

Moderation of e-assessment:

Case studies

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Introduction

E-assessment has been an accepted method of assessment for SQA qualifications for some time. Centres have approached SQA for advice on a number of issues regarding the conduct of e-assessment (in its many different forms). The issues raised were addressed in the publication *E-moderation: Guidelines for FE Staff and External Moderators* (November 2004). This publication forms the output from a project into e-moderation.

As a consequence of the e-moderation project it was decided to investigate actual occurrences of e-assessment and the corresponding issues for the moderation process. The investigations took the form of a series of case studies involving centres which had implemented e-assessment procedures and were conducted by existing experienced External Moderators. The case studies focus in on practical experiences in the centres identified in the research project. The studies have been collected from four further education colleges who have agreed to have their experiences in e-assessment matters published for others to draw on.

SQA wishes to thank the staff in Elmwood, Langside, Falkirk College of Further and Higher Education, and Glenrothes Colleges for their support and co-operation in the project.

The data obtained from each case study is presented as collected. There then follows a conclusion based on the discussions and findings obtained at the centres. The case studies are presented in a series of tables. The second column of each table identifies the criteria being explored and the right-hand column shows the result or responses to the questions based on the criteria.

The tables are followed up by an evaluative commentary based on External Moderators' conclusions from moderating assessments that had already taken place, and from questioning centre staff and candidates on their experiences of undertaking e-assessment.

There are four case studies in total. Three are based on Higher National and National Units covering Computing, Sports Coaching, and Economics. The fourth case study is based on Scottish Vocational Qualifications (SVQs) in the Care sector. The case studies were carried out at:

- 1 Elmwood College
- 2 Adam Smith College (formerly Glenrothes College)
- 3 Forth Valley College (formerly Falkirk College of Further and Higher Education)
- 4 Langside College

The project did not investigate the construction of e-assessment instruments or the conversion processes necessary for the transfer of conventional paper-based assessment instruments to electronic form.

Software

The software packages mentioned in these case studies are chosen by the individual colleges and are not exclusively recommended or endorsed by SQA. Institutions can use any suitable software for e-assessment.

This publication should be read in conjunction with *E-moderation: Guidelines for FE Staff and External Moderators* (November 2004).

Case study 1: Elmwood College

The Elmwood College case study is based on one model of e-assessment covering Higher National and National Units in Computing.

e-assessment details					
1	Specify the qualification type	NQ and HN			
2	Specify the SQA Unit number	DF36 10, D75Y 34 and D77A 34			
3	SQA Unit name	Information and the Internet (Int1), Information Systems and Services, and Computer Operating Systems			
4	Outcome being e-assessed	Outcome 1 for all Units			
5	If e-assessment does not cover a complete Outcome, please state part to which it relates	Not applicable.			
6	This assessment was:	Formative	<input type="checkbox"/>	Summative	X <input type="checkbox"/>
7	What is the assessment format that was used	Multiple choice questions	<input checked="" type="checkbox"/>	Multiple response questions	<input checked="" type="checkbox"/>
		Report	<input type="checkbox"/>	Project	<input type="checkbox"/>
		Other — please specify	<input type="checkbox"/>	Mixed MC and MR	<input type="checkbox"/>
8	How many candidates were involved?	16			
9	What conditions applied to the conduct of this assessment?	Closed-book	<input checked="" type="checkbox"/>	Supervised conditions	<input checked="" type="checkbox"/>
		Other — please specify	<input type="checkbox"/>		
10	Does the centre have evidence to confirm that assessment conditions were met? Please provide details.	YES	<input checked="" type="checkbox"/>	NO	<input type="checkbox"/>
		Details of evidence: Virtual Learning Environment (VLE) Normal assessment conditions in line with SQA specifications			
11	Where is this evidence held?	VLE — start and end times are computer recorded			
12	Was the assessment subject to a time limit?	YES	<input checked="" type="checkbox"/>	NO	<input type="checkbox"/>
13	If YES what was the time limit applied?	As per descriptor			
14	Where is the evidence of application of timing conditions kept?	The VLE has restricted access, which is password protected. Start and end times are computer recorded.			
15	How many candidates passed/achieved the assessment?	All (16 in total)			

e-assessment details continued		
16	Did you use a 'control' group (ie other candidates, or the same group of candidates) undertaking the same/similar assessment by traditional means?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> Results checked against previous groups who had used 'traditional' paper-based method
17	If a control group was used please specify the numbers involved	No in control group Not applicable
		No passing/achieving Not applicable
18	How did the candidates submit their responses to the assessment?	Keyed directly into VLE <input checked="" type="checkbox"/> e-mailed to tutor/assessor <input type="checkbox"/> Other — please specify <input type="checkbox"/>
19	What candidate authentication measures were in place for this assessment?	Candidates were known by the invigilator, and centre staff observed normal control conditions. Students had an individual login to the network then another login for the VLE
20	If the candidates were not directly supervised during the assessment, what evidence is there to support the work submitted was that of the individual participant candidates?	Not applicable
21	How was the assessment marked?	By computer <input checked="" type="checkbox"/> Manually <input type="checkbox"/> Both <input type="checkbox"/> Double marked <input type="checkbox"/> Other — please specify <input type="checkbox"/>
22	If evidence is electronic, does the centre have a central storage policy for evidence retention?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> Same as for paper-based assessment
23	What is this policy?	Retain assessment evidence for 3 weeks after unit completion date or longer if External Moderator has planned a visit (<i>same as paper-based</i>)
24	Did anything unexpected happen during the conduct of the assessment?	No <input checked="" type="checkbox"/> Equipment failure <input type="checkbox"/> Power cut <input type="checkbox"/> Fire alarm <input type="checkbox"/> Other — please specify <input type="checkbox"/>
25	What steps were in place to attend to or overcome technical problems?	Technician was on-hand to help with login or technical problems Teaching staff have authority to amend exam settings (eg if additional time is needed) A paper-based 'backup' is being considered for the future

Internal/external moderation		
26	Has this e-assessment instrument been internally moderated?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
27	Was this e-assessment internally moderated using the normal centre procedures?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
28	What specific issues did the IM process raise in relation to the instrument of assessment?	It was noted that this method was better than the paper-based method
29	How will Internal/External Moderators be able to access the candidate evidence?	Electronically <input checked="" type="checkbox"/> Paper (printouts) <input checked="" type="checkbox"/> Other — please specify <input type="checkbox"/>
30	How will the evidence relating to the assessment conduct and corresponding results be made available?	Electronically <input type="checkbox"/> Paper <input checked="" type="checkbox"/> Other — please specify <input type="checkbox"/> Results manually recorded in the register
31	Does your centre have a policy covering the retention of e-assessment evidence?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
32	If YES, what is this policy?	It follows SQA policy guidelines
33	Were candidates asked for feedback on their e-assessment experience?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> Online — immediately after assessment
34	Please summarise the candidates' response(s)	Majority liked the online assessment Overall feeling was 'good' Most students asked for more online assessments
35	Did any candidate express a view that indicates they felt disadvantaged by this method of assessment?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
36	Specific candidate comments?	Well laid out, easy to follow Good to get instant results All assessments should be done this way
37	Does the centre feel that candidates were disadvantaged by this method of assessment?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> If YES, in what way?
Centre infrastructure used		
38	What specific hardware was used for this e-assessment?	Standard PC + network connection with access to the college VLE
39	What specific software was used for this e-assessment?	VLE — WebCT (software application package)
40	Where did this e-assessment take place?	IT centre — using test centre booths
41	Were any special requirements necessary for this e-assessment?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>

Centre infrastructure used continued		
42	What were these requirements?	Technician on hand (or on call) to deal with login and technical problems
43	What supervision regime was in place?	Standard regime used for paper-based assessments
44	How are candidates provided with their results?	Instant feedback — at end of assessment Result and printout
45	If candidate feedback is immediate, are candidates advised that these results are provisional until moderation has taken place?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> Same as normal paper-based assessments Printed in student handbook
General comments from centre on the conduct of the assessment		
<p>‘The conduct of e-assessment is the same as the conduct for paper-based assessment.’</p> <p>‘Online assessment is at an early stage, only a small number of staff are using this method.’</p> <p>‘Staff like it and student feedback is very positive.’</p> <p>‘Staff time is released to allow for teaching (instead of marking) and allows staff to cover the Unit in more detail and prepare students better for assessment.’</p> <p>‘The centre is planning to develop the test centre so that it can be used by more students in the future.’</p>		

Conclusions from this case study

Good practice

The centre gave very clear instructions to candidates for all assessments.

Very useful e-assessment reports were automatically produced following assessment, giving a breakdown of candidate performance.

Candidates are routinely asked to complete an online evaluation of their assessment — at the end of their online assessment.

Evaluation of the effectiveness of online assessment

The Units that were e-assessed during this case study:

DF36 10 Information and the Internet (Intermediate 1)
D75Y 34 Information Systems and Services
D77A 34 Computer Operating Systems

Candidates had completed formative assessments online, so that they were familiar with online assessments prior to being presented with online summative assessments.

Instruments of Assessment: All assessments met the requirements detailed in the Unit specifications.

Evidence: Material was available from all three Units. Outcome 1 of each of the Units is assessed by multiple choice questions. They are available as paper-based assessments and online (e-assessments). The same assessments were being used for both methods and had been internally moderated prior to use.

D75Y 34 Information Systems and Services: This assessment was well presented and easy to follow with clear marking scheme. The assessment exemplar pack (AEP) and teaching pack were available. Candidates were given clear instructions for all assessments.

D77A 34 Computer Operating Systems: These were well presented, easy to follow and included AEP and COLEG pack.

DF36 10 Information and the Internet (Int 1): As above and included the National Assessment Bank (NAB) being used along with teaching packs.

Software used

The centre uses a software application package called WebCT for their e-assessments in a dedicated assessment area within the college. Computer desks are separated by screens (into booths).

WebCT produces reports which identify the candidate and give a review of their responses. Summary information is produced for the group showing percentages of correct answers for each question. The reports were all clear and easy to follow.

It was possible to access the system and to review individual candidates' responses. Detailed information was available for each candidate, including the amount of time the candidate had spent on each question.

Candidates' evaluation of online assessment

Candidates had responded very positively to this form of assessment. In fact, some had asked for all assessments to be delivered in this way. Some candidates had remarked that they felt more confident using a computer for the assessment — where they didn't have to write anything down (even their name). They were more relaxed completing an assessment online — since they used computers all the time.

Special assessment arrangements

Software was available to help candidates with dyslexia, so there was no need to have a 'reader' or 'scribe' present for the assessment. The software was able to 'read' the questions and listen to the four alternatives through headsets. This software was made available to any candidates who wanted to use it.

Integrity of assessment

Candidates were 'locked out' of all other areas (eg internet access and help functions) while they were completing their online assessment.

Lecturers' evaluation of online assessment

Lecturers in the college were very keen to use the technology and had embraced the concept of e-assessment.

Case study 2: Adam Smith College

The Adam Smith College (formerly Glenrothes College) case study is based on one model of e-assessment of Higher National and National Units. The e-assessment research is based on qualifications in computing and sports coaching.

e-assessment details					
1	Specify the qualification type	NQ and HN			
2	Specify the SQA Unit number	D684 11, D75V 35 and DF9P 34			
3	SQA Unit name	Human Physiology in the Development of Performance: an Introduction, Network Technology and Data Communication Network Concepts			
4	Outcome being e-assessed	Outcomes 1 and 2			
5	If e-assessment does not cover a complete Outcome, please state part to which it relates	Not applicable.			
6	This assessment was:	Formative	<input type="checkbox"/>	Summative	<input checked="" type="checkbox"/>
7	What is the assessment format that was used?	Multiple choice questions	<input checked="" type="checkbox"/>	Multiple response questions	<input type="checkbox"/>
		Report	<input type="checkbox"/>	Project	<input type="checkbox"/>
		Other — please specify	<input type="checkbox"/>		
		Formative assessments used MC and MRQ			
8	How many candidates were involved?	HN Computing 30–45 NQ Sports Coaching 15			
9	What conditions applied to the conduct of this assessment?	Closed-book	<input checked="" type="checkbox"/>	Supervised conditions	<input checked="" type="checkbox"/>
		Other — please specify	<input type="checkbox"/>	Normal conditions (as paper-based)	
10	Does the centre have evidence to confirm that assessment conditions were met? Please provide details.	YES	<input checked="" type="checkbox"/>	NO	<input type="checkbox"/>
		Details of evidence: System records who and when — time allowed 1 hour (students logged on with specific login and password)			
11	Where is this evidence held?	Perception (software application package)			
12	Was the assessment subject to a time limit?	YES	<input checked="" type="checkbox"/>	NO	<input type="checkbox"/>
13	If YES what was the time limit applied?	60 minutes			

E-assessment details continued			
14	Where is the evidence of application of timing conditions kept?	Perception (software application package)	
15	How many candidates passed/achieved the assessment?	Most	
16	Did you use a 'control' group (ie other candidates, or the same group of candidates) undertaking the same/similar assessment by traditional means?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> Previously used control group when 'testing' other packages (as part of previous studies and projects)	
17	If a control group was used please specify the numbers involved.	No in control group	Not applicable
		No passing/achieving	Not applicable
18	How did the candidates submit their responses to the assessment?	Keyed directly into VLE <input type="checkbox"/> e-mailed to tutor/assessor <input type="checkbox"/> Other — please specify <input checked="" type="checkbox"/> Direct input to the Perception software package	
19	What candidate authentication measures were in place for this assessment?	Each student had a login and password Invigilator knew all students (photo ID could have been requested)	
20	If the candidates were not directly supervised during the assessment, what evidence is there to support the work submitted was that of the individual participant candidates?	Not applicable	
21	How was the assessment marked?	By computer <input checked="" type="checkbox"/> Manually <input type="checkbox"/> Both <input type="checkbox"/> Double marked <input type="checkbox"/> Other — please specify <input type="checkbox"/>	
22	If evidence is electronic does the centre have a central storage policy for evidence retention?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	
23	What is this policy?	Retain assessment evidence for 3 weeks after Unit completion date or longer if External Moderator has planned a visit (<i>same as paper-based</i>)	

e-assessment details continued		
24	Did anything unexpected happen during the conduct of the assessment?	<p>Equipment failure <input checked="" type="checkbox"/></p> <p>Power cut <input type="checkbox"/></p> <p>Fire alarm <input type="checkbox"/></p> <p>Other — please specify <input type="checkbox"/></p> <p>One computer did not allow student to log in.</p> <p>The candidate was given a ‘dummy password’ and completed the assessment online. After the assessment an administrator transferred the test to the candidate’s electronic work location so that it was available for moderation and resulting.</p>
25	What steps were put into place to attend to/overcome technical problems?	<p>Paper-based assessments were available and a technician was on hand.</p> <p>One student opted to complete a paper-based assessment</p> <p>Next session there will be a backup server which will be a ‘mirror image’ to the main perception server. This server will automatically take over if the first one ‘goes down’.</p>
Internal/external moderation/verification		
26	Has this e-assessment instrument been internally moderated?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
27	Was this e-assessment internally moderated using the normal centre procedures?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
28	What specific issues did the IM process raise in relation to the instrument of assessment?	No issues were raised.
29	How will Internal/External Moderators be able to access the candidate evidence?	<p>Electronically <input checked="" type="checkbox"/></p> <p>Paper (summary) <input checked="" type="checkbox"/></p> <p>Other — please specify <input type="checkbox"/></p>
30	How will the evidence relating to the assessment conduct and corresponding results be made available?	<p>Electronically <input checked="" type="checkbox"/></p> <p>Paper <input checked="" type="checkbox"/></p> <p>Other — please specify <input type="checkbox"/></p> <p>Normal invigilation conduct</p> <p>Front screen information</p>
31	Does your centre have a policy covering the retention of e-assessment evidence?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
32	If YES, what is this policy?	<p>Same as paper-based assessments.</p> <p>However, electronic copies are on the server for longer than the required time (no storage problems).</p>

Internal/external moderation/verification continued		
33	Were candidates asked for their feedback on their e-assessment experience?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
34	Please summarise the candidates' response(s)	Very positive response Results were provided when everyone had finished
35	Did any candidate express a view, which indicates they felt disadvantaged by this method of assessment?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
36	Specific candidate comments?	None
37	Does the centre feel that candidates were disadvantaged by this method of assessment?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> If YES, in what way?
Centre infrastructure used		
38	What specific hardware was used for this e-assessment?	Standard networked computers using a dedicated server
39	What specific software was used for this e-assessment?	Perception
40	Where did this e-assessment take place?	Standard networked computer room
41	Were any special requirements necessary for this e-assessment?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> For 2 students
42	What were these requirements?	Students with special needs (eg dyslexia — needed a reader) — same arrangements as per paper-based assessments. These candidates had not used the 'reader software' prior to their assessment.
43	What supervision regime was in place?	Standard invigilation
44	How are candidates provided with their results?	Results were provided when the class group had all completed the assessment
45	If candidate feedback is immediate, are candidates advised that these results are provisional until moderation has taken place?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> Same as paper-based arrangements

General comments from centre on the conduct of the assessment

‘The conduct of assessments is exactly the same as paper-based assessments — “change of medium does not change the conduct.”’

‘Sports Coaching students need some practice using online assessments; this could be done by having more online formative assessments.’

‘Students could be assessed in an assessment centre — where they could “book themselves in” at a time that suits them (onus on students).’

‘Computerised system keeps a record of “number of attempts” thereby making it easier to audit.’

Conclusions from this case study

Good practice

Clear guidelines to candidates.

The Faculty of Computing and IT stores master folders in electronic format, held centrally and available to all staff within the Faculty. This ensures that the master folders are up to date and that everyone uses the correct assessments. A backup copy is available on a CD-ROM.

Evaluation of the effectiveness of online assessment

The Units that were e-assessed during this case study:

- D684 11 Human Physiology in the Development of Performance: An Introduction
- D75V 35 Network Technology and Data Communications
- DF9P 34 Network Concepts

Instruments of Assessment: All assessments met the requirements detailed in the Unit specifications.

Evidence: Material was available from all three Units; some were complete and others partially complete.

D684 11 Human Physiology in the Development of Performance: An Introduction: Outcome 2 assessments are multiple choice. The same questions used in paper-based assessments were used for e-assessment. Part a) bones and part b) muscles — 10 questions for each assessment and candidates need to correctly answer seven from 10 to pass. The assessments had been prior moderated and satisfied the requirements of the Unit.

D75V 35 Network Technology and Data Communications: This Unit uses multiple choice questions for Outcomes 1 and 2 and a report is used to assess Outcome 3.

The multiple choice questions (two banks) had been internally moderated for paper-based assessment, before being used for e-assessment. It was also noted that the Unit had been externally moderated during the previous session.

Once again there were clear instructions to candidates for all the multiple choice assessments. The evidence provided for Outcome 3 (the report) was also complete and satisfied the needs of the descriptor.

DF9P 34 Network Concepts: This Unit uses multiple choice questions for Outcomes 1 and 2 and part of Outcome 3 and 4. Outcomes 3 and 4 also have a practical element where candidates keep a record in a logbook.

The multiple choice questions had been internally moderated for paper-based assessment, before being used for e-assessment.

A good layout was used with clear instructions to candidates for all the multiple choice assessments. The practical elements were also clear and well structured.

Software used

All multiple choice questions were provided through the college network using Perception (produced by Question Mark Computing Ltd). The questions and answers were randomised so that question 1 on one computer would be different from question 1 on another.

Candidates' evaluation of online assessment

Candidates were given their score at the end of the assessment, indicating a pass or fail. Many had commented that this was a very good method of assessment and they were pleased to be given their score at the end.

Special assessment arrangements

Additional software was available for candidates with dyslexia, for example, which enabled them to highlight the question (and their own answers) and have them read to them through headphones. However, nobody has used this facility to date (two candidates had previously used a person (reader) to read the questions for them, and decided to use the same method for these assessments as well — since they had not used the on-screen reader in an assessment situation).

Integrity of assessment

Once the assessment is complete a tutor can request reports, from Perception, to indicate the candidate results and an analysis of each question. These reports can then be used to identify strengths and weaknesses in the candidate's understanding — teaching methods can then be reviewed to improve the candidates' experience.

It is possible for an External Moderator to have access to the software and to look at individual candidate responses. The system seemed quite sophisticated and had great potential for analysis and reports. Dedicated support staff (administrators) were given access to the system to create the assessments and to make changes where required.

Lecturers' evaluation of online assessment

Lecturers in the college were keen to use new technology and embraced the concept of e-assessment.

Additional information

Glenrothes College CAA delivery guidelines: online assessment procedures — guidance for staff

These guidelines are for staff responsible for arranging summative assessment using computer assisted online/screen-based approaches which involve automatic marking. They are not intended to cover the special arrangements which may already be in place for some professional body examinations or the specific requirements of Vendor qualifications, eg CISCO, ECDL, nor the use of e-portfolio systems. These guidelines will therefore apply to most NQ, HN and SVQ qualifications where an objective test is used for summative assessment.

For specific guidelines on the design and use of objective questions in constructing assessments, see the separate guidelines *Design and Use of Perception Question Types*.

- 1 Summative assessment can only be delivered on software systems prior approved by the Quality Manager (or designated persons) as fit for purpose. Currently, the only approved product is:

Perception (Question Mark Computing Ltd.)

Note: The Virtual Campus VLE is currently NOT approved for delivery of summative assessment.

An administrator — the ‘Perception Administrator’, is responsible for scheduling summative assessments and also for subsequent management and reporting of the results to the class tutor or designated person.

- 2 All summative assessment must be time scheduled and time limited, ie the assessment will only be visible to a candidate at a specified time, and for a specified duration. The Perception administrator will allocate a one-hour time-slot by default. If another duration is required, ie as specified in the Unit descriptor, or special arrangements apply, this must be stated, in writing or by e-mail, at the time of requesting the assessment to be scheduled.
- 3 All summative assessments must be prior internally moderated in line with the existing procedures outlined in the appropriate section of the quality manual. For online assessments this should include appropriate entries and minutes for the Unit internal moderation record in whatever form this is currently held. A paper copy of questions (and marking scheme) can optionally be included in the master folder of the Unit to which it applies, or preferably, a reference to the filename and location of the question/assessment bank from which the assessment was generated. The following are additional requirements.
 - a) Someone other than the assessment creator must have ‘pre-tested’ the assessment online to ensure that the marking scheme has been correctly applied, eg correct answers score and incorrect ones do not, and that the parameters outlined below have been adhered to. Evidence of this having

taken place and subsequent authorisation to use the assessment must be available for the administrator before scheduling takes place.

- b) The Perception software administrator will, by default, allow only a single attempt for a summative assessment. The assessment will be available to the candidate when they login at the agreed scheduled time. Once they have started the assessment (by clicking 'START'), they will be unable to restart the assessment. It will no longer be listed as available to them on subsequent returns to the Perception home page or subsequent logins, unless re-scheduled by the Perception administrator on request from the class tutor.
 - c) Random generation of questions from a bank is NOT permitted without prior approval of the Quality Manager and approval of an Internal Moderator.
 - d) By default, all questions in an assessment will be presented in a random order ie all candidates will be presented with the same question set, but in a different random order.
 - e) Options within MCQ and MRQ question types can be randomised, if so requested.
 - f) Individual question feedback should be disabled.
 - g) It is at the tutor's discretion to provide end-of-assessment scores and feedback. By default this will be enabled, but where the assessment contributes to an aggregated score, eg a two-part examination, it is recommended that this is disabled.
- 4 As with all summative assessment, either locally or at a remote location, the assessment invigilator must confirm the identity of candidates. Where the candidate is unknown to the invigilator, they must produce identification in the form of a college photo ID card or other official documentation. The assessment will not proceed if this ID is not provided.
- 5 Where a candidate is permitted access to an assessment, the conditions for assessment must be applied by the responsible person at the location where the candidate has access, eg to ensure there is no reference to notes, books, internet for closed-book conditions etc.
- 6 Candidates must be informed prior to undertaking online summative assessment that only the assessment delivery software should be running on the computer. In most cases this means the browser, and will probably be Internet Explorer. They should be informed that access to other resources, either held locally on the PC or through network communication software (unless this is required by the assessment) eg e-mail, instant messaging, will result in the immediate cessation of the assessment, and appropriate action will follow in line with the disciplinary and academic deceit procedures.

- 7 Candidates must be given the opportunity for trial formative assessment, using the same screen template and navigation tools used to present the summative assessment. The questions used for formative assessment must be different from those used for summative assessment. Formative assessments need not have the same restrictions as detailed above, eg:
- a) The Perception software administrator will, by default, allow unlimited attempts at formative assessments.
 - b) Random generation of questions from a bank is permitted.
 - c) Individual question feedback should be enabled.
 - d) Formative assessment will normally provide end of assessment scores and summary feedback.
- 8 The Perception administrator will place the following report in the relevant folder on the shared network drive:
- ◆ **Grade Book — Score List Report**
This is the summary of the scores of individual candidates undertaking the assessment.

In addition, the following reports are available on request for internal or external moderation purposes. Support on the use of these reports is available from the Perception Administrator.

- ◆ **Coaching Report**
This is the detail of the individual responses of each candidate to each question.
- ◆ **Question Statistics Report**
This report can include a variety of analyses on the performance of individual questions, eg facility, discrimination etc.

Note: These guidelines may be superseded by the issue from SQA of national guidelines on the delivery of online assessment.

Case study 3: Forth Valley College

The Forth Valley College (formerly Falkirk College of Further and Higher Education) case study is based upon one model of e-assessment taking into account a Unit from SQA's National Units catalogue. The qualification being assessed was in Economics.

e-assessment details				
1	Specify the qualification type	National Unit		
2	Specify the SQA Unit number	New Code: E9KJ 04 Old Code: 6120120		
3	SQA Unit name	Economics of the Market		
4	Outcome being e-assessed	Outcome 3		
5	If e-assessment does not cover a complete Outcome, please state part to which it relates	Not applicable		
6	This assessment was:	Formative		Summative <input checked="" type="checkbox"/>
7	What is the assessment format that was used	Multiple choice questions	<input checked="" type="checkbox"/>	
		Multiple response questions	<input type="checkbox"/>	
		Report	<input type="checkbox"/>	
		Project	<input type="checkbox"/>	
		Other — please specify	<input type="checkbox"/>	
8	How many candidates were involved?	10		
9	What conditions applied to the conduct of this assessment?	Closed-book	<input checked="" type="checkbox"/>	
		Supervised conditions	<input checked="" type="checkbox"/>	
		Other — please specify	<input type="checkbox"/>	
10	Does the centre have evidence to confirm that assessment conditions were met? Please provide details.	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	
		Details of evidence: Attendance check carried out Unit Lecturer — witness VLE Support Officer in attendance		
11	Where is this evidence held?	Parent Department (paper) and Flexible Learning Unit (VLE)		
12	Was the assessment subject to a time limit?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	
13	If YES what was the time limit applied?	Not applicable		
14	Where is the evidence of application of timing conditions kept?	Not applicable		

e-assessment details continued		
15	How many candidates passed/achieved the assessment?	7
16	Did you use a 'control' group (ie other candidates, or the same group of candidates) undertaking the same/similar assessment by traditional means?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> Same group attempted instrument of assessment (IA) in paper format and through the VLE
17	If a control group was used please specify the numbers involved.	No in control group 10
		No passing/achieving 7
18	How did the candidates submit their responses to the assessment?	Keyed directly into VLE <input checked="" type="checkbox"/> e-mailed to tutor/assessor <input type="checkbox"/> Other — please specify <input type="checkbox"/>
19	What candidate authentication measures were in place for this assessment?	Unit Lecturer — as witness Candidate college ID number generates IT account, which is then uploaded to VLE
20	If the candidates were not directly supervised during the assessment, what evidence is there to support the work submitted was that of the individual participant candidates?	Not applicable
21	How was the assessment marked?	By computer — for VLE version <input checked="" type="checkbox"/> Manually — for paper version <input checked="" type="checkbox"/> Both <input type="checkbox"/> Double marked <input type="checkbox"/> Other — please specify <input type="checkbox"/>
22	If evidence is electronic does the centre have a central storage policy for evidence retention?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
23	What is this policy?	All VLE material is archived for 5 years. Centre not yet at end of first 5 year period.
24	Did anything unexpected happen during the conduct of the assessment?	Equipment failure <input type="checkbox"/> Power cut <input type="checkbox"/> Fire alarm <input type="checkbox"/> Other — please specify <input checked="" type="checkbox"/> A re-log was necessary due to the network terminal freezing.
25	What steps were put into place to attend to/overcome technical problems?	Re-boot Re-log in Re-authenticate candidate

Internal/external moderation/verification	
26	Has this e-assessment instrument been internally moderated? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
27	Was this e-assessment internally moderated using the normal centre procedures? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
28	What specific issues did the IM process raise in relation to the instrument of assessment? None
29	How will Internal/External Moderators be able to access the candidate evidence? Electronically <input checked="" type="checkbox"/> Paper (summary) <input checked="" type="checkbox"/> Other — please specify <input type="checkbox"/> Temporary password will be issued for VLE
30	How will the evidence relating to the assessment conduct and corresponding results be made available? Electronically <input checked="" type="checkbox"/> Paper <input checked="" type="checkbox"/> Other — please specify <input type="checkbox"/>
31	Does your centre have a policy covering the retention of e-assessment evidence? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
32	If YES, what is this policy? Intention is to keep material for 5 year archive period
33	Were candidates asked for feedback on their e-assessment experience? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
34	Please summarise the candidates' response(s) Candidates found: VLE IA easy to use and more straightforward to attempt.
35	Did any candidate express a view, which indicates they felt disadvantaged by this method of assessment? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
36	Specific candidate comments? None
37	Does the centre feel that candidates were disadvantaged by this method of assessment? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> If YES, in what way?
38	What specific hardware was used for this e-assessment? PC lab, Pentium 4-based, wireless network
39	What specific software was used for this e-assessment? Virtual Campus + E-Learning Questions
40	Where did this e-assessment take place? Learning Resource Centre
41	Were any special requirements necessary for this e-assessment? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>

Centre infrastructure used		
42	What were these requirements?	Not applicable
43	What supervision regime was in place?	Unit Lecturer VLE Support Officer Backup: Learning Resource Centre Staff
44	How are candidates provided with their results?	On VLE
45	If candidate feedback is immediate, are candidates advised that these results are provisional until moderation has taken place?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
General comments from centre on the conduct of the assessment		
<p>‘Interesting experience.’</p> <p>‘Staff are supportive about use of VLE — this is being integrated into normal assessment activities.’</p> <p>‘Use of technology and innovation has resulted in centre gaining SFEU national award — “Putting IT in the Classroom.”’</p> <p>‘No perceived barriers.’</p> <p>‘Tracking/e-portfolio system considered useful.’</p>		

Conclusions from this case study

This centre is committed to the continued development of online assessment across all practical curriculum areas. Their systems appear to be robust and mirror those used to deliver paper-based assessments. The material moderated/inspected — both electronic and paper — was of an appropriate standard and would have been accepted if presented under normal moderation conditions.

Good practice

- ◆ the VLE-based instrument of assessment (IA) was available at pre-advertised times during the normal college working day
- ◆ feedback was available at conclusion of IA
- ◆ it is possible to navigate through the IA and to revisit questions
- ◆ questions are presented by the VLE in a random fashion to avoid the opportunity of copying between adjacent terminals
- ◆ both VLE-based and paper versions of IA were available for moderation and a (random) sample from each was inspected
- ◆ a report on the IA and results is generated by the system

Evaluation of effectiveness of online assessment

The Unit which was e-assessed during this case study:

E9KJ 04 Economics of the Market

The correlation between the results obtained from the VLE-based assessment and the paper-based version was noticeable. The results mirror those obtained by this centre in other curriculum areas not subject to this investigation, but assessed using the VLE.

Instruments of assessment

All assessments met the requirements detailed in the Unit specification. The instruments of assessment were:

- ◆ centre-devised
- ◆ internally moderated as per stated system
- ◆ identical paper version to VLE version
- ◆ multiple choice questions covering one Outcome only

Evidence

Candidate evidence was available for inspection for both the paper-based and VLE-based version of this Outcome assessment. This was readily available and well presented (paper).

The VLE was easy to navigate, and evidence was easily located.

Software used

Virtual Campus + E-Learning Questions

Candidates' evaluation of online assessment

Candidates had responded very positively to this form of assessment. Some candidates had remarked that they felt more confident using a computer for the assessment — where they didn't have to write anything down. They were more relaxed completing an assessment online, since they used computers all the time.

Special assessment arrangements

On this occasion, special assessment arrangements were not required for the candidates completing their assessment.

Integrity of assessment

Candidates were 'locked out' of all other areas of the system while they were completing their online assessment.

Lecturers' evaluation of online assessment

Lecturers in the college were very keen to use the technology and had embraced the concept of e-assessment.

Case study 4: Langside College

The Langside College case study is based upon one model of e-assessment via an e-portfolio taking into account SQA's Scottish Vocational Qualifications (SVQs) in the Care sector.

e-assessment details		
1	Specify the qualification type	SVQ
2	Specify the SQA Unit number	Care at level 2 (G3HT 22), Care at level 3 (G45P 23), Care at level 4 (G4EN 24)
3	SQA Unit name	Care SVQs — all Units
4	Outcome being e-assessed	Level 2 and 3 portfolios inspected
5	If e-assessment does not cover a complete outcome, please state part to which it relates	Not applicable
6	This assessment was:	Formative <input type="checkbox"/> Summative <input checked="" type="checkbox"/>
7	What is the Assessment format that has been used	Multiple choice questions <input type="checkbox"/> Multiple response questions <input type="checkbox"/> Report <input type="checkbox"/> Project <input type="checkbox"/> Other — please specify <input checked="" type="checkbox"/> Digital Dictaphone entries, scanned documents, pictures and photos (digital camera)
8	How many candidates were involved?	110 live candidates
9	What conditions applied to the conduct of this assessment?	Closed-ook <input type="checkbox"/> Supervised conditions <input checked="" type="checkbox"/> Other — please specify <input checked="" type="checkbox"/> Formal sessions with candidate and assessor
10	Does the centre have evidence to confirm that assessment conditions were met? Please provide details.	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> Details of evidence: system logins
11	Where is this evidence held?	On server/master terminal
12	Was the assessment subject to a time limit?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
13	If YES what was the time limit applied?	Not applicable
14	Where is the evidence of application of timing conditions kept?	Not applicable

e-assessment details continued		
15	How many candidates passed/achieved the assessment?	SVQs — not applicable, portfolio evidence inspected was all accepted by assessors and IVs
16	Did you use a ‘control’ group (ie other candidates, or the same group of candidates) undertaking the same/ similar assessment by traditional means?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
17	If a control group was used please specify the numbers involved	No in control group <input type="checkbox"/> Not applicable
		No passing/achieving <input type="checkbox"/> Not applicable
18	How did the candidates submit their responses to the assessment?	Keyed directly into VLE <input type="checkbox"/> e-mailed to tutor/assessor <input checked="" type="checkbox"/> Other – please specify <input checked="" type="checkbox"/> Most evidence items were electronically captured as the bulk of them were ‘audio’.
19	What candidate authentication measures were in place for this assessment?	Normal centre procedures apply and candidates were present with assessors when assessment(s) were undertaken.
20	If the candidates were not directly supervised during the assessment, what evidence is there to support the work submitted was that of the individual participant candidates?	Not applicable
21	How was the assessment marked?	By computer <input type="checkbox"/> Manually <input checked="" type="checkbox"/> Both <input type="checkbox"/> Double marked <input type="checkbox"/> Other — please specify <input type="checkbox"/>
22	If evidence is electronic does the centre have a central storage policy for evidence retention?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
23	What is this policy?	See moderation comments below.
24	Did anything unexpected happen during the conduct of the assessment?	No <input checked="" type="checkbox"/> Equipment failure <input type="checkbox"/> Power cut <input type="checkbox"/> Fire alarm <input type="checkbox"/> Other — please specify <input type="checkbox"/>

e-assessment details continued		
25	What steps were put into place to attend/overcome technical problems?	N/A — but see comments below at moderation comments
Internal/external moderation/verification		
26	Has this e-assessment instrument been internally moderated?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
27	Was this e-assessment internally moderated using the normal centre procedures?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
28	What specific issues did the IM process raise in relation to the instrument of assessment?	See comments below at moderation comments.
29	How will Internal/External Moderators be able to access the candidate evidence?	Electronically <input checked="" type="checkbox"/> Paper <input type="checkbox"/> Other — please specify <input type="checkbox"/>
30	How will the evidence relating to the assessment conduct and corresponding results be made available?	Electronically <input checked="" type="checkbox"/> Paper <input type="checkbox"/> Other — please specify <input type="checkbox"/>
31	Does your centre have a policy covering the retention of e-assessment evidence?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
32	If YES, what is this policy?	Portfolios are held for 7 years as per ESF requirements. It is possible to store up to 10 portfolios on 1 CD-R, which is done.
33	Were candidates asked for their feedback on their e-assessment experience?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
34	Please summarise the candidate's candidates' response(s)	Candidates find that the system used for the VQs moderated is much easier to use and is less intimidating than a paper-based portfolio construction system.
35	Did any candidate express a view, which indicates they felt disadvantaged by this method of assessment?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
36	Specific candidate comments?	No applicable
37	Does the centre feel that candidates were disadvantaged by this method of assessment?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> If YES, in what way?
Centre infrastructure used		
38	What specific hardware was used for this e-assessment?	Pentium 4 based pc for server / master terminal Pentium 4 based laptops for assessor use — one per assessor

Centre infrastructure used continued		
39	What specific software was used for this e-assessment?	PAPERFREE
40	Where did this e-assessment take place?	In centre or at placement
41	Were any special requirements necessary for this e-assessment?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
42	What were these requirements?	Not applicable
43	What supervision regime was in place?	Normal centre candidate / assessor conditions
44	How are candidates provided with their results?	Verbally and by inspection of candidate PAPERFREE file
45	If candidate feedback is immediate, are candidates advised that these results are provisional until moderation has taken place?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
General comments from centre on the conduct of the assessment		
<p>‘The centre is very satisfied with this product and its use in the formation/construction of candidate VQ portfolios. The centre feels that the system is particularly relevant for the client groups involved with the VQs on offer. The system lends itself to the support of candidates who do not, and do not need to have, detailed or specific IT knowledge.’</p> <p>‘The innovative capture of candidate evidence — digital Dictaphone files for example — is considered appropriate for these candidate groups.’</p> <p>‘The overall ease of portfolio construction was highlighted.’</p>		

Moderators' comments

The evidence inspected during this visit did not conform to the normal definition of e-assessment in that none of the assessment evidence moderated was generated by an e-assessment, delivered online.

The system operated by the centre is essentially an e-portfolio construction system, with all evidence being held electronically. Because the system is paper free — the package used is called PAPERFREE — this means that all internal moderation is conducted electronically. This has an implication for external moderation in that no paper portfolios will be presented to an EM.

The PAPERFREE System

(PAPERFREE is a commercially available product.)

The system, as implemented at Langside College, consists of:

- ◆ home station with PAPERFREE licence
- ◆ Assessor/IV laptops with PAPERFREE license (currently 11)

The system as installed and inspected can accommodate up to **9999** candidates/portfolios. More laptops are to be added in the near future.

The home station, referred to above as the master terminal or server, is accessed **only** by the senior lecturer in charge, and is subject to an access code and password. Each assessor/IV laptop is similarly protected by access/user code and password. If an EM requires access for external moderation purposes, then a dummy user access code and password is supplied for the duration of the moderation visit. Certain functions are disabled to effectively make the system **read only** for the EM — no changes are permitted to any captured evidence. A similar arrangement is implemented for IMs, but IMs have greater access rights than an EM.

When logged on, the initial start screen presented does not change as evidence items are chosen or displayed. This makes the system easy for a 'stranger' — ie an EM — to pick up during a (short) visit with limited time. Menu options from this start-up screen are listed below.

Backup and security

There are several locations where candidate information is stored for backup and security purposes. These are:

- ◆ master terminal
- ◆ each laptop PC
- ◆ CD-ROM generated by master terminal
- ◆ college server

If the system does go down, there are thus several sources of appropriate backup.

Internal moderation

The process involves all IMs and assessors meeting for one day per month. The schedule is for all standardisation to be done in the morning of this meeting with all IM activity reserved for the afternoon.

Staff find this a very productive arrangement.

External moderation

Candidate names are displayed with their unique reference numbers on the start-up screen. These must be entered for update purposes. The start-up screen then displays a list of candidate Units — mandatory and options. This information is entered on the master terminal and is held there.

All standards for the chosen Unit are displayed — the company enters these under the PAPERFREE maintenance agreement. This information includes:

- ◆ PCs and range
- ◆ underpinning knowledge
- ◆ the number of times an activity needs to be successfully attempted
- ◆ the number of times this has been submitted

The standard screen also shows an indication of the percentage of successfully completed work for each Unit **and** for the VQ as a whole, for candidate feedback purposes.

Units **cannot** be signed off unless these two figures agree.

Evidence items can easily be cross-referenced across Units.

Candidate and centre staff evaluation of the use of the electronic portfolio.

The following points were raised in discussion with assessing staff:

- ◆ assessment is essentially holistic but the (digital) recording of candidate submissions is not — this is done in its entirety
- ◆ there are significant cost implications with this system — evidenced in increased throughput/workload of assessors
- ◆ candidates do not now ‘body swerve’ assessors — the system has effectively been met with customer approval
- ◆ e-mail attachments can be sent to assessors and stored in the system as evidence, if appropriate
- ◆ system concentrates on candidate performance

- ◆ it is easy to identify gaps in evidence with this system — ensuring complete capture and coverage
- ◆ IM — certain menu options are locked out — as with EM
- ◆ IMs **cannot** IM their **own** work — there is a lockout facility
- ◆ master terminal allows construction of a CD for prior issue to an EM with an agreed sample
- ◆ ‘Iceberg centres’ — candidates **cannot** be hidden in this system

PAPERFREE menu options

The following options are available at initial sign-on to PAPERFREE:

1. Portfolio Evidence
2. Portfolio Management
3. Backup Evidence Links
4. Training Needs Analysis (not active at Langside)
5. Enter Verification Screens for Sampling (IM or EM)
6. Data transfer IN
7. Data Transfer OUT
8. Transfer Verifier Comments Only
9. Create Single Portfolio (CD)

Synopsis of positive and negative issues raised by centres

The case studies carried out so far in this project highlight the following points:

Positive

- ◆ e-assessments are always available
- ◆ these can be attempted 'out of class' — usually in an assessment centre
- ◆ they provide immediate feedback
- ◆ an analysis of candidate responses is immediately and readily available
- ◆ they allow for remote moderation to take place
- ◆ they enable the teaching and learning processes to have higher priority in terms of time
- ◆ they allow the same procedures / regimes as paper-based assessments
- ◆ utilities are usually available to 'read' the questions that have been set
- ◆ animations are now possible in questions to provide a higher quality of presentation

Negative

- ◆ time involved in the preparation and testing of questions and assessments
- ◆ there is a definite requirement to develop and maintain an appropriate question bank
- ◆ candidates require practice time to familiarise themselves with online assessment procedures and practices

Summary

The research project was informed by raw data generated by the questionnaire as shown above. The centres' actual responses are presented in each case study. It must be emphasised that the data presented should be considered as a 'snapshot of the day' — ie findings at a particular time in the centres' journey down the e-assessment/moderation (internal and external) road.

The subjective views obtained by the External Moderator undertaking the case studies were:

- ◆ most centres are at any early stage in their development of e-assessment
- ◆ centre staff involved in e-assessment demonstrate significant enthusiasm by providing the opportunity to bring their subject areas under the e-assessment umbrella
- ◆ candidates in general were equally enthusiastic in taking assessments electronically — they find them easier to cope with
- ◆ centres are currently formulating policy on e-assessment activity (for Adam Smith College's policy please see page 16) and complementary internal moderation procedures

These subjective views are substantiated by General Centre Comments at the conclusion of the questionnaires.