Biotechnology on-screen pilot

Introduction

In May 2006, 63 volunteer candidates at seven schools and FE colleges sat the objective sections of the Biotechnology Intermediate 2 and Higher external assessments on-screen.

This was the first use of such technology in a formal external examination in Scotland, and was a milestone in modernising Scotland's examination system. The success of this trial has paved the way for on-screen assessments in other subject areas and at other levels in the 2007 examination diet.

This case study will give you an insight into the experiences of those who participated in the pilot, and into the issues raised and how these were addressed.

Background to the pilot

In the weeks before the examination, SQA and the commercial company providing the software that delivers the assessments worked closely with all staff and candidates in the seven pilot centres. The centre staff involved included Biotechnology teachers, SQA Co-ordinators, Chief Invigilators, and information systems staff.

Two versions of the e-assessment were tested — an online version and a LAN (local area network) version. In the online version, the assessment was delivered directly in real time to candidates' PCs using a secure internet connection. With the LAN version, the candidate information and the assessments were securely delivered by SQA to local authority servers before the date of the assessment. On the day of the exam, candidates accessed the assessments from these servers. All centres that used the on-screen assessments with their candidates on the day of the actual examination used the LAN system.

Throughout the preparation period, staff and candidates familiarised themselves with the assessment system (using the 2005 exam questions). This gave candidates the opportunity to do some extra Biotechnology revision while getting to know the system being used.

This project was highly successful — partly because of the level of commitment given to the project by all who were involved in it.

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Comments from the Qualifications Manager and the Principal Assessors

The objective questions in section A of the on-screen version of the 2006 Intermediate 2 and Higher Biotechnology assessments were identical in all respects to the paper versions. This was an important consideration since candidates sitting the on-screen version had to sit an assessment of identical demand to those candidates sitting the paper version.

One limitation of this is that not all paper-based objective questions lend themselves to the on-screen format — some graph-based questions in particular. Candidates who were using the on-screen version also had the paper version and were able to refer to it if they needed when interpreting the graphs.

On the positive side, the Qualifications Manager and the Principal Assessors thought that the on-screen questions were very clear and the layout was less distracting than the paper version. Each question in the on-screen version was viewed individually whereas, in the paper version, there are at least seven questions in each double page spread.
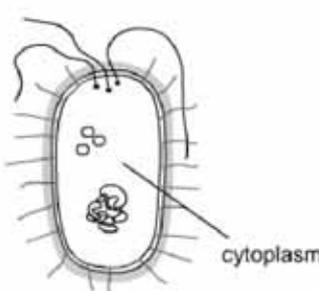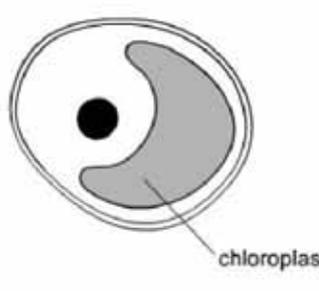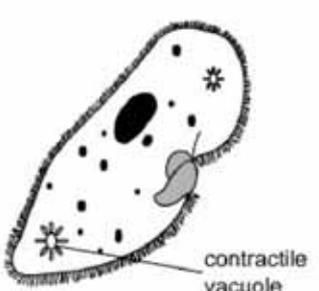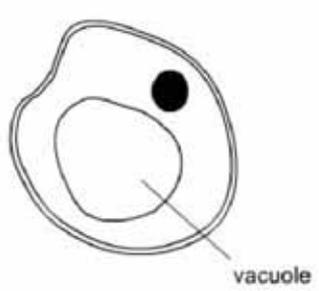

The on-screen facility allowing candidates to mark questions for review was good. This helped candidates remember those questions that they were unsure about and which they wanted to go back to before submitting their answers. The marks grid present on-screen showed candidates the questions they had answered.

Finally, candidates could not submit the test until they were absolutely sure that they wished to do so. There were several prompts before the test could be submitted, which ensured they could not submit in error.

The experience of one centre

All the staff and candidates in the centres involved in the project were asked about their experiences. The following comments from the staff and candidates in one centre are typical of those received.

It is in the nature of a pilot project that all the participants bring a different perspective to the project and that issues come to light during the pilot. These factors are reflected in the comments made about the trials beforehand and about the experiences on the day of the assessment. The main aim of this case study is to allow others to share and benefit from the lessons learned by both SQA and the centres involved.

The **Biotechnology teacher** of the class felt that the trials which were conducted beforehand were most useful in that they gave the candidates extra practice in the Biotechnology content. He also made the following observations:

As a teacher I was not heavily involved other than taking the pupils to rooms where there was access to computers in order to practice. Some pupils, knowing that this was imminent, did some extra revision. The exercise was painless on my part, possibly better for some pupils, and will no doubt save marking time in the future as it is rolled out to other subjects.

The **SQA Co-ordinator** was the member of staff who was most involved in the organisation of the project in the centre:

There was a disproportionate amount of administration for such a simple output – 25 multi-choice questions! I shudder to think what might happen for subjects with large presentation numbers.

This observation is valid for the trial run in this pilot project. However, as e-assessment becomes more routine, and staff and candidates become familiar with the systems being used, the administration of e-assessments will be no more onerous than it is at present for paper assessments — indeed, e-assessment should reduce the administration burden. Systems put in place for the 2006 pilot are available for on-line assessments in 2007 and beyond, so the administration required is already reduced.

The Co-ordinator felt that the trials that were conducted beforehand with candidates were useful in:

- allowing staff and candidates to become familiar with the hardware and software
- giving the candidates extra practice in the Biotechnology content
- bringing to light any issues with the e-assessments

The **IT technician** in the centre was crucial to the smooth running of the pilot. He felt well informed about the project and its aims. He also commented on the amount of work involved in the pilot, but looked forward to this reducing in the future:

A lot of time and support for staff and pupils was needed to get this up and going, and to ensure smooth operation on the day of the exam. This would not necessarily need to be the same in future as staff and pupils become more familiar with the concept.

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The **Chief Invigilator** was also involved in the project. She felt well informed about its aims and thought that the communication with SQA was particularly useful. Her concerns, naturally, were about the delivery of the assessments on the day, and about the accommodation and level of supervision necessary to ensure the security of the assessment.

It can be more difficult to be sure candidates can't copy each other's work during e-assessment than if they are doing paper-based exams. Therefore it is necessary to keep candidates further apart. It is possible to install screens between computers, although the rooms would hold fewer candidates using computers than if they were writing the exam, therefore more invigilators may be required. An IT technician is also required because exams done on computer require the help of an IT teacher or technician.

These are all issues that will concern SQA and centres as more and more e-assessments are introduced. Well-prepared centres will start to consider their computing provision before e-assessments become more widely available. The comments above emphasise clearly the importance of a strong relationship between the SQA Co-ordinator, the Invigilator and the IT teacher or technician for the effective delivery of e-assessments.

The Chief Invigilator also observed that one candidate pressed 'submit' before finishing the exam and had to use the paper version as well. (For this trial on-screen assessment, a paper version was also available to the candidates.) This particular candidate submitted on-screen having completed only 18 of the 25 Intermediate 2 questions — 18 being the number of questions that appeared in the left-hand pane of the display without scrolling. In the actual assessment, as in the trial beforehand, candidates were asked to confirm that they were ready to submit their answers. Similar situations have occurred in the past with paper assessments — that is why all paper-based SQA examinations now end with the statement
[END OF QUESTION PAPER]

We have reviewed the procedure to ensure that it is as difficult as reasonably possible for candidates to submit answers before they have completed the assessment. We will ensure that candidates have to confirm at least twice that they wish to exit the test before they are able to do so.

Another observation made by the Chief Invigilator was that the on-screen assessment was well received by all candidates. This included one candidate who had a fear of sitting examinations in the school hall. This girl had no problems with either the trial or the final examination.

The final comments about on-screen assessments must go to the **candidates**. Observations about some of these comments have been added in brackets.

- *I would like to see the overall grid to check the pattern of answers.* (This is because some teachers advise that the proportion of any one answer in a multiple choice assessment should not be too high.)
- *Can all 30 answer boxes be shown on one screen?* (This might be possible without cluttering up the screen.)
- *It's good to be able to tag a question that I want to go back to.*
- *It's not as easy to measure a graph on the screen.* (Paper versions of graphs will be available in situations like this, but in the longer term it will be possible to design questions specifically for delivery on-screen, eliminating issues such as this.)
- *I prefer on computer — the screen layout is clear and there is no delay.*
- *Can I have an on-screen calculator?* (No reason why not if a normal calculator is permitted for the paper assessment.)
- *Go for it!*