

Integrative assessment

Balancing *assessment of* and
assessment for learning

Guide no 2

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Preface

The approach to quality and standards in higher education (HE) in Scotland is enhancement-led and learner-centred. It was developed through a partnership of the Scottish Funding Council (SFC), Universities Scotland, the National Union of Students in Scotland (NUS Scotland) and the Quality Assurance Agency for Higher Education (QAA) Scotland. The Higher Education Academy has also joined that partnership. The Enhancement Themes are a key element of a five-part framework which has been designed to provide an integrated approach to quality assurance and enhancement. The Enhancement Themes support learners and staff at all levels in enhancing HE in Scotland; they draw on developing innovative practice within the UK and internationally.

The five elements of the framework are:

- a comprehensive programme of subject-level reviews undertaken by higher education institutions (HEIs) themselves; guidance on internal reviews is published by SFC (www.sfc.ac.uk)
- enhancement-led institutional review (ELIR), run by QAA Scotland (www.qaa.ac.uk/reviews/ELIR)
- improved forms of public information about quality; guidance on the information to be published by HEIs is provided by SFC (www.sfc.ac.uk)
- a greater voice for students in institutional quality systems, supported by a national development service - student participation in quality scotland (sparqs) (www.sparqs.org.uk)
- a national programme of Enhancement Themes aimed at developing and sharing good practice to enhance the student learning experience, facilitated by QAA Scotland (www.enhancementthemes.ac.uk).

The topics for the Enhancement Themes are identified through consultation with the sector and implemented by steering committees whose members are drawn from the sector and the student body. The steering committees have the task of establishing a programme of development activities which draw on national and international good practice. Publications emerging from each Theme are intended to provide important reference points for HEIs in the ongoing strategic enhancement of their teaching and learning provision. Full details of each Theme, its steering committee, the range of research and development activities and the outcomes are published on the Enhancement Themes website (www.enhancementthemes.ac.uk).

To further support the implementation and embedding of a quality enhancement culture within the sector - including taking forward the outcomes of the Enhancement Themes - an overarching committee, the Scottish Higher Education Enhancement Committee (SHEEC), chaired by Professor Kenneth Miller, Vice-Principal, University of Strathclyde has the important dual role of supporting the overall approach of the Enhancement Themes, including the five-year rolling plan, and institutional enhancement strategies and management of quality. SHEEC, working with the individual topic-based Enhancement Themes' steering committees, will continue to provide a powerful vehicle for progressing the enhancement-led approach to quality and standards in Scottish HE.



Norman Sharp
Director, QAA Scotland

Balancing assessment *of* and assessment *for* learning

Enhancement Themes Guides to Integrative Assessment, no 2

This Guide discusses ways of striking an optimal balance between the twin central functions of assessment, ie to evaluate and certify students' performance or achievement, and to assist students in fulfilling their fullest potential as learners. Balancing assessment *of* and assessment *for* learning well, it is argued, is a key aspect of an **integrative** approach to enhancing assessment, ie one which brings the many and various strands of assessment together in a coherent way that addresses the desired goals and takes account of opportunities and constraints in the setting concerned.

The other three Guides in the **Integrative Assessment** series focus on *Blending assignments and assessments for high-quality learning*, *Managing assessment practices and procedures*, and *Monitoring students' experiences of assessment*. All four Guides can be freely downloaded from the Enhancement Themes website: www.enhancementthemes.ac.uk/themes/IntegrativeAssessment

Introduction

Assessment, as David Boud (2000) has observed, has to do 'double duty' - and on many fronts. It is called upon to be rigorous but not exclusive, to be authentic yet reliable, to be exacting while also being fair and equitable, to adhere to long-established standards but to reflect and adapt to contemporary needs, and at one and the same time to accommodate the expectations not only of academics, their students and the university in which both are engaged, but also of government and government bodies - Scottish, UK and European - employers, professional and accrediting organisations, subject and disciplinary associations, parents and the public at large.

Of the various tall orders it confronts, however, probably the most challenging is to mediate between the needs and requirements of assessment *of* learning (often called summative assessment), and assessment *for* learning (or formative assessment). Striking an appropriate balance between these uneasy twins is especially tricky because what aids the former may be deleterious to the latter, and vice versa. Some imbalances arise because assessment *for* and *of* learning are too weakly interconnected. One frequently observed side-effect is **low-energy feedback**: the scales have tipped towards assessment of learning, with too great an emphasis on procedures for end-of-course grading and certifying of students' performance, and a concomitant undervaluing of, or under-investment in, feedback on the part of staff. There may well be some opportunities for students to gain practice in tasks on which they will later be formally assessed, but feedback is too sparse, too low in nutrients, or comes too late, to benefit the quality of their learning significantly (see for example Higgins et al 2002; Yorke 2001; Gibbs 2006).

Another side-effect can flow from a **disjunction** between the aspirations and intentions embodied in a course design and what is actually rewarded in end-of-course assessments (Rowntree 1987; Gibbs 1999). Thus, for instance, while everyday learning-teaching activities might involve students gaining expertise in working collaboratively in teams, tracking down relevant research findings, and giving oral presentations, these advances in their learning are unlikely to be consolidated if grades are calculated predominantly on performance in unseen exams in which none of these newly honed capabilities can be deployed. No less critically, students may find themselves confronting summative, end-of-course assessment in a particular form (for instance, short-answer or multiple-choice questions) that had featured seldom if at all in their day-to-day learning in that course unit, and on which there would be little or no post-exam feedback.

But imbalances can also occur where assessment *for* and *of* learning have been too tightly, rather than too loosely, interwoven. This too can have unwelcome, if unintended consequences. One is a fractionalisation of assessment, which arises from the conviction that students will neglect, or put too little effort into, assigned work unless it carries marks. Over time, as marks get attached to an ever-widening pool of study activities, the weighting of any one task becomes smaller and smaller. Since everything seems to count, everything matters a little, but little matters a lot. Staff can find themselves with an unmanageable marking load, administrators have to run systems that count innumerable piles of small change, and students may feel pressed to turn out and turn in the latest of their set work requirements, rather than necessarily doing it well or trying to learn from it.

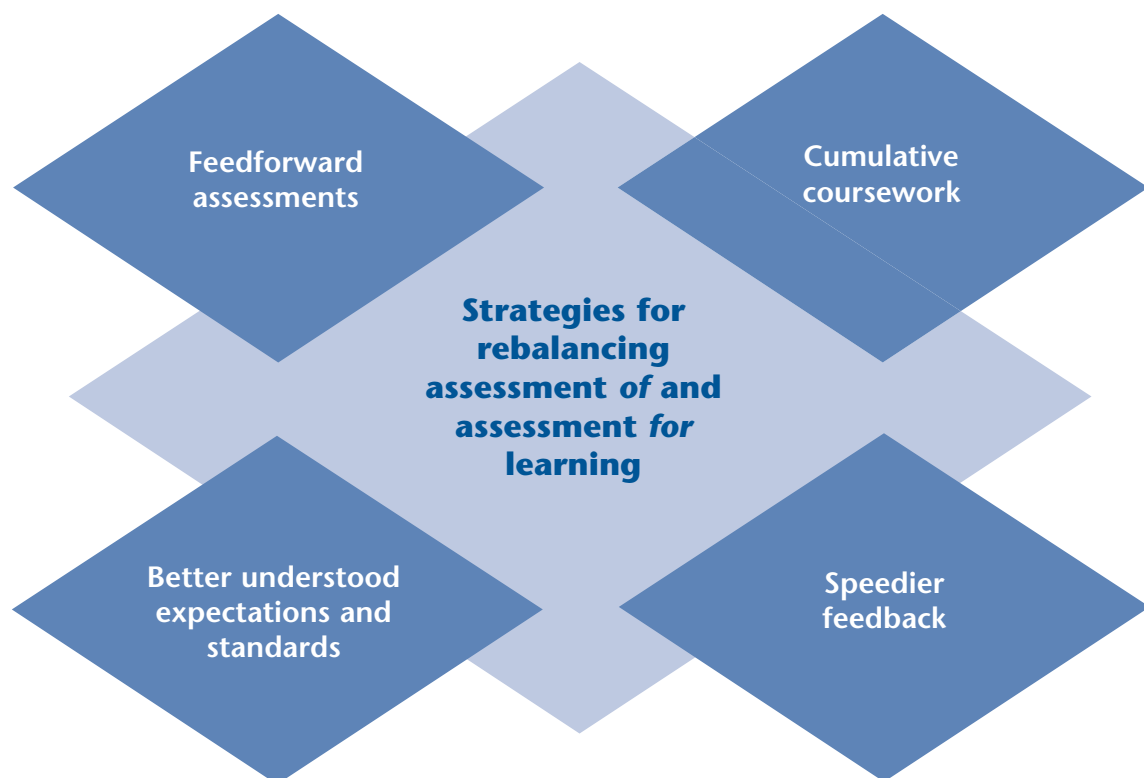
A second unintended consequence of over-tautness between assessment *for* and *of* learning can be **premature testing**, where students are graded on relatively unfamiliar tasks before they have had an opportunity to gain sufficient practice and confidence in doing them (Hounsell et al 2006; QAA 2006). This may occur particularly in modularised and semesterised curricula where course units run over a shorter span of weeks than hitherto, with the consequent risk of shrinking opportunities for students to try their hand at an unfamiliar task, learn from feedback on it, and practise it afresh, before being formally assessed on it (see, for example, Gibbs 2006). It can also arise where assumptions are made about what kinds of assignments students will have experienced and learnt to do well at in previous course units, in a situation where the sheer range of course combinations students can opt for would make any such assumption precarious.

Thirdly, there is **loss of focus**, which can also result when the twin functions of assessment are too tightly interlaced, as may occur in peer assessment for which there has been insufficient groundwork, or where what is being asked of students is too daunting. For example, if students experience great discomfort at being put in the position of having to mark - and possibly **mark down** - their fellow students, these feelings of unease can overwhelm whatever potential the activity might offer for the students to derive greater insight into what represents good-quality work in the subject. A similar consequence can arise where students are uncertain or confused about what criteria to apply, or about how to apply the criteria provided (eg in assessing the individual contributions of their peers to a group project).

The present guide is concerned with how to avoid - or at least minimise - imbalances such as these, to meet the wider goal of integrative assessment. This is particularly necessary since the risks of imbalances arising between assessment *of* and *for* learning seem to have increased in recent years, and usually to the detriment of assessment *for* learning (see, for example, Knight 2006; Yorke 2001). A variety of reasons can be adduced: not only modularisation but squeezed resources, growing student diversity, and anxieties about internet-fuelled plagiarism and cheating have all been said to contribute. Yet it also needs to be acknowledged that there have been other striking developments which can help to provide a counterweight, and from three broad sources. First, the contemporary revolution in information and communications technologies (ICT) has brought in its wake some new possibilities which can enhance assessment for learning while also benefiting the summative outcomes achieved by students. Secondly, new research into educational assessment, combined with efforts to synthesise and reappraise a large and diffuse body of research findings, has yielded compelling evidence of gains in the quality of learning associated with well-designed formative assessment (see, for example, Black and Wiliam 1998; Black et al 2003; Nicol and Macfarlane-Dick 2006). Thirdly, initiatives by university teachers to rethink and recraft how they go about assessing their students have generated new ways of interweaving assessment for and assessment of learning.

This Guide aims to survey these new possibilities. To that end, a very wide-ranging search has been undertaken of the literature relevant to rebalancing assessment; samples of students in two Scottish higher education institutions have been interviewed; and the Integrative Assessment Enhancement Theme network of contacts and advisers has been consulted to track down and document examples from within as well as outwith the Scottish higher education sector. The wealth of initiatives the guide draws upon runs across the full subject range and benefits from similar efforts in Australia and the Far East (James et al 2002; Carless et al 2006). The four strategies identified are summarised in Figure 1.

Figure 1 Strategies for rebalancing assessment *of* and assessment *for* learning



Strategies for rebalancing assessment

Feedforward assessments

This strategy aims to improve the balance between assessment *for* and assessment *of* learning by interlinking the twin functions more directly, yet not confounding them. In traditional approaches to assessment, coursework assignments are often relatively self-contained, with feedback in the form of a mark and comments following on later. Indeed, by the time the work is returned to students, it can seem to them as though the feedback has passed its use-by date, with little or no relevance to the subsequent work they have now become engaged in. Where the assignment mark formally counts towards their final grade, feedback can seem 'beside the point', since no amount of diligent attention to the tutor's comments will alter the mark given.

What this particular strategy seeks to do is to convert feedback into feedforward, by interconnecting assignment and assessment tasks and creating a recursive cycle, or 'feedback loop' (QAA 2006), in which feedback comments on one task, draft or set of questions can be fed directly into a subsequent task or draft, or will aid preparation for an exam. As the case examples below illustrate, students therefore have the opportunity for 'low-stakes' practice on assessable work, and to benefit directly from the feedback in a way that can also contribute to a subsequent formal mark or grade.

A lecturer at Napier University has used Peer Feedback Marking (PFM) in her three trials of peer assessment with biology and psychology undergraduates. First, criteria were agreed between students and teachers; secondly, peer reviews took place after the first draft according to previously agreed criteria; finally, a reflective statement on their experiences of PFM was submitted by each student. Most students rated the scheme as useful, and identified a variety of benefits.

Falchikov N (2002) 'Unpacking' peer assessment, in Schwartz P and Webb G (eds) *Assessment: Case Studies, Experience and Practice from Higher Education*, London: Kogan Page, pp 70-135

Cindy McCreery has reported her attempts to refashion history coursework at Sydney University to help first-year students to improve their essay-writing abilities. Two separate assignments, an analysis of a journal article and a long essay, were replaced with a three-stage essay assignment comprising a draft essay plan, a bibliography and final version of the essay, interleaved with group discussion. To aid this process, tutorials were refocused and students joined a tutorial group for the particular essay topic they had chosen.

McCreery C (2005) Less is more: rethinking assessment in a first-year history unit, *Synergy*, no 22 www.itl.usyd.edu.au/synergy/article.cfm?articleID=265 (last accessed 18 December 2006)

In the Hong Kong Institute of Education, a single substantial assignment was turned into six more-manageable, small assignments, forming a cycle that followed the phases learning/assessing/relearning. The initiative proved beneficial in scaffolding students' understanding and enabling them to consolidate what they had learned.

Yu F Y Y (2006) Staged assessment and feedback, in Carless D et al (eds) *How Assessment Supports Learning: Learning-Oriented Assessment in Action*, Section 3.37, Hong Kong: Hong Kong University Press www.hkupress.org/asp/bookinfo.asp?PD_NUM=9622098231 (last accessed 18 December 2006)

A progressive process for writing an assigned research paper has been introduced in the Sociology and Criminology Department at St Mary's University in Canada. It follows the stages first draft/feedback on first draft/final draft/marking. By creating a feedback loop, students have more time to reflect on and learn from constructive feedback within the context of their end-of-term assignments. In consequence, there has been a dramatic reduction in unintentional student plagiarism, while the pressure has lessened to produce work at the last minute.

Smythe D M (2006) Research paper assignments that prevent plagiarism, in Carless D et al (eds) *How Assessment Supports Learning: Learning-Oriented Assessment in Action*, Section 3.1, Hong Kong: Hong Kong University Press
www.hkupress.org/asp/bookinfo.asp?PD_NUM=9622098231 (last accessed 18 December 2006)

At the University of Sydney, a writing learning cycle was developed in first-year biology to emphasise the links between communicating through writing and understanding the biological concepts. The stages of the writing cycle involved: planning and preparation, in which students worked in groups to review examples of writing; individual writing up by students; a formative feedback from the teacher; and lastly, revision and submission for the final report for summative assessment. An online seminar was also used to support the process of writing.

Peat M, Franklin S and Taylor C (2005) Application of ICT to provide feedback to support learning in first-year science, in McLoughlin C and Taji A (eds) *Teaching in the Sciences: Learner-Centered Approaches*, Binghampton, New York: Food Products Press/Howarth Press, pp 157-175

In a psychology course at the University of St Andrews, the feedback given to students on an assignment was specifically designed to also help them to prepare for a final exam that included similarly styled questions. Furthermore, feedback was also available on their exam answers, so that that they could benefit from it in undertaking future modules.

Oram M (2003) Feedback on Essays and Examinations, *Enhancing Student Learning through Effective Formative Feedback: Student Enhanced Learning through Effective Feedback Project* online case study
www.heacademy.ac.uk/assessment/ASS025D_SENLEF_FeedbackonEssays.doc (last accessed 18 December 2006)

A series of formative assessment activities have been developed for a virtual learning environment in the School of Humanities at the University of Northumbria to create a structured space for students to practise and prepare for assessment independently before they are asked to submit similar assessed work. The virtual learning environment bridges the gap between learning in seminars and students' work on assessments in their own time.

Holland S and Arrowsmith A (2000) Practising Theory On-Line, *Assessment and the Expanded Text Project* online case study
www.english.heacademy.ac.uk/archive/publications/casestudies/practising.pdf (last accessed 18 December 2006)

In the Department of Nursing and Midwifery at Bell College, students were given opportunities to sit a sequence of formative tests to prepare them for both the content and format of exam situations. The rationale was to increase students' confidence as well as preparedness for exams through ongoing practice during term-time.

Dick J (1998) Combining Formative and Summative Assessment on a Continuous Basis, *Enhancing Student Learning through Effective Formative Feedback: Student Enhanced Learning through Effective Feedback Project* online case study
www.heacademy.ac.uk/assessment/ASS012D_SENLEF_CombiningFormativeSummative.doc (last accessed 18 December 2006)

Cumulative coursework

In this strategy, a better balance between assessment *for* and assessment *of* learning is achieved by introducing a form of coursework that is **cumulative**. In other words, rather than being prepared and submitted on a single occasion - as is typically the case with traditional essays and reports - the assignment evolves over the span of a semester or longer, and can therefore reflect and benefit from the student's evolving grasp of the subject matter and from ongoing feedback from tutors, fellow students or placement supervisors and work colleagues. Cumulative coursework of this kind can be in paper or electronic mode, and may take the form of a portfolio, log or workbook. Portfolios, which also have the advantage of being able to incorporate written and other materials of a wide variety of kinds, are probably the most widely found type of cumulative coursework, and there is a growing literature on their use for a range of purposes (see, for example, Young 1999; Klenowski 2002; Davies and LeMahieu 2003).

At the University of Newcastle, ePortfolios were piloted with undergraduate medical students during the 2003-04 academic year. The ePortfolios were integrated with online curricula and virtual learning environments to provide evidence on the achievement of learning outcomes, and to give the learner a personalised view of their accumulating assessment results.

Cotterill S, Bradley P and Hammond G (2006) EPortfolios: supporting assessment in complex educational environments, in Bryan C and Clegg K (eds) *Innovative Assessment in Higher Education*, London and New York: Routledge, pp 191-199

At Griffith University in Queensland, an online course portfolio was devised as the main assessment tool for the Graduate Certificate in Flexible Learning. This dynamic and cumulative form of assessment could be easily modified, built upon and restructured over the life of the course, and even beyond, and could make peer review easy to implement.

Bowie C, Joughin G, Taylor P, Young B and Zimitat C (2002) Portfolios from cyberia, in Schwartz P and Webb G (eds) *Assessment: Case Studies, Experience and Practice from Higher Education*, London: Kogan Page, pp 54-61

At the end of the semester, students following a course in Translation and Interpretation at the University of Hong Kong are required to submit a portfolio. The portfolio task consists of seven types of documents, which touch upon the main issues covered in the module, as evidence of their learning on the course. It provides students with a clearly structured framework for studying, helping them to become aware of what they know and where their weaknesses might lie as well as prompting them to work steadily.

Mak W H (2006) Using portfolio assessment to promote autonomous learning, in Carless D et al (eds) *How Assessment Supports Learning: Learning-Oriented Assessment in Action*, Section 3.27, Hong Kong: Hong Kong University Press
www.hkupress.org/asp/bookinfo.asp?PD_NUM=9622098231 (last accessed 18 December 2006)

A lecturer in the Department of Science and Technology Studies at University College London invited students in a final-year undergraduate course to carry out an independent research project under a shared theme. For the assessment, students wrote an essay, submitted all of their research records and materials, and sat an exam which tested their understanding of one another's work. The following year's cohort began their project with the previous cohort's research documentation and outputs.

Chang H (2005) Turning an undergraduate class into a professional research community, *Teaching in Higher Education*, 10.3, pp 387-394

At the University of Strathclyde, postgraduate students following the Energy Systems and the Environment programme in the Engineering Faculty were asked to present a group project as a web page in the form of a logbook. The project and the logbook then became a visible record of what students had done, what they had achieved and how they had achieved their outcomes. As a result, the students were able to present their work in a much more professional manner.

Stefani L (2002) Assessing reflection or supporting learning? in Schwartz P and Webb G (eds) *Assessment: Case Studies, Experience and Practice from Higher Education*, London: Kogan Page, pp 40-46

Better understood expectations and standards

It is increasingly recognised that if students are to attain high standards, it is essential that they develop a good grasp of what counts as high-quality work in a given subject and at a given level (Sadler 1989, 1998). But it is also becoming apparent that making explicit to students the criteria used to assess their progress and performance, valuable though that is, is not in itself enough to help students to come to hold 'a concept of quality roughly similar to that held by the teacher' (Sadler 1989).

An important development in rebalancing assessment has therefore been the emergence of initiatives to close this gap by more interactive briefing and training of students about assessment expectations and requirements. One prominent focus has been dialogue about assessment, but there have also been attempts to involve students in generating their own criteria for assessing an unfamiliar task, and to offer them training in evaluating their own and others' work.

A rather different path towards the same goal involves students in closer engagement with the work of their fellow students, seeking to nurture the evaluative 'connoisseurship' or acumen that is expected of experienced assessors and which comes not just from familiarity with marking criteria alone, but from first-hand experience in applying those criteria to a varied range of submitted assignments or assessments and arriving at considered judgements (Eraut 1995; Morgan 2004; Claxton 1995). One possibility is through discussion with students that is focused around 'exemplars' - that is, examples of very good and excellent assignments completed by past students. As Sadler himself observes, reflecting on the striking impact of such an experience on two of his students, 'exemplars convey messages that nothing else can' (Sadler 2002). Another possibility is through peer feedback, where students have opportunities to evaluate and comment on drafts or completed work by their fellow students (see, for example, Liu and Carless 2006; QAA 2006). Besides developing students' appreciation of what constitutes high standards in the subject on one or more assessment criteria, peer feedback has the further incidental benefit of enlarging the volume or range of comment that students might expect to receive on their work.

A workshop was developed for psychology students at three British universities (Liverpool, London Metropolitan and Aston) to help them to understand core assessment criteria. The workshop programme touched upon assessment criteria, assessment questions and structure, ways to develop an argument, use of evidence and evaluation, and approaches to applying criteria to one's own work. Norton L, Harrington K, Elander J, Sinfield S, Lusher J, Reddy P, Aiyegbayo O and Pitt E (2005) Supporting students to improve their essay writing through assessment criteria-focused workshops, in Rust C (ed) *Diversity and Inclusivity*, Improving Student Learning Series, Oxford: Oxford Centre for Staff and Learning Development, pp 159-174

At Oxford Brookes University, an attempt was made to develop business students' understanding of assessment criteria and the assessment process through a structured intervention involving both tacit and explicit knowledge transfer methods. The tacit component entailed information that can be transferred through the use of exemplars and opportunities for practice and dialogue between staff and students, while the explicit component consisted of standards, levels and criteria for assessment in written format.

Rust C, Price M and O'Donovan B (2003) Improving students' learning by developing their understanding of assessment criteria and processes, *Assessment and Evaluation in Higher Education*, 28.2, pp 147-164

Three cases from Hong Kong Institute of Education covered the areas of fashion design, art education and primary teacher education. Each encouraged peer learning by using ICT for peer assessment and peer feedback.

Keppell M, Au E, Ma A and Chan C (2006) Peer learning and learning-oriented assessment in technology-enhanced environments, *Assessment and Evaluation in Higher Education*, 31.4, pp 453-464

In preparing a poster presentation, biology students at Staffordshire University were asked to generate marking criteria in discussion with their tutors, and subsequently to apply these criteria in completing their own posters and in providing written feedback on the posters prepared by their classmates. The task was designed to enhance students' ability to implement marking criteria in self and peer assessment, and tutors marked the posters only of those students with whom they had discussed marking criteria.

Orsmond P, Merry S and Reiling K (2002) The use of exemplars and formative feedback when using student-derived marking criteria in peer and self-assessment, *Assessment and Evaluation in Higher Education*, 27.4, pp 309- 323

Orsmond P, Merry S and Callaghan A (2004) Implementation of a formative assessment model incorporating peer and self-assessment, *Innovations in Education and Teaching International*, 41.3, pp 273-290

Sport studies students at St Martin's College were involved in an exercise where they used tutor-generated assessment criteria to evaluate their peers' work, but were also assessed by their tutors on the marking and feedback comments they had proposed for their fellow students. The initiative helped to promote more serious engagement with peer assessment.

Bloxham S and West A (2004) Understanding the rules of the game: marking peer assessment as a medium for developing students' conceptions of assessment, *Assessment and Evaluation in Higher Education*, 29.6, pp 721-733

First-year law students at the University of Hong Kong learn and practise how to apply a set of criteria for effective writing to their own and their classmates' assignments. Developed by the University's English Centre, the strategy was applied in a course which teaches the students how to draft legal problem answers, and so develops their skills in shaping and improving their own writing.

Bruce N (2006) Training students to peer and self-evaluate their writing, in Carless D et al (eds) *How Assessment Supports Learning: Learning-Oriented Assessment in Action*, Section 3.24, Hong Kong: Hong Kong University Press

www.hkupress.org/asp/bookinfo.asp?PD_NUM=9622098231 (last accessed 18 December 2006)

In the School of Bioscience at Queen's University Belfast, a survey revealed marked differences between students and staff in how undergraduate honours-level project work was perceived and understood. Establishing a climate of greater and more open dialogue was therefore seen as essential, and a one-day induction programme for students aimed to meet this need.

Stefani L, Tariq V-N, Heylings D J A and Butcher A C (1997) A comparison of tutor and student conceptions of undergraduate research project work, *Assessment and Evaluation in Higher Education*, 22.3, pp 271-288

In the part-time MA in Management Learning and Leadership at Lancaster University, course participants work in 'learning sets' (four to six learners plus a tutor) face to face or online. Assessment is highly participative: members of a set, in consultation with their tutor, advise one another on their assignments, read one another's completed work, and take part in a feedback and marking meeting for each other's assignments.

Hodgson V (2006) Participative assessment and the learners' experience, in Ashwin P (ed), *Changing Higher Education: The development of learning and teaching*, London: Routledge, pp 33-46 [see especially pp 39-41]

Speedier feedback

A fourth strategy for rebalancing assessment aims to increase the impact of feedback by speeding up its provision to and immediacy for students, and so more directly aid their subsequent performance in summative assessments. Such a strategy capitalises on the vital role that feedback has to play both in accelerating learning and in optimising the quality of what is learned, and thereby raising collective as well as individual attainment (Hounsell, in press). It is most commonly found in larger courses where multiple-choice or similar types of questions are a significant component in the overall assessment mix. In such instances, it typically takes the form of an online computerised resource that enables students both to review and test out their understanding, and to get constructive feedback on those items which they answer incorrectly. However, the last two case examples below (of initiatives at Hong Kong and Keele Universities) represent 'low-tech' forms of speedier feedback.

Students in a large first-year biology class at the University of Sydney were offered a variety of computer-based assessment opportunities. Within these programmes students could receive fast and direct feedback prior to summative testing.

Peat M and Franklin S (2002) Supporting student learning: the use of computer-based formative assessment modules, *British Journal of Educational Technology*, 33.5, pp 515-523

The Immediate Feedback Assessment Technique is a commercially available answer format for multiple-choice testing that can be used easily and conveniently with large classes. It was implemented in three psychology courses at Brock University in Canada, and received very positive reactions from the students.

DiBattista D, Mitterer J O and Gosse L (2004) Acceptance by undergraduates of the Immediate Feedback Assessment Technique for multiple-choice testing, *Teaching in Higher Education*, 9.1, pp 17-28

At the University of Bath, computer-aided assessment was used in first-year chemistry to offer students online feedback on test questions. Most students who had made use of formative feedback prior to the end-of-unit exam felt that their overall assessment performance had improved.

Price G (2006) Computer-aided assessment and formative feedback - can we enhance students' early experience at university? *Wavelength, Newsletter of the Higher Education Academy Physical Science Centre*, 2.1, 2006

www.physsci.heacademy.ac.uk/Publications/Newsletter/news2w1d.pdf (last accessed 18 December 2006)

At the Open University, a web-based assessment strategy was developed for the Maths for Science course to provide students with individualised and instantaneous feedback. Consequently, no hand-marking was required, and a 'tutor at their elbow' could be simulated for the students.

Ross S, Jordan S and Butcher P (2006) Online instantaneous and targeted feedback for remote learners, in Bryan C and Clegg K (eds) *Innovative Assessment in Higher Education*, London and New York: Routledge, pp 123-131

A book publisher's system, Mastering Physics (MP), was implemented in the School of Physics at the University of Sydney to deliver assignment/tutorial questions to students. The MP offers immediate feedback and marking to students, and reduces copying of assignments since all students must complete the assignment under their own login.

O'Byrne J (2006) The tutorial benefits of on-line assignments: Mastering Physics in first-year physics at the University of Sydney (A case study provided to the Integrative Enhancement Assessment Theme by the author)

Engineering and mathematics students at the University of Western Australia have the opportunity not only to tackle a long series of problems online during the semester, but also to obtain precise and detailed feedback about the errors in their answers. In addition, the software developed provides an integral 'forum' for students to ask questions and obtain answers from their tutors online. These answers are then seen by all students.

Scott N and Judd K (2002) Efficient continuous online assessment of large classes: continuous diagnostic assessment in engineering & mathematics subjects, *Assessing learning in Australian universities* online case

www.cshe.unimelb.edu.au/assessinglearning/04/case13.html (last accessed 18 December 2006)

At Oxford Brookes University, a weekly web-based multiple-choice question (MCQ) test was used in Introductory Chemistry to help the students to practise and get prepared for the final summative exam. The strategy was judged to reduce staff workload and increase student learning by providing instant feedback.

Grebenik P and Rust C (2002) IT to the rescue, in Schwartz P and Webb G (eds) *Assessment: Case Studies, Experience and Practice from Higher Education*, London: Kogan Page, pp 18-23

Law students at the University of Hong Kong are required to submit a solution to a hypothetical problem. Later that day, or as soon as possible afterwards, the same problem is discussed in a tutor-led discussion. The tutor then places an 'ideal' solution based on the discussion on the course website. This simple technique aims to mitigate the effects of lag-time by engaging students in a review of the coursework on a same-day or near same-day basis. Although there is no formal mark or individual written feedback (to minimise the effects on staff workloads), students can identify any errors and participate in the critical discussion leading to the ideal solution.

Glofcheski R (2006) Same-day feedback and analysis of assessed coursework, in Carless D et al (eds) *How Assessment Supports Learning: Learning-Oriented Assessment in Action*, Section 3.6, Hong Kong: Hong Kong University Press
www.hkupress.org/asp/bookinfo.asp?PD_NUM=9622098231 (last accessed 18 December 2006)

A lecturer in politics and international relations at Keele University put the two-hour tutorials at the centre of the assessment process to encourage greater 'active learning' by students. The 1,500-word essay and two-hour exam were replaced by 500-word 'briefing papers' expressing students' position on a given question prior to the tutorial concerned, a tutorial discussion of their papers, and a subsequent 500-word 'evaluation report' reviewing the tutorial discussion.

Macmillan J and Mclean M J (2005) Making first-year tutorials count, *Active Learning in Higher Education*, 6.2, pp 94-105

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Additional resources

For further information and additional resources, please look at Balancing assessment on the Enhancement Themes website: www.enhancementthemes.ac.uk/themes/IntegrativeAssessment
This contains a downloadable copy of this Guide and button links to case examples of strategies for balancing assessment *for* and assessment *of* learning.

The Integrative Assessment Enhancement Theme Guides were written and compiled by Professor Dai Hounsell, Dr Rui Xu and Miss Chun Ming Tai in the Centre for Teaching, Learning and Assessment, University of Edinburgh, in consultation with a network of institutional contacts drawn from across Scottish universities, representatives of Higher Education Academy Subject Centres and members of the Integrative Assessment Enhancement Theme Steering Committee. Thanks are due to the many colleagues within and outwith the UK whose initiatives, experiences and insights are reported in the Guides.

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The Quality Assurance Agency for Higher Education
Southgate House
Southgate Street
Gloucester
GL1 1UB

Tel 01452 557000
Fax 01452 557070
Email comms@qaa.ac.uk
Web www.qaa.ac.uk