

## The formative-summative interface: strategic incorporation of computer-based assessment

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Through a 3-year grant from the Higher Education Funding Council (England) we have established a consortium of 14 UK higher education institutions with common interests in the area of computer-based assessment (CBA), collectively forming the OnLine Assessment and Feedback (OLAAF) project. Our primary interest lies in exploring, developing, and evaluating strategies for the targeted use of CBA to support student learning, particularly (but not exclusively) in university-level biological sciences.

Our philosophy is based on the premise that assessment can motivate student learning [1] and is congruent with the '11 conditions under which assessment supports student learning' [2]. We see CBA as but one tool in the assessment arsenal, a view predicated on the assertion that only a thoughtfully integrated assessment *regime* will produce 'assessment for learning'. CBAs targeted to address knowledge and concepts that underpin the understanding required for application to *new tasks* should "feed-forward", supporting additional learning in subsequent activities—even those that later will be assessed by other methods. Notably, well-designed CBAs targeting knowledge, tasks and concepts underlying *process* require relatively few test items (not large test banks!) to detect critical misconceptions that may impede learning. The flexible delivery afforded by CBA, the rapidity of feedback provision, and the possibility of automation give CBA distinct advantages over other forms of assessment in serving this formative/diagnostic role.

Exemplifying our philosophy is a first year module, *Molecular Cell Biology*. Frequent CBAs enforce the pace of study, and are targeted to support learning of fundamentals necessary for later work. Some of this is assessed by other means (e.g. a written laboratory report and a practical test requiring interpretation of novel data), allowing triangulation of outcomes from different forms of assessment. Summative CBAs take on a formative role: after completion, tests are available online for practice and revision. A previous report documented some of the benefits of these approaches, including the support they evidently provide for students whose first language is not English [3]. The design of another module, *Field Biology*, is informed by the same philosophy, but uses a different distribution model for the CBAs (via CD), as it is taught in a 'semi-distance' mode. Presently, our evaluation strategy is to monitor student attitudes and behaviours using validated instruments (including the Assessment Experience Questionnaire) [2]. To minimise the contaminating effects of novelty, the evaluation instruments do not directly address CBA, but encourage students to reflect on the utility of the overall assessment regime.

This paper will report the findings from our latest evaluations. In addition, we will report on the application of this approach at University of Plymouth, where CBAs are being developed to act as an "adjunct tutor" in a course employing problem-based learning.

1. Gibbs, G. (1999) In: Assessment Matters in Higher Education (eds. S. Brown & A. Glasner). SRHE/OU Press.
2. Brown E., Gibbs G. & Glover C. (2003) <http://bio.ltsn.ac.uk/journal/vol2/index.htm>
3. Baggott G.K. & Rayne R.C. (2001) In: Proceedings of the 5<sup>th</sup> International CAA Conference (eds. M. Danson & C. Eabry), pp. 9-20.

**Accepted and presented at the SECOND BIENNIAL JOINT NORTHUMBRIA/EARLI SIG ASSESSMENT CONFERENCE, Bergen, Norway. 23-25 June 2004.**

This work has been carried out under the auspices of the OnLine Assessment and Feedback (OLAAF) project. OLAAF is supported by the Higher Education Funding Council of England (HEFCE) under the Fund for Development of Teaching and Learning (FDTL4) and by grants from the Birkbeck College Development Fund.