Quality Enhancement Themes
The First Year Experience

Transforming Assessment and Feedback:
Enhancing Integration and Empowerment in the First Year

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Summary

Formative assessment and feedback are driving forces for student learning. It is surprising therefore that they have not previously played a prominent role in thinking and research on the first year experience in higher education. 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 mere 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. This publication also provides a wide range of practical examples of good practice in the implementation of formative assessment in first year disciplinary contexts.

Paper 1 provides the set of recommendations on how to improve assessment and feedback practices in higher education. Paper 2 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. Twelve principles of good formative assessment and feedback practice are identified and analysed in relation to this framework.

Paper 3 provides a description, and a brief rationale based on published research, for each of the twelve principles of assessment and feedback presented in Paper 2. 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. In the Appendices to this paper there are practical examples of ways of implementing good assessment and feedback practices across a range of disciplines.

In Appendix 1, examples are given describing how each of the 12 assessment principles might be implemented in a module or course. Appendix 2 provides some disciplinary case studies showing how many assessment principles might be implemented in the same learning design so as to increase the power of the design and to enhance possibilities for academic and social integration and learner empowerment.

A Guide for Readers

The 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 Paper 1 on how to improve assessment and feedback practices in HE of interest. They are written with teachers, senior managers, policy-makers in mind as well as all those with an interest in how to enhance the quality of teaching and learning in higher education. Although the recommendations are based on the analysis in Paper 2 and Paper 3 they can usefully be read before either of the two main papers.

Papers 2 and 3 and the Appendices are ordered from the theoretical to the practical. However, in order to make each paper self-contained there is inevitably some duplication across these papers. Paper 2 presents the research background. This will be of greater interest to those wishing a summary of recent research on assessment and feedback and its relation to the first year experience. Paper 3, and especially its two Appendices, are more practical and focus on the rationale for and how to implement the assessment and feedback principles. Paper 3 also includes 12 questions that teachers might ask about their own practice based on the assessment principles. Readers looking for ideas for implementation might wish to go straight to Paper 3, or even to the Appendices, perhaps returning to Paper 2 at a later time.

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Paper 1
Recommendations for the Improvement of Assessment
and Feedback in the First Year of Higher Education

This paper provides a set of recommendations on how to improve assessment and feedback practices in the first year of higher education. 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 Papers 2 ad 3). From this analysis twelve formative assessment and feedback principles were identified (see Table 1) that, if applied within HE, 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 develop a sense of identity and a sense of belonging within disciplinary and institutional cultures.

GOOD ASSESSMENT AND FEEDBACK PRACTICE SHOULD:

1. **Help clarify what good performance is (goals, criteria, standards).**
   To what extent do students in 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 self-correct.**
   What kind of teacher feedback do you provide – in what ways does it help students 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 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 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 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

Recommendations

The main recommendation below is that higher education institutions should implement the assessment principles in Table 1. The other recommendations are about strategies for successful implementation.

1. **Use the principles to inform module, programme and strategy developments in higher education.**

   Those in HE institutions should consider adopting the twelve 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 the principles at module level has been demonstrated through the Re-engineering Assessment Practices (REAP) project where a subset of these principles were used as the basis for the redesign of 19 first-year modules across a range of disciplines and across three HE institutions (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 HE institutions in the UK have also already adopted some of these principles at strategy level (e.g. University of Strathclyde, Sheffield Hallam University, University of Leicester, University of the Highlands and Islands 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. There must also be opportunities for students 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 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 through group projects (principles 2, 6 and 10). Such relationships have been shown to influence the identities students' form and their sense of belonging within the academic and social milieu of the institution. Also, when academic structures trigger social bonding this often results in positive backwash effects on academic learning.

2. **Use professional judgement about which principles to implement and their relative weighting.**

   The twelve assessment and feedback principles in Table 1 represent a comprehensive framework for the enhancement of teaching and learning practice 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 that are implemented the more powerful the learning design. Appendix 1 shows that the implementation of even a single principle can enhance learning and learner 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) or the implementation of regular and distributed learning tasks (principle 2) creates many opportunities for students to reflect on their learning and to generate internal feedback (principle 7). It is recommended therefore that course leaders and teachers make their own professional judgement about which principles are appropriate to their disciplinary context.

One 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). Or, giving students a choice in the methods of assessment (principle 8) might represent a threat to commonality of standards. These potential tensions highlight the requirement that teachers apply the principles judiciously and to try to make sure that unintended consequences are as far as possible avoided.

3. **Use a tight-loose approach to the implementation of the principles.**

The ways in which the principles are implemented (i.e. 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 the principles might be called upon in practice may vary depending on the type of first year student – full time students, part-time students, distance learning students. 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).

4. **Involve students actively in the implementation of the principles.**

A key idea behind all the assessment principles is that the more active the students are and the more responsibility that 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 (e.g. produced by a previous student cohort) to identify which is 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 is always given to how responsibility might be shared with students so that they are active participants in assessment processes.

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 'bolted on' 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 (e.g. to achieve benefits that could not be achieved by other means) rather than just 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 and 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 to previous years (see Appendix 2). 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 technology use are given in Appendix 1 and three of the case studies in Appendix 2 are drawn from the REAP project (www.reap.ac.uk).

6. Involve students as partners in assessment and feedback decisions

If institutions or teachers decide to redesign student learning based on some of these assessment and feedback principles it is strongly recommended that students are involved as partners in the process. Some re-education will be required if students are to appreciate when they enter higher education that they, as much as the teacher, must play an active role in making assessment and feedback processes effective. At the module level, it would be important to inform students about why, for example, self-assessment is a valuable skill in learning and in 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, departmental handbooks could highlight the assessment principles and emphasise the importance of such skills as self-assessment for employability.

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 with regard to assessment and feedback practices. Given that the NSS is being promoted as a way of helping students 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 that 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 approach fails to recognise the active role that students must play in

feedback processes – 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 (e.g. self-generated, peer) and types of feedback (spoken, vicarious, informal etc),

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 (point 6 above) and to raise awareness of the active role of students play in generating, discussing and using feedback (point 4). Institutions should also consider widening the range of evaluation measures collected through the NSS and what other measures might be appropriate. Ipsos MORI, who 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 itself. It is strongly recommended that HE institutions include the new additional items on Assessment (B10), Learning Communities (B11) and Intellectual Motivation (B12). These items are highly relevant to the notions of empowerment and academic-social integration that underpin the first year experience.

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 the way academic and support staff spend their time, especially as new technologies become more pervasive. 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.

9. *Address the effects of changes in assessment and feedback at module level on programme coherence.*

   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. 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 (the 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 whereas 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 competencies that all students should develop in first year and beyond. This is the approach adopted by Banta at Indiana University-Purdue University Indianapolis, US where the students are expected to develop competencies 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 US (see, Mentkowski and Associates, 2000). A third strategy discussed below might be to use the principles as a tool to review courses and programmes, possibly through quality enhancement procedures.

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). 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 re-design. Such process measures therefore can augment traditional input and output measures. Although changes in educational processes (e.g. opportunities for self-assessment. will not guarantee that students become better at regulating their learning (given that students mediate all teaching interventions) it 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, that they lead to improvements in student learning, in satisfaction (student and staff) or in more efficient use of time. Unfortunately in HE there has not been a strong tradition of evaluating educational developments even when considerable funds are invested in development projects. Also, where evaluations have been required, normally it is those responsible for the implementation who have been tasked with conducting the evaluation. Yet, in REAP it was found that academic staff have little time to conduct an evaluation and that they often do not have the expertise to plan and implement it. In REAP an evaluation service was provided to ease the burden on academic staff and this service was highly valued. It is therefore recommended that if HE institutions fund educational improvement projects that there is support both human and financial for evaluation. As well as helping convincing staff of the value of making changes in teaching evaluation should help institutions to identify which investments are worthwhile and where it is best to direct further funding.

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 might be used by teachers or institutions to reflect on and review their assessment practices at module or programme level. Appendix 1 and 2 provide practical examples of how the assessment and feedback might be enhanced through the application of the principles.

12. Develop specific guidelines on what might constitute good teacher feedback

The research surveyed for this publication has revealed that there is almost no guidance available within HE institutions about what constitutes good written feedback in the first year. Those who mark and give written feedback on a student's assignment are not usually supported in this practice. Teacher feedback can be given on the task outcome, on the way the task is carried out (process), on the person (focusing on personal qualities) or on the 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 could be analytically formulated and linked to preset criteria, linked to grade level descriptors or it could involve holistic judgements or a combination of these. It could be provided in the text of an assignment or on an assignment feedback sheet. It could provide considerable detail or involve 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 therefore might 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.

Paper 2: Literature Review

**Formative assessment and feedback for first year success:
Integration and Empowerment**

Introduction

Assessment processes lie at the centre of the learning experience in higher
education. 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 has consistently shown that, across a range of teaching
and learning indicators, the lowest level of student satisfaction in higher education is
with formative assessment practices, including the provision of feedback. Formative
assessment is particularly important in the first year where students entering higher
education 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 ten years, changes in higher education 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 HE institutions 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.

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, Yorke and Longden, 2004: Seidman, 2006). Most researchers,
however, regard Tinto's (1975) *interactionist* theory of non-completion as a useful
starting point for understanding retention issues, even though there are have been
critics and new theory developments (e.g. Braxton et al, 2004; Zepke et al, 2006).
Tinto views early student departure from higher education 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 (1975) levels of academic and
social integration are good predictors of persistence and success in the first year.
Academic integration consists of structural dimensions (e.g. meeting the explicit
demands of university study) and normative dimensions (identification with the norms
underpinning the academic system). Social integration is about the way that 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 it is more applicable to traditional campus based
students as opposed to distance learning, part-time and mature students (Braxton
and Hirschy, 2004), although the growing influence of social media and the internet
might change this in the future.

Engagement and Empowerment

In Scotland, the dual concepts of engagement and empowerment have recently been used by the Quality Assurance Agency (QAA) 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 focus of the QAA Scotland (through its First Year Enhancement Themes) is not just about 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 will be 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, this review tries to identify how formative assessment practices might be used to enhance learner engagement and facilitate learner empowerment while at the same time be used to support integration of students into the academic and social milieu of the first year.

Definitions and Purposes of Assessment and Feedback

In higher education, assessment describes any process that involves evaluating or appraising a student's knowledge, understanding, skills or abilities. In line with the QAA Code of Practice for Assessment of Students in Higher Education (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 influencing 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 (e.g. through appropriate monitoring), this feedback can supplement that provided by teachers and it can also model experiences in employment.

While engaging in learning tasks students routinely 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 to reflect systematically on their strategies they use during a task or to reflect back 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 (see, Knight and Yorke, 2003: Black and Wiliam, 1998: Boud, 2000: Nicol and Macfarlane-Dick, 2006).

While this review is primarily about assessment <u>for</u> learning using the above perspective it inevitably includes some discussion of assessment <u>of</u> learning given that these processes are not easily separated in practice.

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 to lessen 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.

- o *Helping students 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 higher education (e.g. in work, school etc) and this may prove too demanding or demoralising for some students resulting in poor performance and/or early departure.

- o *Setting high expectations*
  Tinto (2005) argues that setting high expectations is a necessary condition for student success in the first year. He cites evidence from Kuh (2003) showing that 'universities often expect too little of students, especially during the critical first year of college' (Tinto, 2005, p321). Kuh found that students did not spend enough time studying out of class for successful learning. Tinto argues that expectations are built up through both informal (e.g. the way teachers label students) and formal processes (e.g. advice given about study requirements).

- o *Regular opportunities for formative feedback*
  An emphasis on formative assessment in the early weeks of the first year, and on a regular and frequent feedback is associated with student success (Tinto, 2005: Yorke, 2005: Thomas et al, 2001: Layer et al, 2002). Formative tasks provide both teachers and students with information about performance and enable them to adjust teaching and learning in ways that promote achievement.

- o *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 with some students, especially mature students, leaving 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.

- o *Sensitivity to the diversity of commitments of the student body*
  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 and Drew, 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

curriculum diet (which might disadvantage even those without part-time work), some institutions are providing more flexible curriculum opportunities often supported by new technologies.

- o *Fostering self-responsibility for and self-regulation of learning*
  Most universities across the world have, in recent years, 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; that is, by fostering in students more independence and self-responsibility in the early years (Knight and Yorke, 2004). Structured opportunities for self and peer assessment represent one approach to 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: they lay the foundation for later years of study and for professional life.

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

- o *Personal contact with teachers*
  The diversity of the student body and the cultural changes associated with the transition to university require that more support 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 US have shown that high levels of teacher-student contact are correlated with good quality undergraduate education.

- o *The formation of friendship groups*
  There is a general acceptance in the first year experience literature that ideally students should make contact and connect with others in the university if they are to succeed and dropout is to be avoided. According to Tinto (2005), the more students are socially involved the more likely they are to persist in their studies (Tinto, 2005). 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.

The Role of Assessment and Feedback

Many of the conditions listed in the previous section can be positively influenced by assessment practices. For example, Yorke (2005) has 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 clarify the meaning of goals and criteria and they provide feedback to students so that they can keep realigning their work to what is required. Also, 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 suggests that early successes in assessment and early feedback are particularly important for students who doubt their ability to succeed. He reported that some higher education institutions had redesigned the first semester to be a formative experience and had deferred summative assessment till the end of the first year, thereby allowing students to experiment and acclimatize 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 the 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. Yorke also notes the role of formative assessment practices in helping to develop a sense of personal control over learning. For example, the integration of opportunities for reflection and self and peer assessment are beneficial as they provide students with early experiences of self-monitoring and of making evaluative judgements about their own and other's 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 foster 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 there has, to date, been little attempt to analyse assessment processes systematically in relation to the first year experience. Also, the research on assessment that exists has not been directly related to current frameworks for thinking about the first year experience. What follows helps address this issue.

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 a Scottish project funded by the Higher Education Academy (www.heacademy.ac.uk/**senlef**.htm). The result of this review was the identification of 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 in Nicol and Milligan (2006). In 2005, work began on the Re-engineering Assessment Practice (REAP) project, a large-scale initiative funded by the Scottish Funding Council involving collaboration across three Scottish Universities. The REAP project has involved the re-design and embedding of innovative assessment practices supported by technology within large cohort first year classes across a wide range of disciplines (www.reap.ac.uk). 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 is the twelve principles of good formative assessment and feedback practice presented in Table 1.

As well as building on this earlier research, these assessment principles also draw on the QAA Code of Practice on Assessment (QAA, 2006) and on published studies of university policies and practices that are associated with high levels of student success (Kuh, Kinzie, Schuh and Whitt, 2005). A specific debt is owed to David Boud for principle five which draws on his published work (Boud, 2000; Boud, 2007) and specifically on discussions that were held around his presentation at the REAP International Online Conference in 2007 (see, http://www.reap.ac.uk).

GOOD ASSESSMENT AND FEEDBACK PRACTICES SHOULD:

1. Help 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 self-correct.
4. Provide opportunities 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 communities
11. Encourage positive motivational beliefs and self-esteem.
12. Provide information to teachers that can be used to help shape their teaching

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Table 2. Principles of good formative assessment and feedback.

These formative assessment principles have proved to be robust and have been used successfully as a bridge linking theory to practice in the redesign of formative assessment practices in nineteen modules across a range of disciplines (Nicol, 2006, in press;: www.reap.ac.uk). However the analysis that follows takes the thinking further by relating the assessment principles identified in Table 1 to the dimensions of academic and social integration and engagement and empowerment, central to current thinking about the first year experience.

The Theoretical Context

A core idea behind the theorising and many studies of the first year experience is that of integration - academic and social (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, 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 about personal relations. In the early years, students are more likely to adapt to university life if they develop friendship networks (and actually feel they have friends),

have a sense of identity and a sense of belonging within one or more social groupings. Another concept used by Harvey and Drew (2007) and others and which blurs differences across academic and social dimensions is 'adjustment'. Harvey and Drew (2007) draw attention to research on how students adjust upon entering HE with this research also exploring issues of identify and belonging. This highlights not just academic adjustment and relations amongst students but also relations between academic staff and students, which were shown by Thomas (2002) to be crucial to academic achievement and perseverance.

Many studies of the first year experience have recommended that HE institutions create learning environments that help *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 re-orientate to new academic requirements, discourses and ways of working and extant social systems. Another theoretical perspective that has emerged, somewhat in contrast to Tinto's theorising, is that instead of students being integrated into the institutional culture that there should be some *adapting* by the institution to embrace the culture that the student brings. 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, Leach and Prebble, 2006, p589).

It is interesting that the concepts of assimilation and adaptation have their parallels in the concepts of *engagement* and *empowerment*, currently being discussed by the Scottish QAA. In some senses, engagement is about students being assimilated into the academic and social culture of the institution whereas empowerment is about students taking responsibility for their own learning (academic empowerment) and about developing their own social cultures within HE institutions (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 will be argued below, both engagement and empowerment are important in the design of learning environments that lead to student success in the first year.

A Framework for Analysis

Figure 1 provides a framework for the thinking about the application of the assessment and feedback principles presented in Table 1. It links engagement and empowerment with academic and social integration in the first year.
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Figure 1: Assessment and feedback practices: dimensions of implementation

EMPOWERMENT/ SELF-REGULATION

ACADEMIC EXPERIENCE

SOCIAL EXPERIENCE
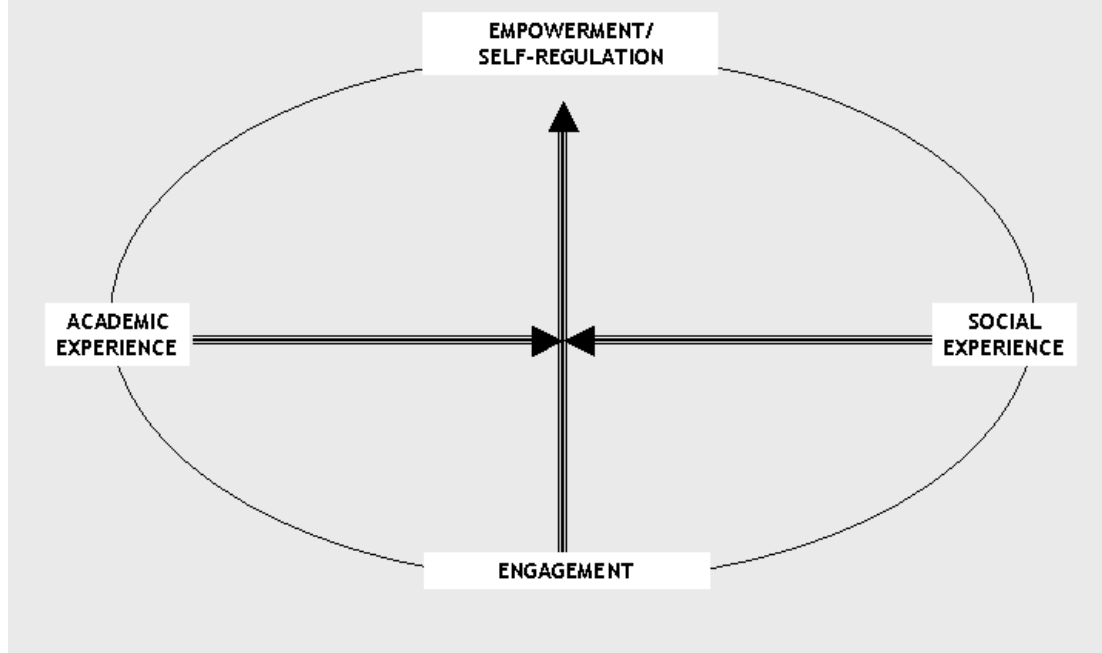
ENGAGEMENT

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 upward 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 QAA Scotland use of the term empowerment 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' (p297). 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 brings out the fact 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 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).

In Nicol (in press) it was 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 1) by providing students, in advance of an assignment, with examples of the kind of work required (e.g. some examples of essays from previous student cohorts). Alternatively, the teacher might organise a session where students are required to examine these essay examples to identify which is better and why. The second approach would usually be more supportive of the development of learner self-regulation than the first because the student would be more actively engaged in constructing, internalising and owning the assessment criteria. The important point is that if students are given an active and responsible role in the implementation of a principle, then this is more likely to develop learner self-regulation. Taking this further, the most empowering scenario might be one where (e.g. in later years of study) students feel able to organise their own active engagement with criteria and even question their appropriateness or validity (e.g. as might be expected in a research degree).

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. In the academic-social dimension it is assumed 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 pointing to each other.

This importance of the social dimension has been a strong finding from the REAP project (www.reap.ac.uk). Many of the most effective course redesigns have occurred when learning tasks have been carefully structured so as to encourage group learning in which there are rich opportunities for formative assessment and feedback of an informal nature from peers and academic staff. In these cases, the outcome has usually been evidence of learning benefits. The academic structure encourages social bonding which in turn results 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, the students work online in groups of 6-7 to write an 800-word essay. Detailed evaluations show that this social interaction not only scaffolds the academic writing skills of individual students, but that it also provides 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 to 57.4% compared to before this innovation. Baxter reports that first year students produced writing that was equivalent in calibre to that of second year and sometimes third year students.

The Principles and the Dimensions: Application to the first year

Figure 2 shows how certain groupings of assessment and feedback principles (derived from Table 1) 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
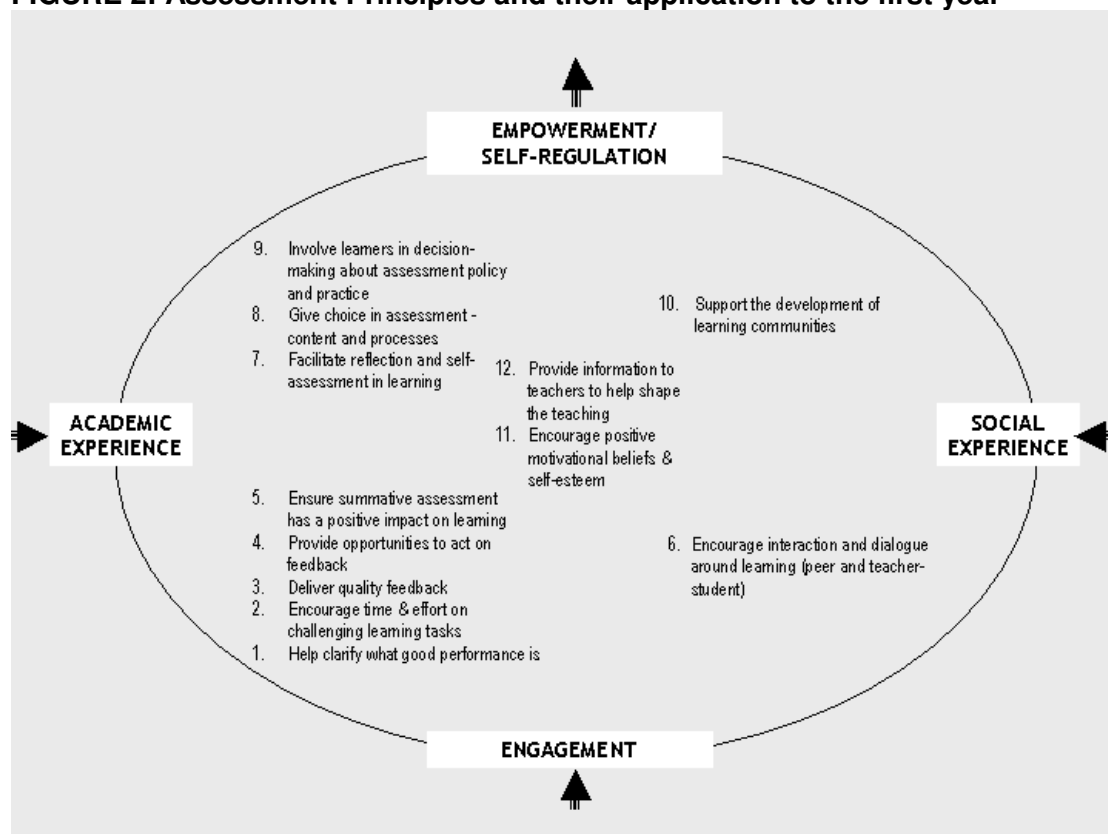
Academic engagement (lower left quadrant)

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 would help lay the foundation for the development of 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), when they actively engage in relevant learning activities in and out of class (principle 2), when they receive regular and constructive feedback on their performance (principle 3) and when there are 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). For example, this might mean 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). This is different from traditional course design, where the focus is often more on teacher delivery rather than on what the students are doing. Such learning tasks should be sequenced so as progressively to challenge students (stretch them) and they should be appropriate to the disciplinary context: for example, where practice and consolidation are important learning tasks might be tightly structured whereas others might be more open-ended to allow learners to develop their own strategies and approaches. The utilisation 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 used as the basis for in-class activities (Nicol, 2007).

Structuring learning around a sequence of learning tasks helps 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, in order 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 (i.e. low stakes assessment). Without some observable student productions, teachers will be unable to ascertain what progress is being made or to provide appropriate feedback. Another strategy is not to award marks for the formative tasks but to tightly link these tasks to later tasks that are marked. Early and frequent summative assessment tasks can have a negative effect in the first year, and especially if these tasks 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 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) note that distributed learning tasks also provide opportunities for teachers to receive early warning of when students experience difficulty thus allowing them to organise support. In some cases large learning tasks, like projects, will have to be broken down into component parts in order to manage teacher workload.

Implementing the five principles discussed in this section would help address many of the core problems identified in the research literature on the first year experience in higher education (and listed earlier on page 5). 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).

In this section, it has been assumed that it is the teacher who takes responsibility for providing structure for learning in the first year, for designing learning tasks and for organising formative feedback. Such teacher guidance is important if students are to come to terms as rapidly as possible 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 for activities that support the development of learner self-regulation. As discussed earlier, one way to foster such learner 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, the student might be asked to request feedback in relation to areas of work that they have found difficult (principle 3); 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 provided (principle 4).

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

Linking academic and social engagement (lower-right quadrant)

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 is an important influence on student success in the early years of study (Tinto, 1993: 2007). 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 facilitate the establishment and maintenance of supportive social relationships and the development of affinity groups. This helps promote a sense of belonging but it can also enhance academic learning. While Figure 2 depicts the academic and social in different quadrants, this is purely for analytical purposes as the goal is that they are integrated 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 that the teacher would 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 – 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 there is a higher risk of negative effects from summative assessment where group tasks are involved: for example, assessments must be seen to be fair and to address potential 'free-rider' effects.

There are significant benefits 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 clarify the goals of learning tasks and help make teacher feedback more intelligible (principles 1 and 3). Secondly, group learning tasks can be more challenging and more authentic than individual tasks and can help 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).

There are many ways of organising learning tasks so that they call for interaction and dialogue, although large numbers of students can 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 first year. Another approach is for the teacher to structure opportunities for peer dialogue and feedback in class (Chickering and Gamson, 1987). 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 (i.e. reflections by students on their performance in relations to the class responses), peer 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; Sharpe, 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 that support classroom interaction can be used to address this issue (see, Banks, 2006: Boyle and Nicol, 2003). Some lecturers have also begun to replace face-to-face lectures with online materials (e.g. 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, by 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, 1991: Yorke and Longden, 2004). Linking opportunities for dialogue into structured learning tasks would go some way towards addressing these issues.

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 Peterson, 2002). Hence dialogue can help the teacher balance structure with some learner responsibility and this can support processes of student empowerment.

Academic empowerment (upper-left quadrant)

In the previous two sections, the focus has been largely 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) has 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 develop the skills needed to monitor, judge and manage 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 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 shows 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 develop the skills needed to make objective judgements against standards, skills which are often transferred when students turn to producing their own work.

Another way of empowering students is to shift the focus from teacher to learner-led choices in assessment processes (principle 8). The provision of choice in the topic, method, criteria, weighting or timing of assessment tasks is about offering learners flexibility in what, how and when they study. Harvey (2006), in discussing the first year experience, has however argued that 'choice' is only fully empowering when it is exercised through the design of the experience rather than though being able to select from a range of options determined by the provider (the teacher). In higher education 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 assignment before submission: that is, identify and provide a rationale for the best features of 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 itself. 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 also 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 were critical to success. The latter is a key skill required in professional practice.

Detailed examples of the implementation of these principles are provided in the Appendices at the end of Paper 2.

Social empowerment (upper-right quadrant)

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 the ways in which teachers might facilitate the development of learning communities on campus (upper-right quadrant, principle 10).

Tinto (2006) defines 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 (2006) maintain 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'. (p198)

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 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 Glasgow University (www.reap.ac.uk/assessment/pilotsGUBio.html) 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, in a course at Glasgow Caledonian University, students set up their own virtual space to share 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) describes 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 (e.g. self-assessment, choice and involvement in decision-making) should act as a catalyst for learning community developments.

Motivation and the role of the Teacher (centre of figure)

Motivation is of central importance in the first year as it is linked to self-confidence, self-efficacy and self-esteem. Many researchers argue that the relation between assessment processes and motivation is a neglected consideration in research and in teaching practice, even though most would argue that a high level of motivation is a precondition for academic success in the first year. In this paper, 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 both 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 (e.g. related to real life problems) and when feedback encourages students to focus on learning goals such as mastering the subject, 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 decision-making 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 trigger intrinsic motivation, often with significant benefits for academic learning (principle 10). It is important that teachers appreciate the many and varied ways that motivation can be encouraged when they apply the principles suggested in Figure 2.

In order to structure learning environments that trigger in students appropriate and motivating academic and social activities, 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 – information that 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. This 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.

As Yorke (2003) notes:

'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, p482).

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

- Structuring learning tasks so that there are regular outputs by students with these being monitored by staff (principle 2)
- Creating opportunities for dialogue in class using one-minute papers or electronic voting systems. This would provide dynamic and ongoing feedback to teachers about difficulties with subject matter e.g. 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 could also offer to be members of online and social spaces and to answer questions that go beyond the expertise of peer groups. This might help 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 these groupings also require some qualification. Firstly, it was noted above that 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 then 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 will agree that taking care of this group of principles is a priority as this will help clarify to students what is expected of them and will create 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 and was intended primarily to highlight the relationship between these dimensions and to 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) argues that *all* learning occurs within social organisations or communities, even though the community context might merely at times only be 'in one's head' (e.g. 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 within the Re-engineering Assessment Practices project (www.reap.ac.uk) has found that integration and empowerment are significantly increased where many principles are operative in the same assessment design (see Nicol, 2006). Some of these designs are presented in the Appendix 2.

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 points out the need for teachers to make decisions about what is appropriate to their context. For example, a clear structure might be required early in the course before choices are made available. Alternatively choice may be possible within a structured framework (e.g. students choosing which of four assignments might count in the exam). Obviously a balance across the principles must be struck 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 one 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). These students maintained that not all were comfortable with being 'forced' to work in groups. One approach to resolving this issue might be to argue that group working be made an option rather than compulsory. A more compelling approach is to argue that group working is necessary in future employment and that it is the duty of the university to prepare students for this. This might require establishing a new 'contract' with students about the purposes of higher education. Whatever the decision, it is important to recognise the difference between group working as part of academic learning (e.g. tasks that require students to learn together) and group working with a social goal (e.g. to create friendships). While the former might be compulsory the latter goal must be pursued at the students' discretion.

Despite the artificial and permeable character of the quadrant boundaries and the fact that the principles might have 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 the principles to map the characteristics of different assessment strategies in different years of study, its value might be extended. For example, one would expect first year assessment and feedback processes to have a different profile (overlap in different ways) to assessment and feedback processes as implemented in later years of study.

PAPER 3

Bridging Theory and Practice;
Assessment and feedback principles and questions to review practice

Introduction

The twelve assessment and feedback principles in Table 1 provide guidance for teachers interested in improving the quality of the learning experience of students in the first year of higher education. These principles are based on recent research on assessment (Black and Wiliam, 1997: Yorke, 2001: Nicol & Macfarlane-Dick 2004, 2006: Nicol, 2007, in press: Boud, 2000: Knight, 2006: Knight and Yorke, 2003: Boud and Falchikov, 2007), the QAA (2006) guidelines on assessment of student learning and published studies of University policies and practices that are associated with high levels of student success (Kuh, Kinzie, Schuh and Whitt, 2003: Tinto, 1993, 1997, 2005: Chickering and Gamson, 1987). Overall, this research suggests that if teachers implement principles depicted in Table 1 in first year modules and programmes, then this will encourage a sense of integration (academic and social) and will also help develop in students the ability to monitor, manage and regulate their own learning.

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

Appendix 1 provides examples of the implementation of each principle in courses and programmes across a range of disciplines.

Appendix 2 provides case study examples showing how more than one principle might be implemented in the same learning design.

GOOD ASSESSMENT AND FEEDBACK PRACTICE SHOULD:

1. **Help clarify what good performance is (goals, criteria, standards).**
   To what extent do students in 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 self-correct.**
   What kind of teacher feedback do you provide – in what ways does it help students 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 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 in 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 are your assessment and feedback processes help encourage social bonding and support 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 help inform and shape your teaching?

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

The twelve principles of good assessment and feedback: evidence base

1. Clarify what good performance is (goals, criteria, standards)

Under-performance in the first year and low levels of commitment have been linked to a lack of clarity regarding expectations (Yorke, 2004: Tinto, 2006). Students often do not understand learning and assessment requirements even when they are provided with documents with definitions of criteria and standards. This influences the goals students set themselves and the outcomes they achieve (Rust, Price and O'Donovan, 2003). More time spent by students in identifying, discussing or even re-formulating 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 <u>actively</u> engage with goals, criteria and standards the more likely they are to internalise them and to be able to use them to regulate their own learning (Price and O'Donovan, 2006). For example, having students before undertaking an assignment (individually or in groups) examine selected assignments completed by a previous student cohort, to identify which is superior and why (criteria), would generally be more effective than just providing students 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 has argued that concrete representations of standards (i.e. 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 (Sadler, 2005).

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

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

2. Encouraging '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 bunch 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 is especially true in the first year where regular study helps 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 (e.g. self-assessment, self-generated feedback, discussions with peers), even if these don't carry marks. However, making learning tasks compulsory or awarding minimal marks (i.e. low stakes assessment) is usually necessary to ensure student engagement and to ensure that teachers are able to ascertain what progress is being made before providing feedback (Gibbs, 2006). This is different from frequent high stakes assessment tasks (which carry 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 experience 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, and 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 issue, some HE teacher/researchers have introduced the idea of the 'patchwork text' for assessment (Scoggins and Winter, 1999: Winter, Parker and Ovens, 2003). Students are asked to create several short pieces of writing based on different genres throughout a module and to discuss these with peers (e.g. 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 below). Students can also be given choice in the selection of patches to be integrated, which offers some autonomy in learning (see principle 8).

> 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?*

3. Deliver high quality information to students about their learning (to help them self-assess and self-correct)

Both Yorke (2005) and Tinto (2006) have argued that teacher feedback is of critical importance to student learning in the first year of undergraduate study. Teacher feedback helps 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 higher education (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 with which to evaluate their own work. However, the quality of teacher feedback has been criticised in more than one in ten QAA audit reports in the UK (QAA, 2006) and this is the main area where problems have been identified in the UK National Student Satisfaction survey. Research shows that a great deal of external feedback given to students is delayed (e.g. feedback on first assignment is not given until after the second assignment is due), is not understood, is de-motivating 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 – 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) maintain that good quality feedback should ultimately be geared to helping students learn to trouble-shoot and self-correct their own performance. This might be achieved by providing feedback that, rather than provide the answer, points students

to where to find the answer (e.g. '*go back to p35 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 (e.g. an assignment). Other strategies known to enhance the power of teacher feedback include linking feedback information to assessment criteria, providing corrective advice not just information on strengths and weaknesses and by 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 tells them what to focus on to make improvements in subsequent tasks (Knight, 2006). The latter helps stimulate transfer of learning to new problems.

Hattie and Timperley (2007) review the impact of four different types of teacher feedback on learning and achievement. Feedback can be provided about performance of the task (e.g. often corrective feedback), about the processing of the task (e.g. the strategies used to accomplish the task), about self-regulation (the way students monitor, direct and regulate actions to the goal) and about the person (personal evaluations of the learner). The last of these is the least effective and can have a negative impact on learning. The second and third types of feedback 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 is not more research in this area.

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

4. Provide opportunities 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, p158).

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 and especially if there are few assignments and/or they occur too near the end of a module. Greater emphasis can however be given to providing feedback on work in progress (e.g. essay structures, plans for reports, sketches) and to engaging students in reflecting and acting on the feedback they do receive (e.g. 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 apply the knowledge and skills they have gained   in a new context.

> The key question here is: *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.

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, Yorke (2005) has argued that 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, to 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 (e.g. where coursework is developing one set of skills but the marked assessment, for example, 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 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.

In addressing the above issues a number of avenues of action are possible. In some HE institutions in the UK, exams for first year students are being abolished and replaced with coursework and/or with 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 (e.g. self-confidence, autonomy), they can usefully be formatively assessed and developed (Knight and Yorke, 2003: Elton, 2004). As students learn to self-evaluate, they will be 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 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?*

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

In analysing 50 years of research in higher education 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: 2006) research on first year learning at University, social engagement as well as academic engagement has been 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) describes a process called 'peer instruction' (Mazur, 1997) which involves triggering peer interaction and dialogue in large classes. Mazur explains a physics concept to students and then presents them with a multiple-choice question (MCQ). Students respond individually to the MCQ and receive feedback as a bar chart showing the class responses. If many have given the wrong answer, they are 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: it exposes students to alternative perspectives and students often 'scaffold' each other's learning. Group projects also encourage students to study and learn together and this 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 (e.g. 'this report requires more critical analysis') and to 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 one-to-one 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 electronic voting systems (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 in your course?*

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 (e.g. write an essay, solve 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 shows 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 both in identifying the standards/criteria that apply to their work and in making judgements about how this work relates to these standards (Boud, 2000). Hence principle 1 above (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. For example, students might be asked to make some judgement about their own work before an assignment submission (e.g. its strengths and weaknesses, whether they have met certain criteria) or estimate the mark that they think will be awarded and give a reason 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 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, Cohen and Sampson, 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 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 in your course?*

8. Give choice in the topic, methods, weighting, criteria and timing of assessment tasks

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

will often be required as professionals to create the criteria for their own learning and assess themselves against these criteria. Hence at university, students should have opportunities to develop these skills. Also, although all 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, for example, with 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 and this 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 higher education: 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). However, choices of this kind are often only available in later years of study. They could be brought back 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 develop the skills required in order to achieve those outcomes (see principle 5 for a discussion of summative assessment).

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

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

In higher education a more developed and different form of academic empowerment would occur if students were involved in decision-making about assessment policies and strategies at course, department or faculty level. The latter normally occurs through student representation on faculty and university academic committees that have a learning and/or assessment brief (e.g. programme validation committees) and/or by students providing feedback on their assessment experience with this feedback being used to make continuous improvements in assessment practices. However, deep involvement at this level is rare in higher education although this is a developing area with many possibilities. For example, final year students might work with first year course leaders to re-design assessment tasks so they are more engaging. Even involving first year students in discussion 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 in your course kept informed and engaged in consultations regarding assessment policy decisions?

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 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 where there are large class sizes, a wide mix of cultures with students of different nationalities, ages and backgrounds and with commuter students with external commitments and part-time employment. Assessment practices not only influence academic integration, but they also influence levels of social integration in and out of class. Group projects and assignments can be used to encourage students to study together and this 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 understandings or when it is beneficial that group members are exposed to contrasting perspectives. Online environments can help enable supportive relationships to develop amongst 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, has 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 responding to students in difficulty. Moving beyond social integration is the idea of learning communities where more stable communities spontaneously 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 Glasgow University, 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 encourage social bonding and the development of learning communities?*

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, Anderman and Anderman. 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 & Crick, 2003). Dweck (1999) argues that such assessments encourage students to focus on performance goals (passing the test, to 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 low ability students (Craven, Marsh & Debus, 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 raise levels of motivation include allocating time for students to rewrite selected pieces of work (this helps focus students on learning goals), automated testing where students can test their understanding in private and at a time that suits them (e.g. online practice tests) and by enhancing learner agency and choice in assessment processes (see principles below). Moving away from expressing levels and standards for assessed performance in terms of 'excellence minus some qualities' to expressing levels as a 'threshold plus qualities' would also enhance motivation: such a move would help transform the discourse of assessment form 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?*

12. Provide information to teachers that can be used to help 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, p482). In order to produce feedback that is relevant and informative and that meets students' needs, teachers themselves need good data about how students are progressing.

A variety of strategies is available to teachers to help generate and collate quality information about student learning. Many 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) have also shown the value of 'one-minute papers' where students carry out a small assessment task and hand this in anonymously at the end of a class (e.g. 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 the department.

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

Techniques for implementing the assessment and feedback principles

This Appendix provides a range of ideas or techniques for the implementation of formative assessment and feedback in first year modules and programmes in higher education. 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 that 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 Paper 2 although this is not a rigorous feature of the lists of examples. However, it is important to keep in mind that the more active and pro-active students are, and the more responsibility they take (or are given) during the implementation of a principle, the more likely it is that students will develop their abilities to manage and regulate their own learning (empowerment). This point is discussed in Paper 2 and in the Recommendations Paper 1 (point 4).

1. Clarify what good performance is (goals, criteria, standards)

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

Techniques that have proved effective in clarifying goals criteria, standards include:

- 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 (e.g. 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 modell essay writing strategies in Psychology or how to use primary sources in History.
- Providing students with model answers for assessment tasks and providing opportunities for them to make comparisons against their own work. Nicol (in press) describes a first year Psychology module where students create a group response (800-word essay) to an online essay question. Model answers are chosen from the group submissions and replayed to students after they submit. This helps students to know what is required and increases their motivation because they see what other students have produced. It also raises motivation. In an Economics course, model answers including feedback were selected from submissions made by students in previous years and were made available in the library short-loan collection. A range of examples was chosen spanning different levels of achievement. Sadler (2005) advises that more than one example is required where the task is complex, as a single case cannot fully represent a standard.

- Requiring that students before an assignment, individually or in groups, examine selected examples of completed assignments (e.g. from previous years) to identify which is superior and why. This helps students 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)

2. Encouraging '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 that might prove effective here include:

- 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) that are set and distributing them across the timeline of the module. Race (2006) argues that shorter assignments (e.g. a 300 word critical interpretation rather than a 3000 essay) might often better tap into higher-level cognitive skills. Such tasks could be made compulsory and/or only carry minimal marks (5-10%) to ensure that students engage but that staff workload does not become excessive.
- The teacher might also decompose a large assignment (project, essay) into smaller components where performance is monitored and feedback is 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, the introduction etc.
- 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 provided when students adhere to their own work-plan and deliver on time.
- Linking in-class and out of class activities might be achieved by providing homework activities (e.g. problem solving tasks) that are subsequently built on in class (e.g. 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) describes such a strategy in Mechanical Engineering where the in-class follow-up involved interactive lectures using an electronic voting system.
- Winter, Parker and Ovens (2003) describe an innovative coursework assignment format, called the 'patchwork text' which involves using 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 that are 'stitched together' through a final integrative commentary (e.g. 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 for this format can be tailored to the context with fewer marks for early assignments or with all marks provided 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.

3. Deliver high quality information to students about their learning (to help them self-assess and self-correct)

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

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

- In many engineering and science classes, students work through problem sets in tutorials where teacher feedback is available. This ensures the feedback is timely and is received when students get 'stuck'.
- In Engineering at the University of Strathclyde there is also a policy where for extended written assignments (essays and reports) the turn around time for the return of the assignment with feedback is two weeks.
- Race (2006) suggests 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 will just have worked through their assignment and will 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 the feedback is provided in relation to previously stated criteria helps link feedback to expected learning outcomes. Many academics use assignment return sheets for this where comments are 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 about ticking off each criterion but 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 (e.g. the pages in the textbook). 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 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) suggests asking students to attach three questions about what they would like to know about a written submission or about what aspects they would like to improve. This develops the 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 teacher 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.

4. Provide opportunities 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?*

Techniques to help students act on external feedback to close gaps:

- Increase the number of opportunities for re-submission.
- Modelling the strategies that might be used to deal with difficulties in student work in class (close a performance gap). For example, model 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 (e.g. to say which parts they found 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 to explain how they might help in future assignments.
- Using classroom time to involve students in identifying 'action points' for future assignments. They 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.

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 understandings?*

Techniques to maximise the positive impact of summative assessment include:

- 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 where students provide evidence of their achievement in areas that are more difficult to assess (e.g. initiative, working independently, group collaboration).
- Helping students to understand and record their own learning achievements through portfolio processes. Encouraging students to link these achievements, where appropriate, to the knowledge, skills and attitudes required in future employment.

- Move 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 student successes rather than their failures.
- McCreery has reported a redesign of assessment in a history course at Sydney University, The aim is to help students improve their historical analysis skills through essay writing and to align formative and summative assessment processes. Two separate assignments, an analysis of a journal article (worth 10%) and a long essay (35%), were replaced because they were not aligned with the expected learning outcomes or the final exam and feedback was limited. A three-stage essay assignment was introduced comprising an initial tutorial where the essay question is discussed in groups, a second stage, which involves producing a draft essay plan with biography (10%) and the final stage where the essay is produced (35%). There is group discussion and enhanced feedback at each stage from both peers and tutors. McCreery believes that this revised design helps students more readily achieve the desired learning outcomes, is more efficient and helps develop learner independence. Details can be found at: McCreery, C (2005), *Less is more: rethinking assessment in first year history*, http://www.itl.usyd.edu.au/synergy/pdfs/2223.pdf
- The School of Engineering and Science at the University of Edinburgh have recently adopted a teaching and learning strategy that focuses on the development of the 'responsible learner'. This strategy involves changing the summative-formative balance: they propose a reduction in formal teaching and summative assessment and a maximisation of self-assessment. The strategy states:

    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'.

Edinburgh has initiated a range of vanguard courses to implement this strategy.

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 in your course?

Techniques for feedback dialogue include:

- Reviewing feedback in tutorials. Students are asked to read the written feedback comments they have been given by tutors on an assignment and to discuss these with peers – they might also be asked to provide some ideas or strategies that they might use to improve performance next time.

- Students might be encouraged in class to give each other feedback on an assignment in relation to published criteria before submission.
- Group projects create natural peer dialogue. However, structuring this so that students discuss criteria and standards expected before the research begins and return to discuss progress in relation to criteria during the project would enhance the feedback provided by peers.
- Use of electronic voting systems (EVS) to make lectures more interactive. Nicol (Nicol and Boyle, 2003: Boyle and Nicol, 2003) has 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 and then presenting a multiple-choice question (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. With this strategy three forms of feedback can be provided - computerized feedback (bar chart), feedback from peers ('peer discussion') and feedback from the teacher during facilitated class discussions. Banks (2006) discusses the use of this technology across a range of disciplines.
- Teacher-student feedback in class can also be facilitated 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 to stimulate discussion at the next lecture session. This not only integrates feedback into teaching and learning processes but it also helps build a dialogue around learning in large classes (see, Draper for a review of different variations on the one minute paper (http://www.psy.gla.ac.uk/~steve/resources/tactics/minute.html)

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?

Techniques to encourage structured reflection and/or self-assessment are varied and include:

- Create 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 shows that students find such tests valuable (Grebnik and Rust, 2002) and will often make repeated attempts at such tests particularly if they are pegged to some aspect of summative assessment; for example, students might have to achieve 80% 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 – which area they would like comment on, for example, 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 develop the skills to make objective judgements against criteria, skills which are often transferred when students turn to regulating their own work (Gibbs, 1999).
- Gardner-Medwin (2006) uses online multiple-choice tests in a medical degree at University College London but with a critical modification called 'confidence-based marking' (CBM). In CBM students not only select the answer but they also rate their confidence on a three-point scale (C=1, 2 or 3). Both these components determine the marks 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 that the teacher actually collect or analyse the reasons underlying students' answers but the online tool does provide a mark. See http://www.ucl.ac.uk/~ucgbarg/
- Pharmacy (at the University of Strathclyde) is piloting the use of an assignment cover sheet which 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 stated criteria and estimate the mark that they expect. This encourages reflection and provides useful information to teachers about levels of competence and judgement**.** An example of such an essay cover sheet used at Oxford can be found at http://www.learning.ox.ac.uk/files/coversheet.pdf
- Another way to directly involve students in monitoring and reflecting on their own learning is through portfolios. The construction of a portfolio requires that students reflect on their achievements and select work, and make claims about how their work meets different requirements, criteria or standards. Portfolios help increase students' sense of ownership over their work and help them to integrate learning across different subject domains.
- Students might also be asked to write a reflective essay or keep a reflective journal in relation to their learning on a module or course.

8. Provide opportunities for choice in the topic, methods, weighting, criteria and timing of assessment tasks

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

Techniques for giving students more say (choice) in assessments:

- 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, about 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 <u>criteria</u> that would be used to assess their projects. This task proved extremely demanding and 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 are asked to add their own specific <u>criteria</u> to the general criteria provided by the teacher. These are taken into account in the final assessment for the module.
- In an Accountancy module at the University of Sydney, the students get a short introduction and then in pairs they produce multiple-choice tests over the duration of the module. They also produce feedback for the correct and the incorrect answers. What tests to produce are determined by students although they are chosen with reference to the module's learning objectives. These tests are then taken by the rest of the class and evaluated by them. Some of the tests are used in the final examination. The teacher argues that this procedure develops a deep understanding of the topic with the creation of feedback for wrong answers raising students' awareness of subtle aspects of the discipline. It also helps students generate questions and criteria for correct answers both of which deepen understanding.
http://www.itl.usyd.edu.au/Synergy/article.cfm?articleID=283

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 decisions?

Techniques for involving students in decision-making might include:

- 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 didn't, and about the structuring of assessment tasks. The tutor's responses to these questions had a positive effect: students felt that they had a voice in policy decisions.
- Student representation on committees that discuss assessment policies and practices. It has recently 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.
- Request feedback from students on their assessment experiences in order to make improvements – e.g. collate feedback on their experiences of exams and tests, on experiences of feedback and marking, on the weighting of assessments and on their wider experience across programmes. It might also be prudent to collate data across subject areas and years of study.
- Carry out a brief survey mid-term or mid-semester while there is time to address major concerns.
- If using the ideas in this document in modules and programmes it will be important to explain your rationale to the students. Students are more likely to appreciate the importance of self-assessment, peer dialogue and self-

generated feedback after having analysed and discussed their own role in making learning effective and in developing their ability to learn throughout life.

- Departments or 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.

10. Support the development of learning groups and communities

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

Techniques that have proved effective in fostering social cohesion include:

- Constructing group tasks and projects in the first year so that students have opportunities to form friendship.
- In a Technology and Management module in one university the teacher required students working in groups to set tasks for the all other groups taking the module. This required that each group 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.
- Link modules together as a pathway so that the same students work in the same groups across a number of modules (see Tinto, 1993)

11. Encourage positive motivational beliefs and self-esteem

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

Techniques to enhance motivation might include:

- Structuring learning tasks so that there is a progressive level of difficulty so that weaker students can have some success but those more able are not held back.
- 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 are able to 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).
- Well-organised online simulations (in business and engineering) can be motivational when they are based on real life scenarios (authentic) and when the feedback provided is dynamic and allows students to see what progress they are making towards goals in 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 enhance student motivation, for example, opportunities for self-assessment (principle 7), choice and involvement in decision-making (principle 8 and 9) and the formation of supportive learning communities (principle 10)

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 generate and collate useful information about student learning include:

- One-minute papers where students carry out a small assessment task and hand this in anonymously at the end of a class (e.g. what was the main point of this lecture?; what question remains outstanding for you at the end of this teaching session?') – the teacher 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 can provide teachers with cumulative information about student progress that could be analysed and used to shape subsequent teaching.
- Online multiple choice tests delivered before a lecture class can be analysed and used to determine what is taught in class (see Nicol, 2006: 2007)
- Online tools have built in functionality for class and individual recording and reporting levels of student engagement with resources, with tests and in online discussions.
- Electronic voting systems provide dynamic feedback in class and the stored data provides further information about responses that could be analysed.
- Providing opportunities for students to self-assess and reflect on their learning. If these reflections are written down they would provide important input to teachers about students ability to evaluate their own learning.

..

Case Studies of Assessment and Feedback practices
in the first year of undergraduate study

Appendix 2 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; that is, 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 provides a description of the module or course, information about the learning design and the results of any evaluation, where one was carried out. The case study is also analysed in relation to the assessment and feedback principles. The general approach has been to note from the module those principles that were key to the learning design and are strongly implemented but also to highlight how the module 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 Paper 1, point 4).

Two of the case studies are drawn from the Re-engineering Assessment Practices (REAP) project (www.reap.ac.uk) 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 (student numbers ranged from160-900 students) across a range of disciplines. Individually, the case studies reported through REAP only provide tentative support for the principles as a means of designing learning in the first year. These studies report on only one or two years of implementation and therefore the findings might be seen as merely highlighting promising possibilities that need to be confirmed through more rigorous study. Against this it should be noted that in the REAP project more than half of the 19 modules redesigned 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 thus provides some converging support for the value of the assessment and feedback principles.

Taking another stance, it is arguable that having a clear pedagogical rationale for module and programme design embodied in principles that are supported by the research is a productive way of addressing improvements in the first year experience. In Paper 1 it has also been 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 redesigned modules offer 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 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 (e.g. 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 Paper 1, point 10). All the modules redesigned in REAP were analysed in relation to these assessment principles. Further examples can therefore be found on the website (www.reap.ac.uk)

Case Study 1: Psychology

Title: Online collaborative work in a large first year Psychology course

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Source
The redesign reported here was supported through the REAP project
(www.reap.ac.uk)

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, 4 tutorials and 12 practical laboratories over two semesters. The course leader delivered the lectures and 12 graduate 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%), tutorial attendance (4%), participation in an experiment (5%) and a final exam where students wrote five essays from a choice of twelve (66%). 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, to encourage regular and deeper reading of psychology texts, to provide practice in writing necessary for the exam. All this was to be achieved without increasing staff workload.

The Redesign
Basic Psychology was re-designed 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 (e.g. Anderson, Howe, Soden, Halliday and Low, 2001: Doise and Mugny, 1984). The redesign involved the use of the discussion tools within the institutional virtual learning environment (WebCT).

In the academic year 2006-7, students were divided into 82 online discussion groups with 6-7 students per group. They remained in the same discussion groups throughout the year. In the redesign, the number of lectures was cut in half (i.e. 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, etc.). 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:

- **Week 1**: A light written task (e.g. all students answer 7 short questions defining terms in a topic area, then discuss online and post a group response)
- **Week 2**: Guided reading in preparation for the week 3 essay
- **Week 3**: Deep written task in which students produce individual inputs to an 800 word essay question and then collaborate 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, model answers, selected from the amongst the students' group work, were posted by the teacher. 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 are that the learning tasks become progressively more difficult over the duration of the module, that students are encouraged to make individual contributions but also to engage in constructing a group response and that for each writing task there is a model answer for comparison. Neither the course leader nor the graduate tutors moderated the quality of the online discussion. The course leader did provide general feedback to the class-wide discussion board. However, this was as much motivational (encouraging confidence in ability) as on the content. In 2006-7, 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 would contact students who failed to participate. In 2007-8 a small percentage mark is being awarded for contributions (2%) which are being monitored by the teaching assistants. Students can thus gain up to 24% for regular participation. The availability of a record of the online group work enabled the class leader to reformulate groups if students reported problems (e.g. free-riding). Only 5 groups had to be reformed in 2006-7.

Evaluation
The evaluation of this course redesign comprised questionnaires, focus groups with students and the 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, with students supporting 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 concur with the student responses to end of year questionnaires (2006-7). Table 1 provides 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 understand how to improve my own answer (i.e. model answers)	50%	15%
I found that reading other people's contributions helped me understand psychology.	64%	18%
I made friends as a result of the online projects	12%	85%

Table 1: Student responses (n=164) to end of course questionnaire. [5 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 due to 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 questions (Table 1), although there were a high number of neutral responses. Open comments made by the student reinforced the quantitative questionnaire data. These emphasised both the way the collaborative learning tasks enhanced student confidence and the perceived benefits in learning. The staff and student perceptions are consistent with the improvements found in mean exam performance for this course, which has risen from 51.1 to 57.42% (p<0.001). The failure rate has also dropped from 13% in previous years to 2% in the 2006-7 in this 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 postings per student being 44.3. There were 6000 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 the fact that this was a campus-based course students actively participated in the online discussions. The questionnaire also showed that only forty three percent of the students actually met face-to-face to discuss the learning tasks. This might suggest that the online discussion format might be tapping into the habits of those first year learners accustomed to social networking However, 86% 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 the sharing and discussion of 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 in this course was that the redesign did not increase staff workload. In Psychology, the cutting of the number of lectures

in half and the use of graduate teaching assistants to monitor student contributions resulted in similar costs (staff time) when compared to previous years.

In summary, the psychology course is a good example of an elegant and efficient learning design that 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, and is simple to implement as it only involves a standard tool available in every virtual learning environment (discussion board).

Relation to 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 were also extremely positive about the use of the online environment as a tool to establish their own support networks. The following provides a more comprehensive breakdown in relation to the assessment and feedback principles:

1. The standard format and model answers provide progressive clarification of expectations for students taking this first year class (Principle 1).
2. The learning tasks are spread using three-week cycles across the whole year and this encourages regular study in and out of class. The tasks are also ordered so there is an increasing level of challenge as the course progresses (Principle 2)
3. The teacher selects the model answers as a feedback source for students and provides feedback to the whole cohort through the general discussion board (Principle 3). There is a plan to provide more feedback from the teaching assistants in future iterations of the course although the plan is that this would not be on content but rather to encourage more peer dialogue around learning.
4. 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)
5. 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 examination. Also, the small percentage of marks to be used in 2007-8 will mean that formative and summative processes will become more tightly integrated (Principle 5)
6. The online peer discussion around 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.
7. Students are encouraged to self-assess (reflect) by comparing their responses against the model answers (Principle 7).
8. There is some choice and flexibility in the way that students divide up work in their groups although there is no choice in the actual learning tasks (Principle 8)
9. Students are not engaged in decision-making about assessment policy (Principle 9)
10. The results show that the online interactions did result in productive learning relationships developing and there was evidence in the general discussion board of students forming groups to discuss work in other classes they were enrolled in (Principle 10)
11. The increasing complexity of the online tasks scaffold learning development and the focus on learning rather than marks enhances intrinsic motivation. The

compulsory nature of the task provides some extrinsic motivation to participate (Principle 11)

12. The online archive of the group discussions and their outputs means that the course leader was able monitor progress and adapt classroom teaching in relation to students needs (Principle 12)

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Case Study 2: French

Title: Engagement and self-study in French language learning

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Source

The redesign reported here was supported through the REAP project
(www.reap.ac.uk)

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 and 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% 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 first year from more diverse backgrounds and with a wider range of language skills (e.g. listening, speaking, writing) than in the past. This pointed to a need to reduce not increase the class size. Assessment in French comprised 30% for course work carried out during the year and 70% for a three hour written exam testing grammar, translation and comprehension. Students could gain exemption if they achieved above 50% in assignments, class tests and in oral class work.

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 study. The course leader had identified that increasing numbers of students were engaged 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, utilising face-to-face and online modes. Tutorials were reduced from two to one each week but with smaller groups sizes (around 20). The second weekly tutorial was replaced by an interactive lecture with the whole cohort. An Electronic Voting System was used to support this lecture format (see below). The class leader also provided an extensive range of formative language exercises online 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 (MCQs) 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 information and information about students' expectations of university study. This gave tutors more information than in the past about prior language knowledge and skills and about personal considerations (e.g. numbers engaged in part-time employment). Throughout the year there were frequent opportunities for online formative testing using texts, videos and audio recordings. The 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 is for the teacher to present a question, normally a multiple-choice question (MCQ) in class. Students respond to the question using handsets (similar to TV controllers) and software collates the responses and presents a bar chart to the class showing the distribution of answers. After polling the class, the teacher can stimulate small peer group discussions (about difficult grammar points), for example, when many in the class get the answer wrong (see, Boyle and Nicol, 2003). Students can then be retested on the same question to establish that understanding has improved. The teacher can also provide her own feedback on the question or facilitate further class-wide discussion. In effect, EVS technology simultaneously supports three types of feedback in the same class session: feedback through reflection where students compare their own MCQ response to the responses of the class (bar chart); peer feedback derived through discussion and teacher feedback.

The formative online tests were synchronised to support the tutorials and the EVS interactive lectures. For example, the teacher used the findings from the online tests to determine areas of weakness and to determine 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, Patterson, Gavrin & Christian, 1999)

Assessment under the new design was based on five items:
(i)   Fortnightly online self-assessment tests
(ii)   Fortnightly online guided listening tests (video + questions)
(iii)   Online class tests done 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 are marked electronically and the first two offer some flexibility in when they are taken and in the number of attempts before the mark counts. As noted above, students can gain exemption from the final exam if they score above 50% in each of these marked assessments.

Evaluation
Evaluations involved focus groups, an end of course questionnaires and exam results. Questionnaire responses show that students valued the opportunity for the regular self-assessment and feedback provided through the online tasks. They reported that the speedy return of marks which helped them identify what progress they were making and where to focus their study efforts. They also valued the flexibility in when and where they took the tests. For example, 91.3% of students reported in an end of course questionnaire that '*having to work regularly* (on self-assessment tests) *helped me to learn*' and 76% reported that they '*had to work more in French than in any other subjec*t'. Both these results show the way in which regular assessment tasks kept the students engaged in study. The tutors in the course reported that the redesign saved teaching time compared to previous years but also resulted in better quality of personal contact time with students.

The progression rate from 1st year to 2nd year improved from 71.7% to 78% in 2006-7 when compared against previous years. Also, the fail rate dropped from 24% in 2005-6 to 4% in 2006-7 for those who were not exempt and who took the final exam. It was also reported by the course leader that attendance at lectures and tutorials, which had been falling, improved markedly compared to 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 keeps students engaged out of class and the use of EVS which ensures active engagement in class (principle 2), the multiple sources of feedback (especially peer and teacher) provided in the interactive lectures supported by EVS (Principle 3 and 6). The online self-assessment tests also enabled 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 reinforced by frequent online testing and through in-class discussions with immediate feedback using EVS (Principle 1)
- The online exercises and fortnightly tests required 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 merged if students achieved an exemption. On the other hand, if students had to take the exam, alignment would have been considerably less (Principle 5)
- Peer dialogue was primarily planned for within the EVS lecture classes (Principle 6). More project work might have been used for the more conceptual aspects of this class (e.g. 'to widen students understanding of contemporary France').
- Students had regular opportunities to self-assess using the online formative and summative tests (Principle 7)
- Choice was a strong aspect of this design and centred around providing flexible opportunities in relation to when students took tests (Principle 8)
- No attempt was made to involve students in decision-making about this class (Principle 9)
- There was some evidence of an online community developing within the WebCT discussion board but it was not supported in any way (Principle 10)
- Regular self-testing and practice opportunities helped 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 align their teaching to student needs (Principle 12)

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Case Study 3: Biology

Title: 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 that is 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% of their overall mark for the class. The other assessments are two paper-based objective question assignments (15%), a laboratory report (15%) and a two-hour end-of-year examination (50%) comprising multiple-choice tests, calculations and sequencing questions and short essays,

About the Lifestyle Group 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 team-working skills, acquire oral and visual presentation skills and to undertake independent research.

The project includes three main activities with the marks for each activity 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%)

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

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

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 also the ability of the group 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 this and suggesting a mark.

Although the staff teaching this class reported that the peer marking exercise had worked reasonably well, a number of groups each year had problems in agreeing the individual marks. For these cases, it had been extremely time-consuming to investigate the source of difficulties and to resolve disputes. A second issue was that some group members had difficulty attending group meetings because of personal commitments. A third issue was that some groups each year appeared to have difficulty in scheduling their activities effectively. This resulted in a rush to complete posters and 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 2006-7 and the university's Virtual Learning Environment (VLE), Moodle, was harnessed to support the changes made. In thinking about the redesign of this class, the course team drew on the thinking behind the Re-engineering Assessment Practices (REAP) project (www.reap.ac.uk).

The student cohort was divided up into 80 groups of 8 students. Each group was assigned an online discussion board forum within Moodle, accessible only to group members and to graduate 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 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' that were 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 that each group posts:

- A list of the marking criteria that that they planned to use to assign peer marks at the end of the project. In 2006-7 students had to negotiate these within their groups at the beginning of the project rather than wait till the end. Research shows that disputes can be reduced if students actively engage in determining their own assessment criteria for group working.
- 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 (research, synthesis of ideas, presentation etc)
- Summaries of the group material to be used in the poster presentation and in the debate.

- After receiving the group mark the group had to agree the individual marks based on the agreed criteria and self-assessments. They had to provide their mark allocations with justification.
- The students also 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 for 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 timing and division of labour associated with the micro-tasks.

After deliverables were posted, the tutors would provide 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 quickly and to take remedial action or to adapt subsequent classroom activities to provide more support or guidance to the whole class if required.

Key features
There are a number of noteworthy features of the redesign of the Lifestyle project. Firstly, the division of large tasks into smaller micro-tasks with regular deliverables was intended to promote regular working and improved engagement ('time on task'). This was supported by the staged release of information and instructions online. Second, Moodle provided more flexibility in the way students could work and when and how they communicated (online or face-to-face). Thirdly, peer processes were better managed with the agreement of criteria before group work began. Fourthly, the online environment and its archiving of student work made it easier for teachers to monitor progress and to deal with group difficulties as they arose. Frequent submission of micro-tasks also offered multiple opportunities for teacher feedback

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

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

The students reported using Moodle extensively to communicate with members of their group. This was also evidenced by the logged data on Moodle where each students averaged around 80 postings over the timeline of the project. When questioned about what they communicated about this was split between using Moodle to discuss their ongoing research in the lifestyle project and using Moodle 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 no correlation between Moodle activity and the debating task.

The online record of group postings has provided useful information relating to peer marking activities. In the focus group, students reported that they felt reassured that academic members of staff were monitoring their online interactions because they provided documented evidence about contributions to group activities. They maintained that this '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 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.

Staff members have noted the willingness of students to interact using the discussion boards and the positive contribution this has made both to interactive group work and to the cohesion of each group and the whole class. Positive changes in the way that students have subsequently interacted in class have led staff members to conclude that the online interactive elements of the course have helped to encourage the development of a burgeoning learning community.

Discussion

Splitting a large task into smaller 'micro-tasks' has had a number of positive effects. Firstly, it has focussed attention on crucial elements of the activity that 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. Secondly, the requirement that groups regularly evidence their progress encourages effective scheduling of activities and minimises instances of last-minute 'panics'. Regular submission of smaller deliverables also provides 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. The use of Moodle to structure the learning activities and the fact that there were less problems in groups under the new scheme meant that the time allocated by staff to this project did not increase. Indeed, they have reported that now that all the information is in Moodle it should reduce workload in subsequent years.

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 in other class-based teaching activities was reported to be livelier. In the questionnaires, in comparison to previous years, it was shown that 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.

Relationship to 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 (Principle 2)
- The micro tasks offer multiple opportunities for formative feedback from the teacher although this was used primarily to motivate students. (Principle 3)

- The feedback is provided at a time when students would still be 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 considerable discussion and dialogue throughout the Lifestyle project (Principle 6)
- Students encouraged to self-assess not only by reflecting on the task but by comparing their experiences with others (Principle 7)
- Students given choice in the topics for the lifestyle project, how they divide up the tasks and in the criteria they set for group working (Principle 8)
- No specific involvement in decision-making in this project (Principle 9)
- Design encourages development of learning groups as students share experiences and offer feedback to other students. (Principle 10)
- Frequent submission of micro-tasks and archiving within Moodle provides the teacher with rich information about student's progress, including misconceptions around group task. (Principle 12)

Title: Collaboration and reflection in Software Engineering

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

Data Structures and Algorithms is an introductory first year class typically delivered to 30-60 students on the University of Auckland's Bachelor of Engineering (Software Engineering) course. The class is taught using elements of Betty Collis' "contributing student" approach (Collis, 2005). Students are asked to develop learning resources (quizzes, reading lists, etc.), 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 examination (worth 75%), laboratory work (10%) and 15% for contributions to the class resource base.

The redesign
A recent development in the class is 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 (typically half a page to two pages) reflective essay 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 and students are instructed to select a sample to read and comment upon, noting any differences in methodological approach during the lab task and noting any surprising or interesting variations.

When class feedback comments have been posted to the wiki one student group (typically 3 or 4 students) is selected to read all of the essays and feedback and to write a paper describing the expected results of the lab task and 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 points 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) reports 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 that 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 to groups asked to do this later on. It could also be argued that although the evaluation of this class demonstrates 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.

Key features of the intervention
- Repeated cycle of tasks reinforces criteria and provides multiple feedback opportunities
- Feedback is received when it is most relevant and useful
- Problem-solving skills replicate professional practice
- Students receive regular formative feedback written by other students in a language that they understand
- Informal sharing of experiences motivates, builds confidence and encourages development of learning communities

Relationship to 12 assessment and feedback principles
- Repetition of tasks throughout the year provides progressive clarification of expectations (Principle 1)
- Regular formative assessment opportunities throughout the year (Principle 2)
- Feedback is written by students for students. Written feedback is enhanced with peer discussion. (Principle 3)
- Repeated cycle of topics and tasks provides multiple opportunities for students to self-correct. (Principle 4)
- Students encouraged to self-assess not only by reflecting on the task but by comparing their experiences with others (Principle 7)
- Design encourages learning communities as students share experiences and offer feedback to other students. (Principle 10)
- Frequent formative assessment provides the teacher with rich information about student's progress, including misconceptions around topics. (Principle 12)

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