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Quality Enhancement Themes: The First Year Experience

Transforming assessment and feedback: enhancing integration and empowerment in the first year

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Quality Enhancement Themes: The First Year Experience

Transforming assessment and feedback: enhancing integration and empowerment in the first year

Professor David Nicol

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 further improving higher education 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 is published by the 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 is provided by the 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 as well as 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, as well as 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 higher education.

Norman Sharp
Director, QAA Scotland

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1 Outline and scope

Formative assessment and feedback are driving forces for student learning. It is, therefore, surprising that they have not previously played a prominent role in thinking and research on the first-year experience in higher education (HE). This publication provides practical recommendations for policy-makers, senior managers and teachers on how to implement institutional change in assessment and feedback practices.

These recommendations are based on a review of the research on formative assessment and feedback from the perspective of the first-year experience. The review goes beyond a summary of the literature, however, in that it links the research to the concepts of integration and empowerment - concepts that frame current thinking about the first-year experience. The publication also provides a wide range of practical examples of good practice in implementing formative assessment in different disciplinary contexts.

Section 3 sets out the recommendations on how to improve assessment and feedback practices in HE. Section 4 provides the theoretical and research background; the literature is reviewed and a framework is proposed linking formative assessment and feedback to academic and social integration and to engagement and empowerment. In relation to this framework, 12 principles of good formative assessment and feedback practice are identified and analysed.

Section 5 provides a description and a brief rationale (based on published research) for each of the 12 principles of assessment and feedback presented in Section 4. For each principle, a question is also provided that teachers might use to think about and review formative assessment practices in their courses or programmes.

Section 6 contains practical examples of ways of implementing good assessment and feedback practices across a range of disciplines. Subsection 6.1 provides some simple techniques for the implementation of each of the 12 assessment principles in a module or course. Subsection 6.2 gives some examples of disciplinary case studies. These show how many assessment principles might be implemented in the same learning design to increase the power of the design and enhance possibilities for academic and social integration and learner empowerment.

2 A guide for readers

This document has been structured so that readers can find the information that is most relevant to their needs and the time they have available. All readers will find the set of recommendations in Section 3 on how to improve HE assessment and feedback practices of interest. These have been written with teachers, senior managers and policy-makers in mind, as well as all those with an interest in how to enhance the quality of teaching and learning in HE. Although the recommendations are based on the analysis in Sections 4 and 5, they can usefully be read before either of those two sections.

Sections 4 to 6 are ordered from the theoretical to the practical. However, in order to make each section self-contained there is inevitably some duplication across them. Section 4 presents the research background. This will be of greater interest to those seeking a summary of recent research on assessment and feedback and its relation to the first-year experience. It also proposes a framework of 12 principles for effective assessment and feedback.

Section 5, and especially Section 6, are more practical and focus on the rationale for and how to implement these assessment and feedback principles. Section 5 also includes 12 questions that teachers might ask about their own practice, based on each of the assessment principles. Readers looking for ideas for implementation might wish to go straight to Section 5, or even to Section 6, perhaps returning to Section 4 at a later time.

3 Practical recommendations for improving assessment and feedback in the first year of higher education

3.1 Introduction

This section provides a set of recommendations on how to improve assessment and feedback practices in the first year of higher education (HE). These recommendations are intended for teachers, senior managers, quality enhancement personnel and policy makers. The recommendations are based on an analysis of the research on assessment and the first-year experience (see Sections 4 and 5). From this analysis, 12 formative assessment and feedback principles were identified (see table 1). If applied within HE, these principles should encourage learner **engagement**, foster learner **empowerment** and enhance **academic** and **social integration**.

A key goal in the first year is to shift the locus of control from mere engagement (active involvement in study) to learner empowerment (the ability to monitor, manage and evaluate one's own learning). A second goal is to bring the academic and social experience together so that they are mutually reinforcing, thus helping learners to develop a sense of identity and a sense of belonging within disciplinary and institutional cultures.

Good assessment and feedback practice should:

1 **Help to clarify what good performance is (goals, criteria, standards)**
To what extent do students on your course have opportunities to engage actively with goals, criteria and standards before, during and after an assessment task?

2 **Encourage 'time and effort' on challenging learning tasks**
To what extent do your assessment tasks encourage regular study in and out of class and deep rather than surface learning?

3 **Deliver high-quality feedback information that helps learners to self-correct**
What kind of teacher feedback do you provide, and in what ways does it help students to self-assess and self-correct?

4 **Provide opportunities to act on feedback (to close any gap between current and desired performance)**
To what extent is feedback attended to and acted upon by students in your course and, if so, in what ways?

5 **Ensure that summative assessment has a positive impact on learning**
To what extent are your summative and formative assessments aligned and supportive of the development of valued qualities, skills and understanding?

6 **Encourage interaction and dialogue around learning (peer and teacher-student)**
What opportunities are there for feedback dialogue (peer and/or tutor-student) around assessment tasks in your course?

7 **Facilitate the development of self-assessment and reflection in learning**
To what extent are there formal opportunities for reflection, self-assessment or peer assessment in your course?

8 **Give choice in the topic, method, criteria, weighting or timing of assessments**
To what extent do students have choices in the topics, methods, criteria, weighting and/or timing of learning and assessment tasks in your course?

9 **Involve students in decision-making about assessment policy and practice**
To what extent are students in your course kept informed or engaged in consultations regarding assessment policy decisions?

10 **Support the development of learning groups and communities**
To what extent do your assessment and feedback processes help to encourage social bonding and the development of learning communities?

11 **Encourage positive motivational beliefs and self-esteem**
To what extent do your assessment and feedback processes enhance your students' motivation to learn and be successful?

12 **Provide information to teachers that can be used to help shape their teaching**
To what extent do your assessment and feedback processes inform and shape your teaching?

Table 1: principles of good formative assessment and feedback, and questions teachers might ask about their current practice

3.2 Recommendations

The main recommendation is that higher education institutions (HEIs) should implement the assessment principles set out in table 1. The following recommendations are about strategies for successful implementation.

3.2.1 Use the principles to inform module, programme and strategy developments in higher education

Those in HEIs should consider adopting the 12 assessment and feedback principles defined in table 1 at module or course level and as part of an institutional strategy for enhanced assessment in the first year and beyond. The value of these principles at module level has been demonstrated through the Re-engineering Assessment Practices (REAP) project, where a subset of the principles was used as the basis for redesigning 19 first-year modules across a range of disciplines and three HEIs (www.reap.ac.uk). The results were improved exam performance, reduced failure rate and increased student satisfaction - without increases (and sometimes with reductions) in teacher workload. Some HEIs in the UK have also already adopted some of these principles at strategy level (for example, University of Strathclyde, Sheffield Hallam University, University of Leicester, UHI Millennium Institute).

Two dimensions frame the implementation of the assessment and feedback principles: **engagement-empowerment** and **academic-social integration**. In the first year, it is important that teachers structure the learning environment in ways that encourage regular student **engagement** in learning activities in and out of class. Normally, this is achieved through a sequence of learning tasks that become progressively more challenging (principle 2). Participating in such tasks generates information about achievements for the individual student, and provides opportunities for rich and varied feedback from teachers and peers (principles 3, 4, 6).

The experience of engaging in learning tasks and generating and receiving feedback is vital if students are to come to terms, as rapidly as possible, with what is required by first-year study. However, while engagement is necessary, it is not a sufficient condition for first-year success. Students must also have opportunities to develop ownership over their own learning, to experience a sense of **empowerment**. Structured opportunities for self-assessment, choice in learning and involvement in assessment decision-making are important here (principles 7, 8, 9).

Bringing the academic and the social together is also important in the design of first-year learning. **Academic** structures should be organised so as to trigger productive **social** relationships, for example, through peer feedback processes and group projects (principles 2, 6 and 10). Such relationships have been shown to influence the identities that students form and their sense of belonging within academic structures. Also, when academic structures trigger social bonding this often results in positive 'backwash' effects on academic learning.

3.2.2 Use professional judgement about which principles to implement and their relative weighting

The 12 assessment and feedback principles in table 1 represent a comprehensive framework for the enhancement of teaching and learning practices in HE. It is not, however, necessary to apply **all** the principles simultaneously to gain benefits when redesigning a module, even though it could be argued that the more principles which are implemented the more powerful the learning design.

Section 6 shows that implementing even a single principle can enhance learning and learners' self-regulation. A single principle invariably carries with it aspects of other principles, thereby enhancing the effects. For example, implementing self-assessment (principle 7) encourages students to pay more attention to goals and criteria (principle 1). Implementing regular and distributed learning tasks (principle 2) creates many opportunities for students to reflect on their learning and generate internal feedback (principle 7). It is recommended, therefore, that course leaders and tutors make their own professional judgements about which principles are appropriate to their disciplinary context.

A specific concern during implementation is that tensions might exist across some assessment principles or between the principles and desired practice. For example, encouraging time and effort on challenging learning tasks (principle 2) might be incompatible in some situations with providing choice and flexibility in the timing or content of assessments (principle 8). Also, giving students a choice in the methods of assessment (principle 8) might represent a threat to commonality of standards. These potential tensions highlight the need for teachers to apply the principles judiciously and to try to make sure that unintended consequences are avoided as far as possible.

3.2.3 Use a 'tight-loose' approach to implementation of the principles

The ways in which the principles are implemented (that is, the techniques of implementation) are likely to differ depending on the discipline. For example, a self-assessment technique that works well in first-year pharmacy might not be appropriate for psychology. Also, the way in which the principles might be called upon in practice may vary depending on the type of first-year student (full-time, part-time, distance learning).

For these reasons, it is recommended that a 'tight-loose' approach to implementation be adopted (see Thompson and Wiliam, 2007). While teachers should try to maintain fidelity to the pedagogy (educational intent) behind each assessment principle (tight), the techniques of implementation should be tailored and adapted to the teaching and learning context (loose).

3.2.4 Involve students actively in implementation of the principles

A key idea behind **all** the assessment principles is that the more active students are and the more responsibility they have in the implementation of a principle, the more empowering the educational experience.

For example, a teacher might 'clarify what good performance is' (principle 1) for an essay-writing task by providing students in advance of the assignment with a list of

printed criteria. Alternatively, the teacher might organise a session where students are required to examine some example essays (for example, produced by a previous student cohort) to identify which are better and why. The second approach would usually be more empowering than the first because the students would be more actively engaged in constructing, internalising and owning the assessment criteria.

It is recommended, therefore, that in formulating applications consideration should always be given to how responsibility might be shared with students, so that they are active participants in assessment processes.

3.2.5 Use digital technologies to support and add value to the implementation

The application of new technologies can enhance teaching and learning in the first year, but this is less likely if the technologies are added to current practices. Effective application of technology requires a clear pedagogical rationale. The assessment principles provide this: they make it possible to identify where technology can add value (for example, to achieve benefits that could not be achieved by other means) rather than just result in increases in staff workload and the costs of delivery.

For example, in one first-year psychology module at the University of Strathclyde, redesigned as part of the REAP project, a single teacher was able to organise rich, regular peer feedback dialogue for over 560 students (principle 6) on a series of online essay-writing tasks without a workload increase but with significant learning gains compared with previous years (see Section 6).

In another first-year mechanical engineering module with over 250 students, the class coordinator was able to cut homework marking in half - saving 102 hours - by encouraging students to engage in self-assessment (principle 7) using an online homework system, without any drop in exam performance. Many other examples of effective use of technology are given in Section 6 and others can be found at www.reap.ac.uk

3.2.6 Devise ways of engaging students in a new teacher-student 'contract' around assessment and feedback processes

If institutions or teachers decide to redesign student learning based on some of these assessment and feedback principles, it is strongly recommended that students be involved as partners in the process. Some re-education will be required if students are to appreciate when they enter HE that they, as much as the teacher, must play an active role in making assessment and feedback processes effective.

At module level, it would be important to inform students about why, for example, self-assessment is a valuable skill in learning and preparation for employment. It would be even more effective if a consistent message to that effect were provided at departmental, faculty and institutional level through policy documents and in practice. The 12 assessment and feedback principles, and the thinking behind them, should be brought to the attention of students as early as possible in the undergraduate years and reinforced throughout their academic career.

The roles and responsibilities of students might be clarified through a student charter in the first year, perhaps developed in collaboration with the local students' association.

Activities could also be organised at induction, while departmental handbooks could highlight the assessment principles and emphasise the importance of such skills as self-assessment for employability. The changes advocated here point to the redefinition of the teacher-student contract.

3.2.7 Align responses to the National Student Survey to the assessment principles

In the UK, the National Student Survey (NSS) has consistently shown that across a range of teaching and learning indicators, student satisfaction - though generally high - is least high regarding assessment and feedback practices. Given that the NSS is being promoted as a way of helping students to choose where to study, and indirectly as an institutional league table, many universities are looking for ways to enhance their own results.

The most common response is to identify ways in which teachers can provide more **detailed, timely** and **written** feedback. While these measures are important, the transmission of more timely and detailed written feedback is unlikely on its own to result in greater student satisfaction. Some institutions have already tried this and found that students did not take advantage of the extra feedback opportunities, or collect the feedback, or act on it. This 'delivery' approach fails to recognise the active role that students must play in feedback processes - that is, in decoding the feedback message, internalising it and using it to make judgements about their own work. It also fails to recognise the different sources (for example, self-generated, peer) and types of feedback (for example, spoken, indirect, informal).

In responding to the NSS it is therefore recommended that any attempt to improve teacher feedback must be linked to strategies and techniques that are designed to manage student expectations (see 3.2.6) and to raise awareness of the active role students play in generating, discussing and using feedback (3.2.4). Institutions should also consider widening the range of evaluation measures collected through the NSS and what other measures might be appropriate. Ipsos MORI, which administers the NSS, already offers institutions the opportunity to extend the scope of the survey by including supplementary items and the option of an item specifically formulated by the institution. It is strongly recommended that HEIs include the new additional items on Assessment (B10), Learning Community (B11) and Intellectual Motivation (B12)[1]. These items are highly relevant to the notions of empowerment and academic-social integration that underpin the first-year experience.

3.2.8 Explore new staff workload models appropriate to new teaching and assessment practices

The redesign of modules and programmes to incorporate the thinking behind the assessment principles is likely to change how academic and support staff spend their time, especially as new technologies become more widespread. For example, teachers might spend more time providing feedback online or organising and monitoring peer-group activities, with some reduction in face-to-face contact time. Changes of this kind might require a rethinking of institutional policies and practices regarding staff-student contact hours.

[1] NSS questionnaire and optional questions can be found here: www.thestudentsurvey.com/documents/NSS%202009%20-%20NSS%20Questions%20and%20Optional%20Items.pdf

3.2.9 Address the effects on programme coherence of changes in assessment and feedback at module level

One issue raised by the principles is that their application could easily be undermined if they are only applied in some modules within a first-year programme. This might reduce the coherence of the first-year experience and send mixed messages about assessment and feedback requirements and expectations. So this raises the question: how might these principles be used in a systematic way to enhance the first-year experience?

One strategy would be to embody some of these principles in teaching, learning and assessment strategies at institutional or faculty level. One Scottish institution is currently doing the former (University of Strathclyde), while another is embedding similar principles in a faculty strategy (University of Edinburgh, School of Science and Engineering). In Edinburgh, the strategy connects the assessment principles to other principles specifically related to learning in science and engineering. For example, one principle highlights a commitment to an enquiry-based approach to learning, and another makes a commitment to reducing summative assessment to a minimum while maximising self-assessment.

A second strategy might be to include some of these principles as part of a set of competences that all students should develop in the first year and beyond. This is the approach adopted by Banta at Indiana University-Purdue University Indianapolis in the USA (Banta, Hamilton and Kahn, 2007). Here, students are expected to develop competences in reflective thinking and self-assessment as part of a set of graduate attributes. These skills are defined at introductory, intermediate and advanced levels. A similar approach is adopted at Alverno College in the USA (see Mentkowski and Associates, 2000). A third strategy discussed on page 11 (3.2.11) might be to use the principles as a tool to review courses and programmes, possibly through quality enhancement procedures.

3.2.10 Evaluate the impact of changes brought about by the implementation of the assessment principles

It is important to evaluate the effects of changes in assessment and feedback practices at module and/or strategy level. Typical approaches are to evaluate changes in **inputs** such as staff time (costs) or **outcomes** such as the effects of assessment changes on exam performance, student satisfaction and/or retention statistics (benefits).

While such evaluations need to be conducted at a number of levels, the use of assessment and feedback principles can add value to the evaluation. Having a clear pedagogical rationale embodied in principles provides some 'process' indicators against which to evaluate change. For example, it is possible to evaluate the extent to which redesigned modules or programmes offer enhanced opportunities for learner self-regulation. This can be inferred, for instance, by comparing the number and opportunities for peer dialogue (principle 6), self-assessment (principle 7) or choice in assessment (principle 8) before and after a redesign. Such process measures can augment input and output measures.

Although changes in educational processes (for example, opportunities for self-assessment) will not guarantee that students become better at regulating their learning, given that students mediate all teaching interventions, they will increase the likelihood that this outcome is achieved.

Another reason why evaluation is important is that it is much easier to engage staff in teaching improvements when there is evidence that new practices are likely to be successful - that is, they lead to improvements in student learning, in satisfaction (student and staff) or in more efficient use of time. Unfortunately, HE has not had a strong tradition of evaluating educational developments, even when considerable funds have been invested in development projects.

Also, where evaluations have been required, those responsible for the implementation have normally been tasked with conducting the evaluation. Yet in REAP it was found that academic staff had little time to conduct an evaluation and that they often did not have the expertise to plan and implement it. REAP provided an evaluation service to ease the burden on academic staff, and this service was highly valued.

It is therefore recommended that if HEIs fund educational improvement projects, there should be support - both human and financial - for evaluation. As well as convincing staff of the value of making changes in teaching, evaluation should help institutions to identify which investments have been worthwhile and where it would be best to direct further funding.

3.2.11 Use the principles to inform institutional quality enhancement processes

The assessment and feedback principles could play a key role in quality enhancement processes at module, course or institutional level. Table 1 provides specific questions that teachers or institutions might use to reflect on and review their assessment practices at module or programme level. Section 6 provides practical examples of how assessment and feedback might be enhanced through application of the principles.

3.2.12 Develop specific guidelines on what might constitute good teacher feedback

The research surveyed for this publication revealed that there is almost no guidance available within HEIs about what constitutes good written feedback in the first year. Those who mark and give written feedback on students' assignments are not usually supported in this practice.

Teacher feedback might be given on the task outcome, on how the task has been carried out (process), on the person (focusing on personal qualities), or on students' ability to reflect on and assess their own performance. It might focus on weaknesses, strengths and/or what to do to improve (feed-forward). It might be analytically formulated and linked to preset criteria or grade-level descriptors, or it could involve holistic judgements, or a combination of these. It might be provided in the text of an assignment or on an assignment feedback sheet. It might provide considerable detail or a few targeted comments.

This publication has taken a wide perspective on feedback, arguing that there are different sources of feedback (teachers, self, peers) and that feedback is an ongoing process - all steps of the feedback cycle are important, from understanding the task criteria to applying what is learned to new tasks. Nonetheless, even with this wider perspective, it is still a concern that there is little clarity or consistency about what teachers might usefully write in response to a student assignment. Institutions might therefore wish to develop some guidelines on appropriate teacher feedback for their academic staff who teach first-year modules. This is also an area that calls for further research.

4 Literature review and framework

4.1 Introduction

Assessment processes lie at the centre of the learning experience in HE. For students, assessment has both a formative role in that it makes learning possible and a summative role in that it certifies achievements. In the UK, the National Student Survey (NSS) has consistently shown that across a range of teaching and learning indicators, the lowest level of student satisfaction in HE is with formative assessment practices, including the provision of feedback.

Formative assessment is particularly important in the first year, where students entering HE must quickly come to terms with the demands of a new academic environment, develop appropriate study strategies and cultivate supportive social relationships. All these factors can be influenced by formative assessment practices. Yet over the last 10 years, changes in HE such as increased class sizes, modularisation, a more diverse student intake and less resource per student have adversely affected the quantity and quality of formative assessment in the first year. This in turn has had an impact on the quality of the academic and social experience.

Across the UK and internationally, many HEIs have initiated interventions designed to enhance the first-year experience. Surprisingly, however, formative assessment practices have not usually been the focus for such interventions. This review addresses this gap. It explores how formative assessment and feedback might be used to enrich the first-year experience, encourage student success and support processes of academic and social integration.

4.1.1 Academic and social integration

Over the last two decades, international research on the first-year experience and student retention has been carried out from a range of different conceptual perspectives (see for example, Yorke and Longden, 2004; Seidman, 2005). Most researchers, however, regard Tinto's (1975) **interactionist** theory of non-completion as a useful starting point for understanding retention issues, even though there have been critics and new theory developments (for example, Braxton et al, 2004; Zepke et al, 2006).

Tinto viewed early student departure from HE as being the result of an interaction between what the student brings to college or university (background experiences, goals and intentions) and what they actually experience through their academic and social activities. According to Tinto, levels of academic and social integration are good predictors of persistence and success in the first year. Academic integration consists of structural dimensions (for example, meeting the explicit demands of university study) and normative dimensions (identifying with the norms underpinning the academic system). Social integration is about how the individual student relates to other students and to the social system of the college or university.

Many initiatives to improve the first-year experience aim to provide a mix of measures targeted at achieving more effective academic and social integration. Despite the power of Tinto's theory, however, it is more applicable to traditional campus-based students than to distance learning, part-time and mature students (Braxton et al, 2004). But the growing influence of social media and the internet might change this in the future.

4.1.2 Engagement and empowerment

In Scotland, the dual concepts of engagement and empowerment have been used by the Enhancement Theme on this topic to conceptualise the first-year experience. According to Mayes (2006), 'engagement concerns a student's attitudes and commitment to study whereas empowerment focuses on their competency to do so effectively'. From a teaching perspective, facilitating engagement is about devising interventions that encourage student participation in, and commitment to, study, whereas facilitating empowerment is about devising interventions that help students to take more control over, and responsibility for, their own learning.

Consistent with this perspective, the Enhancement Theme's focus has not just been on why some students leave programmes early (a question that is likely to lead to a deficit model at the institutional level), but on how all students can be helped to succeed. As shown below, balancing engagement and empowerment is critical to student success in the early years of HE study.

This review explores the role of formative assessment and feedback in the context of the first-year experience. It examines these assessment practices in relation to the concepts of engagement and empowerment as well as to academic and social integration. It links these four concepts together within a coherent framework. In practical terms, the review tries to identify how formative assessment practices might be used to enhance learner engagement and facilitate learner empowerment, while at the same time being used to support students' integration into the academic and social environment of the first year.

4.2 Definitions and purposes of assessment and feedback

In HE, assessment describes any process that involves evaluating or appraising a student's knowledge, understanding, skills or abilities. In line with Section 6: Assessment of students, in the *Code of practice for the assurance of academic quality and standards in higher education* (published by QAA in 2006), assessment in this review is taken to be an integral component of teaching and learning, serving multiple purposes.

Assessment can be used to enhance student learning (formative assessment, or assessment **for** learning) as well as to judge and certify learning achievements (summative assessment, or assessment **of** learning). This broad scope recognises that there are different sources of assessment and feedback information, each of which influences learning in qualitatively different ways: peers, self, tutors and those external to the course. When students work in groups they often get feedback from each other (peer feedback); in effect, feedback is embedded in the act of learning. If carefully structured (for example, through appropriate monitoring), such peer feedback can supplement that provided by teachers and can also model experiences in employment.

When engaged in learning tasks, students generate their own internal feedback by monitoring, reflecting on and self-assessing their progress. This feedback is also integral to the learning process. But students differ in their degree of awareness of such processes, many of which are tacit. However, awareness can be raised and the generation of inner feedback strengthened through formal procedures such as requiring students to self-assess their work before an assignment submission, or reflect systematically on strategies used during a task, or reflect on their work (for example, to compile a portfolio). Students might also be asked to comment on or mark each other's work (peer assessment), so as to develop objectivity in evaluative judgements. Developing the skills to monitor, manage and self-assess learning is a key requirement in the professions and for lifelong learning (Knight and Yorke, 2003; Black and Wiliam, 1998; Boud, 2000; Nicol and Macfarlane-Dick, 2006).

While this review is primarily about assessment **for** learning it inevitably includes some discussion of assessment **of** learning, given that these processes are not easily separated in practice.

4.2.1 Pre-conditions for success in the first year

From the research literature, a range of factors has been shown to enhance the first-year experience and lessen the chances of students leaving early. The following list focuses only on factors that could be influenced by assessment practices. How assessment and feedback might be redesigned to foster student success in the first year is the focus of the rest of this review.

- **Helping students to come to terms with what is expected in academic study**
  Some students find it difficult to make the transition and adjust to university in the first year (Tinto, 2005; Yorke, 2005; Yorke and Longden, 2004). At a practical level, the style of teaching, the expected standard of work and the way it is assessed might differ from that experienced before entering HE (for example, in work or school). This may prove too demanding or demoralising for some students, resulting in poor performance and/or early departure.
- **Setting high expectations**
  Tinto (2005) argued that setting high expectations is a necessary condition for student success in the first year. He cited evidence from Kuh (2003) showing that 'universities often expect too little of students, especially during the critical first year of college' (Tinto, 2005, p 321). Kuh found that students did not spend enough time studying out of class for successful learning. Tinto argued that expectations are built up through both informal processes (for example, the way teachers label students) and formal ones (for example, advice given about study requirements).
- **Regular opportunities for formative feedback**
  An emphasis on formative assessment in the early weeks of the first year, and on regular and frequent feedback, is associated with student success (Tinto, 2005; Yorke, 2005; Thomas et al, 2003; Layer et al, 2002). Formative tasks provide teachers and students with information about performance and enable them to adjust teaching and learning in ways that promote achievement.
- **Limiting the negative effects of summative assessment**
  Summative assessment (sometimes called 'high-stakes' assessment) in the first few weeks of term has been shown to be detrimental in the first year; some students, especially mature students, leave if they obtain poor marks (Yorke, 2005).

Early high-stakes assessment results in students having little opportunity to experiment and to find out what learning strategies work best. Modularisation contributes to this difficulty as the short time span per module often results in increased numbers of summative tests.

- **Sensitivity to the diversity of students' commitments**
  The lives of students extend beyond the university. Many first-year students have commitments to family and friends, and many now engage in part-time employment (Yorke and Longden, 2004; Harvey et al, 2006; Krause et al, 2005). This points to a need for more flexible arrangements around learning and assessment tasks. Rather than all students following a strict curricular diet (which might disadvantage even those without part-time work), some institutions are providing more flexible curricular opportunities, often supported by new technologies.

- **Fostering self-responsibility for and self-regulation of learning**
  Most universities across the world have begun to rethink their teaching and learning approaches. Students who withdraw from first-year programmes often miss classes and have poor study and time-management skills (Johnson, 1994; Trotter and Roberts, 2006). Researchers now recognise that the solution to these problems resides not just in study-skills programmes, but in shifting the perceived locus of control for learning by fostering in students more independence and self-responsibility in the early years (Knight and Yorke, 2003). Structured opportunities for self and peer assessment represent one way of supporting this shift (Boud, 2000; Nicol and Macfarlane-Dick, 2006). Such practices engage students actively in monitoring, regulating and making judgements about their own learning and study approaches. Developing these 'regulatory' skills in the early years is important, as they lay the foundation for later years of study and for professional life.

- **Enhancing motivation and a belief in ability to succeed**
  Related to the previous point, an important aspect of the first-year experience is developing in students the confidence and motivation to be successful. Dweck (1999) showed how students' beliefs about whether intelligence is fixed (the 'entity' theory) or changeable and improves incrementally (the 'incremental' theory) also affect performance. Those holding an entity belief are more likely to opt out if the learning task appears too demanding, whereas those holding an incremental belief are more likely to increase effort on the task. Importantly, Dweck showed that interventions can change students' beliefs about intelligence, which in turn can have a positive effect on classroom achievement. Bandura (1997) argued that belief in the ability to succeed might be the single most important determinant of success in any year of study.

- **Personal contact with teachers**
  The diversity of the student body and the cultural changes associated with the transition to university require more support to be available in the early years of study, especially for those who experience difficulty. Chickering and Gamson (1987), in summarising 50 years of research in the USA, showed that high levels of teacher-student contact correlated with good quality undergraduate education.

- **Formation of friendship groups**
  The literature on the first-year experience generally accepts that students should ideally make contact and connect with others in the university if they are to succeed and drop-out is to be avoided. According to Tinto (2005), the more students are socially involved, the more likely they are to persist in their studies. McInnes and

James (1995) in Australia found that, on average, around a quarter of students did not make any friends of significance in their first year of study, and that this pattern continued into subsequent years and influenced the quality of these students' academic learning. Yorke and Longden (2007) found similar results in a recent UK survey of the first-year experience.

4.3 The role of assessment and feedback

Many of the pre-conditions listed above can be positively influenced by assessment practices. For example, Yorke (2005) discussed the important role played by formative assessment tasks in clarifying expectations. In order to be successful, students in the first year must have a clear understanding of what is required by academic study. Such understanding can be facilitated through early and regular formative assessment tasks. Formative tasks help to clarify the meaning of goals and criteria and provide feedback to students so that they can keep realigning their work to what is required. High expectations can also be communicated through assessment tasks. For example, students might be more likely to work between classes (out of class) if they know they will receive helpful formative feedback or a grade.

Yorke (2005) also suggested that early successes in assessment and early feedback are particularly important for students who doubt their ability to succeed. He reported that some HEIs had redesigned the first semester to be a formative experience and had deferred summative assessment until the end of the first year, thereby allowing students to experiment and acclimatise to academic study. An obvious danger in this approach is that the end-of-year assessment might come as a shock to students. This can be avoided, however, by aligning formative and summative tasks so that the formative tasks build the skills required by end-of-year assessments. Alternatively, summative tests might be used earlier but with minimal marks awarded so as to attenuate any negative effects from experimentation.

In addition, Yorke (2005) noted the role of formative assessment practices in helping to develop a sense of personal control over learning. For example, integrating opportunities for reflection and self and peer assessment is beneficial, as they provide students with early experiences of self-monitoring and making evaluative judgements about their own and others' learning (Boud, 2000; Nicol and Macfarlane-Dick, 2006). Even the social aspects of learning can be influenced by assessment tasks. Group tasks in the first weeks of term have been shown to help in fostering friendships, some of which last throughout a degree programme (Tinto, 2005).

Although Yorke (2004; 2005) has discussed and provided research on assessment and feedback in relation to the first-year experience, to date there has been little attempt to analyse assessment processes systematically in relation to the first-year experience. Also, the research on assessment has not been directly related to current frameworks for thinking about the first-year experience. What follows helps address this issue.

4.3.1 Principles of good assessment and feedback

In 2004, Nicol and Macfarlane-Dick carried out a literature review of the research on formative assessment and feedback as part of a Scottish project funded by the Higher Education Academy[1]. This review identified seven principles of good practice in formative assessment and feedback in relation to the development of learner self-regulation. A developed version of these seven principles and their analysis in relation to self-regulation can be found in Nicol and Macfarlane-Dick (2006) and Nicol and Milligan (2006).

In 2005, work began on the Re-engineering Assessment Practices (REAP) project[2], a large-scale initiative funded by the Scottish Funding Council with collaboration across three Scottish universities. The REAP project involved the redesign and embedding of innovative assessment practices supported by technology within large-cohort first-year classes across a wide range of disciplines. The focus on the first year makes it highly relevant to this review. Through the REAP project further assessment principles were identified (Nicol, 2007a).

The culmination of this work has been the 12 principles of good formative assessment and feedback practice presented in table 2. As well as building on this earlier research, the principles draw on Section 6, Assessment of students, in the *Code of practice for the assurance of academic quality and standards in higher education* (published by QAA in 2006) and published studies of university policies and practices associated with high levels of student success (Kuh et al, 2005). A particular debt is owed to David Boud for principle 5, which draws on his published work (Boud, 2000; Boud, 2007) and specifically on discussions held around his presentation at the REAP International Online Conference in 2007.

Good assessment and feedback practice should:	
1	help to clarify what good performance is (goals, criteria, standards)
2	encourage 'time and effort' on challenging learning tasks
3	deliver high-quality feedback information that helps learners to self-correct
4	provide opportunities to act on feedback (to close the gap between current and desired performance)
5	ensure that summative assessment has a positive impact on learning
6	encourage interaction and dialogue around learning (peer and teacher-student)
7	facilitate the development of self-assessment and reflection in learning
8	give choice in the topic, method, criteria, weighting or timing of assessments
9	involve students in decision-making about assessment policy and practice
10	support the development of learning groups and communities
11	encourage positive motivational beliefs and self-esteem
12	provide information to teachers that can be used to help shape their teaching.

Table 2: principles of good formative assessment and feedback

[1] www.heacademy.ac.uk/ourwork/learning/assessment/senlef

[2] www.reap.ac.uk

These formative assessment principles have proved to be robust. They have been used successfully as a bridge linking theory to practice in the redesign of formative assessment practices in 19 modules across a range of disciplines (Nicol, 2006, in press; www.reap.ac.uk). However, the following analysis takes the thinking further by relating the assessment principles identified in table 2 to the dimensions of academic and social integration and engagement and empowerment, which are central to current thinking about the first-year experience.

4.3.2 The theoretical context

A core idea behind the theorising and many studies of the first-year experience is that of academic and social integration (Tinto, 1993). As discussed above, **academic integration** refers to the integration of students into the academic culture of first-year study. New students must 'learn how to learn' in an unfamiliar context where academic expectations differ, and where they must acquire new disciplinary discourses and develop learning and assessment strategies that match those required for academic success.

Social integration is an overlapping but wider concept, with a key component being personal relations. In the early years, students are more likely to adapt to university life if they develop friendship networks (and actually feel that they have friends) and have a sense of identity and of belonging within one or more social groupings. Another concept used by Harvey et al (2006) and others, and which blurs differences across academic and social dimensions, is 'adjustment'. Harvey et al (2006) drew attention to research on how students adjust on entering HE, with this research also exploring issues of identity and belonging. This highlighted not just academic adjustment and relations among students, but also relations between academic staff and students. Thomas, Yorke and Woodrow (2003) showed these to be crucial to academic achievement and perseverance.

Many studies of the first-year experience have recommended that HEIs create learning environments that help to **assimilate** students into existing academic and social cultures. From this perspective, improving the first-year experience is mainly about smoothing this transition by helping students to reorientate to new academic requirements, discourses and ways of working, and extant social systems. However, another theoretical perspective that has emerged, somewhat in contrast to Tinto's theorising, is that instead of students being integrated into the institutional culture, the institution should do some **adapting** to embrace the culture brought by the student. From this perspective, student departure is 'influenced by students' perceptions of how well their cultural attributes are valued and accommodated and how differences between their cultures of origin and immersion are bridged' (Zepke et al, 2006, p 589).

It is interesting that the concepts of assimilation and adaptation have their parallels in the concepts of **engagement** and **empowerment** being discussed by the Enhancement Theme on the First Year Experience. In some senses, engagement is about students being assimilated into the academic and social culture of the HEI, whereas empowerment is about students taking responsibility for their own learning (academic empowerment) and developing their own social cultures within HEIs (social empowerment). Self-confidence, self-efficacy and a feeling of being in control are important to social and academic empowerment (Yorke and Longden, 2004). As argued below, engagement and empowerment are both important in designing learning environments that lead to student success in the first year.

4.4 A framework for analysis

Figure 1 provides a framework for the thinking on application of the assessment and feedback principles presented in table 2. It links engagement and empowerment with academic and social integration in the first year.

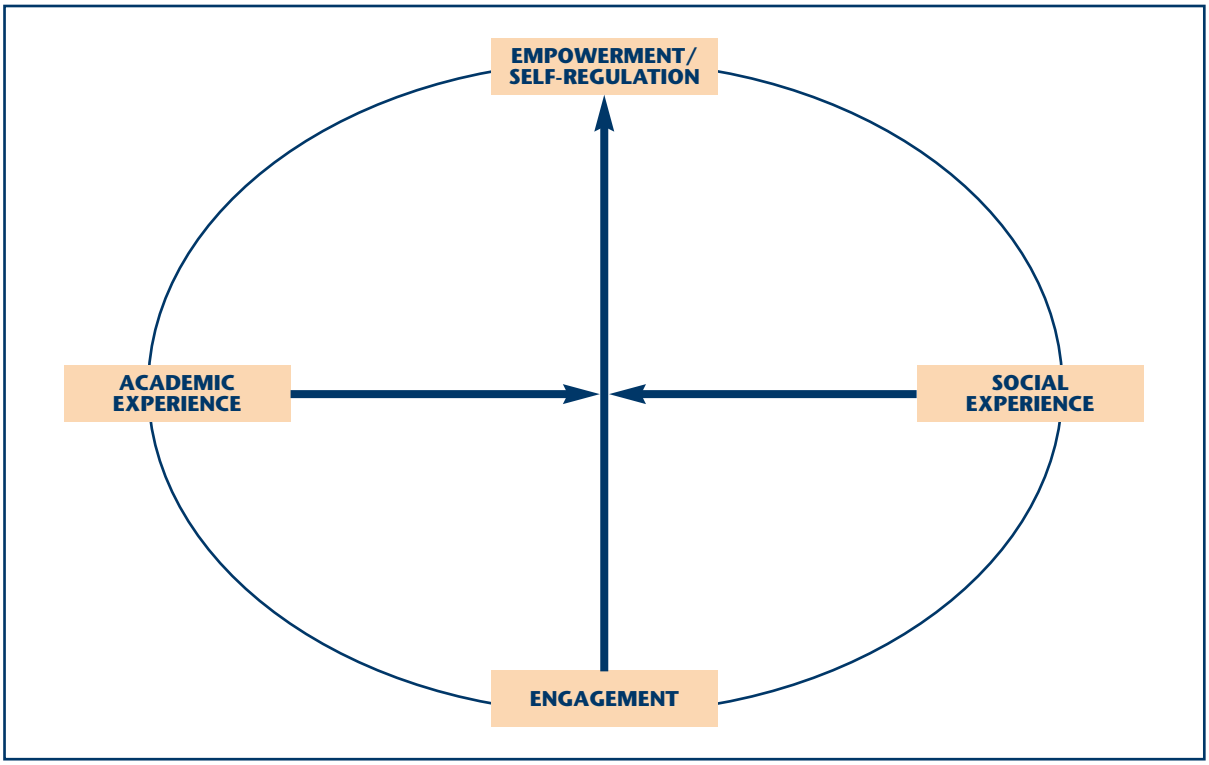

Figure 1: assessment and feedback practices - dimensions of implementation

4.4.1 Engagement-empowerment dimension

The vertical dimension in figure 1, **engagement-empowerment**, is about the extent to which students are given opportunities to self-regulate and take responsibility for their own learning. Moving towards increased empowerment (learner self-regulation) is seen as a natural direction for development in the first year and beyond - hence the upwards pointing arrow. Note that the term **self-regulation** is used alongside the term **empowerment** in figure 1. This is to emphasise the correspondence between the use of the term empowerment within the First Year Enhancement Theme and the way self-regulation has been used by Nicol and Macfarlane-Dick (2006).

In the US literature, the engagement dimension is subsumed under the concept of **involvement**, defined by Astin (1984) as 'the amount of physical and psychological energy a student devotes to the academic experience' (p 297). A key argument is that the more students are academically and socially involved, the more likely they are to persist and succeed in their studies (Tinto, 2005).

However, distinguishing different facets of involvement is helpful. It reveals that students can be involved at a level where they are slavishly carrying out activities defined by their teachers (without much sense of ownership), or they can be involved because they have taken on some responsibility for these activities. The engagement-empowerment distinction thus captures the idea that although teachers should create academic structures

that involve and engage, they also need to develop ways of moving the locus of control to students and of sharing responsibility for learning with them (empowering them).

In the engagement-empowerment dimension, engagement is seen as a necessary but not a sufficient condition for empowerment: students can be engaged without much sense of empowerment. However, it is unlikely that they would feel academically empowered without being engaged. Another way to view this dimension is that it depicts the progressive reduction of teacher 'scaffolding' as students develop their capacity for self-regulation (Vygotsky, 1978).

Nicol (in press) suggested that, depending on how it was implemented, any assessment principle could be more or less supportive of the development of learner self-regulation - that is, it could slide up or down the engagement-empowerment dimension.
For example, a teacher might 'clarify what good performance is' (principle 1 in table 2) by providing students with examples of the kind of work required (such as examples of essays from previous student cohorts) in advance of an assignment. Alternatively, the teacher might organise a session where students are required to examine these essay examples to identify which are better and why. The second approach would usually be more supportive of the development of learner self-regulation because students would be more actively engaged in constructing, internalising and owning the assessment criteria.

The important point is that if students are given an active, responsible role in the implementation of a principle, this is more likely to develop learner self-regulation. Taking this further, the most empowering scenario might be one where (for example, in later years of study) students feel able to organise their own active engagement with criteria and even question their appropriateness or validity, as might be expected if students were participating in post-graduate research.

4.4.2 Academic-social dimension

The horizontal dimension in figure 1, **academic-social**, is about the extent to which academic and social experiences combine to support students' learning and development. The academic-social dimension assumes that academic experiences can trigger supportive social experiences, and that social experiences can enhance and strengthen academic experiences. This accounts for the direction of the arrows, which point to each other.

This importance of the social dimension was a strong finding from the REAP project. Many of the most effective course redesigns occurred when learning tasks were carefully structured to encourage group learning with rich opportunities for formative assessment and informal feedback from peers and academic staff. In these cases, the outcome was usually enhanced learning. The academic structure encouraged social bonding, which in turn resulted in a positive backwash effect on academic learning.

An example would be where the teacher organises structured activities in which students work in small groups on an open-ended task to produce an agreed output. In the psychology case study presented by Baxter (2007) at the REAP online conference, students worked online in groups of six or seven to write an 800-word essay. Detailed evaluations showed that this social interaction not only scaffolded the academic writing skills of individual students, but that it also provided positive social support. Students in this study produced academic work of a quality higher than that seen before in the department. Also, the mean exam performance improved from 51.2 per cent to

57.4 per cent ($p<0.001$) compared to before this innovation. Baxter reported that first-year students produced writing that was equivalent in calibre to that of second-year and sometimes third-year students.

4.4.3 The principles and dimensions: application to the first year

Figure 2 shows how certain groupings of assessment and feedback principles (derived from table 2) might be used to support the development of academic and social integration and self-regulation in learning.

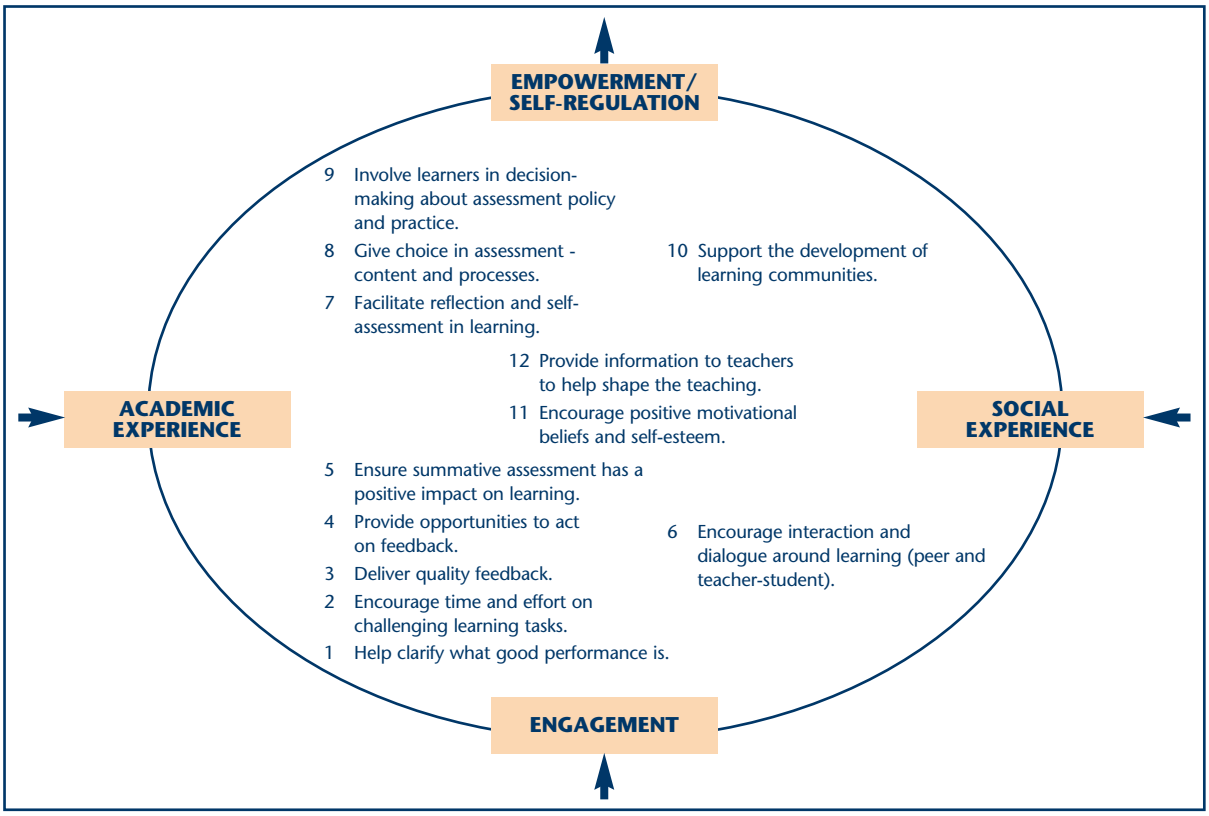

Figure 2: assessment principles and their application to the first year

Academic engagement (lower-left quadrant of figure 2)
The five principles in the lower-left quadrant of figure 2 are considered critical to student success in the first year. Their implementation would increase the probability of academic engagement and help to lay the foundation for developing self-regulation in learning.

Academic engagement is likely to be enhanced when students have some understanding of what they are trying to achieve (principle 1), actively engage in relevant learning activities in and out of class (principle 2), receive regular and constructive feedback on their performance (principle 3) and have opportunities to use this feedback to make performance improvements in subsequent work, thereby closing the feedback loop (principle 4). It is also important that summative assessment has a positive impact on learning (principle 5). This might mean, for example, aligning formative and summative processes so that students have opportunities to practise and get feedback before their work is marked (summatively assessed).

The key idea underpinning these first five principles is the need to create a clear academic structure for learning in the first year. This is achieved by designing first-year courses

around a series of small but distributed **learning tasks** that engage students regularly in learning activities (principle 2). It differs from traditional course design, where the focus is often more on teacher delivery rather than on what students are doing.

Such learning tasks should be sequenced to progressively challenge students (stretch them) and should be appropriate to the disciplinary context. For example, where practice and consolidation are important, learning tasks might be tightly structured, whereas other tasks might be more open-ended to allow learners to develop their own strategies and approaches. The use of learning tasks is not only relevant to scheduled class time, but also applies to out-of-class learning. When out-of-class learning is structured around learning tasks, this can help students learn to work independently. A sequence of tasks can also be used to integrate in-class and out-of-class learning; for example, online tests out of class can be used as the basis for in-class activities (Nicol, 2007b).

Structuring learning around a sequence of learning tasks helps to clarify expectations and enriches opportunities for formative feedback. When learning tasks are spread over the timeline of a course, students get repeat information about what is required by academic study and have many opportunities to practise and develop new skills. Distributed tasks also enable the teacher to provide regular feedback, which students can use to keep realigning and refining their understanding and skills in relation to course expectations.

However, to ensure student engagement in these tasks, it might be necessary to make at least some of them compulsory (but without awarding marks) or to award minimal marks (that is, low-stakes assessment). Without some observable student productions, teachers are unable to ascertain what progress is being made or provide appropriate feedback.

Another strategy is not to award marks for the formative tasks, but to link them tightly to later tasks that are marked. Early and frequent summative assessment tasks can have a negative effect in the first year, especially if they carry many marks. Some students experience this kind of regime as highly stressful and as providing limited opportunities to experiment and find out what is required (Yorke, 2005).

Regular and distributed learning tasks also help to establish milestones and deadlines for student participation, thus discouraging procrastination and making it less likely that students will fall behind in their studies. Gibbs and Simpson (2004) noted that distributed learning tasks also provide opportunities for teachers to receive early warning of when students are experiencing difficulty, thus allowing them to organise support. In some cases, large learning tasks (such as projects) have to be broken down into component parts in order to manage teacher workload.

Implementing the five principles discussed in this section would help to address many of the core problems identified in the research literature on the first-year experience in HE (and listed in section 4.2.1). These include lack of clarity regarding expectations (Yorke, 2005), poor student engagement in study (Tinto, 1993), setting expectations too low (Tinto, 2005), low levels of teacher feedback (Yorke, 2005) and the damaging effect of early summative testing (Yorke, 1999, 2001; Yorke and Longden, 2004).

This section has assumed that it is the teacher who takes responsibility for providing structure for learning in the first year, designing learning tasks and organising formative feedback. Such teacher guidance is important if students are to come to terms as rapidly as possible with what is expected of them (Yorke, 2005). Nonetheless, a key

challenge - even in the first year - is to balance academic structure with sufficient opportunities for experimentation and activities that support the development of learner self-regulation.

As discussed earlier, one way to foster such learner self-regulation and responsibility is to give students a more active role in the implementation of these principles. For example, instead of the teacher structuring all learning tasks, students themselves might be asked to identify the milestone tasks for a large project (principle 2). Instead of just receiving feedback from the teacher, students might be asked to request feedback in relation to areas of work they have found difficult (principle 3). And instead of the teacher just providing opportunities to use feedback, students might be asked to formulate action plans for future assignments based on the feedback given (principle 4).

The sections that follow identify other ways of involving students in assessment decision-making.

Linking academic and social engagement (lower-right quadrant of figure 2)
The previous section was concerned with principles that might support processes of academic engagement. However, in Tinto's model, social engagement as well as academic engagement was an important influence on student success in the early years of study (Tinto, 1993). This section explores how the social and academic might be brought closer together to support first-year learning.

One way of achieving this is to make teaching and learning a social experience by providing students with enhanced opportunities for interaction and dialogue with peers and academic staff during learning (lower-right quadrant, principle 6). Structured interaction and dialogue (for example, through group tasks) can help to facilitate the establishment and maintenance of supportive social relationships and the development of affinity groups. This helps to promote a sense of belonging, but it can also enhance academic learning. While figure 2 (see page 21) depicts the academic and social in different quadrants, this is purely for analytical purposes as the goal is to integrate them in ways that mutually support the learning experience.

From an academic perspective, dialogue is not just about having a social conversation or exchanging ideas; it also involves a respectful relationship, in which participants think and reason together (Burbles, 1993). In linking the academic and social, a key idea is for the teacher to implement dialogic learning in a structured way.

As in the previous section, **learning tasks** are seen as the critical mechanism for designing and implementing dialogue in learning, for both peer and teacher-student dialogue (see Gravett and Petersen, 2002). Moreover, when using learning tasks to trigger supportive social processes, the five principles outlined in the previous section become even more important. Bringing the academic and the social together within learning tasks still requires clarity about goals or intentions (principle 1), that students actually spend time and effort on these tasks (principle 2), that teachers organise feedback (principle 3) and that there are opportunities to use that feedback (principle 4). It is also important that any summative assessment of learning tasks centred on peer dialogue and interaction (principle 5) is handled with care. Indeed, the risk of negative effects from summative assessment is higher where group tasks are involved; for example, assessments must be seen to be fair and to address potential 'free-rider' effects.

Significant benefits are associated with linking the academic and the social as far as the first five principles are concerned. Firstly, dialogue with peers or teachers can help to clarify the goals of learning tasks and make teacher feedback more intelligible (principles 1 and 3). Secondly, group learning tasks can be more challenging and authentic than individual tasks and can help to develop important personal and social skills valued by employers (principle 2). Thirdly, where students engage in group tasks they get informal feedback from peers when they discuss their academic work outside of class. It is also possible to organise such tasks so that they provide rich opportunities for more structured peer feedback. Informal and formal feedback from peers differs from that provided by teachers. There is ample evidence that this source of feedback can enhance both individual and group achievements (see below).

Learning tasks can be organised in many ways so that they call for interaction and dialogue, although large numbers of students might make this difficult. The traditional approach is for teachers to set group tasks, although it could be argued that these figure more prominently in later years of study rather than being a key feature in the first year.

Another approach is for the teacher to structure opportunities for peer dialogue and feedback in class (Chickering and Gamson, 1987: 1991). An example of this is 'peer instruction' (Mazur, 1997), where students respond individually to a multiple-choice test centred on a difficult concept in class and then engage in peer discussion of their answers, with the teacher providing his/her own perspective (see Nicol and Boyle, 2003).

This kind of structured dialogue has been shown to support multiple sources of feedback in the same classroom session: individual feedback (that is, reflections by students on their performance in relation to the class responses), peer feedback and teacher feedback. There is a vast body of evidence that this approach leads to enhanced learning and achievement (Crouch and Mazur, 2001). When used in first-year classes on a regular basis, it also leads to social bonding around these academic problem-solving sessions (Mazur, 1997; Sharp and Sutherland, 2007).

Teacher-student dialogue and interaction are also important (Chickering and Gamson, 1987). According to Endo and Harpel (1982), students who report higher levels of contact with academic staff demonstrate higher learning gains during their time in university. Large class sizes in the first year can make high levels of teacher contact difficult, but new technologies such as electronic voting systems (EVS) which support classroom interaction can be used to address this issue (Banks, 2006; Boyle and Nicol, 2003). Some lecturers have also begun to replace face-to-face lectures with online materials (for example, podcasts of lectures) and to use the saved contact time for one-to-one or small-group discussions.

The literature on the first-year experience shows that academic success is highly dependent on experiences of social integration - whether students participate in friendship groups, have a sense of belonging, see themselves as competent members of the academic community, and have contact with academic staff outside the classroom (Tinto, 2005 Yorke and Longden, 2004). Linking opportunities for dialogue into structured learning tasks would go some way towards addressing this issue.

One specific advantage of introducing peer dialogue into structured tasks in the first year is that it can lead to an attenuation of the teacher's voice, allowing the student voice to be heard (Gravett and Petersen, 2002). Hence dialogue can help the teacher

to balance structure with some learner responsibility, which can then support processes of student empowerment.

Academic empowerment (upper-left quadrant of figure 2)
The focus in the previous two sections has largely been on actions that teachers can take to ensure students' engagement academically and socially. However, while engagement is an important determinant of academic success, many researchers now maintain that, rather than having a reactive role in relation to teacher-organised activities, students should be given a much more active and participative role in assessment processes. For example, Yorke (2005) argued that a key component of academic motivation and success is that students perceive themselves as agents of their own learning. If students are to have a sense of control over their learning, then formative assessment practices must also help them to develop the skills needed to monitor, judge and manage their own learning (empowerment).

One way of increasing empowerment is to give students a more active role in the implementation of principles 1 to 6. However, the grouping of principles in the upper-left quadrant of figure 2 takes this further by suggesting specific ways in which teachers might structure learning tasks and activities with the express purpose of sharing responsibility for assessment decision-making with learners.

One of the most effective ways to foster self-regulation in learning is to provide students with opportunities to practise regulating aspects of their own learning (Pintrich, 1995). Self-assessment tasks are a good way of doing this, as are activities that encourage reflection on progress in learning (principle 7). A key principle behind self-assessment and self-regulation is that students are involved both in identifying the standards/criteria that apply to their work and in making judgements about how their work relates to these standards. Hence principle 1 (clarify the goals, criteria and standards that define good performance) might be seen as a prerequisite for the effective implementation of self-assessment.

Research has shown that training in self-assessment can improve students' performance in final exams (McDonald and Boud, 2003). A related approach is to have students provide feedback on the work of their peers (Gibbs, 1999). Such peer processes help to develop the skills needed to make objective judgements against standards - skills that are often transferred when students turn to producing their own work.

Another way of empowering students is to shift the focus from teacher-led to learner-led choices in assessment processes (principle 8). Providing choice in the topic, method, criteria, weighting or timing of assessment tasks is about offering learners flexibility in what, how and when they study. However, Harvey (2006), in discussing the first-year experience, argued that 'choice' is only fully empowering when it is exercised through the design of the experience rather than through being able to select from a range of options determined by the provider (the teacher). In HE, therefore, a more developed form of academic empowerment would occur if students were to actively design their own assessments in negotiation with their teachers, or were involved in decision-making about assessment strategies at course or departmental level (principle 9).

Principles 7, 8 and 9 can be easily implemented at some level in the context of first-year learning tasks. For example, students could self-assess their own assignments before submission. That is, they could identify and provide a rationale for the best features of

the submitted work or say what mark they think would be fair and provide a reason (principle 7). They might choose the topic for a project or add their own assessment criteria for a learning task, thereby supplementing those given by the teacher (principle 8). Or they might participate in staff-student committees and give feedback on the effectiveness of, and student reactions to, the assessment regime (principle 9).

Moreover, each of these strategies could potentially be enriched by modifying the approach so that it incorporated peer or teacher feedback processes. For example, having the teacher provide feedback on the student's own self-assessment of a submission would usually be more powerful than just providing feedback on the submitted work. The application of these principles could also be enriched by increasing student responsibility. For example, instead of students self-assessing themselves against teacher-defined criteria, they could be asked as a group to decide the criteria for their own project. This would engage them not only in self-assessment but also in discussing and negotiating what criteria would be critical to success. The latter is a key skill required in professional practice.

Detailed examples of the implementation of these principles are provided in Section 6.

Social empowerment (upper-right quadrant of figure 2)
The previous sections identified ways in which students could be engaged and empowered through academic practices related to learning tasks. This section is concerned with how teachers might facilitate the development of learning communities on campus (upper-right quadrant of figure 2, principle 10).

Tinto (2005) defined learning communities as having three characteristics: **shared knowledge** developed through a common curricular experience; **shared knowing**, with students participating both socially and intellectually in the co-construction of knowledge; and **shared responsibility**, where the learning of the group and the individual are mutually interdependent. Kuh et al (2005, p 198) maintained that:

> Living and learning with other students and faculty creates a community based on shared intellectual experiences and leavened by social interactions outside of class. As a result, students are often more actively involved with the course material than if they simply attended classes.

Although teacher (or institutional) interventions can support the development of learning communities, they cannot actually mandate them. Many learning communities form spontaneously with only minimal teacher intervention. For example, the mere setting up of a shared discussion board (virtual space) for first-year students, linked to a course or module, might stimulate and enhance the natural development of friendship networks and learning communities. This happened in a large first-year biology class at the University of Glasgow[3]. Alternatively, providing physical social spaces on campus that are conducive both to academic study and peer interaction might simultaneously enrich both the educational and social experience (principle 6).

When students have a positive experience of group working in class they might also be more likely to extend these activities beyond the classroom. For example, students on a course at Glasgow Caledonian University set up their own virtual space to share

[3] www.reap.ac.uk/assessment/pilotsGUBio.html

resources and discuss assignments outside the classroom. They organised their own feedback and discussion groups using technology previously only used for informal learning (and leisure pursuits) to support formal learning. Moving in this direction of social empowerment might help to address Zepke et al's (2006) concern that institutions should be adapting to what the student brings, not just the other way round.

Institutions can, however, structure courses in ways that positively facilitate the formation of learning communities. For example, Tinto (1997) described a scenario where an institution organised a 'coordinated studies programme' where all students enrolled together on several courses with a unifying theme. They participated in cooperative learning activities in all classes, in which the learning of the group was dependent on the learning activities of each individual member (a form of shared responsibility). This was shown to strengthen bonding across all members of the learning group and to enhance academic attainment. Students also reported an increased sense of responsibility for both their learning and that of others.

Although some students will naturally form their own study groups and learning communities, such developments are more likely for the majority if academic programmes actively encourage students to take some responsibility for their learning. Hence implementing some of the principles in the previous sections (for example, self-assessment, choice and involvement in decision-making) should act as a catalyst for the development of learning communities.

Motivation and the role of the teacher (centre of figure 2)
Motivation is of central importance in the first year as it is linked to self-confidence, self-efficacy and self-esteem. Many researchers have argued that the relationship between assessment processes and motivation is a neglected consideration in research and teaching practice, even though most would agree that a high level of motivation is a precondition for academic success in the first year. In this report, a separate principle is defined around motivation (principle 11), and it is placed at the centre of figure 2. This recognises that motivation interacts with academic and social processes and that it underpins both engagement and empowerment.

Current research suggests that motivation is not a fixed attribute of the student, nor is it completely determined by the environment. Instead, students 'construct their motivation' based on their appraisal of the teaching, learning and assessment context (Paris and Turner, 1994). This means that teachers can influence student motivation through learning tasks and feedback processes.

All the principles described above have an effect on whether motivational beliefs and self-esteem are encouraged. For example, motivation is encouraged when learning tasks (principle 2) are perceived to be interesting and authentic (for example, related to real-life problems), and when feedback encourages students to focus on learning goals such as mastering the subject and developing appropriate strategies rather than on performance goals such as grade comparisons with peers (principle 3) (Dweck, 1999).

Group projects are motivating when a climate of mutual respect is encouraged and when the project fosters individual and group accountability (principle 6). All humans have a basic need for autonomy and self-determination (Deci and Ryan, 1985). Learners want to be in charge, and value a sense of control over their environment. Self-regulation requires 'will' as well as skill (Garcia, 1995).

Principles 7, 8 and 9 (self-assessment, choice, participation in decisions about assessment) are seen as ways of enhancing students' sense of control and encouraging intrinsic motivation. Opportunities to create supportive learning communities can also help to trigger intrinsic motivation, often with significant benefits for academic learning (principle 10). It is important that teachers appreciate the many and varied ways in which motivation can be encouraged when they apply the principles suggested in figure 2.

In order to structure learning environments that trigger appropriate and motivating academic and social activities in students, teachers need some information about how students experience those environments and how they act in them. In effect, teachers must find ways of generating ongoing feedback information about student learning and about any difficulties encountered. This information can be used to modify teaching in relation to student needs.

Feedback to the teacher is depicted as principle 12 at the centre of figure 2. It recognises that the teacher is both proactive, in structuring the learning through activities and processes (principles 1-11), and reactive (principle 12), in modifying these activities and processes based on student needs.

In figure 2 it is assumed that information about students only becomes available when learning activities lead to public performances and products. Teachers can generate such public information about students' learning through a variety of methods, many of which have been described in earlier sections:

- structuring learning tasks so that students create regular outputs, which are monitored by staff (principle 2)
- creating opportunities for dialogue in class using one-minute papers or EVS; this would provide dynamic and ongoing feedback to teachers about difficulties with subject matter, such as conceptual misunderstandings (principle 6)
- providing opportunities for students to self-assess or reflect on their own learning; these reflections would provide important input on whether students were able to evaluate their own learning (principle 7)
- teachers offering to be members of online and social spaces and to answer questions that go beyond the expertise of peer groups; this might help to establish whether more could be done to enhance social activities that are supportive of academic learning (principle 10).

Commentary on groupings of principles

While the groupings of principles in figure 2 highlight some important ideas about how to design the first-year experience, they also require some qualification. First, as noted above (section 4.4.1), each principle in the diagram could shift its position up or down the engagement-empowerment axis depending on how actively engaged students are in its implementation. If the goal of learning is to empower students, they should be given as active a role as possible. However, the clustering of principles in the lower-left quadrant is important: it highlights the role of the teacher in providing a clear academic structure for learning in the first year. Most teachers would agree that taking care of this group of principles is a priority, as it helps to clarify to students what is expected of them and creates the conditions for effective first-year university study.

A second issue concerns the separation of the academic and social dimensions in figure 2. This separation is artificial, intended primarily to highlight the relationship between these dimensions and show how the social could enhance the academic experience and vice versa. In reality, academic and social experiences are interwoven in the life of all first-year students. Billet (2001) argued that **all** learning occurs within social organisations or communities, even though the community context might at times only be 'in one's head' (for example, in the case of solo study).

A third point is that good assessment practice in the first year is not about implementing each principle in isolation. Research under the REAP project found that integration and empowerment were significantly increased where many principles were operative in the same assessment design (Nicol, 2006). Some of these designs are presented in Section 6.

A fourth and important point is that in practice there might be conflicts across the principles proposed in figure 2. For example, encouraging time and effort on challenging learning tasks (principle 2) might be incompatible in some situations with providing choice and flexibility in the timing or content of assessments (principle 8). However, this merely highlights the need for teachers to make decisions about what is appropriate to their context. For instance, a clear structure might be required early in the course before choices are made available. Alternatively, choice may be possible within a structured framework (for example, students choosing which of four assignments might count in the exam). Obviously, a balance must be struck across the principles for any given implementation. A key challenge here would be managing teacher workload while at the same time personalising assessments and feedback opportunities to different learner needs.

Another area of potential conflict centres on the idea of encouraging peer dialogue through group working (principle 6). When the 12 principles were recently presented to a mixed staff-student audience in a university, some students expressed a concern that being assessed on group work (principle 6) violated the idea of giving choice in assessment processes (principle 8). They maintained that not all students were comfortable with being 'forced' to work in groups.

One approach to resolving this issue might be to argue that group working should be made optional rather than compulsory. A more compelling approach is to argue that group working will be necessary in future employment and that it is the university's duty to prepare students for it. This might require establishing a new 'contract' with students about the purposes of HE. Whatever the decision, it is important to recognise the difference between group working as part of academic learning (for example, tasks that require students to learn together) and group working with a social goal (for example, to create friendships). While the former might be compulsory, the latter goal must be pursued at students' discretion.

Despite the artificial and permeable character of the quadrant boundaries and the principles possibly having different effects depending on their implementation, it is hoped that readers will find the framework in figure 2 useful in thinking about the design of formative assessment and feedback in the first year. Moreover, by using the quadrants and principles to map the characteristics of different assessment strategies in different years of study, its value might be extended. For example, one would expect assessment and feedback processes in the first year to have a different profile (overlap in different ways) to those implemented in later years of study.

5 Bridging theory and practice: assessment and feedback principles

5.1 Introduction

The 12 assessment and feedback principles in table 3 provide guidance for teachers interested in improving the quality of the learning experience of students in the first year of HE. These principles are based on recent research on assessment (Black and Wiliam, 1998; Yorke, 2001; Nicol and Macfarlane-Dick, 2004, 2006; Nicol, 2007a, in press; Boud, 2000; Knight, 2006; Knight and Yorke, 2003; Boud and Falchikov, 2007), code of practice guidelines on assessment of student learning published by QAA (2006), and published studies of university policies and practices associated with high levels of student success (Kuh et al, 2005; Tinto, 1993, 1997, 2005; Chickering and Gamson, 1987). Overall, this research suggests that if teachers implemented the principles depicted in table 3 in first-year modules and programmes, this would encourage a sense of integration (academic and social) and help to develop in students the ability to monitor, manage and regulate their own learning.

This section provides a description and brief rationale for each principle, based on published research evidence. A **key question** is also provided for each principle. Teachers might use these to think about and review formative assessment practices in their courses or programmes.

Section 6 provides examples of the implementation of each principle in courses and programmes across a range of disciplines and case studies, showing how more than one principle might be implemented in the same learning design.

Good assessment and feedback practice should:

1 **Help to clarify what good performance is (goals, criteria, standards)**
To what extent do students on your course have opportunities to engage actively with goals, criteria and standards before, during and after an assessment task?

2 **Encourage 'time and effort' on challenging learning tasks**
To what extent do your assessment tasks encourage regular study in and out of class, and deep rather than surface learning?

3 **Deliver high-quality feedback information that helps learners to self-correct**
What kind of teacher feedback do you provide, and in what ways does it help students to self-assess and self-correct?

4 **Provide opportunities to act on feedback (to close any gap between current and desired performance)**
To what extent is feedback attended to and acted upon by students on your course and, if so, in what ways?

5 **Ensure that summative assessment has a positive impact on learning**
To what extent are your summative and formative assessments aligned and supportive of the development of valued qualities, skills and understanding?

6 **Encourage interaction and dialogue around learning (peer and teacher-student)**
What opportunities are there for feedback dialogue (peer and/or tutor-student) around assessment tasks on your course?

7 **Facilitate the development of self-assessment and reflection in learning**
To what extent are there formal opportunities for reflection, self-assessment or peer assessment on your course?

8 **Give choice in the topic, method, criteria, weighting or timing of assessments**
To what extent do students have choice in the topics, methods, criteria, weighting and/or timing of learning and assessment tasks in your course?

9 **Involve students in decision-making about assessment policy and practice**
To what extent are students on your course kept informed or engaged in consultations regarding assessment policy decisions?

10 **Support the development of learning groups and learning communities**
To what extent do your assessment and feedback processes help to encourage social bonding and the development of learning communities?

11 **Encourage positive motivational beliefs and self-esteem**
To what extent do your assessment and feedback processes enhance your students' motivation to learn and be successful?

12 **Provide information to teachers that can be used to help shape their teaching**
To what extent do your assessment and feedback processes inform and shape your teaching?

Table 3: principles of good formative assessment and feedback, and questions teachers might ask about their current practice

5.2 The 12 principles of good assessment and feedback: evidence base

Principle 1: Help to clarify what good performance is (goals, criteria, standards)

Underperformance in the first year and low levels of commitment have been linked to a lack of clarity regarding expectations (Yorke, 2004; Tinto, 2005). Students often do not understand learning and assessment requirements even when they are provided with documents containing definitions of criteria and standards. This influences the goals students set themselves and the outcomes they achieve (Rust et al, 2003). More time spent by students in identifying, discussing or even reformulating criteria in their own words has been shown to elevate performance, particularly in open-ended tasks. This can be done at the planning stage, but it is also helpful if students are encouraged to revisit goals, criteria and expected standards while carrying out extended tasks such as project and laboratory work.

The more students **actively** engage with goals, criteria and standards, the more likely they are to internalise them and be able to use them to regulate their own learning (Price and O'Donovan, 2006). For example, before undertaking an assignment (individually or in groups), having students examine selected assignments completed by a previous cohort to identify which are superior and why (criteria) would generally be more effective than just providing them with a printed list of criteria or even just examples of the kind of work required (Gibbs, 1999). This approach not only leads to learner engagement with criteria, but also to engagement with examples of assignments of different standards. Sadler (2005) argued that concrete representations of standards (that is, many exemplars at each level of performance) are necessary where learning tasks are complex and multidimensional, and where criteria are tacit and difficult to express as verbal descriptions.

In some scenarios where creativity or the ability to solve open-ended problems are valued, tightly specified goals or criteria in advance may be inappropriate: for example, in engineering or design where students are required to identify the problem and then provide a solution. However, it is still important that teachers share their intentions with students about the nature of the assignment and actively engage students in making their own judgements about what would constitute quality.

> **The key question here is:** To what extent do students on your course have opportunities to engage actively with goals, criteria and standards before, during and after an assessment task?

Principle 2: Encourage 'time and effort' on challenging learning tasks

It has been shown that if students spend time studying in and out of class on a regular basis, if their in-class and out-of-class activities are inter-related, and if they allocate time across the module rather than bunching all their work at the end, they are more likely to be successful in their studies (Chickering and Gamson, 1987; Gibbs and Simpson, 2004). This applies especially in the first year, where regular study helps to acculturate students to the requirements of university study. Learning tasks - the basic element of a planned curriculum - are one way of encouraging such a balanced study pattern. Tasks should be distributed across the module, challenge students and encourage a 'deep approach to learning' rather than a surface approach characterised by memorisation.

Spreading activities out through learning tasks provides opportunities for early and regular feedback. Learning tasks are important because they always engage students in assessment and feedback processes of some kind (for example, self-assessment, self-generated feedback, discussions with peers), even if these do not carry marks. However, making learning tasks compulsory or awarding minimal marks (low-stakes assessment) is usually necessary to ensure student engagement and to make sure that teachers can ascertain what progress is being made before providing feedback (Gibbs, 2006). This is different from frequent high-stakes assessment tasks (carrying high marks), which can result in high tutor workloads, high levels of student stress and the inhibition of student experimentation (Yorke, 2005). Regular tasks also provide tutors with warning of when students are experiencing difficulty, thus allowing them to organise additional support.

Small assessment tasks or large tasks broken down into component parts may, however, be necessary to manage teacher workload, especially where marking is involved. Workload can also be managed by making learning tasks compulsory (without marking) or by using pass-fail categories rather than specific marks, and by providing feedback to groups rather than individuals. Another technique is peer feedback, but this might have to be monitored by tutors.

One problem with small assessment tasks is that they can fragment the learning experience and undermine the synthesis of concepts and ideas that characterises deep learning. In response to this problem, some HE teachers/researchers have introduced the idea of the 'patchwork text' for assessment (Scoggins and Winter, 1999; Winter et al, 2003). Students are asked to create several short pieces of writing throughout a module, based on different genres, and to discuss these with peers (for example, a book review, contributions to a discussion, a position statement, a response to a lecture). Taken together, these 'patches' are intended to build a coherent pattern of learning in relation to diverse module objectives. The final piece of writing is an integrative review of some or all of the component patches (parts). In some scenarios, students can edit or rework the patches in the final submission. The 'patchwork text' methodology, as well as encouraging 'time on task', also encourages peer dialogue and feedback (principle 6, page 36). Students can also be given choice in the selection of patches to be integrated, which offers some autonomy in learning (see principle 8, page 38).

> **The key question here is:** To what extent do your assessment tasks encourage regular study in and out of class, and deep rather than surface learning?

Principle 3: Deliver high-quality feedback information that helps learners to self-correct

Both Yorke (2005) and Tinto (2005) have argued that teacher feedback is of critical importance to student learning in the first year of undergraduate study. Teacher feedback helps to reinforce academic expectations in the early stages of a module or programme, and is especially important when academic demands differ from those experienced by students before entering HE (Yorke and Longden, 2004). Teacher feedback is also a source against which students can check their understanding of assessment requirements, criteria and standards.

Through feedback, students can learn from their mistakes and misconceptions and build on achievements. Over time, teacher feedback should help students to develop accurate perceptions of their abilities and establish internal standards against which to evaluate

their own work. However, the quality of teacher feedback has been criticised in more than one in 10 QAA audit reports in the UK (QAA, 2003). This is also the main area where problems have been identified in the UK National Student Survey. Research shows that a great deal of external feedback given to students is delayed (for example, feedback on the first assignment not being given until after the second assignment is due), not understood, demotivating and does not provide any guidance for future action. But what is good-quality feedback?

According to Gibbs and Simpson (2004), good teacher feedback should focus on what students have achieved and what they need to do next. It should be timely, so ideally it should be available when students are 'stuck', when it will have maximum impact, and in time to improve subsequent assignments. Nicol and Macfarlane-Dick (2006) maintained that good-quality feedback should ultimately be geared to helping students to learn to trouble-shoot and self-correct their own performance. This might be achieved by providing feedback which, rather than giving the answer, points students to where to find the answer (for example, 'go back to p 35 in the text and rethink how you would explain this point in future'), or by providing feedback on students' attempts to self-assess their own work.

Other strategies known to enhance the power of teacher feedback include linking feedback information to assessment criteria, providing corrective advice and not just information on strengths and weaknesses, and prioritising specific areas for improvement. There is evidence that 'feed-forward' information is more effective than feedback information. Such information does not just tell students where they went wrong, but also what to focus on to make improvements in subsequent tasks (Knight, 2006). This helps to stimulate transfer of learning to new problems.

Hattie and Timperley (2007) reviewed the impact of four different types of teacher feedback on learning and achievement. Feedback could be provided on performance of the task (often corrective feedback), processing of the task (for example, the strategies used to accomplish it), self-regulation (how students monitored, directed and regulated actions to achieve the goal) and the person (personal evaluations of the learner). The last of these types of feedback is the least effective and can have a negative impact on learning. The second and third types are more likely to encourage deep processing, mastery and transfer of learning. Although teacher feedback has a powerful influence on learning, it is surprising that HE teachers receive so little guidance about what type of feedback is likely to be most effective, and that there has not been more research in this area.

> **The key question here is:** What kind of teacher feedback do you provide, and in what ways does it help students to self-assess and self-correct?

Principle 4: Provide opportunities to act on feedback (to close any gap between current and desired performance)

> The only way to tell if learning results from feedback is for students to make some kind of response to complete the feedback loop (Sadler, 1989). This is one of the most often forgotten aspects of formative assessment. Unless students are able to use the feedback to produce improved work, through for example, re-doing the same assignment, neither they nor those giving the feedback will know that it has been effective. (Boud, 2000, p 158).

In the first year, student numbers are often large and curricula are modularised, both of which make it difficult to create opportunities to use feedback in this way - especially if assignments are few and/or occur too near the end of a module. Greater emphasis can, however, be given to providing feedback on work in progress (for example, essay structures, plans for reports, sketches) and to engaging students in reflecting and acting on the feedback they do receive, for example, by formulating an action plan for future work or by not releasing the grade until students have commented on the feedback provided (Gibbs, 1999). However, the latter approach might impact on summative assessment practices. For example, it might be necessary to devise ways of testing what students are able to do in the absence of tutor help. One way of doing this would be in an exam where students applied the knowledge and skills they have gained while receiving feedback in a new context.

> **The key question here is:** To what extent is feedback attended to and acted upon by students on your course and, if so, in what ways?

Principle 5: Ensure that summative assessment has a positive impact on learning

Summative assessment is concerned with making judgements about the extent to which students have achieved the learning outcomes specified in the curriculum. It has been argued that summative rather than formative assessment has the largest impact on student learning (Boud, 2007). Whether by coursework, final examination or a combination of the two, the requirements of summative assessment strongly influence where students concentrate their effort and what knowledge and skills are given most attention.

In the first year, the implementation of summative assessment raises many issues. Firstly, as argued by Yorke (2005), programmes involving frequent summative assessment can put excessive pressure on students just when they are adjusting to the demands of university study. Also, if summative assessment comes too early it can undermine opportunities for students to experiment academically, receive feedback and align their activities to what is required.

Secondly, summative assessment practices can undermine the potential benefits of formative assessment practices. For example, where formative and summative processes are not aligned (for example, where coursework is developing one set of skills but the marked assessment, such as a three-hour exam, tests for different skills), students might not see the relevance of or engage with formative processes.

Thirdly, and perhaps more importantly, summative assessment is usually a process whereby teachers make one-way judgements about student performance. Many researchers believe that this is incompatible with the idea that learning at university from the first year onwards should be about helping students to become active learners who are self-directed and able to make evaluative judgements about their own learning (Boud, 2007; Knight, 2007).

Fourthly, summative assessment typically focuses on individual achievement and encourages competition within student cohorts. This might undermine the positive benefits to be gained from peer and collaborative learning in terms of social integration in the first year. It might also limit the development of social skills required for future employment contexts.

To address these issues, a number of avenues of action are possible. In some HEIs in the UK, exams for first-year students are being abolished and replaced with coursework and/or grades restricted to a simple satisfactory/unsatisfactory classification (Newman, 2007). The intention here is to move students away from an instrumentalist attitude to study and towards a more participative role where they actively engage with feedback, learn to evaluate their own work and support each other's learning.

A second strategy is to rebalance teacher judgements with more opportunities for students to develop the capacity to evaluate and make 'claims' about their own learning, for example, through portfolio processes (Knight, 2007). This strategy recognises that although many of the attributes we wish graduates to develop cannot be summatively assessed, either reliably or validly (for example, self-confidence, autonomy), they can usefully be formatively assessed and developed (Knight and Yorke, 2003; Elton, 2004). As students learn to self-evaluate, they are better able to make claims about achievements in these areas and showcase them through portfolios to prospective employers.

A third strategy is to introduce more authentic and real-life tasks for assessment, where students work with others and with peers in making judgements. This would help to simulate the kinds of environments that motivate students and would develop skills valued by employers.

> **The key question here is:** To what extent are your summative and formative assessments aligned and supportive of the development of valued qualities, skills and understandings?

Principle 6: Encourage interaction and dialogue around learning (peer and teacher-student)

In analysing 50 years of research in HE, Chickering and Gamson (1987) identified student-peer and student-teacher interaction and dialogue as key conditions for high-quality student learning. In Tinto's (1993, 2005) research on first-year learning at university, social as well as academic engagement was shown to be an important determinant of student success. One implication of this research is that teaching and learning in the first year should be conceptualised as a social experience where students are provided with rich and varied opportunities for interaction and dialogue with peers and with academic staff.

One approach to making learning an interactive and social experience is for teachers to organise peer dialogue and feedback in class. For example, Mazur (1997) described a process called 'peer instruction', involving triggering peer interaction and dialogue in large classes. Mazur explained a physics concept to students then presented them with a multiple-choice question (MCQ). Students responded individually to the MCQ and received feedback as a bar chart showing the class responses. If many gave the wrong answer, they were then instructed to 'convince their peers that they have the right answer' (see Nicol and Boyle, 2003).

This kind of dialogue encourages cognitive dissonance and perspective shifting - processes that have been shown to enhance learning and achievement. When used in first-year classes on a regular basis, however, structured dialogue of this kind also leads to social bonding around academic pursuits. The methodology used by Mazur has been adapted to support learning across almost all disciplines (see Banks, 2006).

Another approach to structuring dialogue is for teachers to set group tasks. For example, peer dialogue is particularly powerful in contexts where students in groups have to agree a common output in relation to a complex task or project. In this case, peer dialogue can significantly benefit individual learning as it exposes students to alternative perspectives and students often 'scaffold' each other's learning. Group projects also encourage students to study and learn together, which leads to the natural development of friendships and supportive groupings.

Teacher-student dialogue and interaction are also important to effective learning and social integration (Chickering and Gamson, 1987). In academic contexts, teacher-student dialogue is often required to clarify the meaning of feedback messages (for example, 'this report requires more critical analysis') and clear up conceptual misunderstandings.

In most studies of feedback, students request more one-to-one contact with academic staff. However, with the current large numbers of students in first-year classes it can be difficult to increase such contact. Peer dialogue can help here, if appropriately monitored. Some lecturers have also begun to replace face-to-face lectures with online materials so as to increase opportunities for personal contact time with their students. Others have begun to use new technologies such as EVS and discussion boards (Nicol, in press; Banks, 2006). EVS makes structured teacher-student dialogue possible in large classes, while discussion boards can provide a record of peer discussions, enabling tutors to monitor peer feedback processes in a supportive and non-dominating way.

> **The key question here is:** What opportunities are there for feedback dialogue (peer and/or tutor-student) around assessment tasks on your course?

Principle 7: Facilitate the development of self-assessment and reflection in learning

In order to foster independent learning in the first year of university study, it is necessary to provide students with many opportunities to regulate their own learning. This calls for structured tasks that encourage reflection and self-assessment. When students engage in academic tasks (for example, essay writing, solving problems), to varying degrees they are already monitoring and assessing their own progress. Hence, formalising opportunities for self-assessment in the curriculum would not only capitalise on abilities that students already possess, but would also ensure that these abilities are developed further.

Through self-assessment, students develop the ability to make evaluative judgements about what and how they are learning. This moves them away from dependence on a teacher towards greater self-responsibility in learning. Research has shown that systematic practice in self-assessment enhances learner autonomy, improves performance in final exams and activates intrinsic motivation (Black and Wiliam, 1998; McDonald and Boud, 2003). Self-assessment involves students in identifying the standards/criteria that apply to their work and making judgements about how this work relates to these standards (Boud, 2000). Hence principle 1 (clarify goals, criteria and standards) might be seen as a prerequisite for the effective implementation of self-assessment.

Self-assessment tasks can range from the simple to the complex. Students might, for example, be asked to make some judgements about their own work before an assignment submission (for example, its strengths and weaknesses, whether they have met certain criteria), or estimate the mark they think will be awarded and give a reason for this judgement, or they might be involved in selecting and compiling work for a

portfolio. Another way that self-assessment skills can be developed is by providing students with opportunities to evaluate and give feedback on the work of other students (with tutor monitoring where appropriate). Such peer processes help to develop the skills needed to make objective judgements against standards - skills which are often transferred when students turn to producing and regulating their own work (Boud et al, 1999; Gibbs, 1999).

Importantly, the development of self-assessment is a necessary condition in order to maximise the effectiveness of teacher feedback. To make use of teacher feedback, students must decode feedback messages, internalise them and use them to make evaluative judgements about their own learning and also to make improvements. Clearly, the better students are at self-assessment the better use they can make of teacher feedback.

> **The key question here is:** To what extent are there formal opportunities for reflection, self-assessment or peer assessment on your course?

Principle 8: Give choice in the topic, method, criteria, weighting or timing of assessments

The provision of choice in the topic, methods, weighting, criteria or timing of assessment tasks is about offering learners more **flexibility** in what, how and when they study. Greater flexibility gives students control over aspects of their own learning and prepares them for their future as lifelong learners (see Heron, 1988, for a discussion of ideas behind this principle). When students enter the workplace they are often required as professionals to create the criteria for their own learning and assess themselves against these criteria. Hence at university they should have opportunities to develop these skills.

Also, although students normally follow a fixed curricular diet based on their course, a case can be made that not all students progress in learning at the same pace. This suggests a need for more personalisation, such as different timings for assessments tied to individual needs or progress. At a pragmatic level, increasing numbers of students now have part-time employment while at university, which calls for more flexible assessment arrangements. Accessibility legislation is also showing that different modes of assessment might be required for students with different needs.

Some flexibility and personalisation already exist in HE. Students are often able to select **topics** for project work and they sometimes have choice about when they can take an online test **(timing)**. In portfolio assessment, students are asked to choose what **content** to put forward for assessment to evidence their achievement. Another strategy is to involve students in adding their own **criteria** to those provided by the teacher when engaging in project work (with assessment being based on both sets).

Choices of this kind are often only available in later years of study, however, they could be brought into the first year if the goal is to motivate and empower students. A key issue raised here concerns comparability of standards - flexibility should not allow students to avoid studying critical areas of the defined curriculum. On the contrary, rigorous assessment of learning outcomes should continue where appropriate, but flexibility in formative opportunities is critical where it helps students to develop the skills required to achieve those outcomes (see principle 5, page 35 for a discussion of summative assessment).

The key question here is: To what extent do students have choice on the topics, methods, criteria, weighting and/or timing of learning and assessment tasks in your course?

Principle 9: Involve students in decision-making about assessment policy and practice

A more developed and different form of academic empowerment would occur in HE if students were involved in decision-making about assessment policies and strategies at course, department or faculty level. Involvement at faculty level normally occurs through student representation on faculty and university academic committees that have a learning and/or assessment brief (for example, programme validation committees) and/or by students providing feedback on their assessment experience; such feedback is then used to make continuous improvements in assessment practices.

However, deep involvement at this level is rare in HE, although it is a developing area with many possibilities. For example, final-year students might work with first-year course leaders to redesign assessment tasks so they are more engaging. Even involving first-year students in discussions about why marks for an assignment are allocated the way they are, or why assessments are structured the way they are, might prove productive and empowering. A key idea behind such developments would be to foster ownership by students and enhance their level of stakeholder engagement in the university.

The key question here is: To what extent are students on your course kept informed and engaged in consultations regarding assessment policy decisions?

Principle 10: Support the development of learning groups and learning communities

Academic success at university has been shown to be highly dependent on experiences of social integration - by whether students participate in friendship groups, have a sense of belonging, feel part of the wider academic community and have contact with academic staff outside the classroom (Tinto, 1993; Krause et al, 2005; Yorke, 2005). Failure and early departure are not just the result of difficulty in meeting academic demands, but are often also related to a failure to integrate socially (Yorke and Longden, 2004).

Social integration is particularly challenging in institutions that have large class sizes, a wide mix of cultures with students of different nationalities, ages and backgrounds, and commuter students with external commitments and part-time employment. Assessment practices influence not only academic integration, but also levels of social integration in and out of class.

Group projects and assignments can be used to encourage students to study together, which can lead to the formation of enduring friendships. This is particularly important when students first enter university, but should not be neglected in later years. In some projects students might select the members of their own group, while in other situations it may be appropriate to manage the membership mix - for example, when the aim is to enhance cross-cultural understanding or when it is beneficial to expose group members to contrasting perspectives. Online environments can enable supportive relationships to develop among commuter students with external commitments. Key challenges here, as elsewhere, include achieving an appropriate solo/group-work balance, discouraging behaviours that could be placed under the general label of plagiarism, and assessing individual contributions to group projects.

Contact with members of academic staff and a sense that there is empathy have also been shown to enhance social integration (Endo and Harpel, 1982; Chickering and Gamson, 1987). This is difficult in large classes, but there is some evidence that teachers can project their presence within online environments, for example, by sensitive response to students in difficulty.

Moving beyond social integration is the idea of learning communities, where more stable communities develop around academic study. Some learning communities form spontaneously with only minimal teacher intervention or institutional support. For example, in a large first-year biology class at the University of Glasgow, the setting up of a shared discussion board (virtual space) where students could interact academically was shown to stimulate and enhance the development of friendship networks and learning communities. Also, when students have a positive experience of group working in class they might be more likely to extend these activities beyond the classroom. Learning communities can be more directly encouraged at course level by realigning structures so that students learn and study together across a range of modules (see Tinto, 1997).

> **The key question here is:** To what extent do your assessment and feedback processes help to encourage social bonding and the development of learning communities?

Principle 11: Encourage positive motivational beliefs and self-esteem

Motivation is of central importance in the first year as it is linked to self-confidence, self-efficacy (belief in the ability to do something) and self-esteem. Students' motivation is determined by whether they perceive that their own needs are being met, whether they see value in what they are doing and whether they believe they have the ability to succeed with reasonable effort (Meece et al, 2006). Rather than being fixed or completely determined by the environment, motivation is 'constructed' by students based on their appraisal of the teaching, learning and assessment context (Paris and Turner, 1994). This means that teachers can have an influence on student motivation.

Research in school settings has shown that frequent high-stakes assessment (where marks or grades are given) has a negative impact on motivation for learning and that this militates against preparation for lifelong learning (Harlen and Crick, 2003). Dweck (1999) argued that such assessments encourage students to focus on performance goals (passing the test, looking good) rather than learning goals (understanding and mastering the subject matter). Those with learning goals are more open to using feedback to improve learning, whereas those with performance goals have a narrower focus and are less interested in feedback messages (Knight, 2006). Feedback given as grades and without comments has also been shown to have especially negative effects on the self-esteem of lower-ability students (Craven et al, 1991).

Factors that enhance self-esteem, self-belief and the motivation to succeed include having early experiences of success (hence the need for early and regular low-stakes assessment tasks), encouraging students to focus on learning goals not just performance goals, using authentic assessment tasks that mirror the skills needed in the workplace, and providing opportunities to experiment. Group tasks, if appropriately organised, can also be highly motivating.

Other strategies that help to raise levels of motivation include allocating time for students to rewrite selected pieces of work (which helps to focus them on learning goals), automated testing where students can test their understanding in private and at a time that suits them (for example, online practice tests), and by enhancing learner agency and choice in assessment processes (see also principle 12, below).

Moving away from expressing levels and standards for assessed performance in terms of 'excellence minus some qualities' to expressing them as a 'threshold plus qualities' would also enhance motivation. Such a move would help to transform the discourse of assessment from one of failure to one of success.

> **The key question here is:** To what extent do your assessment and feedback processes enhance your students' motivation to learn and be successful?

Principle 12: Provide information to teachers that can be used to help to shape their teaching

Good assessment and feedback practice is not only about providing good information to students about their learning - it is also about providing good information to teachers. 'The act of assessing has an effect on the assessor as well as the student. Assessors learn about the extent to which students have developed expertise and can tailor their teaching accordingly' (Yorke, 2003, p 482). In order to produce feedback, which is relevant and informative and meets students' needs, teachers themselves need good data about how students are progressing.

Many strategies are available to teachers to help them generate and collate quality information about student learning. Some of these have been discussed in relation to the principles above. For example, regular formative assessment tasks would provide rich and cumulative information about the development of students' understanding and skill. The records of online discussions would make similar information about student learning available.

Angelo and Cross (1993) also showed the value of 'one-minute papers', where students carry out a small assessment task and hand it in anonymously at the end of a class (for example, 'What was the main point of this lecture?'; 'What question remains outstanding for you at the end of this teaching session?'). This kind of task provides the teacher (and students) with information about what is or is not being learned in class. When used regularly, the information provided by this technique can be used to adjust teaching in the next class in ways that promote learning. Regular use of this technique has also been shown to help build a sense of community in class. Engaging students in discussions about assessments (principle 9) would provide another source of feedback to the teacher or department.

> **The key question here is:** To what extent do your assessment and feedback processes inform and shape your teaching?

6 Examples of the implementation of the assessment and feedback principles

6.1 Simple techniques

This section provides a range of ideas and techniques for implementing formative assessment and feedback in first-year modules and programmes in HE. The techniques are organised in relation to the 12 assessment and feedback principles described in Sections 3, 4 and 5 of this publication. Given that each principle could be implemented in many and varied ways, the list of techniques provided here must be seen as a starting point only. Readers should be able to formulate other techniques that align with the principles and are better tailored to their own context.

Some attempt has been made to order the example techniques in relation to the **engagement-empowerment** dimension described in Section 4, although this is not a rigorous feature of the lists of examples. It is important to keep in mind that the more active and proactive students are, and the more responsibility they take (or are given) during the implementation of a principle, the more likely it is that they will develop their abilities to manage and regulate their own learning (empowerment). This point is discussed in Section 4 and in the recommendations in Section 3 (section 3.2.4).

Principle 1: Help to clarify what good performance is (goals, criteria, standards)

To what extent do students on your course have opportunities to engage actively with goals, criteria and standards before, during and after an assessment task?

Techniques which have proved effective in clarifying goals, criteria and standards include the following.

- Providing better definitions of academic requirements before each learning task, using carefully constructed criteria sheets and performance-level definitions.
- Providing opportunities for discussion and reflection about criteria and standards before students engage in a learning task.
- Asking students to reformulate in their own words the documented criteria for an extended writing task before they begin the task. This reformulation could be submitted with the assignment.
- Modelling in class how the teacher would think through and solve 'exemplar' problems in quantitative subjects (for example, mathematics), paying specific attention to the concepts behind the problems (and schema) and the different solution strategies, including incorrect pathways. Similarly, in the social sciences the teacher might model essay-writing strategies in psychology or how to use primary sources in history.

- Providing students with model answers for assessment tasks and opportunities for them to make comparisons against their own work. Nicol (in press) has described a first-year psychology module where students created a group response (800-word essay) to an online essay question. Model answers were chosen from the group submissions and replayed to students after they submitted. This helped students to know what was required because they saw what other students produced. It also raised motivation. In an economics course, model answers (including feedback) were selected from submissions made by students in previous years and made available in the library's short-loan collection. A range of examples was chosen spanning different levels of achievement. Sadler (2005) advised that more than one example is required where the task is complex, as a single case cannot fully represent a standard.
- Before an assignment, requiring students individually or in groups to examine selected examples of completed assignments (for example, from previous years) to identify which are superior and why. This helps students to identify and internalise assessment criteria (Gibbs, 1999).
- Organising a workshop where students, in collaboration with the teacher, devise some of their own assessment criteria for a piece of work (see also principle 8).

Principle 2: Encourage 'time and effort' on challenging learning tasks

To what extent do your assessment tasks encourage regular study in and out of class, and deep rather than surface learning?

Techniques which might prove effective here include the following.

- A basic strategy under this principle is to reduce the size (by limiting the word count) and increase the number of learning tasks (or assignments) set and distribute them across the timeline of the module. Race (2005) argued that shorter assignments (for example, a 300-word critical interpretation rather than a 3,000-word essay) might often tap better into higher-level cognitive skills. Such tasks could be made compulsory and/or only carry minimal marks (5-10 per cent) to ensure that students engage but staff workload does not become excessive.
- The teacher might also break up a large assignment (project, essay) into smaller components where performance is monitored and feedback provided in a staged way over the timeline of the module. For example, essay tasks might require a structured plan, statements of the key arguments and evidence, an introduction and so forth.
- A more empowering strategy might be to require students to draw up their own work plan for a complex learning task by defining their own milestones and deliverables before they begin. Some marks might be assigned when students adhere to their work plan and deliver on time.
- Linking in-class and out-of-class activities might be achieved by providing homework activities (for example, problem-solving tasks) that are subsequently built on in class - for example, by asking students to present and work through their solutions at the front of the class, supported by peer comments.
- Another strategy is to give students online multiple-choice tests to do before a class and then focus the class teaching on areas of identified weakness based on the

results of these tests. Nicol (2007b) described such a strategy in mechanical engineering, where the in-class follow-up involved interactive lectures using EVS.

- Winter et al (2003) described an innovative coursework assignment format called the 'patchwork text'. This uses small, distributed, written assignments of different types (a review of an article, a news report, answers to some questions) each of which is complete in itself, but which are then 'stitched together' through a final integrative commentary (for example, a reflective account or framework that synthesises the key understandings). A 'patchwork text' assignment is designed to be as varied as possible and to cover a wider range of educational objectives. Each of these short pieces of writing can be shared within a small group of students, who provide reciprocal feedback (principle 6). The marking regime can be tailored to the context, with fewer marks for early assignments or all marks given for the final synthesis, where students might also have the opportunity to revise or edit their earlier contributions. This format can also give students some choice in learning (principle 8), in that they might be allowed to select which patches to include in the final reflective account.

Principle 3: Deliver high-quality feedback information that helps learners to self-correct

What kind of teacher feedback do you provide, and in what ways does it help students to self-assess and self-correct?

Techniques that increase the quality of feedback and feed-forward include the following.

- In many engineering and science classes, students work through problem sets in tutorials, where teacher feedback is available. This ensures that the feedback is timely and is received when students get 'stuck'.
- Engineering at the University of Strathclyde also has a policy where for extended written assignments (essays and reports) the turn-around time for returning the assignment with feedback is two weeks.
- Race (2005) suggested giving a lot of feedback to students at the point at which they submit their work for assessment (in class). This feedback might include a handout outlining suggestions in relation to known difficulties shown by previous student cohorts, supplemented by in-class explanations. Race's argument is that students would have just worked through their assignment and would be at their most receptive to feedback. Alternatively, such documented feedback might be given in advance of students attempting the assignment. An online 'frequently occurring problems' list might serve similar purposes.
- Ensuring that feedback is provided in relation to previously stated criteria helps to link the feedback to expected learning outcomes. Many academics use assignment return sheets for this, with comments linked to criteria. Care needs to be taken to limit the number of criteria for complex tasks, especially extended writing tasks, where good performance is not just about ticking off each criterion but is more about producing a holistic response (see Sadler, 1989).
- Instead of providing the correct answer, the teacher might point students to where they can find the correct answer (for example, textbook pages). This might encourage students to seek out solutions and self-assess and self-correct. Another strategy

suggested by Taras (2001) in language teaching is to highlight in the text where students have made errors, but leave it to the student to address these errors for a resubmission. Both these techniques might be made more effective by awarding a small percentage of marks for highlighting the improvements in a resubmission.

- McKeachie (2002), quoting Cambridge (1996), suggested asking students to attach three questions about what they would like to know about a written submission or what aspects they would like to improve. This develops students' ability to evaluate their own writing, and gives teachers guidance about where to focus their comments. Getting students to request feedback based on their questions and concerns is more empowering than just providing feedback based on teachers' interpretations of students' difficulties.
- Asking students to self-assess their own work before submission and providing feedback on this self-assessment as well as on the assignment itself would directly support students as they learn to make evaluative judgements about their own achievements.

Principle 4: Provide opportunities to act on feedback (to close any gap between current and desired performance)

To what extent is feedback attended to and acted upon by students on your course and, if so, in what ways?

Techniques to help students to act on external feedback to close gaps include the following.

- Increasing the number of opportunities for resubmission.
- Modelling the strategies that might be used to deal with difficulties in student work in class (to close a performance gap); for example, modelling how to improve the structure of an essay that was rambling and disorganised.
- Not releasing the grade for an assignment or task until the student has responded to the feedback by commenting on it (for example, to say which parts were useful and why).
- Teachers might write down some 'action points' alongside the normal feedback they provide. This would identify for students what they should do next time to improve their performance.
- Asking students to find one or two examples of feedback comments in class that they found useful and explain how these might help with future assignments.
- Using classroom time to involve students in identifying 'action points' for future assignments. Students would formulate these action points after having read the feedback comments they have received; this would involve them more actively in the generation and planned use of feedback.
- Providing online tasks where feedback is integrated into the task (for example, online tests with feedback and simulations that provide intrinsic feedback).

Principle 5: Ensure that summative assessment has a positive impact on learning

To what extent are your summative and formative assessments aligned and supportive of the development of valued qualities, skills and understanding?

Techniques to maximise the positive impact of summative assessment include the following.

- Aligning learning tasks so that students have opportunities to practise the skills required before the work is marked (summatively assessed).
- Having students work on a regular basis on small summative tasks that carry minimal marks, but each with regular feedback. The marking component could increase later in the course after students have gained a clear understanding of what is required and have had practice in the task.
- Providing students with mock exams so that they have opportunities to experience what is required by summative assessment in a safe environment. This could provide useful opportunities for highly targeted feedback.
- Moving away from summative assessment for complex tasks to a pass/fail system, but with students providing evidence of their achievement in areas that are more difficult to assess (for example, initiative, working independently, group collaboration).
- Helping students to understand and record their own learning achievements through portfolio processes, and encouraging students to link these achievements (where appropriate) to the knowledge, skills and attitudes required in future employment.
- Moving away from the expression of written grade-level descriptors aligned to a system where the top level is 'excellence' and lower levels are 'excellence minus' to descriptors that would portray achievement in terms of 'threshold plus'. This would focus on students' successes rather than their failures.
- Redesigning and aligning formative and summative assessments to enhance student skills and independence. McCreery (2005) reported a redesign of assessment in a history course at the University of Sydney. The aim was to help students to improve their historical analysis skills through essay writing and to align formative and summative assessment processes. Two separate assignments (analysis of a journal article, worth 10 per cent, and a long essay, worth 35 per cent) were replaced because they were not aligned with the expected learning outcomes or the final exam, and feedback was limited. Instead, a three-stage essay assignment was introduced. This comprised an initial tutorial where the essay question was discussed in groups, a second stage of producing a draft essay plan with biography (10 per cent), and the final stage where the essay was produced (35 per cent). There was group discussion and enhanced feedback at each stage from peers and tutors. McCreery believed that this revised design helped students more readily achieve the desired learning outcomes, was more efficient and helped to develop learner independence.
- Adjusting assessment to develop students' responsibility for their learning. The School of Engineering and Science at the University of Edinburgh has adopted a teaching and learning strategy that focuses on developing the 'responsible learner' and involves changing the summative-formative balance. The School has proposed a reduction in formal teaching and summative assessment and a maximisation of self-assessment. The strategy states that:

> Our learning environment, and the requirements and expectations that we communicate to students, will be designed to ensure that they are given, and feel, a genuine responsibility for their own learning, seeing rewards and benefits from effectively managing their activities, and negative consequences from failing to do so.

In relation to summative assessment it states that:

> ...in pre-honours years, preparedness to progress to the next level and excellence will be assessed by separate elements of summative assessment. The extent of formal summative assessment will be the minimum required for these purposes. Students will monitor their own learning by self-assessment.

The School of Science and Engineering at Edinburgh University has initiated a range of vanguard courses to implement this strategy.

Principle 6: Encourage interaction and dialogue around learning (peer and tutor-student)

What opportunities are there for feedback dialogue (peer and/or tutor-student) around assessment tasks on your course?

Techniques for feedback dialogue include the following.

- Reviewing feedback in tutorials. Students are asked to read the written feedback comments they have been given by tutors on an assignment and discuss them with peers. They might also be asked to provide some ideas or strategies they might use to improve performance next time.
- Encouraging students to give each other feedback on an assignment in relation to published criteria before submission. This might be achieved in class or online.
- While group projects create natural peer dialogue, structuring this so that students discuss the criteria and standards expected before the research begins, and then return to discuss progress in relation to the criteria during the project, would enhance the feedback provided by peers.
- Using EVS to make lectures more interactive. Nicol and Boyle (Nicol and Boyle, 2003; Boyle and Nicol, 2003) described a first-year mechanical engineering module where the teacher uses EVS to support different types of dialogue in class. The session starts with the teacher explaining a difficult concept then presenting an MCQ to test students' understanding. Students make responses to the MCQ using handsets. The responses are collated in real time by computer and displayed as a bar chart, thus providing almost immediate quantitative feedback on the distribution of class responses. This procedure is enhanced through peer and teacher feedback. One approach involves structured peer discussion. Students in groups are asked (after the bar chart feedback) to convince their neighbour that they have the right answer. They are then retested on the same MCQ. Another approach is class-wide discussion. The teacher asks different groups of students to explain the reasoning behind their answers, whether right or wrong, and then provides his/her own explanation. Three forms of feedback can be provided with this strategy - computerised feedback (bar chart), feedback from peers (peer discussion), and feedback from the teacher during facilitated class discussions. Banks (2006) discussed the use of this technology across a range of disciplines.

- Facilitating teacher-student feedback in class through the use of in-class feedback techniques. One example described by Angelo and Cross (1993) is the 'one-minute paper'. Students are asked for written short answers to two questions posed at the end of a lecture class - for example, 'What was the key idea in today's lesson?' and 'What question remains unanswered in your mind?'. They respond to these questions on paper and the teacher uses the results to provide feedback and stimulate discussion at the next lecture session. This not only integrates feedback into teaching and learning processes, but also helps to build a dialogue around learning in large classes (Draper, 2007).

Principle 7: Facilitate the development of self-assessment and reflection in learning

To what extent are there formal opportunities for reflection, self-assessment or peer assessment on your course?

Techniques to encourage structured reflection and/or self-assessment are varied and include the following.

- Creating a series of online objective tests and quizzes that students can use to assess their own understanding of a topic or area of study (Bull and McKenna, 2004). Research has shown that students find such tests valuable (Grebnik and Rust, 2002) and will often make repeated attempts at them, particularly if they are pegged to some aspect of summative assessment. For example, students might have to achieve 80 per cent correct in a final objective test exam, but they can practise beforehand with a databank of formative tests as many times as they wish.
- Students requesting the kinds of feedback they would like when they hand in their work - for example, which area they would like comment on in relation to the criteria.
- Structuring opportunities for peers to assess and provide feedback on each other's work using criteria. Such peer processes help to develop the skills to make objective judgements against criteria - skills which are often transferred when students turn to regulating their own work (Gibbs, 1999).
- Using confidence-based marking (CBM). Gardner-Medwin (2006) used online multiple-choice tests in a medical degree at University College London, but with a critical modification called 'confidence-based marking'. In CBM, students not only select the answer but also rate their confidence on a three-point scale (C=1, 2 or 3). Both these components determine the marks that students receive. When the answer is correct the mark depends on the confidence level (M=1, 2 or 3). If the answer is wrong, then the higher the confidence level the higher the penalty (-2 at C=2 and -6 at C=3). By having to rate their confidence, students are forced to reflect on the soundness of their answer and assess their own reasoning (reflection/self-assessment). Importantly, CBM does not require the teacher to actually collect or analyse the reasons underlying students' answers, but the online tool does provide a mark.
- Using an assignment cover sheet for reflection and self-assessment[4]. Pharmacy at the University of Strathclyde has been piloting the use of an assignment cover sheet that students fill in when they submit an essay. They have to rephrase the essay question in their own words, make a judgement about whether they have met the

[4] An example of an essay cover sheet used at the University of Oxford is available at www.learning.ox.ac.uk/oli.php?page=43

stated criteria and estimate the mark they expect. This encourages reflection and provides useful information to teachers about levels of competence and judgement.

- Directly involving students in monitoring and reflecting on their own learning through portfolios. The construction of a portfolio requires students to reflect on their achievements, select work and make claims about how their work meets different requirements, criteria or standards. Portfolios help students to increase their sense of ownership over their work and integrate learning across different subject domains.
- Asking students to write a reflective essay or keep a reflective journal in relation to their learning on a module or course.

Principle 8: Give choice in the topic, method, criteria, weighting or timing of assessments

To what extent do students have choice in the topics, methods, criteria, weighting and/or timing of assessment tasks in your course?

Techniques for giving students more choice in assessments include the following.

- Students are often given opportunities to select the **topics** for extended essays or project work. This encourages some ownership of the topic and can increase motivation.
- Students might be given some choice in **timing** regarding when they hand in assignments. This would be particularly appropriate where students have many assignments for different modules and where they are engaged in part-time work. Teacher workload could be managed by offering some scheduled times, or students might be asked when assessments are due and the timings for submissions negotiated.
- In an education course at Strathclyde, students were required to generate in groups the **criteria** that would be used to assess their projects. This task proved extremely demanding. Indeed, students reported it as one of the most demanding learning experiences they had taken part in during their undergraduate degree. Tutors reported that producing the rationale and criteria for the assessment was more demanding than actually carrying out the project task.
- In an e-learning postgraduate module at the University of Edinburgh, students were asked to add their own specific **criteria** to the general criteria provided by the teacher. These were taken into account in the final assessment for the module.
- In an accountancy module at the University of Sydney (Arthur, 2006), students got a short introduction and then in pairs produced multiple-choice tests over the duration of the module. They also produced feedback for the correct and incorrect answers. What tests to produce were determined by the students, although the tests were chosen with reference to the module's learning objectives. The rest of the class then took these tests and evaluated them. Some of the tests were used in the final examination. The teacher argued that this procedure develops a deep understanding of the topic, as the creation of feedback for wrong answers raises students' awareness of subtle aspects of the discipline. It also helps students to generate questions and criteria for correct answers, both of which deepen understanding.

Principle 9: Involve students in decision-making about assessment policy and practice

To what extent are students on your course kept informed or engaged in consultations regarding assessment policy decisions?

Techniques for involving students in decision-making might include the following.

- Providing online discussion fora where students can ask questions about assessment procedures. In one class (psychology), students asked why the department had a compensation scheme and others did not, and about the structuring of assessment tasks. The tutor's responses to these questions had a positive effect, as students felt that they had a voice in policy decisions.
- Student representation on committees that discuss assessment policies and practices. It has been suggested that one strategy to avoid student complaints and litigation resulting from the National Student Survey (where there is marked dissatisfaction with assessment and feedback) is to involve students as partners in assessment decision-making.
- Requesting feedback from students on their assessment experiences in order to make improvements (for example, collating feedback on their experiences of exams and tests, marking and feedback, the weighting of assessments and their wider experience across programmes). It might also be prudent to collate data across subject areas and years of study.
- Carrying out a brief survey mid-term or mid-semester while there is time to address major concerns.
- It will be important to explain your rationale to students if using the ideas suggested in this publication. Students are more likely to appreciate the importance of self-assessment, peer dialogue and self-generated feedback if they have had opportunities to reflect on and discuss their own role in making learning effective.
- Departments, faculties or institutions might wish to go further and work with their students to develop an agreement, contract or charter where roles and responsibilities in assessment and learning are defined.

Principle 10: Support the development of learning groups and learning communities

To what extent do your assessment and feedback processes help to encourage social bonding and the development of learning communities?

Techniques that have proved effective in fostering social cohesion include the following.

- Constructing group tasks and projects in the first year so that students have opportunities to form friendships.
- Getting students to set tasks for each other. In a technology and management module in one university, the teacher required students working in groups to set tasks for all other groups taking the module. This required each group to try to understand the range of perspectives of those taking the module. The task-setting group also had to develop suitable assessment criteria. The fact that all groups developed a task and carried out tasks set by other groups led to high levels of engagement and sensitivity to different backgrounds and cultures.

- Encouraging the formation of peer study groups or creating opportunities for students from later years to support or mentor students in earlier years.
- Linking modules together as a pathway so that the same students work in the same groups across a number of modules (Tinto, 1993).

Principle 11: Encourage positive motivational beliefs and self-esteem

To what extent do your assessment and feedback processes enhance your students' motivation to learn and be successful?

Techniques to enhance motivation might include the following.

- Structuring learning tasks to have a progressive level of difficulty, so that weaker students can have some success but those who are more able are not held back.
- Encouraging a climate of mutual respect and accountability. Group projects are motivating when a climate of mutual respect is encouraged and when the project embodies procedures that support both individual and group accountability.
- Providing objective tests where students can assess their understanding in private and make comparisons with their own learning goals rather than with the performance of other students. This allows students to focus effort on making improvements in their learning rather than just on competing and comparing themselves with their peers (Elliot and Dweck, 1988).
- Using real-life scenarios and dynamic feedback. Well-organised online simulations (for example, in business and engineering) can be motivational when they are based on real-life scenarios and when the feedback allows students to see what progress they are making towards goals on an ongoing basis.
- Providing marks on written work only after students have responded to feedback comments.
- Many of the strategies described under the other principles would also enhance student motivation - for example, opportunities for self-assessment (principle 7), choice and involvement in decision-making (principles 8 and 9) and the formation of supportive learning communities (principle 10).

Principle 12: Provide information to teachers that can be used to help shape their teaching

To what extent do your assessment and feedback processes inform and shape your teaching?

Techniques that help teachers to generate and collate useful information about student learning include the following.

- One-minute papers where students carry out a small assessment task and hand it in anonymously at the end of a class (for example, 'What was the main point of this lecture?'; 'What question remains outstanding for you at the end of this teaching session?'). The teacher then uses this test to inform teaching in the next class (Angelo and Cross, 1993).
- Having students request the feedback they would like (perhaps in relation to the stated criteria) when they make an assignment submission.

- Frequent low-stakes assessment tasks with regular outputs. These can provide teachers with cumulative information about student progress, which could be analysed and used to shape subsequent teaching.
- Online multiple choice tests delivered before a lecture class. These can be analysed and used to determine what is taught in class (Nicol, 2006, 2007b).
- Using online tools with built-in functionality for class and individual recording and reporting. Online tools can provide information about levels of student engagement with resources, with online tests and in online discussions.
- EVS to provide dynamic feedback in class. The stored data provide further information about responses, which could be analysed.
- Providing opportunities for students to self-assess and reflect on their learning. If these reflections were written down they would provide important input to teachers about students' ability to evaluate their own learning.

6.2 Case studies of assessment and feedback practices in the first year of undergraduate study

This section provides some disciplinary case studies showing how multiple assessment and feedback principles might be implemented in the same learning design. Implementing more than one principle should increase the power of a learning design: in comparison to a single principle, the existence of multiple principles should result in better support for the development of academic and social integration and learner empowerment.

Each case study contains a description of the module or course, information about the learning design and the results of any evaluation where one has been carried out. The case studies are also analysed in relation to the assessment and feedback principles. The general approach has been to note from the module/course those principles that were key to the learning design and strongly implemented, but also to highlight how the module/course relates to all 12 principles. In theory it would be possible within each case study to suggest how the learning design might be strengthened by, for example, using additional assessment principles or enacting the same principles in more powerful ways (see Section 3, paragraph 3.2.4).

Three of the case studies are drawn from the REAP project, which focused on the first year of undergraduate study. REAP involved implementing a subset of these assessment and feedback principles in the redesign of 19 first-year large-cohort modules (with student numbers ranging from 160 to 900) across a range of disciplines. Individually, the case studies reported through REAP provide initial support for the principles as a means of designing learning in the first year. However, the studies reported on only one or two years of implementation, and therefore the findings need to be confirmed through more rigorous study.

Against this, more than half of the 19 redesigned modules in the REAP project showed learning improvements (improved exam performance, reduced failure rates) and all showed enhanced student satisfaction, as indicated by questionnaires and focus-group data. This was a surprising result given the time frame and provides some converging support for the value of the assessment and feedback principles.

From a different perspective, it could be argued that having a clear pedagogical rationale for module and programme design, embodied in principles which are supported by the research, is a productive way of driving forward improvements in the first year experience. Section 3 of this report also argued that the assessment principles provide some important 'process' indicators against which to evaluate change in modules and programmes in relation to the development of learner self-regulation. For example, it is possible to evaluate the extent to which a redesigned module offers enhanced opportunities for peer dialogue (principle 6), self-assessment (principle 7) or choice in assessment (principle 8) when compared to the design it replaces.

Such process measures can show the extent to which a module provides opportunities for the development of learner self-regulation, even if it does not directly show the extent to which self-regulation occurs. These measures can therefore augment input measures (for example, staff time) and outcome measures, such as the effect of the intervention on exam performance, student satisfaction and/or retention statistics (see extended discussion in Section 3, paragraph 3.2.10). All the modules redesigned in REAP were analysed in relation to these assessment principles. Further examples can therefore be found on the REAP website.

Case study 1: Online collaborative work in a large first-year psychology course

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Background

The first-year Basic Psychology class at the University of Strathclyde introduces students to key findings, theories and debates in contemporary psychology. Before the redesign described here, the course comprised six topic areas delivered through 48 lectures, four tutorials and 12 practical laboratories over two semesters. The course leader delivered the lectures and 12 postgraduate teaching assistants managed the tutorial discussions. The class size is generally around 550 students.

The assessment comprised two paper-based multiple-choice tests over the year (worth 25 per cent), tutorial attendance (4 per cent), participation in an experiment (5 per cent) and a final exam where students wrote five essays from a choice of 12 (66 per cent). Feedback was only available through marks given on the multiple-choice tests and students were not given practice in or feedback on their writing, even though essays were the basis of the final exam.

The class leader wished to redesign this class so as to enhance the first-year experience. The main objectives were to increase students' understanding of the topics being studied, encourage regular and deeper reading of psychology texts, and provide practice in writing necessary for the exam. All this was to be achieved without increasing staff workload.

The redesign

Basic Psychology was redesigned to provide opportunities for constructive formative assessment (scaffolding) linked to supportive peer discussion. The redesign drew on research showing cognitive gains when peer discussion is directed at the resolution of conflicting views (for example, Anderson et al, 2001; Doise and Mugny, 1984). The redesign involved the use of the discussion tools within the institutional virtual learning environment (VLE), WebCT.

In the academic year 2006-07, students were divided into 82 online discussion groups with six or seven students per group. They remained in the same discussion groups throughout the year. In the redesign, the number of lectures was halved (12 instead of 24) and replaced with six cycles of three-week online learning tasks, each cycle dealing with one of the six topic areas in psychology (memory, social psychology, and so on). The year started with an initial induction task where students in the groups introduced themselves to each other via the online discussion board. Thereafter each cycle comprised the following:

- week 1 - a light written task (for example, all students answered seven short questions defining terms in a topic area, then discussed online and posted a group response)
- week 2 - guided reading in preparation for the week 3 essay
- week 3 - deep written task in which students produced individual inputs to an 800-word essay question and then collaborated online to produce the essay.

Within each task week, the course leader used the Monday lecture to introduce new material. Immediately after this lecture a learning task was posted, with the date for online submission being the following Monday. After the students' submissions, the teacher posted model answers selected from among the students' group work. Students could compare what they had done against those the course leader had selected as good answers. A class-wide discussion board was also set up in WebCT where students could ask questions of the course leader or other students or engage in peer discussion.

Key features of the implementation were that:

- the learning tasks became progressively more difficult over the duration of the module
- students were encouraged to make individual contributions, but also to engage in constructing a group response
- for each writing task there was a model answer for comparison.

Neither the course leader nor the postgraduate tutors moderated the quality of the online discussion. The course leader provided general feedback to the class-wide discussion board. However, this was as much motivational - encouraging confidence in ability - as on the content. In 2006-07, the students were not formally assessed on these online tasks, but they were compulsory. Tutors alerted the course leader about individual non-participation and he contacted students who failed to participate. The availability of a record of the online group work enabled the class leader to reformulate groups if students reported problems (for example, 'free-riding'). Only five groups had to be reformed in 2006-07.

In 2007-08, a small percentage mark is being awarded for contributions (2 per cent), which are being monitored by the teaching assistants. Students can thus gain up to 24 per cent for regular participation.

Evaluation

The evaluation of this course redesign comprised questionnaires, focus groups with students, scrutiny of online discussions and comparisons of exam performance against previous years.

The submissions to the online tasks showed that many groups produced written essays online of an exceedingly high standard, often at third and fourth-year level. The course leader reported that this work was 'at a level not seen before from first-year students', and that the productions clearly showed that students were regularly reading and discussing the prescribed texts. The online discussion data also showed that, although different groups progressed at different rates, there were visible examples of peer scaffolding. Students supported each other's transition over time from a weak and tenuous grasp of a conceptual idea to a more considered and robust understanding. These findings concurred with student responses to end-of year-questionnaires (2006-07). Table 4 shows some findings from the student questionnaires.

Questions about psychology redesign	Agree	Disagree
I read more about psychology and read it earlier in each semester than I would have done without the online projects	70%	13%
I learned more about psychology because of online projects than I did in my other subjects	48%	22%
The feedback based on other students' work helped me to understand how to improve my own answer (ie model answers)	50%	15%
I found that reading other people's contributions helped me to understand psychology	64%	18%
I made friends as a result of the online projects	12%	85%

Table 4: student responses (n=164) to end-of-course questionnaire (five-point Likert scale running from strongly agree to strongly disagree)

The questionnaire responses show that the majority of students read more in psychology and earlier in the year because of the online tasks, and that reading the contributions of others during the online group discussions had a positive effect on learning. Around half the students felt that the online feedback (model answers) was beneficial and that they learned more through online projects than they did in other subjects. Only a small proportion disagreed with the first four statements (table 4), although there were a high number of neutral responses. Open comments made by the students reinforced the quantitative questionnaire data. These emphasised both the way in which the collaborative learning tasks enhanced student confidence and the perceived benefits in learning.

Staff and student perceptions were consistent with the improvements found in mean exam performance for this course, which rose from 51.1 to 57.4 per cent ($p<0.001$). The failure rate also dropped from 13 per cent in previous years to 2 per cent in the 2006-07 academic year.

Students made extensive postings to discussion boards. The total number of messages posted within the 82 (closed) groups was 24,362, with an average number of 44.3 postings per student. There were 6,000 postings to the class-wide discussion board, which students used to answer each other's questions and to post questions to the teacher. In this forum some students also formed groups to discuss other courses they were enrolled in.

One interesting finding was that despite this being a campus-based course, students actively participated in the online discussions. The questionnaire also showed that only 43 per cent of the students actually met face to face to discuss the learning tasks. This might suggest that the online discussion format may have tapped into the habits of those first-year learners accustomed to social networking. However, 86 per cent of the students disagreed with the statement: 'I made friends as a result of the online projects'. This was somewhat surprising given that the group discussion data showed that as well as academic peer scaffolding there was significant evidence of social engagement, including sharing and discussing personal information. This raises questions about what students understood by the word 'friend' in this context and about the nature of these

social processes in relation to academic learning. The research literature has identified social integration as a powerful influence on the first-year experience (Tinto, 1997), so this finding warrants further investigation.

A key consideration from the teacher perspective was that the redesign of the course did not increase staff workload. Halving the number of lectures and using postgraduate teaching assistants to monitor student contributions resulted in similar costs in staff time when compared to previous years.

In summary, the Psychology course is a good example of an elegant, efficient learning design which uses technology to maximum effect to improve the first-year learning experience. Indeed, it is difficult to see how the course leader could have managed and monitored 82 groups without this technology. Moreover, the psychology design plan is easily transferable to other courses and contexts. It is simple to implement as it only involves a standard tool available in every VLE - a discussion board.

Relationship to the 12 assessment and feedback principles

The strong features of this design are the regular cycles of learning tasks across the module (principle 2); the online peer discussion and associated feedback encouraged by these tasks (principle 6), which leads to the construction of group responses; and the use of model answers for self-assessment (principle 7). The students have also been extremely positive about the use of the online environment as a tool to establish their own support networks (principle 10). The following is a more comprehensive breakdown in relation to the 12 assessment and feedback principles.

- The standard format and model answers provide progressive clarification of expectations for students taking this first-year class (principle 1).
- The learning tasks are spread using three-week cycles across the whole year, which encourages regular study in and out of class. The tasks are also ordered, so the level of challenge increases as the course progresses (principle 2).
- The teacher selects model answers as a feedback source for students and provides feedback to the whole cohort through the general discussion board (principle 3). The plan is to provide more feedback from the teaching assistants in future iterations of the course, although this would not be on content but rather to encourage more peer dialogue around learning.
- The repeated cycle of topics and tasks provides significant opportunities for students to transfer learning to new contexts (within a cycle and across cycles) and to close the gap between desired and actual performance (principle 4).
- The formative and summative tasks are aligned in that the more students work on the online essay-writing tasks (formative), the better they are likely to perform in the written exam. Also, the small percentage of marks to be used for contributions in 2007-08 means that formative and summative processes will become more tightly integrated (principle 5).
- The online peer discussion of the learning tasks, with the goal of reaching consensus about the group response, is a core feature of this design (principle 6). It encourages peer scaffolding and the resolution of different viewpoints (cognitive conflict), both known to be associated with deep learning.

- Students are encouraged to self-assess (reflect) by comparing their responses with the model answers (principle 7).
- There is some choice and flexibility in the way that students divide up work in their groups, though no choice in the actual learning tasks (principle 8).
- Students are **not** engaged in decision-making about assessment policy (principle 9).
- The online interactions result in the development of productive learning relationships. Students are also able to form groups to discuss work in other classes they are enrolled in (principle 10).
- The increasing complexity of the online tasks scaffolds learning development, and the focus on learning (rather than marks) enhances intrinsic motivation. The compulsory nature of the tasks provides some extrinsic motivation to participate (principle 11).
- The online archive of group discussions and their outputs means that the course leader can monitor progress and adapt classroom teaching in relation to students' needs (principle 12).

Case study 2: Engagement and self-study in French language learning

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Background

The first-year French class at the University of Strathclyde aims to develop students' knowledge and skills in the French language and widen their understanding of contemporary France. The course has an enrolment of around 200 students. Until the redesign reported here, it was delivered through two tutorials and one practical class per week. However, a reduction in staffing and a 20 per cent increase in student numbers meant that tutorial group sizes would have had to increase to around 40 students. This was seen as too large a number for language teaching. Also, students were now entering the first year from more diverse backgrounds and with a wider range of language skills (listening, speaking, writing) than in the past. This pointed to a need to reduce, not increase, the class size.

Assessment in French comprised 30 per cent for coursework carried out during the year and 70 per cent for a three-hour written exam testing grammar, translation and comprehension. Students could gain exemption if they achieved above 50 per cent in assignments, class tests and oral classwork.

The course leader wished to address three issues through her redesign. Firstly, the redesign should give students more control over their own learning. This was to be realised through more opportunities for self-monitoring of progress and more flexibility in relation to when and where students studied. The course leader had also identified that increasing numbers of students were in part-time employment and could not therefore attend all the scheduled class sessions. Secondly, she wished to enhance opportunities for regular formative feedback, both in class and between timetabled classes. Thirdly, and importantly, she wished to maintain or improve learning quality even though student numbers were increasing and there was little likelihood of increased staffing.

The redesign

The French class was redesigned to provide a wider range of more flexible learning and feedback opportunities, using face-to-face and online modes. Tutorials were reduced from two to one each week, but with smaller group sizes (around 20). The second weekly tutorial was replaced by an interactive lecture with the whole cohort. An EVS was used to support this lecture format (see below). The class leader also provided an extensive range of online formative language exercises spread out through the year, using WebCT assessment and feedback tools. For example, students might watch a recording of the French news and answer some multiple-choice questions to test and get feedback on their listening comprehension.

The academic year began with students engaging in an online diagnostic test and an online survey that collated biographical details and information about their expectations of university study. This gave tutors more information than in the past about prior language knowledge and skills and personal considerations (for example, numbers engaged in part-time employment). Throughout the year there were frequent opportunities for online formative testing using texts, videos and audio recordings. Students could take these tests as often as they wished, from home or on campus.

The interactive lectures were used to develop students' understanding of grammar. A typical format of EVS use was for the teacher to present a question (normally multiple-choice) in class. Students responded to the question using handsets similar to TV controllers. Software collated the responses and presented a bar chart to the class showing the distribution of answers. After polling the class, the teacher could stimulate small peer-group discussions (about difficult grammar points), for example, when many in the class got the answer wrong (Boyle and Nicol, 2003). Students could then be retested on the same question to establish that understanding had improved. The teacher could also provide her own feedback on the question or facilitate further class-wide discussion.

In effect, the EVS technology simultaneously supported three types of feedback in the same class session: feedback through reflection, where students compared their own MCQ response to the class responses (bar chart), peer feedback derived through discussion and teacher feedback.

The formative online tests were synchronised to support the tutorials and EVS interactive lectures. For example, the teacher used the findings from the online tests to determine areas of weakness and decide the focus of tutorials and EVS sessions. This procedure, often called 'just-in-time' teaching, is a way of targeting teaching to students' needs and level of understanding (Novak et al, 1999).

Assessment under the new design was based on five items:

i fortnightly online self-assessment tests

ii fortnightly online guided listening tests (video and questions)

iii online class tests under exam conditions (grammar and listening)

iv online class-based oral comprehension tests under exam conditions

v two written tests - a reading comprehension and a translation.

The first four tests were marked electronically, and the first two offered some flexibility in when they were taken and the number of attempts before the mark counted. As noted above, students could gain exemption from the final exam if they scored above 50 per cent in each of these marked assessments.

Evaluation

Evaluations involved focus groups, end of course questionnaires and exam results. Questionnaire responses showed that students valued the opportunity for regular self-assessment and feedback provided through the online tasks. They also reported that the speedy return of marks helped them to identify what progress they were making and where to focus their study efforts. In addition, they valued the flexibility in when and where they took the tests. For example, 91.3 per cent of students reported in an end-of-course questionnaire that 'having to work regularly [on self-assessment tests] helped me to learn', and 76 per cent reported that they 'had to work more in French than in any other subject'. These results show how regular assessment tasks kept the students engaged in study. The course tutors reported that the redesign saved teaching time compared with previous years, but also resulted in better quality of personal contact time with students.

The progression rate from the first year to the second year improved from 71.7 per cent to 78 per cent in 2006-07 when compared with previous years. In addition, the fail rate dropped from 24 per cent in 2005-06 to 4 per cent in 2006-07 for those who were not exempt and took the final exam. The course leader also reported that attendance at lectures and tutorials, which had been falling, improved markedly compared with previous years.

Relationship to the 12 assessment and feedback principles

The strong features of this design are the regular online tests across the module, which keep students engaged out of class (principle 2), the use of EVS, which ensures active engagement in class (principle 2), and the multiple sources of feedback (especially peer and teacher) provided in the interactive lectures supported by EVS (principles 3 and 6). The online self-assessment tests also enable students to monitor and regulate their own learning (principle 7). The following provides a more comprehensive breakdown.

- Learning goals and criteria are communicated through WebCT, and are reinforced by frequent online testing and through in-class discussions with immediate feedback using EVS (principle 1).
- The online exercises and fortnightly tests require students to study regularly throughout the year. They also call for progressively deeper levels of language skill as the year progresses (principle 2).
- Students receive feedback from the tutor in class during interactive EVS sessions. Some feedback is built into the online tests (principle 3).
- Being able to retake tests enables students to use feedback information to improve their performance in subsequent rounds of testing (principle 4).
- The alignment of the formative and the summative merge if students achieve an exemption. On the other hand, if students have to take the exam, alignment is considerably less (principle 5).
- Peer dialogue is primarily planned for within the EVS lecture classes (principle 6). More project work might be used for the more conceptual aspects of this class (for example, 'to widen students' understanding of contemporary France').

- Students have regular opportunities to self-assess using the online formative and summative tests (principle 7).
- Choice is a strong aspect of this design, centred around providing flexible opportunities in relation to when students take tests (principle 8).
- No attempt has been made to involve students in decision-making about this class (principle 9).
- There is some evidence of an online community developing within the WebCT discussion board, but it has not been supported in any way (principle 10).
- Regular self-testing and practice opportunities help to build student motivation and confidence. They provide a private space for students to test themselves, so as to identify what they should work on in their study (principle 11).
- Diagnostic testing, regular analysis of weekly online tasks and interactive lectures provide a range of feedback information that tutors can use to align their teaching to student needs (principle 12).

Case study 3: Encouraging time on task in first-year biology

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Background

Level 1 Biology at the University of Glasgow is a first-year class divided into two consecutive modules (each spanning a semester of 12 weeks) with 650-700 student enrolments. The class is compulsory for students intending to enter level 2 Biology, but any student on a degree programme at the University of Glasgow can also study these modules.

During the second module, students are asked to participate in a group activity called the 'Lifestyle Project', which accounts for 20 per cent of their overall mark for the class. The other assessments are two paper-based objective question assignments (15 per cent), a laboratory report (15 per cent) and a two-hour end-of-year exam (50 per cent) comprising multiple-choice tests, calculations and sequencing questions, and short essays.

The Lifestyle Project

Most students studying level 1 Biology at the University of Glasgow follow programmes in human or whole animal biology. The Lifestyle Project requires students to compare the lifestyles of humans in different countries and to investigate and evaluate the lifestyles of species other than humans. It was also designed to encourage students to develop teamworking skills, acquire oral and visual presentation skills, and undertake independent research.

The project includes three main activities, with the marks for each one made up as follows.

i In groups, students produce a poster comparing the lifestyle of a typical UK resident with that of a typical resident of another country (6 per cent).

ii Groups of students select a species and argue in a face-to-face debate for the extinction from the planet of their chosen species, on the basis of its destructive lifestyle, and for retention of their opponents' species (6 per cent).

iii Students research and answer one lifestyle problem individually. The problem is selected from a menu provided by the teacher. This provides choice, thus offering some specialisation (8 per cent).

The group tasks (i) and (ii) are marked by two members of academic staff. They assess the quality of the debate presentations for and against each species and the group's ability to field questions at the end. The posters are marked against a number of defined criteria. Individual marks are arrived at through a peer assessment process. Students in the groups are asked to allocate marks to other members of their group on the basis of

their individual contributions to the debate and poster and according to a list of criteria agreed by the individuals in the group. Students are also asked to assess their own contributions to the group tasks and to write a short paragraph justifying these and suggesting a mark.

Although the staff teaching this class reported that the peer-marking exercise worked reasonably well, a number of groups each year had problems in agreeing the individual marks. In these cases, it was extremely time-consuming to investigate the source of difficulties and resolve disputes. A second issue was that some group members had difficulty attending group meetings because of personal commitments. A third problem was that some groups each year appeared to have difficulty in scheduling their activities effectively. This resulted in a rush to complete posters and in poorly conceived arguments during the class debate sessions.

A final issue was that the groups received no teacher feedback while the group activities were being carried out. With such large numbers it was difficult for staff to monitor progress. However, this meant that problems only came to light near the end of the course when feedback was less effective. The changes described below were intended to address these problems.

The redesign

The group working and peer assessment format of the Lifestyle Project were redesigned for 2006-07; the University's VLE, Moodle (www.moodle.com), was harnessed to support the changes made. In considering the redesign of this class, the course team drew on the thinking behind the REAP project.

The student cohort was divided up into 80 groups of eight students. Each group was assigned an online discussion board forum within Moodle, accessible only to group members and to postgraduate teaching assistants, who were asked to monitor (but not to moderate) postings and discussions. Instead of encouraging students to meet in person to complete group tasks, staff introduced the class to Moodle during an introductory lecture and explained the benefits of interacting online. The whole class was also given access to an open discussion board in the VLE. Student groups were required to post deliverables to the Moodle forum during the project. The whole-class discussion board was used for general discussion and by teachers to provide feedback to the whole class on progress in the task. Feedback was also provided to any groups who were in difficulty; this was made possible by monitoring progress in the Moodle forums.

All information about the Lifestyle Project was delivered to student groups via Moodle. Instructions on completing the task were pre-loaded into Moodle, thus ensuring that every student received consistent guidance. Additionally, the Lifestyle Project was organised into series of 'micro-tasks' released progressively via Moodle and through automatically generated email alerts to each student over the timescale of the project. Students had to post deliverables from the 'micro-tasks' to their Moodle forum. The tasks required each group to post the items below.

- A list of the marking criteria they planned to use to assign peer marks at the end of the project. In 2006-07, students had to negotiate these within their groups at the beginning of the project rather than wait until the end. Research shows that

disputes can be reduced if students actively engage in determining their own assessment criteria for group working in advance.

- A decision on which country and species each group planned to examine for their poster and debate, with a brief rationale for each of these choices.
- A statement detailing who would be leading the group and how the tasks would be divided (for example, research, synthesis of ideas, presentation).
- Summaries of the group material to be used in the poster presentation and the debate.
- After receiving the group mark, the group had to agree the individual marks based on the agreed criteria and self-assessments. They also had to justify their mark allocations.
- In addition, the students presented their poster and participated in the face-to-face debate in class time.

Some of these deliverables were necessary for the marking process and the allocation of group marks. Others (rationales, summaries) were intended to cause the members of the group to reflect on the processes in which they were engaged. The groups, however, retained considerable discretion in the division of labour associated with the micro-tasks.

After the deliverables were posted, the tutors provided feedback to the whole class via the open class discussion board. This feedback was intended primarily to motivate students. The regular postings to Moodle provided evidence of student engagement with the tasks and made it possible for staff to identify struggling groups or individuals and to take remedial action, or to adapt subsequent classroom activities to provide more support or guidance to the whole class if required.

Evaluation

The evaluation of this class redesign comprised questionnaires, focus groups and analysis of the group deliverables in Moodle and Moodle log-in data.

Students were positive about the structure of the learning tasks, with a clear timeline and deadlines for submission. For example, 96 per cent of students reported in the end-of-task questionnaire that they had been aware of the deadlines, and 88 per cent said that they had found them useful. In spite of this, fewer than half the groups met all the deadlines on time for any single week. However, the number of groups meeting deadlines increased as the weeks of the project progressed. In addition, it was clear from analysis of the Moodle postings that although postings were continuous throughout the Lifestyle Project, they peaked on the day of each deadline.

Splitting a large task into smaller 'micro-tasks' has had a number of positive effects. It has focused attention on crucial elements of the activity which in the past might have appeared less important to students than creating a poster or participating in a debate - perhaps most notably the development of criteria to inform their assessment of each other's contribution to the group. Regular submission of smaller deliverables has also provided staff members with multiple opportunities to provide feedback to the class. This feedback is usually expressed as a motivational statement intended to reinforce each student's engagement with the next stage of the task. But teachers are also able to use information gleaned from staged submissions to diagnose common problems and offer class-wide suggestions or solutions.

Students reported using Moodle extensively to communicate with members of their group. This was also evidenced by the logged data on Moodle, where each student averaged around 80 postings over the timeline of the project. When questioned on what they communicated about, this was split between using Moodle to discuss their ongoing research in the Lifestyle Project and using it to coordinate the timings of their activities. There were weak (but significant) correlations between the level of online traffic produced by each group and their overall mark in the poster section of the project, but there was no correlation between Moodle activity and the debating task.

The online record of group postings has provided useful information on peer marking activities. In the focus group, students reported that they felt reassured that academic members of staff were monitoring their online interactions, because these provided documented evidence about contributions to group activities. They maintained that this was 'evidence which could be called upon by both staff and peers in the case of a dispute'. In the past, academic staff had some difficulty in detecting groups that were not working effectively and in dealing with group problems. The online working has helped in both these respects, with a significant reduction in the number of groups actually reporting problems.

Anecdotal evidence from staff members suggests that the group task is a powerful tool to support the development of social processes around learning. The atmosphere in laboratory sessions and other class-based teaching activities was reported to be livelier compared to previous years when there was no online working. The questionnaires have shown that, in comparison to previous years, students were more likely to refer to their peers as sources of information during learning tasks. As a result of this enhanced social cohesion, the department has decided to bring forward the scheduling of the Lifestyle Project to the first semester.

The use of Moodle to structure the learning activities and the fact that there have been fewer problems in groups under the new scheme mean that the time allocated by staff to this project has not increased. Indeed, staff have reported that now all the information is in Moodle it should reduce workload in subsequent years.

Relationship to the 12 assessment and feedback principles

The redesign of the Lifestyle Project had a number of noteworthy features in relation to the assessment and feedback principles. Firstly, the division of large tasks into smaller micro-tasks with regular deliverables helps promote regular working and improved student engagement (principle 2). This was supported by the staged release of information and instructions online. Secondly, Moodle provided more flexibility in the way students could work and when and how they communicated with each other (principle 8). Thirdly, peer processes were better managed with the agreement of criteria before group work began (principles 1 and 6). Fourthly, the online environment and its archiving of student work made it easier for teachers to monitor progress and deal with group difficulties as they arose (principle 12). Frequent submission of micro-tasks also offered multiple opportunities for teacher feedback. Finally, there was evidence that these online tasks and the availability of the discussion facilities in Moodle triggered valuable social processes (principle 10). The following is a comprehensive breakdown in relation to the 12 assessment and feedback principles.

- Group development of peer assessment criteria promotes clarity about the characteristics of effective group working in the Lifestyle Project (principle 1).
- The micro-task format with staged deliverables ensures regular activity and time on task, in and out of class (principle 2).
- The micro-tasks offer multiple opportunities for formative feedback from the teacher, although this is used primarily to motivate students (principle 3).
- Feedback is provided at a time when students are still able to use it to make improvements (principle 4).
- There is significant alignment of the formative micro-tasks and the actual summative assessment (principle 5).
- The group tasks encourage discussion and dialogue throughout the Lifestyle Project (principle 6).
- Students are encouraged to self-assess not only by reflecting on the task, but also by comparing their experiences with others (principle 7).
- Students are given choice in the topics for the Lifestyle Project and in how they divide up the tasks and the criteria they set for group working (principle 8).
- There is no specific student involvement in decision-making in this project (principle 9).
- The design encourages development of learning groups as students share experiences and offer feedback to other students (principle 10).
- The poster and debating tasks are motivational as are the group processes which help students establish working relationships in the first year (principle 11).
- Frequent submission of micro-tasks and archiving within Moodle provides the teacher with rich information about students' progress, including misconceptions around group tasks (principle 12).

Case study 4: Collaboration and reflection in software engineering

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Background

This case study reports on a University of Auckland first-year computing class that has incorporated reflective writing into a context already rich with student-generated content and discussion opportunities, both online and off-line.

Data Structures and Algorithms is an introductory first-year class typically delivered to 30-60 students on the University's BEng Software Engineering course. The class is taught using elements of Betty Collis' 'contributing student' approach (Collis, 2005). Students are asked to develop learning resources (for example, quizzes, reading lists), presentations and reviews and to share their materials with their classmates using a class wiki. Summative assessment for the class includes a test and final exam (worth 75 per cent), laboratory work (10 per cent) and 15 per cent for contributions to the class resource base.

The redesign

A recent development in the class has been the introduction of a reflective writing task during each weekly two-hour laboratory session. Instead of creating a standard lab report, students working individually or in small groups are asked to write a short reflective essay (typically half a page to two pages) once their set lab task (usually writing a software programme) is complete. The essay should describe how they approached the task, any problems they encountered, any unexpected or interesting outcomes and a reflection on their decision-making processes. The expectation is that essays are written in the first person and are informal.

Once all the essays are completed they are submitted to the class wiki. Students are instructed to select a sample to read and comment on, noting any differences in methodological approach during the lab task and any surprising or interesting variations.

When class feedback comments have been posted to the wiki, one student group (typically three or four students) is selected to read all of the essays and feedback and to write a paper describing the expected results of the lab task, noting common mistakes or difficulties. This paper is also posted to the wiki and attracts summative marks assigned by the tutor. Each group member receives the same mark for their contribution to this paper, and the cycle is repeated until all student groups have participated in this secondary task.

Discussion

Although reflective writing may at first appear to have little place in a computing course, Hamer (2007) has pointed out that in recording and sharing their observations, understandings, successes and failures, students are participating in a deeply authentic activity of scientific enquiry and discovery.

Students are asked to reflect on their lab task immediately after completion of the activity, and they receive immediate feedback from their classmates. The timing of this self-reflection and peer feedback is a major factor in the power of this design. Students receive feedback when the task remains fresh in their mind and they are at their most receptive. Hamer (2007) reported that the quick turnaround time has another benefit. As there is no opportunity for students to draft or refine their essays (and feedback must be posted within one or two days of the lab session), the task takes on an informal, non-critical and dialogic flavour which builds student confidence and willingness to share.

Another benefit of this quick turnaround time is the opportunity for the tutor to pick up on general class difficulties and adapt subsequent teaching activities or provide additional information or support. The tutor is also able to identify individual students who may be experiencing particular problems and intervene appropriately. This is particularly important in a first-year class, where failing students are most likely to withdraw from the course.

One possible weakness of the current design is the secondary, summative element which requires successive student groups to synthesise all the essays and feedback into a more formal paper. It is possible that groups undertaking this task early in the cycle may be at a disadvantage compared with those asked to do it later on. It could also be argued that although the evaluation of this class has demonstrated that students clearly benefit from multiple ways of sharing information informally, they only receive one opportunity to develop this more formal style of paper which receives summative marks.

Relationship to the 12 assessment and feedback principles

This project was not formally evaluated but it embodied some key assessment and feedback principles. Peer critiquing was a key feature with students receiving regular formative written feedback from other students (principles 3 and 6). The repeated cycle of lab exercises involving the same follow-up activities ensured time on task (principle 2) and helped clarify requirements (principle 1). Also, the quick turnaround time of lab assignments and the associated critiquing made it easy for the teacher to monitor student progress (principle 12) and provide group or individual feedback as required (principle 3). The following provides a more detailed breakdown in relation to the 12 assessment and feedback principles.

- Repetition of tasks throughout the year provides progressive clarification of expectations (principle 1).
- The regular lab tasks also encourage time on task (principle 2).
- The teacher identifies students in difficulty and targets feedback accordingly (principle 3).
- The repetitive sequence of activities also allows students to use their learning in subsequent tasks (principle 4).

- The formative processes do help students know where to target their efforts for better performance in the marked work (principle 5).
- Peer dialogue takes the form of written feedback by students on others' work immediately after the lab task (principle 6).
- Students are encouraged to self-assess not only by reflecting on the lab task but also by comparing their experiences with others (principle 7).
- Some of the essay writing is done in small groups which gives students some say in how they work (principle 8).
- There is no attempt in this study to involve students in decision-making (principle 9).
- The design encourages learning communities, as students share experiences and offer feedback to other students (principle 10).
- Informal sharing of experience motivates and the nature of the task and the clarity of task requirements might be motivating to some students (principle 11).
- Frequent formative assessment provides the teacher with rich information about students' progress, including their misconceptions (principle 12).

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8 Appendix

Quality Enhancement Themes First Year Experience reports

Sector-wide discussion projects:

Gordon, G (2008) *Sector-wide discussion: the nature and purposes of the first year*

Kochanowska, R and Johnston, W (2009) *Student expectations, experiences and reflections on the first year*

Practice-focused development projects:

Bovill, C, Morss, K and Bulley, C (2008) *Curriculum design for the first year*

Nicol, D (2009) *Transforming assessment and feedback: enhancing integration and empowerment in the first year*

Black, FM and MacKenzie, J (2008) *Peer support in the first year*

Miller, K, Calder, C, Martin, A, McIntyre, M, Pottinger, I and Smyth, G (2008) *Personal Development Planning in the first year*

Knox, H and Wyper, J (2008) *Personalisation of the first year*

Alston, F, Gourlay, L, Sutherland, R and Thomson, K (2008) *Introducing scholarship skills: academic writing*

Whittaker, R (2008) *Transition to and during the first year*

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