



## **Computer Aided Assessment Policy and Procedures**

### **University of Dundee, Draft Revision - February 2005<sup>1</sup>**

*Computer aided assessment (CAA) has become a key educational activity, with important administrative and procedural implications. This document sets out policies for the use of CAA at the University of Dundee. All staff involved in the design, presentation, setup and invigilation of CAA for low, medium and high stake assessments are requested to adopt the procedures outlined in this document.*

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Fig 1. Outline of CAA Authoring and Administration Procedures

Table 1. Range of Assessments and General Guidelines

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<sup>1</sup> Original accepted by Academic Standards Committee (11/10/03) and C&IT Sub-committee (5/11/03)



## **1. General**

Since October 2003, electronic transfers between the student management system, the enterprise Blackboard VLE, personnel records, the Novell network and CAA servers permit real-time integration of academic and administration activities. Thus, computer aided assessment offers potential efficiency gains, particularly for large classes.

CAA also offers a number of pedagogical advantages, such as: flexible question design, the ability for students to practise, provision of detailed and immediate feedback to students, and the facility to quantitatively analyse the discriminatory value of questions. Its use tends to force assignments to be aligned more directly with course objectives and it promotes explicit marking criteria. Use of CAA thus tends to shift academic work from post-assignment (traditional marking) to pre-assignment (design and alignment).

Departments running assessments using online resources will be supported by the CLT and ITS. This is a developing activity and departments choosing to use CAA at present must recognise that facilities and capabilities may vary from time to time.

The policies and procedures described here are based on principles that assessments provided to students by CAA will be reliable, fair, confidential, accurate, secure, and run according to legislation and good practice in the areas of safety and provision for disabled students.

## **2. QAA and the British Standard BS7988:2002**

A relevant British Standard (BS7988:2002) entitled: 'Code of Practice for the Use of Information Technology (IT) in the Delivery of Assessments' was published in August 2002. Clearly, assessments using IT carried out at the University of Dundee, at a level of 'high stakes', should comply with the guidelines presented in this standard, and sections of the standard are referenced throughout this document as appropriate. The LEU holds a copy of BS7988:2002 which can be consulted. In addition, the policies and procedures described here are designed to supplement the institution's general guidelines to 'Conduct of Examinations' and 'Guidelines to Invigilation' (ref: <http://www.somis.dundee.ac.uk/sec/academic/invig/0invig.htm>).

## **3. Assessments Covered by these Policies and Procedures**

All assessments occurring within the University that use IT for their delivery are covered by this document. This includes:

- Assessments that use computers for only partial delivery or input of assessment information.
- Assessments for formative purposes only or with low stakes, medium stakes or high stakes outcomes for summative purposes.

Definitions of what constitutes 'formative', 'low stakes', 'medium stakes' and 'high stakes' examinations are provided in Table 1. A purely formative assessment will provide no direct contribution to the final mark of a module, while summative assessments do contribute to the final mark, either through in course work, class examinations or final examination. It is recognised that mixed exam types may occur.

#### **4. Department-based CAA Systems**

Where departments operate their own CAA systems, they should also follow these guidelines and policies.

#### **5. Assessment Lifecycle (see BS7988, s1.3)**

It should be recognised that any assessment has a lifecycle:

- a. identification of need to assess
- b. design of outcomes/assessment methodology
- c. preparation and calibration
- d. pre-registration
- e. distribution
- f. authentication (includes identification) of candidates
- g. delivery
- h. return of responses
- i. scoring, determination of results and/or feedback
- j. return of data
- k. analysis
- l. appeals
- m. certification

The procedures involved in setting up a formative CAA assessment at the University of Dundee are outlined in Fig. 1.

#### **6. Design of Assessments**

The LEU will provide guidance and staff development related to the construction and configuration of medium and high stake assessments. For QuestionMark Perception, the LEU will provide clear guidance for a standardised and functional 'template' for assessment presentations.

In addition to tailored advice for departments, the LEU will provide general academic sessions within the Staff Development programme. It should be normal practice for academic staff using CAA to have completed the Faculty of Education and Social Work accredited course 'Assessment Online' put on by the Centre for Learning and Teaching.

Assessment should be aligned with the intended outcomes of the module. Specifically, the use of CAA should not result in assessments that are optimised for CAA, rather than related to the aims and intended outcomes of the module.

## 7. Design of Questions

Questions should be carefully designed with due regard for the material being assessed. Particular care should be taken in multiple choice or multiple response questions that a sufficient quantity and quality of distracters are used. Negative marking may be used, or compensation for baseline guess factors included. It is important that the calculation regime used should be made clear to the students before the assessment is run.

The LEU will be available to provide general guidance on the overall quality and design of questions and assessment scoring. This analysis should be carried out well in advance of any planned assessment. Departments should be aware that analysis after the assessment (provided within QMP software) can help determine the quality of questions and should be used as part of the ongoing assessment design process.

## 8. Guidance Provided to Students (BS7988, s5.1.2)

Departments must ensure that their students are familiar with the CAA system to be used before they undertake a 'medium stakes' or 'high stakes' exam. This can best be achieved by running a formative assessment of similar format prior to a summative assessment. Where a student is absent from such a formative assessment, the department should ensure that they receive adequate training in relevant procedures.

The following items should be made clear to students before an assessment takes place:

- a. the number and type of question items to be used
- b. the scoring rules for individual items and the overall assessment
- c. the contribution this assessment makes to an overall module
- d. how the question items are selected for each assessment (all or random selection)
- e. any time limit and how this may be judged
- f. any restraints on navigation between question items, or blocks of questions
- g. assessment regulation included permitted and excluded resources
- h. feedback to be provided (including their mark if appropriate)
- i. details of the appeals procedure available to students
- j. how they will be identified for the assessment (i.e. they must bring their matriculation cards)

This information should normally be provided within the module handbook (which may be housed within the VLE).

### *Sensitive Academic Material*

For the purposes of assessment, staff may occasionally find it appropriate to use multimedia, image or text material that has the potential to cause unnecessary offence to users. Examples of such material include; medical images and videos detailing particular graphic detail; forensic science images of human remains; graphic text describing offensive behaviour from a legal or social work perspective.

Whilst students studying the discipline may be familiar with the material, lecturers have a responsibility to:

- (a) ensure students are aware of the nature of the material

- (b) ensure students are aware that others who casually view the material may be offended by it
- (c) minimise the chances of offence by suggesting the material is viewed in specialist or private IT suites, or by scheduling private sessions
- (d) provide guidance to students in the form suggested below

### *Suggested Guidance for Students*

A warning and guidelines must be provided to students **before** the material is presented. This can be configured in Questionmark Perception by using an explanation (non-scoring) question within an initial block, before the main questions are presented. An example of a warning and guidelines is presented below.

‘This material has been prepared as an interactive teaching resource that is relevant to the academic course material. Be aware that its content is both graphic and sensitive. You must not copy or distribute the material in any way.

Please do not display it in public areas or discuss it in a way which may appear to others to be disrespectful. In University or public IT suites you should be aware that the material may be visible to other PC users and may cause offence. You should act to ensure that this does not occur. Sensible precautions may involve using PC suites that are for dedicated medical use, or alternatively using PCs with screens that are not overlooked such as those at the back of the room.’

Academic staff preparing assessments that contain material that may be regarded as offensive by those not studying the topic, should also advise the CAA staff at the LEU prior to the publication of the assessment.

## **9. Pre-examination Procedures**

1. Complete the ‘CAA Pre-Event Registration Form’, at least two weeks before the assessment (copy attached)
2. Book the room required with IT Services
3. Forward the entire assessment to the LEU at least seven days before the examination date
4. Complete checks, peer review and any external examiner review, a minimum of three days before the examination date
5. Ensure correct invigilation procedures will be in place (see below) and that the possibility of collusion due to overlapping exam times or locations is avoided (see below)

Where an assessment is regarded as summative and takes place within the main exam diet, then departments have the responsibility of ensuring that the assessment is timetabled by the Examinations Office as part of the official exam timetable. This is important to ensure that no student will have two assessments at the same time and may require liaison between the department, the LEU, ITS and the Examination Office. If a summative exam occurs outwith the official exam diet, then departments also have the responsibility of ensuring that it is appropriately timed to avoid timetable conflicts for students.

## **10. Invigilation**

CAA assessments require special invigilation procedures. One of the invigilators must be a senior academic with knowledge of the assessment and the assessment software. A technical administrator of the examination system (normally an administrator of Questionmark Perception) must be available to be contacted during the examination. This administrator may attend for the first 15 minutes of any medium or high stakes examination, to ensure correct operation of the CAA systems.

A set of four private mobile two-way radios are available from the LEU to support communication for examinations that are conducted in more than one IT suite. Mobile phone numbers for LEU and ITS staff who support the systems will be provided to invigilators as necessary.

## **11. Detailed Examination Procedure using Questionmark Perception (High Stakes, Summative)**

1. Assessment must be tested by academic staff member, using the format to be used for exam.
2. The examination assessment is installed by the LEU on the Perception Examination Server (CAA-01) and will be installed on the Perception Formative server (CAA-02) if required. The Formative server will only be used in the case of unforeseen problems with the Examination server. In this event, LEU CAA administrators will carry out the necessary steps according to a documented procedure. An examination should be available on the backup server within 15 minutes.
3. Special NDS-based examination accounts are available with a number of shared accounts available for use by each faculty. These accounts automatically start Perception Secure Browser as a force-run application and students are prevented from accessing alternative computer-based resources.
4. Special individual exam accounts are created (Username-E or equivalent) by the LEU based on a list of matriculation numbers provided by the department or obtained from the module within the VLE. Passwords may be matriculation numbers or randomly generated and communicated to individual students.
5. An extra 10% of spare accounts are created.
6. Format within 'Details field' should include: Code:surname:firstname:matric no. (this assists automated sorting and transfer of results).
7. Perception Secure Browser must be used for all high stake exams and may be used for medium stake exams.
8. The 'CAA Examination/Assessment Attendance Form' detailing the examination completed, PC used, student name, username, matriculation number must be completed and signed by the student. This form to be provided by the department and subsequently stored by the department.
9. Immediately after the examination, a copy of the results is taken by the LEU and transferred to a second secure system.
10. The password for the Novell Exam account is changed by LEU staff.

## **12. General Procedures of Good Practice for Assessments**

Students must be encouraged not to login to the server at exactly the same time. This can place a very high load on the server. Rather, students should begin the exam when they are ready within a time window of 2 to 5 minutes. Students should be made aware that no matter when they login, they will all have exactly the same timed exposure to the assessment. Following 'early' completion of an assessment according to such arrangements, students should stay in place until all students have completed the assessment. (Note: in accordance with normal exam procedures, students should not leave in the final 15 minutes in any case.)

Staff should have a complete printed list of expected participants and their login details (usernames and passwords). In degree exams the examinations office will provide this list in the form of student matriculation numbers to the LEU. In other assessments, the department will be responsible for providing it to the LEU, and in some cases it may be obtained from the VLE module.

The time limit allowed for the examination may need to be flexible to compensate for any delays (technical, emergency, etc). Additional time may be permitted for some students, e.g. dyslexic students, those using assistive technology (BS7988, s6.3). It is recommended that all candidates should receive a time warning, typically 10 minutes before an assessment is to finish.

IT suites should normally be booked for 30 minutes before an assessment and at least 15 minutes after the last assessment is scheduled to be finished. Staff may wish to provide a briefing to novice students either in the IT suite or in an alternative location.

An identical assessment may be run in sequence to make best use of facilities and staff availability. In this instance, candidates in the first session are not permitted to leave the examination room, until everyone has finished and the next group is move into the room while the initial group(s) leave(s). This may be achieved through different entrances. Late arrivals should be dealt with according to the standard examination procedures. In the case where one or more groups may have already sat the assessment, then late arrival should not be permitted.

Where appropriate, individual questions may be automatically shuffled in order for presentation to different students (to reduce opportunities for copying). Similarly, it may be appropriate to shuffle the order of answer options in some questions (i.e. multiple choice). Random selection of questions within a block may allow different students to receive similar, but different questions. This works well for numerical based assessments and questions with randomised numerical input can be constructed and presented within Perception.

The network and server systems in use must have been load tested at a level equal to, or greater than that expected during the assessment.

A timer will normally be shown on-screen to candidates. Candidates in an assessment should receive clear guidance when they are required to submit their final answers. This may take the form of an additional on-screen message.

Technical assistance should be available to candidates to ensure they can login and use any of the equipment correctly. Advice to candidates on how to navigate within the assessment will normally be permitted.

Staff should be well-prepared, confident and knowledgeable about procedures and should communicate freely with the students as required. In the event of a problem, the agreed procedures should be followed and the students kept fully informed of events.

### **13. Post-examination Procedures**

1. As soon as possible after a CAA assessment has finished (and certainly within 60 minutes), a copy of the results must be made and transferred to a second secure computer system
2. The assessment 'Post-Event Report Form' (copy attached) must be completed and forwarded to the LEU (this is to assist with the development of CAA procedures at the University)
3. The assessment results must be checked, forwarded to the examination office and should be published to the students as appropriate (the VLE may be used for this purpose)
4. Question responses should be analysed for the question quality.
  - a. How did people who did well in the exam do within this particular question?
  - b. Were the correct answer distracters used, appropriate?
  - c. Were any correct answers marked incorrect?
  - d. Was the question overly easy or difficult, beyond that expected?
5. Mechanisms of feedback to students should be considered.
  - a. Will they get access to their results online when they can see how they performed on individual questions?
  - b. The gradebook feature of Blackboard may be used to make individual marks available to the individual students.
  - c. Can students be shown the detailed result of the test if they consult a tutor?

### **14. Exam Irregularities and Grievance Procedures**

In the event of any examination irregularity or grievance relating to an assessment involving CAA, the Academic Secretary (Dr Ian Francis) must be informed and he will ensure appropriate procedures are followed (as is the case with other examinations).

Electronic logs of assessment details should be retained for a minimum of 90 days after any medium or high stakes assessment

Software used for medium or high stakes assessments must permit the interrogation of individual question answers and must allow human re-marking of questions if judged necessary.

## **15. Reliability**

It is recognised that no system is 100% reliable. However, for high stakes assessments the highest achievable standards are required. The central Perception server is backed up by another server. In the event of primary server failure, an LEU-administered recovery procedure should allow the entire assessment to be made available within approximately 15 minutes. In the event of a system failure at network level, examiners may be forced to cancel exams and retime the event. A backup system of paper copies may be considered for special circumstances, but ought to be generally unnecessary.

All students should be comfortable with the operation of the PC and the exam interface. General templates for exam design will be provided by the LEU and students should be familiar with these through experience obtained during formative exercises. The computer screens and chairs should be adjustable. Spare PCs must be available at a ratio of at least 1 per 15 students, with a minimum of two PCs.

Servers used must be of a high standard with uninterruptible power supplies and supplied through a maintained power supply. Where possible a second server should be available as a backup.

## **16. Security of Assessments (BS7988: s6.4.3, s15.3.2)**

For medium and high stake assessments students will be required to display their matriculation card and will complete the assessment using an account that requires their UoD computer username and matriculation number as password. If this is not available (for whatever reason) they will complete the assessment using one of the spare accounts provided by the LEU. Students should complete and sign a paper form (CAA Examination/Assessment Attendance Form, copy attached) that will be retained by the invigilators that will detail their name, account used, matriculation number, assessment completed, date, time, PC location and number.

For medium and high stake assessments, the assessment and results must be maintained in a secure environment. This will normally involve the use of secure usernames and passwords for all administrators with access to the server, restricted availability of the assessment, presentation of the assessment only through Perception Secure Browser.

The assessment server must be retained in a physically secure environment.

Assessment software and the PC setup should restrict unauthorised access to the internet throughout the assessment. This can be achieved through Perception Secure Browser.

Invigilation of exams should be carried out with due diligence. Invigilators should make unannounced movements throughout the PC suite to check screens and general candidate behaviour, being aware of possible paper material, mobile phones, etc (as is the case in any exam).

## **17 Procedures for Assessments utilising Online Submissions, ePortfolios and Discussions**

The field of e-Learning is rapidly developing, and the University has to achieve a balance of supporting innovation, while ensuring assessments are correctly secured and

managed. The four areas are presented below are recognised as developing, and lecturers should use this guidance provided, but also accept that changes and further recommendations may be made as the technology matures. A particular concern involves the ease of use of these technologies, which frequently mitigates against conventional systems for recording submission and receipt. In addition these systems are developing in complexity and the potential exists that students may submit work in the wrong location, or that lecturers may mark work from the wrong location.

### 1. Digital dropboxes / online submission.

Instructions provided to students for the delivery of material using the Blackboard or Questionmark digital drop boxes, or Blackboard Assignment Submission tools must be clearly made. The recommended tool is the Blackboard Assignment Submission system which can be activated by an instructor completing the following steps:

- a. etc
- b.
- c.

This has the advantage that files are individually uploaded by a student, but they are uniquely named and stored for bulk extraction by the module tutor. The Blackboard Content Management System also presents a secure and flexible system for the submission of documents.

When student course work is submitted online for summative assessment purposes, the students should receive an acknowledgement that their work has been received for assessment. The acknowledgement should be normally made immediately after the deadline has passed. This acknowledgement may be in the form of a personal email from the instructor. The email system within the My Dundee system may be used for this purpose allowing completed student participants to be selected from a list provided. Instructors could then "invert" this list and email all other students alerting them that their work had not been received.

### 2. Plagiarism detection tools and submission.

The JISC Plagiarism Detection Service provides a system which students can submit their work which is subsequently checked for plagiarism and both the work and a plagiarism report made available to the module instructor for assessment. From August 2005 this system is to be charged for and the University may or may not subscribe.

Guidelines for use are similar to those for general Online Submissions provided above that for summative assessments the students should receive a timely message that their work has been received by the instructor.

### 3. ePortfolio presentations and assessment.

Online portfolios offer a flexible and powerful tool for students to collate and reflect upon their University work and personal development. Some types of online portfolios may be prepared for formative and/or summative assessment. The Blackboard Portfolio tool is available for this purpose and is robust and secure. Technical assistance in the use of the Portfolio tool is available from the LEU. Students should receive clear guidance on the role of additional links and file assets within Portfolios. In particular, the ownership of linked resources should be clearly labeled to avoid issues of plagiarism.

Normal conventions established throughout this document should be adhered to when Online Portfolios are used for summative assessment. For instance:

- a. Student should be aware of what the assessment covers, how many marks are available and a general outline of how it will be marked.
- b. It must be clear to the students if the Portfolio is an individual or team-based activity
- c. Guidelines for submission date and method should be clearly presented (typically an the lecturer can be provided with read access to the Portfolio for assessment.)
- d. Once submission is made, the lecturer should acknowledge to each student that they have received and can access their portfolio.

#### 4. Assessment of postings to Discussion Boards/ Email/Online Activities

The ability to assess the contributory role of individual students to a synchronous or asynchronous interactive activity is recognised as a valid mechanism of assessment. There are published methods for assessing these contributions (xxx), and individual instructors may have their own valid approaches. Again conventions of good assessment practice should be followed and students should be broadly aware of the assessment criteria and the marks available.

### **18. Disability and Accessibility Support (BS7988, s5.1.4)**

The University has a legal duty under the Disability Discrimination Act 1995 to anticipate disability and access issues for students. Normally, these will have been considered as part of the provisions within IT suites. The CAA systems follow standard University procedures for good accessibility (ref. <http://www.somis.dundee.ac.uk/sec/academic/disability.htm>) and are compliant with assistive technology (e.g. screen readers).

Candidates with certain disabilities may be granted additional time to complete the assessment, and the facility to operate the assessment for a single person in an alternative room may be required. These candidates should be identified to the LEU.

Where appropriate, and when requested, a non-computer based assessment may be made available to a disabled candidate.

Some disabled students make use of computers as an alternative to handwriting. This activity is described in the document 'Examinations by Computer for Disabled Users at Dundee University' (produced by ITS) and is separate to the policies detailed here.

### **19. Plagiarism**

General guidelines for the interpretation, detection and punishment of plagiarism are provided at this reference: <http://www.somis.dundee.ac.uk/sec/academic/Plagiarism.htm>

The University of Dundee has joined the JISC Online Plagiarism Detection service. However usage of the system is governed by a set of additional guidelines that must be adhered to. Importantly students whose work is going to be submitted to the electronic detection service must have read and signed the detailed agreement form available from the LEU. Staff must also have signed another agreement form. This service is powerful and is likely to locate most occurrences of plagiarism using web-based material. However, there are a number of legal issues relating to intellectual property and storage

of submitted material that mean that all involved must understand their obligations. Procedures to be followed in the event of plagiarism being detected must be understood.

## **20. Copyright Guidance**

According to a UK Government website (<http://www.intellectual-property.gov.uk>, 6 December 2002) there is an accepted copyright exception for anything done for the purpose of setting or answering exam questions (except music). This website reference is relying on section 32 of the Copyright Designs and Patents Act 1988 which provides by subsection (3) that:

Copyright is not infringed by anything done for the purposes of an examination by way of setting the questions, communicating the questions to the candidates or answering the questions. (However, this is qualified by subsection (4) thus: subsection (3) does not extend to the making of a reprographic copy of a musical work for use by an examination candidate in performing the work.)

Accordingly, our present University interpretation is that copyright would not be infringed for items used within an examination, whether the copy is a photocopy, a digitised copy, etc. But it is very important indeed that the image is ONLY used for this examination purpose and NOT for any other, as infringement (and consequent liability) would then be involved (assuming there was no other permission/licence in place).

## **21. Health and Safety Procedures**

PCs, chairs and the general assessment environment must conform to standard safe environmental guidelines (clear screen, adjustable screen, adjustable chair, good lighting and ventilation). University central IT suites are designed to conform to BS 7179. (<http://www.dundee.ac.uk/itservices/regulations/ergpol.htm>).

Candidates should be advised to take 'micro-breaks' to relax their muscles and eyes i.e. stretch, look up at ceiling (BS 7988 s12.1.2).

If the assessment lasts for longer than 90 minutes, then there must be a provision for a break away from the PC. This may require supervision of candidates during the break, although facilities such as the provision of separate tests or blocks of questions may be used.

## **23. Guidelines for the Physical Room and PC Environment**

The normal University PC suites will normally be used for examinations. Care should be taken that the screens are not overlooked, and invigilators may wish to restrict access to certain PCs. The assessment administrator present is likely to require a PC to access the QMP administrator pages.

Two IT suites that are laid out in a particularly favourable manner for CAA are the Tower Level 2 suite (60 PCs) and Tower Basement C suite (95 PCs). The Tower basement suites have the advantage that the helpdesk is adjacent to them.

Bookings for IT suites are made via ITS.



**University of Dundee**  
**Computer Aided Assessment Pre-Event Registration Form**

Purpose – this form is designed to ensure the preparative work for the assessment is completed. Forms must be completed for every CAA assessment by the Academic staff member in charge and forwarded to CAA Administration, LEU, The Tower, at least two weeks before the assessment is scheduled to be run. Receipt of the form will be acknowledged and the academic staff member in charge should take action if acknowledgement is not received.

Module or class and sub-groupings:

Date:

Time of day:

Length of time for exam:

Academic in charge:

Computer suite(s) booked:

Where Summative, confirmation that Examinations Office (n.laker@dundee.ac.uk) have been informed of this exam and its timing

Number of students:

Number of PCs available (including one spare per 15 students with a minimum of two spare):

Preliminary testing procedures carried out by:

Preliminary testing report:

Special instructions (e.g. for dyslexic students) – please provide matriculation numbers



**University of Dundee**  
**Computer Aided Assessment Post-Event Report Form**

Purpose – This form is designed to enable UoD to gain experience of the issues associated with advanced usage of computer aided assessment. Forms should be completed after every CAA event for 2002 and 2003 by the academic staff member in charge of the assessment and returned to CAA Administration, LEU, The Tower, within one week of the assessment being completed.

Module or group of students:

Department:

Academic in charge:

Academic author:

Number of students:

Session dates and times:

Software used for assessment:

PC Suite used:

Server hardware utilised:

Central CAA team involved?

Brief description of event:

Outcome of event:

Specific requests for improvement/action:



**University of Dundee  
Computer Aided Assessment  
Examination / Assessment Attendance Form**

Assessment:

Module (or course):

Degree Program:

Date:  Start time:

Participant Family Name:  First Name:

Participant Matriculation number:

Username (used to access assessment):

PC number:

Room location:

Signed by the candidate:

**Instructions:**

Login to the computer as - Username: *[to be provided by LEU]*  
Password: *[to be provided by LEU]*

Login to Perception Secure Browser with your normal computer username and your matriculation number as password. Username: *e.g. axsmith*  
Password: *e.g. 012345678*

Form to be collected by the examination invigilators and returned to the Examination Office within 2 hours of the completion of the exam.

**Table 2. CAA Systems Available from CLT/ITS (February 2005)**

## A. Blackboard VLE (Enterprise Learning Systems version 6.2 from Nov. 2004).

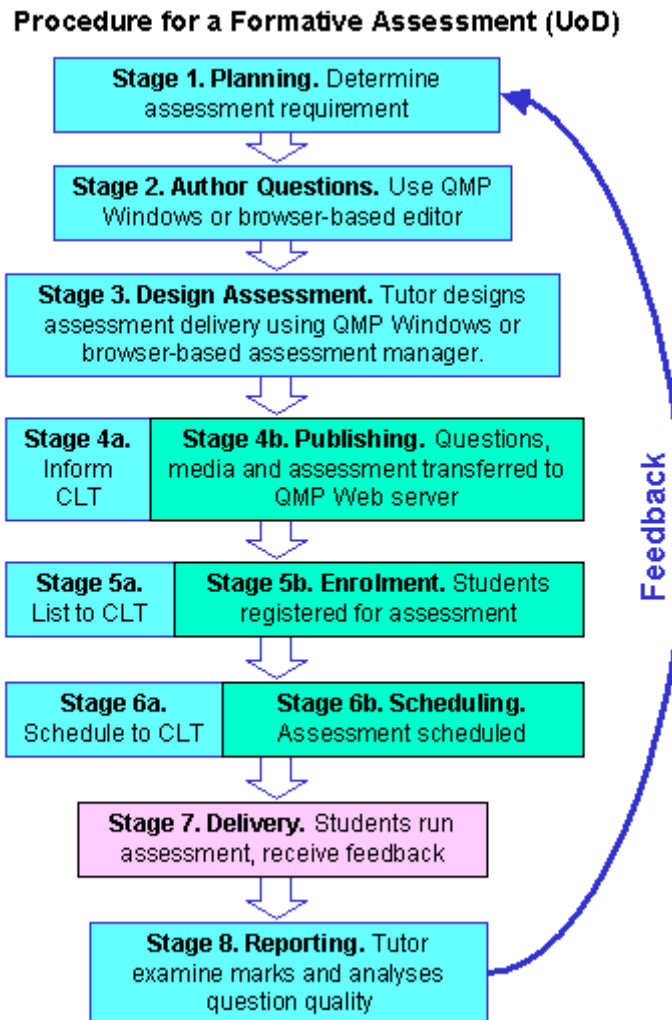
	Type	First line of support	Contract support
Application	Blackboard ELS	LEU	Blackboard
Database	Oracle 9i	ITS (AIS)	Oracle
Operating System	Sun/Solaris	ITS Unix team	Sun
Hardware	Unix 2*480Rs	ITS Unix team	Sun Gold support

## C. QuestionMark Perception Examination Server (CAA-01)

	Type	First line of support	Contract support
Application	QuestionMark Perception	LEU	None at present
Database	Oracle 9i Unix (Dumpty)	AIS	Oracle
Operating System	Windows 2000 Server	ITS server team	Microsoft
Hardware	Compaq ML370	ITS server team	Compaq guarantee

## D. QuestionMark Perception Formative Server (CAA-02)

	Type	First line of support	Contract support
Application	QuestionMark Perception	LEU	None at present
Database	Oracle 9i Unix (Dumpty)	AIS	Oracle
Operating System	Windows 2000 Server	ITS server team	Microsoft
Hardware	Compaq ML370 X 2	ITS server team	Compaq guarantee



**Figure 1. Diagrammatic summary of procedures involved in setting up a formative CAA assessment using the central University of Dundee (LEU) system.**

**Table 1. Range of Assessments and General Guidelines**

<b>Assessment classification</b>	<b>Typical activity</b>	<b>Levels of software &amp; hardware provision</b>	<b>Levels of staff support required</b>
Formative, open	Numerical exercise, free repeats. Good quality of feedback given. Progression expected, very important learning tool.	Software – May be under pilot environment Hardware – Single server permitted	Single academic author and if necessary LEU CAA staff may support
Low Stakes	In course work. May have open time period for submission. May include formative feedback	Recommended that supported systems are used May use Blackboard VLE May use QuestionMark Perception	Single academic author and if necessary LEU CAA staff may support
Medium Stakes	Class exams. Invigilated, and likely to run once only. Internal setting and marking. Academic staff member and students involved should have run a CAA formative or low stakes exam before this event.	Supported systems only May use Blackboard VLE Preference for QuestionMark Perception	Two academic staff available to support event Two LEU CAA staff scheduled to be on duty during assessment ITS server support teams notified of assessment event
High Stakes (1)	Degree exams counting toward final module marks in lower levels of degree. Academic staff member and students involved should have run a CAA formative or low stakes exam before this event.	May use QuestionMark Perception Software – Robust, proven software. Supported by service contract and likely to be full commercial product. At present QMP approved as assessment tool. Hardware – PCs, at least one PC spare for every 20 students and a minimum of 2 PCs spare. Server systems – The assessment should be available on two separate & accessible servers.	Two academic staff available to support event Two LEU CAA staff scheduled to be on duty during assessment ITS server support teams notified of assessment event
High Stakes (2)	Assessments with significant and direct contribution to honours degree classification, or similar professional qualification. Academic staff member and students involved should have run a CAA formative or low stakes exam before this event.	May use QuestionMark Perception Software – Robust, proven software. Supported by service contract and likely to be full commercial product. At present QMP approved as assessment tool. Hardware – PCs, at least one PC spare for every 20 students and a minimum of 2 PCs spare. Server systems – The assessment should be available on two separate & accessible servers.	Two academic staff available to support event Two LEU CAA staff scheduled to be on duty during assessment ITS server support teams notified of assessment event