Human Computer Collaborative Assessment – Access by Computer (ABC) – University of Manchester

Human Computer Collaborative Assessment – Access by Computer (ABC) – University of Manchester

Contact details

Mary McGee Wood mmw@assessment21.com
Assessment21
Cooper Buildings
Arundel Street
Sheffield, S1 2NS
www.assessment21.com

Brief details

This is a delivery and marking system that does not seek to replace human markers but to make their job easier, partly by ordering the student responses to make marking more efficient but also by automating many of the routine tasks. It deals effectively with common question types found on paper, including multiple choice, short answer and essay questions and simple diagrams. The strength of the system is its robustness, its simplicity and its familiarity to academic end users.

Background

The system used by several departments in Manchester is Assess by Computer (ABC), originally developed by the Computer Science department for their own use but rolled out to other faculties. Its development was facilitated through a number of small grants (typically 20-30k) which paid for programming and clerical help. Structural changes at the university precipitated a loss of this funding and the decision was made to go commercial and a venture capital grant was won.

The guiding philosophy has been to interfere with existing assessment processes as little as possible and to leave decision making in the hands of human markers. This has the benefit that test construction is straightforward and while the generation of mark schemes demands no more than that with paper-based systems, the system delivers substantial savings in marking workload.

Computer science

Contact details

John Sargeant john.sargeant@manchester.ac.uk

What was the problem

Tests which were used formatively and summatively were given to large (up to 200) groups of students and involved a considerable marking load. The variety of question types demanded responses of freely entered text of varying lengths, selected choice, diagrams and mathematical and logical symbols eg Universal Model Language (UML). Assess by Computer (ABC) was developed, taking the tests on computer, offering the facility to enter text, diagrams, mathematical symbols (eg algebra, logic, set theory). It proved successful and was offered to other departments in the University

Life sciences

Contact details

Elizabeth Sheader elizabeth.a.sheader@manchester.ac.uk
Ruth Grady ruth.grady@manchester.ac.uk

What was the problem?

Manchester has 500 students of Life Sciences annually. Part of the end of first year assessment were papers of short answer questions based on the outcomes of ongoing practical work which students answered in free text. These were marked by laboratory demonstrators, typically, PhD students. This was very time consuming and there were concerns over inter-rater reliability. The paper-based tests were completed by students over an 8 week period and students were warned not to collaborate. It was believed that students generally performed honourably but there was no easy means of checking for plagiarism.

How does the solution work?

A pilot computerisation involving half the cohort was carried out in 2004. The paper was computerised and students took it on standard browsers, in their rooms, or in college (it was, after all, an open book exam). Students were generally neutral or in favour with regard to taking the test online. By using a variety of computer-supported methods, marking load was substantially reduced (by a factor of two to three times) due to the perfect legibility of the scripts, grouping of similar answers, the speed of on-screen marking and the automatic totalling of marks . A small number of items needed revising – eg ‘sketch a graph’ became ‘comment on the graph’ or ‘select the correct graph’ but, if anything, questions were improved by going though the necessary process of revision. Questions continued to be a mixture of multiple choice, short text and longer text (there was no attempt to build in computer question types such as drag and drop). The tests were summative in that they were a check on first year performance though the results did not count towards the final degree.

Question papers were written in Word (this facilitated circulation amongst staff members for discussion and approval) before being cut and pasted into the authoring tool.

Marking

Training of markers was completed in a single one hour session. The markers can see the mark scheme on-screen and series of responses which are all anonymised, question by question. (This means that individual questions could easily be grouped to be marked by specific markers). Responses to each question can be ordered in a number ways eg by length of response or by similarity to facilitate and speed up marking. Key words from the mark scheme or elsewhere can be highlighted in responses. Furthermore, similarities between responses can be detected in order to check for plagiarism.

Pharmacy and pharmaceutical sciences

Contact details

Jason Hall jason.hall@manchester.ac.uk

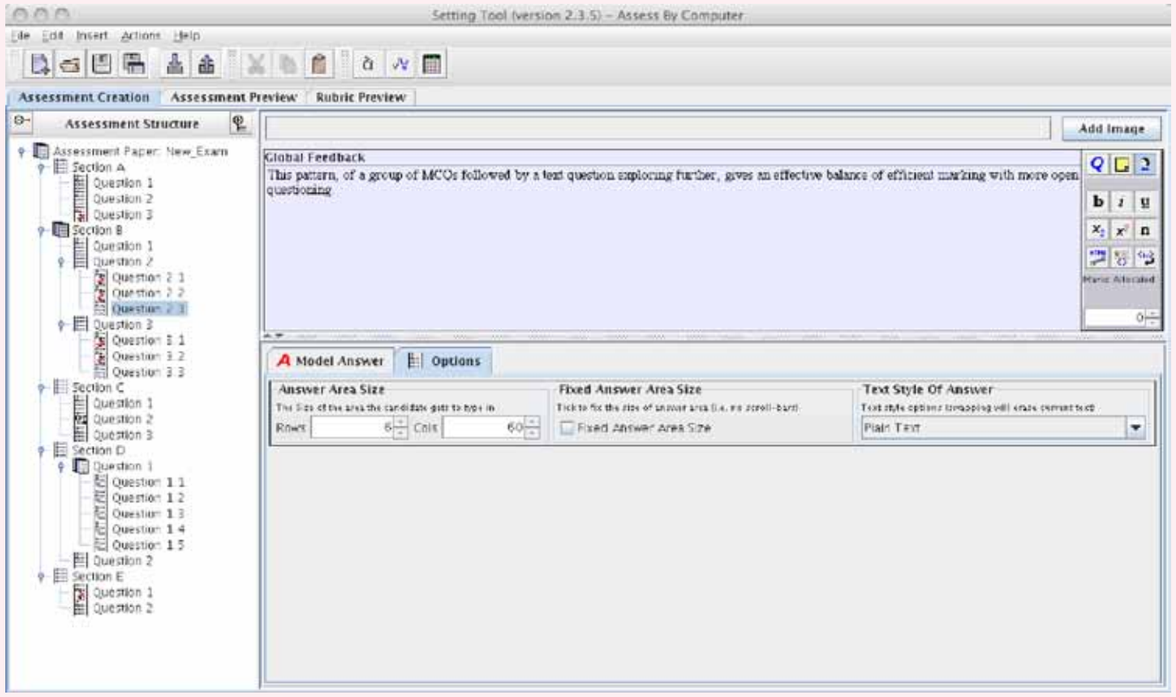
Social pharmacy is assessed through a mixture of short answer and essays. The essays were marked primarily for content but there was also a substantial mark for communication skills. The transition to computer based marking was easily achieved and was very successful in dealing with the short answer responses. A number of tools to facilitate essay marking were introduced – key words from the mark scheme or elsewhere can be automatically highlighted in responses and marks and comments can be tagged into the response text.

Benefits

Tests are generally produced in Word and then cut and pasted into the setting tool which converts it into an xml structure. There is considerable control over appearance, font, etc.
The primary benefit is that the system does not require a great deal of configuration; marking is still performed by humans so no training of the software is necessary (though selected response questions can be marked automatically). Technically, the system is robust and is easily migrated and scaled.

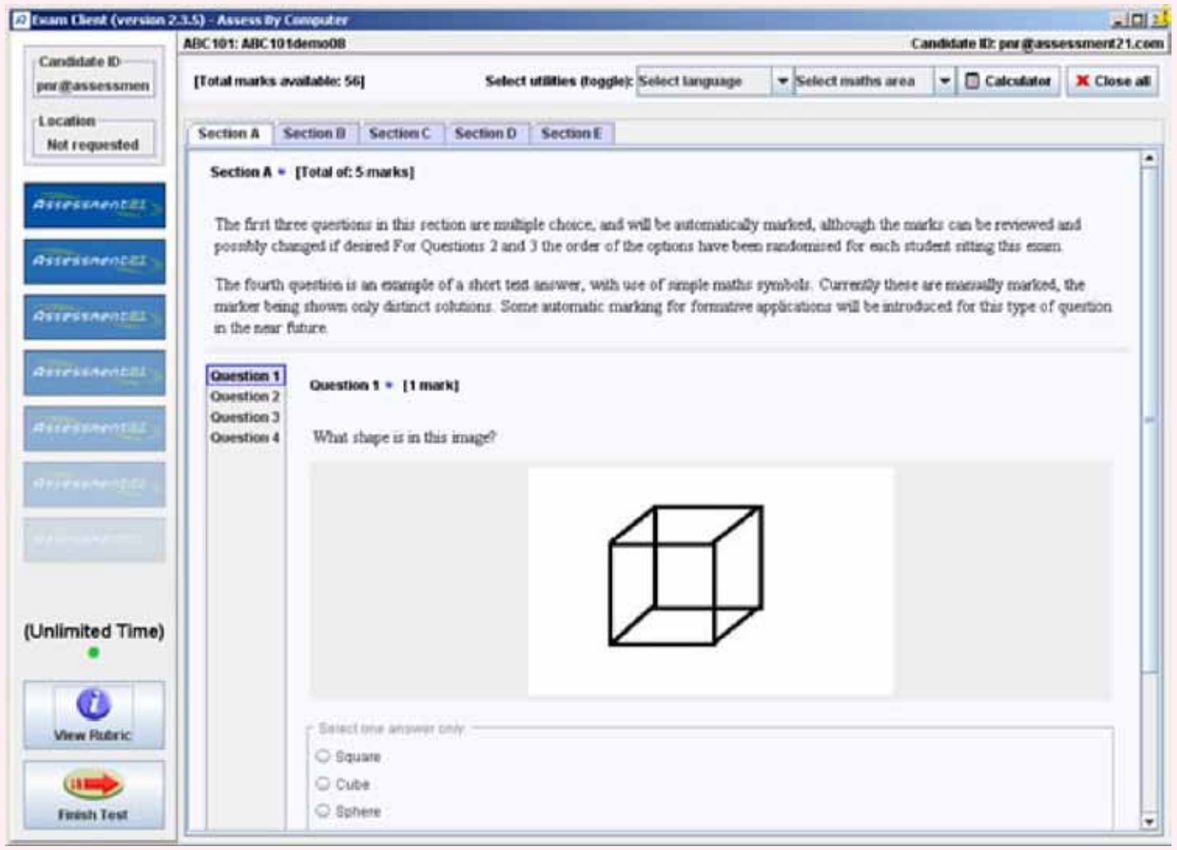
How it works

Item Authoring



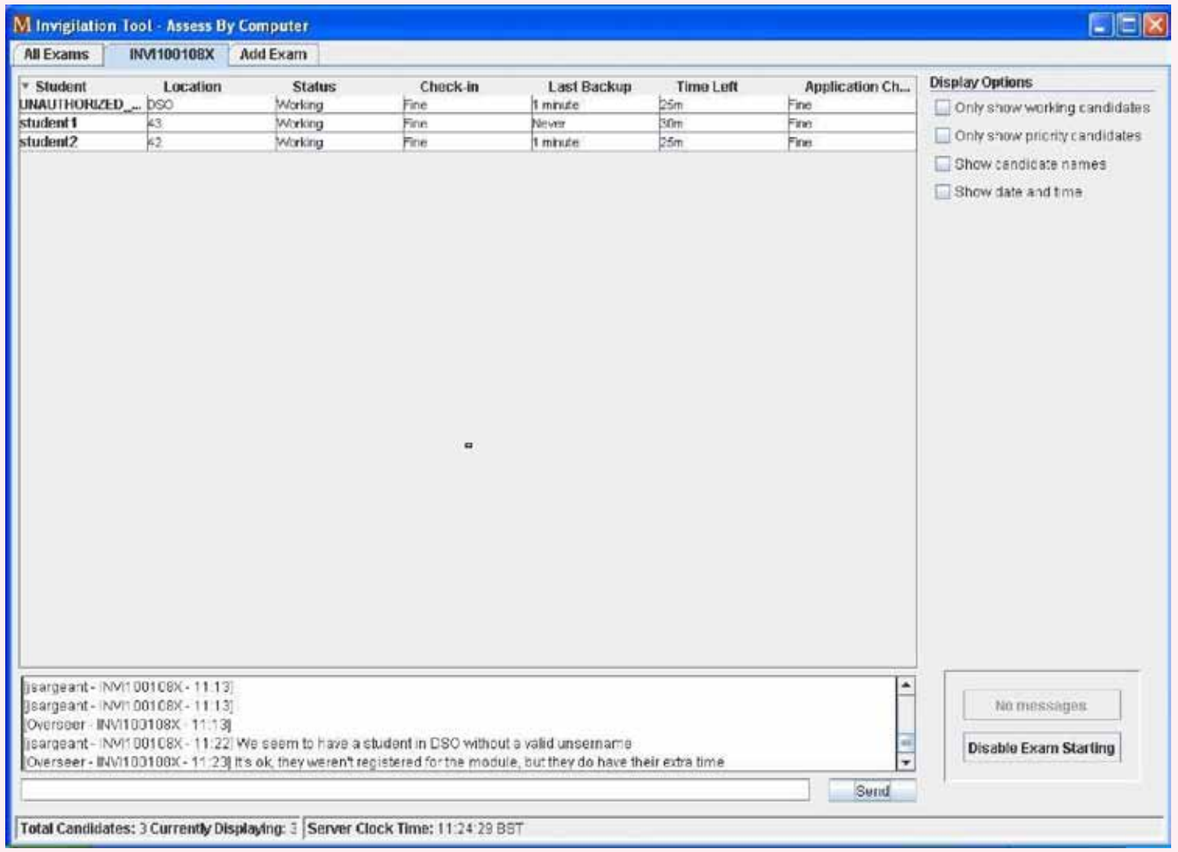
Items are entered and formatted, diagrams imported, size of text entry box constrained, model answers attached,

Delivery



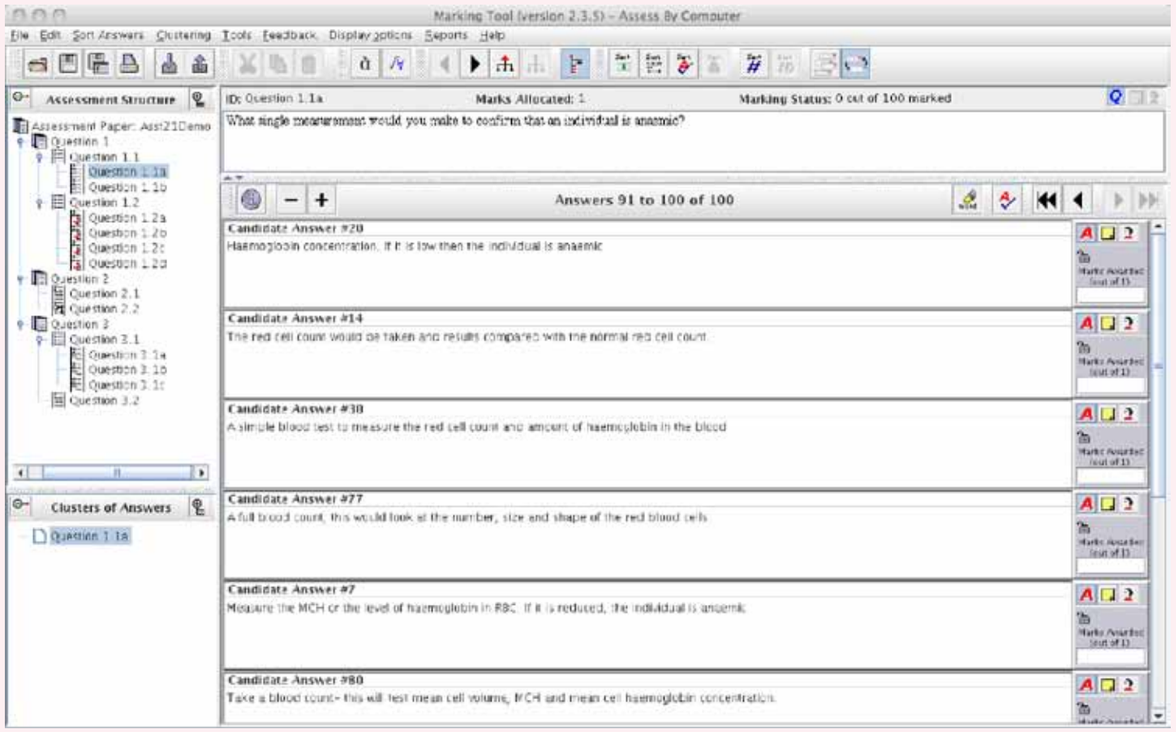
Candidates take test through the standard browser, generally a mixture of multiple choice, short answer, long answer.

Invigilation

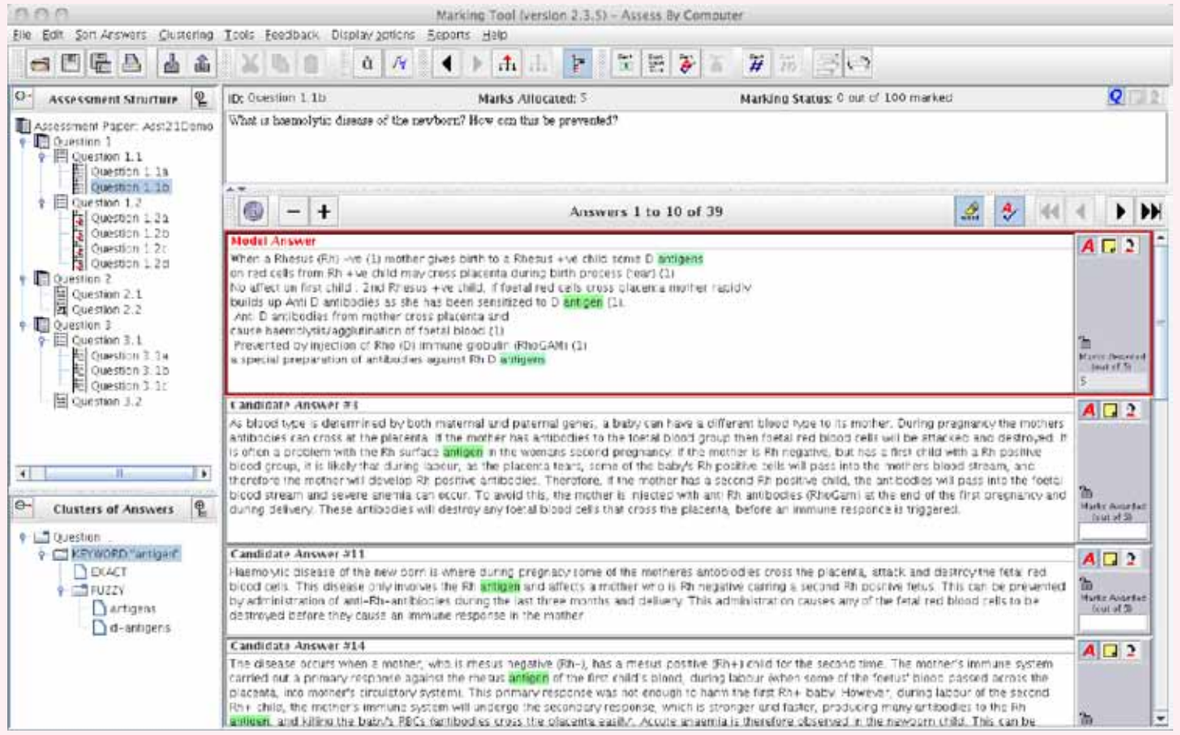


The invigilator can review candidates' progress on the test in real time, including checking whether s/he is visiting an outside site.

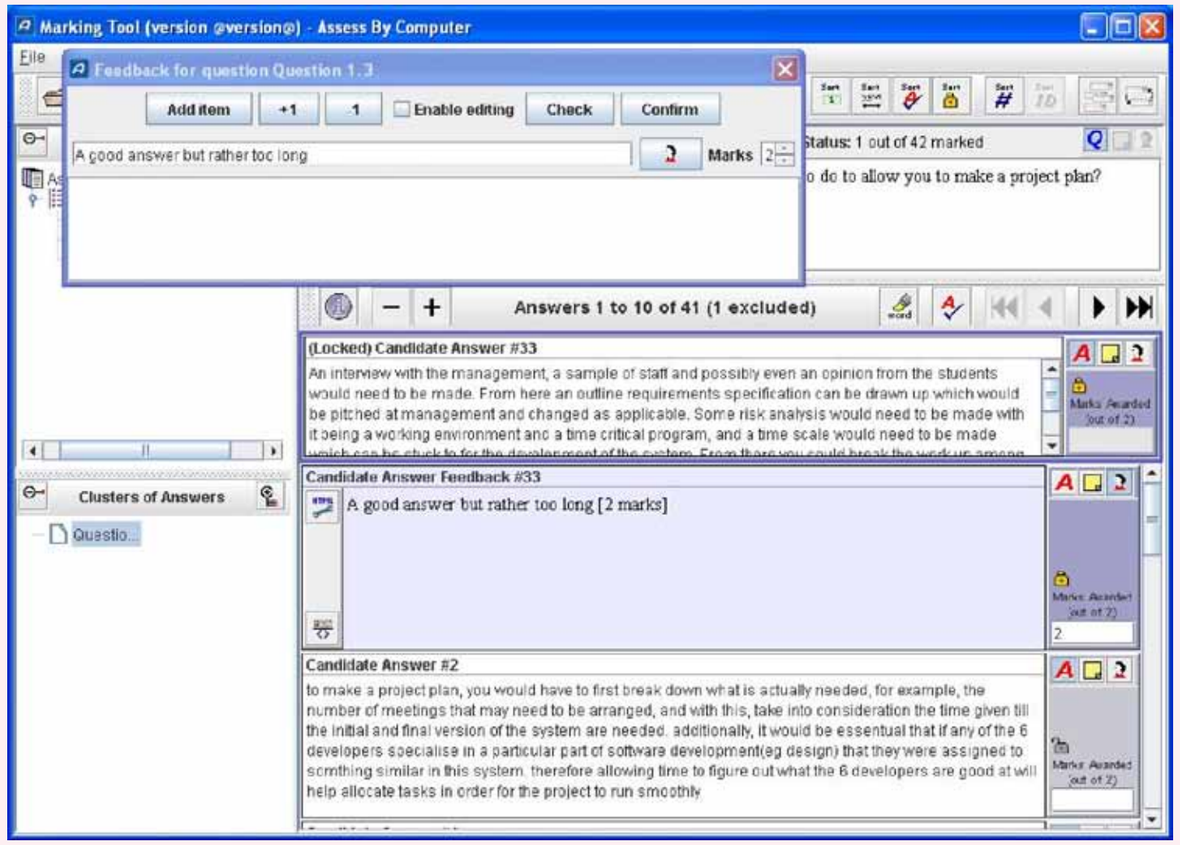
Marking



Responses are grouped on the screen, by candidate number, by length or by similarity according to the personal preferences of the markers and marked on-screen. In addition, keywords (generally from the model answer) can be highlighted. This is helpful on longer questions.



Work can be annotated and comments added.



Manchester runs Blackboard (WebCT) as its VLE. Originally ABC operated as a standalone under the control of Computer Science but it has now been successfully migrated to central computer services. It is planned to link the systems so that students access ABC though the VLE.

Benefits

The actual process of forcing students to enter text on screen increases marking efficiency and marking accuracy. Tests at Manchester have demonstrated that students generally type faster than they write and the output is ‘remorselessly legible’ avoiding the necessity of making best guesses as to what the student meant. Comparative tests at Manchester have shown that students tend to type longer answers than they write (sometimes necessitating the restricting of answer space in the computer-based tests). Typing is particularly beneficial to students who do not have English as a first language and whose first written language is not romanised (eg Japanese, Arabic). These students frequently find handwriting difficult but have considerable text entry ability (from working on the internet). Where students’ responses are similar they can be marked virtually simultaneously saving time and raising consistency.

The system appears practical, extremely robust and usable. It is particularly efficient in dealing with short text and its essay marking tools are being further developed.

links

www.assessment21.com/resources.html

Human Computer Collaborative Asessment – Access by Computer (ABC) – Manchester University