

Getting started with computer-assisted assessment

What is Computer Assisted Assessment?

Computer-assisted assessment (CAA) refers to the use of computers in assessment. The term encompasses the use of computers to design, deliver, mark and analyse assignments or examinations. It also includes the collation and analysis of data gathered from optical mark readers (OMRs). CAA is often referred to as Computer-Based Assessment (CBA).

Objective testing

Objective questions are those where the judgement of the marker does not affect the assessment. Objective testing is largely, but not exclusively, used in CAA.

CAA can be used for...

Diagnostic testing – to determine prior knowledge

Self-assessment – to check one's understanding

Formative assessment – to assist in learning through feedback

Summative assessment – to undertake quantitative grading

Question types

There are many possible types of question but the main examples are...

Multiple choice questions (MCQs) are the traditional *choose one from a list* of possible answers. Special types of multiple choice questions include *Assertion-Reason*, *True/False* and *Yes/No* questions.

Multiple response questions (MRQs) are similar to MCQs, but involve the selection of more than one answer from a list.

Graphical hotspot questions involve selecting areas of the screen, by moving a marker to the required position, or, in the case of OMR questions, by filling in a block in a particular position linked to a graphic illustration on a specially designed paper answer sheet.

Text/Numerical questions involve the input of text or numbers at the keyboard.

Why consider using CAA?

- A wide range of topics can be tested very quickly.
- Can monitor the progress of students through more frequent assessments.
- Graphics and multimedia can widen the scope of questions.
- Computerised marking of tests saves time.
- Large groups can be assessed quickly.
- Diagnostic reports and analyses can be generated.
- Results can be automatically entered into administration systems.
- Students can monitor their own progress through self-assessment.
- Students acquire information technology (IT) skills.
- Formative assessments can be used to aid learning.
- Students can be provided with clues and marked accordingly.
- Adaptive testing can be used to match the test to the student's ability.
- Feedback is available to students during and after a test.

What are some of the limitations of CAA?

- Construction of good objective tests requires skill and practice and so is initially time-consuming.
- Testing of higher order skills is difficult.
- Possible to reinforce misconceptions.
- Implementation of a CAA system can be costly and time-consuming.
- Good system maintenance is required to avoid downtime during examinations.
- Difficult to reproduce *freedom* of paper examination - eg scanning questions to choose which to answer.
- Students require adequate IT skills and experience of the assessment type.
- Assessors and invigilators need training in assessment design, IT skills and examinations management.
- A high level of organisation is required across all parties involved in assessment
- Overuse may promote surface learning.
- Large bank of questions required to prevent banding and hence loss of discrimination.

Resources

General information

CAA Centre

No longer maintained but very useful.

<www.caacentre.ac.uk>

CAA Blueprint (by Joanna Bull and Colleen McKenna)

The original version of the Blueprint for Computer-assisted Assessment is no longer available from the CAA Centre (see above).

A new, updated edition has been published in September 2003 by RoutledgeFalmer.

<www.routledgefalmer.com>

ISBN: 978-0-415-28704-3

Products

Question Mark Computing Ltd - software for authoring tests.

<www.questionmark.com/uk/home.htm>

NetQuest TML - A project at Bristol University using Tutorial Markup Language to create searchable questionbanks for online delivery of tutorials and assessment.

<www.ilrt.bris.ac.uk/netquest>

Examples of CAA in the Physical Sciences

Journal of Chemistry Education QBank

<jchemed.chem.wisc.edu/JCEDLib/QBank/index.html>

The University of Sunderland has a number of **web-based quizzes** developed using Question Mark Perception.

<www.sunderland.ac.uk/~hs0dad/student.htm>

Wizard Test Maker - a database of geology, physics, biology and chemistry MCQs.

<www.eduware.com>

Graduate Record Examinations at Princeton University.

<www.ets.org> select *Tests* then *Subject Tests*.

Resources from the UK Physical Sciences Centre

Effective Practice in Objective Assessment Practice Guide.

<www.heacademy.ac.uk/assets/ps/documents/practice_guides/practice_guides/ps0072_effective_practice_in_objective_assessment_mar_2004.pdf>

Computer-aided Assessment in Chemistry, resources from development projects.

<www.heacademy.ac.uk/physsci/resources/downloads>

The Physical Sciences Question Bank

A database of physical science questions which can be exported in different formats for use in a variety of assessment systems, such as Blackboard or Questionmark Perception.

<www.heacademy.ac.uk/physsci/home/projects/jisc_del/questionbank>

