate self-regulation not only in students but also in teaching staff.

## Useful Links

- Assessment21. ‘E-Assessment for the 21<sup>st</sup> Century’. Website. Available at: <http://www.assessment21.com/index.html> [Accessed 20 Apr 2011].
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