Online Assessment Policy and Procedure
A discussion paper

1.0 Background

This paper was initially drafted as a summary of issues that emerged during the supporting of online exams in the Business School by the JISC Integrate Project team. Through discussion with colleagues in Education Enhancement and with Desktop Support, it became apparent that these issues are timely and worthy of wider discussion, especially given increasing demand from across the University for online assessment solutions. This demand is of strategic importance in that it has arisen from Schools wishing to streamline assessment with large numbers, and to save time that can be put to better use for face-to-face contacts or research.
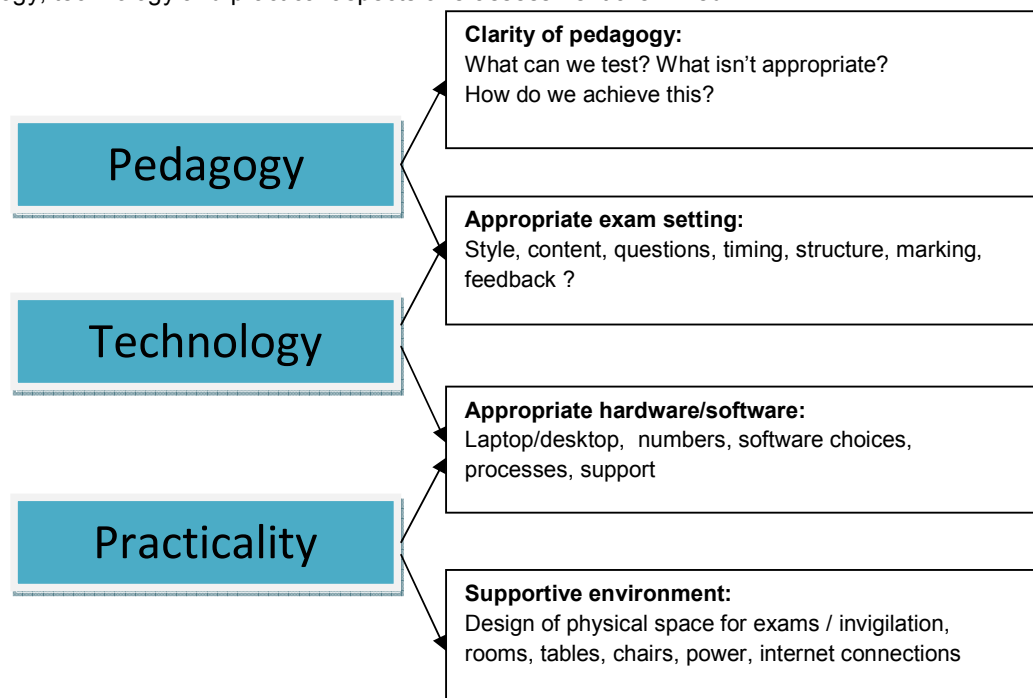
2.0 Introduction

The paper sets out the procedures needed to run successful online exams and raises current questions and challenges for consideration at each stage of the process. Each of the questions below may need to be addressed at different levels of the organization - by the academic setting the exam, the School Office, the Exams Office or senior management and policy makers.

There are essentially three broad areas which must all be carefully considered and well executed in order to successfully run online examinations, particularly given large and increasing student numbers. These three areas are:

- Pedagogy
- Technology
- Practicality

Each of these three areas although discussed in turn below must not be considered in isolation. The pedagogy, technology and practical aspects of e-assessment are linked.

Pedagogy

Clarity of pedagogy:
What can we test? What isn't appropriate?
How do we achieve this?

Appropriate exam setting:
Style, content, questions, timing, structure, marking, feedback ?

Technology

Appropriate hardware/software:
Laptop/desktop, numbers, software choices, processes, support

Practicality

Supportive environment:
Design of physical space for exams / invigilation, rooms, tables, chairs, power, internet connections

3.0 Pedagogy

With increasing pressure in the system from rising student numbers there is growing demand to use online testing methods which have the potential to greatly reduce marking time and increase the time for student feedback,   As demand grows, it is vital to be really clear about the underpinning reasons for testing online, why this would be good and what aspects of a module would be particularly suitable for testing in this way.

The potential time saving from running online exams is significant. Whilst preparation time, in terms of question setting and learning to use examination software can be much more time consuming than running conventional exams, the time pay-off can be huge with early input saved when marking the exams.

Online exams can be written using a range of question types to test a range of knowledge, however it online testing is not always the answer. E-assessment can only be used in certain situations and should not be used for 100% of any module mark. Online testing is not good for structured sentences / paragraphs, essay writing or situations where students are required to construct an argument or develop ideas.

 The JISC project is continually learning about using online testing and is currently looking into clarifying best practice and quantifying the number of days / hours saved by running exams in this way.

Questions for consideration around the pedagogy of online exams.

- Why test online?

- What aspects of a particular module can be tested online?

- What is the range of question types that can be used? How do we best use these?

- How good are we at writing multiple choice questions? How can we get better at this?

- What do excellent online exams look like? What examples do we have?

- Can online exams be used for 100% of a module mark or not?

- How good is the software we have at running the type of exam we would like to set?

4.0 Technology

4.1 Current technical solutions

The JISC project has supported Business School exams using WebCT and Assessment 21's ABC software as well as the Kendata Scanner for speeding up the marking of MCQ exams. There is also experience in University of using Question Mark Perception software which the University has a licence already available. Staff in geography and Engineering are currently using this system.

The JISC project is looking at comparing different technologies and working with Desktop Support, PCMD and the TEL team to clarify the benefits, challenges and best ways forward with online testing in the Business School. These findings may provide information to inform developments more widely across the University.

Table 1: The table below summarises the key characteristics of the different software currently available.

Software	Setting exam: Question Bank	Running Exam: Invigilation tools	Marking Exam:	Sustainability / Scalability
WebCT	Yes. Very easy to set up large question banks and have randomised exam	No, careful invigilation needed to ensure students not using any other interface.	MCQ and slot (fill in the blank) questions marked automatically	WebCT being replaced and current system will be closed at Exeter by start of next academic year.
New Exeter Learning Environment	All current exams and questions are being transferred from WebCT assessments into the new ELE 'Quiz' option. 10 question types available.	No, careful invigilation needed.	All question types can be marked automatically.	Potentially very good for mid term / formative assessment - provides the same level of online exams as current WebCT vle.
Assessment 21	No. Question banks cannot be set up	Yes, an excellent invigilation system shows immediately if students stray outside the exam screen	MCQ and slot questions marked automatically Short answer questions easier to mark.	Piloted within JISC project. Small company based at Manchester Uni. Scalability very uncertain.
Question Mark Perception	Yes. Very easy to set up large question banks and have randomised exams (question delivery and answers). 22 question types available.	Simple invigilation tools available for online exams. Secure exam browser product available.	Questions marked automatically apart from open answer and essay questions. 22 reporting types available	University has been running QMP since 2001 (on a small scale) and already has a licence available. The system can scale indefinitely but investment in current infrastructure will be required to scale up. Exeter's current licence has the following restrictions: 4000 participants at any one time, 22 administrators, unlimited groups, questions and assessments.
Kendata Scanner	No question bank needed. Exam set on paper and answered with X on paper MCQ sheet.	Careful invigilation needed, plus teaching students how to complete answer papers	Large numbers of MCQs scanned and validated very rapidly	Business School has purchased a Kendata scanner for marking scripts. Used by BS and Politics. Very simple and cheap to scale up.

4.2 Infrastructure requirements

The current installation of Questionmark perception is running a legacy version of the package (version 3.4). New virtual servers are available to upgrade this service to version 5 but additional infrastructure (virtual servers, storage and database) may be required if large scale use of this system were to be rolled out. PCMD are already running large scale online exams using Questionmark using the infrastructure provided by the University of Plymouth therefore experience of running large online exams and the infrastructure requirements is know. Support for the Questionmark servers is already provided by the Academic System team within Academic Services.

4.3 Choosing appropriate technology

When planning examinations decisions need to be made early on about whether using technology to support the exam process is possible, and how and why this can work. A simple solution for marking a large amount of scripts in a short time is to use the Scanner to mark MCQ sheets. If a greater range of question types, is required, online exam software could be used. Once it is decided to run an online exam, there are a number of important technical and practical tasks to be co-ordinated:

4.4 Working with the Desktop Support Team

The desktop support team need to discuss individual exam requirements with the academic / school in each case in order to set up the rooms in 'invigilation mode' , set up gest log-ins if needed well in advance.

Note: If guest log ins are set up, this has several advantages:
a) Students do not have access to their own desk-top and files
b) PCs can be logged on in advance
c) Turn-around time between sessions is reduced
d) Cookies can be checked and cleared between sessions
e) Students can be warned about policing, even though policing is not actually particularly effective
f) The Exam URL can be set as a 'favourite' to save the invigilators time
g) Reduced load on the Server (caused if all students used their own logins simultaneously)

Example: For the BEAM047 exam with 645 students, 10 guest logins were set up. Prior to the first exam, all computers were logged in with guest IDs, one ID was used per row. The WebCT log in page was opened. Cookies were cleared and all other browser windows were closed. Invigilators could easily see just a single browser window open at a glance when invigilating.

Questions for consideration around technical aspects of the exam:

- Will the exam use just MCQs and the Kendata scanner for marking?

- Does the exam require online testing software? If so, which software is most appropriate?

- Is this an Open-book / Closed-book exam?

- Is there a need for a bespoke software image?

- Does there need to be locked down browsing?

- Will there be any electronic invigilation tools eg SynchronEyes; Assessment 21

- Are Guest Logins required? (The advantages of this are listed below)

- Will support be needed on the day? If so for how long? Will anyone be on direct call to support the exam?

- Has everyone been notified - Networks / VLE provider / Helpdesk / DST /

- Are there any students needing special access settings or software eg: Zoom Text; Voice Recognition; High Contrast screen settings

5.0 Practicality

5.1 Planning ahead
The key to success of online examinations is planning. In the Business School, with increasing student numbers, the challenge of scheduling online exams is great whilst demand for this type of exam is growing.

5.2 Booking appropriate rooms
Finding computer rooms which can be used for online exams is difficult and given the large numbers on some Business School Modules (we have supported BEMM108 with 296 students and BEAM047 with 645 students) exams cannot be run on a single sitting, they have to run several times.

Currently the main computer rooms on the Streatham Campus suitable for running exams are the two rooms in the Harrison Building (207 and 208) which each seat 47 students and Streatham Court 116 which seats 75 students. Understandably the Harrison computer rooms, which are so heavily used during term time, cannot be booked simultaneously without significant disruption to students. During the exam weeks these rooms are unavailable as they are block booked for the entire exam period by the Examinations office to enable them to offer specialist support during exam time to students with particular needs during exams.

A list of possible rooms is provided below.

Streatham Campus
- Streatham Court SC116 (75)
- Harrison 207 & 208 (47 + 47)
- Laver Building LT6 (120)

St Lukes Campus
- Baring Court (114)

Tremough Campus, Cornwall
- Uncertain

Plans for the new forum building are to have a lecture theatre with every seat supplied with power and network access, however it is not clear at this stage how flexible this new space will be, and how appropriate or not the seating will be for sitting online exams.

Taking into account all the room options, and leaving spare computers in case of technical failure, the maximum number of students who can take an online exams at any one time on the Streatham campus is currently around 115.

5.3 Writing an exam outline
It is important when planning an online exam to communicate exact requirements clearly and as early as possible to everyone involved in the process – academic staff, room booking team, schools office, invigilators, desktop and network support staff. In our experience writing this up as a what/where/when/who/how was very helpful.

Example, details of an exam that ran in January 2010:
What: BEAM047 Fundamentals of Financial Management. Prof Richard Harris.
Where: Streatham Court 116 and the Xfi (G25) computer room
When: Monday 11th and Friday 15th January 2010 4 x 2-hour sessions 9.00, 11.30, 14.00, 16.30
Who: 645 students. 84 students taking the exam in each session (70 students in SC116, 14 in Xfi)
How: It is a 30 question closed book exam using Web-CT 20 MCQs 10 calculations.

5.4 Pre-Exam preparation

Once the exam is scheduled, pre exam-day preparation is essential. The following areas need to be covered:

1. Speak to desktop support and network support well in advance to inform of exams. Ideally this should happen, as soon as the exam is scheduled, and at least a month in advance, to ensure all PCs and staff are fit for purpose and available/trained to invigilate.

2. Set up guest log-ins for use on the day if needed (request from helpdesk well in advance)

3. Arrange for computer room desktops to be set to invigilation mode. (Note: Presently, this just means providing a clear walkway for invigilators to see each screen. This can be achieved with after-market software based on the nature of the exam. That is, to limit the PC to just the required applications for the duration of the exam and/or alert the invigilators to any examinees disallowed activity).

4. Email students information about the exam before the day

5. Run a test exam to ensure all students have been given opportunity to try this process before the exam day.

6. Make arrangements for students with special requirements – different room / access / additional time for taking exam / invigilation

7. Arrange enough invigilators and train them in invigilation of computer based exams.

8. Write up timetable for the exam day to allow enough time for setting up the room, running through written invigilation notes

9. Print out a small number of hard copy exams in case of computer failure (suggest paper copies for 20% of students)

10. Arrange rough work books for any note taking during the exam.

Questions for consideration when planning and scheduling an online exam

- Can we book a room for this exam?

- How many times will we need to run the exam?

- Is this exam Internal - a University Accredited module ?

- Is this exam External – Professional Body Accredited (Medical Research Council / Thompson Reuters)

- What is the process for setting the exam? Is it the same / different from written papers?

- Who schedules the exam? Exams Office or School ? Careful consideration needs to be give to Date / Day / Time / Room Preparation time

- With large numbers, how many students will be examined in each sitting,

- When will each sitting will start, and how long each sitting will last?

- How much time there is between sittings? Is this sufficient time to manage student turn-round and for invigilators to discuss any changes needed and reset the room.

- Is this an open-book exam, or not?

- If it is a closed book exam, then careful trained invigilation will be necessary. Is there a bank of trained invigilators available?

5.5 Running an online exam

The key to ensuring online exams run well on exam day is effective invigilation and good planning by the academic setting the exam. There are specific requirements for invigilators in an online exam which differ from those in a face to face exam. At least one invigilator in the room should have prior experience of working in this environment, should be competent and confident with use of the technology and should set very clear expectations of the invigilation team.

The following paragraphs about running an online exam are based on notes for a case study of the BEAM047 exam which ran in January 2010 in the Business School

5.5.1 Pre exam briefing
- Provide clearly written instructions to students
- Run through timetable and instructions with invigilation team prior to the exam.
- Clarify no use of mobiles and internet by invigilators.
- Arrange when invigilation team are going to take breaks – agree this at the start of the day.
- Ensure sufficient time to set up the room prior to the first exam.

5.5.2 Logging In
Suggest an hour is needed to set up room before start of first exam. Ask desktop support if they can help with setting up the room initially to support the invigilation team and enable more time for invigilation team to sort out paper work, seating arrangements, agree roles, agree break times.

5.5.3 Student seating
Ensure all invigilators know what the seating arrangements are. They should be prepared to organise students, bags, coats, ID cards, mobile phones, pens etc on entry to the room. Deliberately try to split up obvious friendship groups. Getting students into their seats and settled with only an approved calculator. student ID card, and drink (on the floor) can take a significant amount of time, especially in the Winter with many bags, coats etc. Note: This is achieved in PCMD with the use of a number-system. Each desk has a number, and each student sits by their allotted number.

5.5.4 Invigilation instructions
Invigilation instructions should be written up, placed on the visualiser and read out
The students need clear instruction and regular reminders about saving their work as they go along rather than all at once at the end. A summary of key instructions could remain on the OHP during the exam. Inform students not to log off the computer after the exam.

5.5.5 Rough Paper
All students should be provided with a paper booklet to do any calculations/ write notes if needed before providing their answer online. Should provide these booklets upside down and ask students not to start writing on these until the start of the exam. Invigilation instructions should be clear that they must hand in the booklet in order to pass the exam, even though the content won't be marked.

5.5.6 Ending the exam
Just as with paper exams, there needs to be agreement that students cannot leave the room towards the end of the exam (last half an hour?)

5.5.7 Change over between exams
The change over period needs to be around an hour. This allows time for ending an exam, releasing all the students, discussion between the invigilators, a chance to run through anything that needs adapting for the next session, time to sort out the computers, log in again etc if needed. Check browser history, check and clear cookies. Hand out new rough paper, and sort room. Let students into the room 20 minutes before start of the next exam. It takes around 15 minutes to sort out students, bags, coats, notes, phones seating etc. Start invigilation instructions 5 minutes before exam start time.

5.6 Marking and feedback

The clear advantage with online assessment, particularly with large numbers comes with marking. Assessment software can save academics large amounts of time.

It is important that those marking computer based exams are trained in the different software / scanner, and that they have a clear understanding of the different ways scripts and time need to be allocated with online exams rather than when marking paper scripts.

Questions for consideration when running and marking an online exam:

- Are the invigilators confident with technology and well briefed?

- Is desktop support / technical support available?

- How will the flow of students in and out of the room be managed? Is the change over time long enough?

- Will there be a clear seating plan?

- Have invigilation instructions been clearly written?

- Is the main invigilator absolutely clear about the process of running the exam, and can they communicate this with presence and authority to the students?

- How will the exam be marked? Is a team of markers needed?

- Are those marking the exam trained and clear about how they divide the exam marking between them?

6.0 Recommendations:

In the JISC project, we are developing key knowledge about online examinations / e-assessment at Exeter. We are working to find effective ways to capture and share our learning in this area and to develop simple effective protocols to support future developments.

We suggest that a working group at the University could be set up to look at:

1. How the information we have around online exams might be turned into regulations and / or guidance for the new colleges.

2. What is the forecast for increased demand in online exams on the three campuses?

3. How will the university meet increased demand in this area?

4. How clear are we about the key barriers and challenges to successful development of e-assessment over the coming years: Infrastructure : Support : Staffing : Authentication

5. How will the University address all three areas of Pedagogy / Technology / Practicality

Questions around Pedagogy, Technology and Practicality of online exams:

Pedagogy

What skills do we have in understanding what / why / how we might use e-assessment?

What training do we need to develop around question setting / writing good MCQs / using formative and summative assessment?

To what extent can online exams be used in a module / across a school?

Can an online exam make up 100% of a course mark? Who makes this decision?

Technology

Which technical solutions will be available in the future?

How will these be embedded and sustained?

What as the requirements for Training / hardware / infrastructure / support?

Practicalities

How much space do we have now? How flexible are the existing spaces?

Is there an audit of all the possible rooms that can be used for online exams?

Are there plans to install more space? How appropriate and flexible are these spaces?

Will there be development of methods for students to take online exams using their own machines?

Who are the key people / teams across the university who need to be involved in these developments?