Formative assessment in higher education: Moves towards theory and the enhancement of pedagogic practice

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Abstract. The importance of formative assessment in student learning is generally acknowledged, but it is not well understood across higher education. The identification of some key features of formative assessment opens the way for a discussion of theory. It is argued that there is a need for further theoretical development in respect of formative assessment, which needs to take account of disciplinary epistemology, theories of intellectual and moral development, students' stages of intellectual development, and the psychology of giving and receiving feedback. A sketch is offered of the direction that this development might take. It is noted that formative assessment may be either constructive or inhibitory towards learning. Suggestions are made regarding research into formative assessment, and how research might contribute to the development of pedagogic practice.

Keywords: assessment, enhancement, formative assessment, pedagogy, theory

Knowledge of results

> Learning depends on knowledge of results, at a time when, and at a place where, the knowledge can be used for correction. (Bruner 1970, p. 120)

Bruner's dictum contains an important truth, but it is not the whole story. 'Correction' implies the existence of a right answer, and suggests a homeostatic or single loop (Argyris and Schön 1974) view of education that contrasts with the title of a collection of his writings: *Beyond the information given* (Bruner 1974). The quotation is from a chapter whose emphasis is on school education (although there are allusions to a broader range of educational contexts), in which considerable weight is placed on getting things right. Whilst 'getting things right' is of obvious importance in higher education as well (examples from medicine, science and engineering come quickly to mind where 'not getting it right' had direct and seriously damaging consequences), there is a significant dimension to higher education that can, following Barnett (1997), be labelled as 'emancipatory' and which implies

an intention to go beyond the current boundaries of knowledge. The final word of the quotation from Bruner would, more appropriately, have been 'development'.

The aim of Barnett's book is to elaborate the concept of 'critical being'. The purpose in this article is less rarefied – to move towards a theory of formative assessment in higher education and to consider some of the implications for pedagogic practice. Underlying the dimensions of formative assessment that are discussed below is a triple intention – to give credit for what has been done to the expected standard, to correct what is wrong and to encourage emancipation by alerting the student to possibilities which he or she may not have hitherto discerned. The skill which the assessor brings to bear on the student's work is a critical determinant of the capacity of formative assessment to be emancipatory in character.

The essence of formative assessment is captured well by Wood (1987, p. 242) who, in discussing a student's 'maximum performance' in the light of Vygotsky's (1978) 'zone of proximal development' (which – broadly stated – is the region between the student's existing problem-solving ability and the ability to solve more complex problems given guidance and support from a more skilled person), puts forward the idea that 'the teacher/tester and student *collaborate* actively to produce a best performance' (emphasis in the original). Implications of collaboration for the role of the teacher/assessor are noted at various points in this article.

Formative assessment

Definitional fuzziness

Formative assessment is a concept that is more complex than it might appear at first sight. The basic idea seems simple enough – the central purpose of formative assessment is to contribute to student learning through the provision of information about performance. Formative assessment can be formal or informal. Following Rowntree (1987, pp. 4–5), it spans 'a spectrum [...] ranging from the very informal, almost casual, to the highly formal, perhaps even ritualistic'. Formal formative assessments can be defined as those that take place with reference to a specific curricular assessment framework. They involve activities required of the student (i.e. to do the work) and of the assessor (to assess the work and provide feedback from which the student can learn). When students have been surveyed about the value they place on organised formative assessment sessions, such evidence as there is points to an overwhelmingly positive response (Carroll 1995; Rolfe and McPherson 1995; Vaz et al. 1996).

Informal formative assessments are assessments that take place in the course of events, but which are not specifically stipulated in the curriculum design. These include instantaneous feedback as the student takes part in a learning activity and comments on drafts of material for inclusion in portfolios.[1] Contrary to S. Brown's (1999, p. 6) suggestion that formative assessment 'is primarily characterized by being continuous', there is no necessity that it be continuous: formative assessment can be very occasional, yet still embody the essential supportiveness towards student learning.

Formal formative assessments are typically – but not exclusively – undertaken by academic staff or by supervisors of placement activity within a collaborating organisation. They may also involve students as peer assessors. Informal formative assessment can be provided by anyone – as well as those already mentioned, the student could obtain feedback from people outside the immediate higher education context, such as parents or relatives, or from other students not involved in the same programme of study. Informal formative assessment can take place indirectly where the student sees assessments given to peers and is able to evaluate his or her performance with reference to these, or where he or she accesses materials which throw light on the performance.

Gibbs (1999, p. 43ff) offers an interesting example of formative assessment that hovers on the borderline between the formal and the informal. In brief, six times during a second-year Engineering module, students were required to grade their peers' work an hour after its submission. Feedback was immediate, and on an anonymous basis. The improvement in students' end-of-course outcomes was very marked, and attributable to aspects of good learning. Amongst these aspects were the appropriateness of the learning activity, the time the students spent on the task, and – of greater relevance to this article – the promptness of the feedback, the social dimension in which what others thought was important,[2] and the stimulus to self-regulation regarding the standard of submitted work.

In this article, the emphasis is given to feedback in formal situations. However, a number of the points made can, *mutatis mutandis*, be applied to informal learning contexts.

Distinguishing formative from summative assessment

Following Bloom et al. (1971), the distinction is typically made between formative and summative assessment, the latter being concerned with determining the extent to which a student has achieved curricular objectives. As a number of writers have observed, the distinction between formative and summative assessment is however far from sharp. Some assessments (e.g. in-course assignments) are deliberately designed to be simultaneously formative

and summative – formative because the student is expected to learn from whatever feedback is provided, and summative because the grade awarded contributes to the overall grade at the end of the study unit. Summative assessments in relation to a curricular component (the student passes or fails a module, for example) can act formatively if the student learns from them. One of the less desirable effects of the unitisation of curricula in UK higher education has been the reduction in the amount of formal formative assessment as the number of end-of-unit summative assessments has increased. Also feedback is sometimes received too late for student choice and may also be insufficient, if only given as a mark or grade, for learning on subsequent modules.

Convergent or divergent assessment

Torrance and Pryor (1998, 2001) draw a distinction between convergent and divergent assessment. Broadly, the former refers to assessments that test whether students can fulfil pre-specified objectives, whereas the latter tests students' ability to succeed in more open-ended tasks. If, as is argued below, a key purpose of higher education is to facilitate the autonomy of learners in a world of lifelong learning – a point made forcefully by Boud (2000) – then formative assessments (and summative assessments, for that matter) must contain a significant proportion of divergence.

Fostering student self-regulation

Formative assessment helps students to appreciate the standards that are expected from them. Statements of expected standards, curriculum objectives or learning outcomes are generally insufficient to convey the richness of the meaning that is wrapped up within them. Exemplifications and discussion are needed for understanding: Wolf (1995) gives, with reference to learning outcomes, an empirical justification of Polanyi's (1958, p. 54) dictum that 'Connoisseurship . . . can be communicated only by example, not by precept'. In the Open University's course H851 (whose focus is the accreditation of teachers in higher education) the expectations set for students are exemplified in the course materials, and feedback by tutors is given on drafts of items intended to be collated in an assessed portfolio. There is a deliberate intention to maximise the intersubjectivity of understanding, amongst staff and course members, regarding the course's demands.

Speed of feedback

There is a range of ways in which assessors can provide feedback on student performances – comments can be written on assignments, be given orally following an assessed presentation of some sort, or be given quickly during a learning activity which is not formally assessed.[3] Regarding the last of these, a teacher may, for example, be working on an activity with a group of students (for example, when undertaking geological field studies or working in an art or drama studio) – in which case he or she has the opportunity to provide rapid, informal feedback on what the students are doing. Not to be forgotten, also, is the formative feedback that a student receives from peers and others not in teaching roles, but this is outside the scope of the present article.

The *purpose* of the formative assessment is the same in each case (a contribution to student learning) but – as Eraut (1994, p. 149ff) notes in respect of professional development in general – the rapidity with which feedback has to be provided implies differences in the ways that assessors work. Grading and commenting on an assignment is typically a deliberative process which involves the assessor in analysing what the student has said and how well it has been said, what he or she has not said, and so on. At the opposite end of the dimension of reaction time, the assessor makes instant comments on what he or she observes: the student might, for example, be using equipment in a potentially dangerous way, or inadvertently be about to destroy a rare specimen in the field. The assessor recognises immediately, from his or her repertoire of knowledge, the need for action and does not need to deliberate regarding the appropriateness of that action – what has to be done is professionally 'obvious'. In between these two polar positions as regards reaction time, there is an intermediate in which the assessor has to make a fairly rapid but not instantaneous decision about the performance – for example, in judging the merits of a drama student's delivery of a speech from Shakespeare, or of a team presentation in a Business Studies programme.

The risk of student overconfidence

In their analysis of the reliability of portfolio assessments on a course at the UK Open University, Baume and Yorke (2002) note that the high success rate is in part attributable to the feedback that students receive on drafts of portfolio components. Many students take the opportunity to polish up their submissions in the light of this feedback.

However, there is, in the provision of feedback on draft work a potential problem. The success of the student is, to some extent, due to the work that the teacher put in at the draft stage. It is not clear whether the student has developed sufficiently to deal satisfactorily with analogous work

without the support of the teacher – in theoretical terms, it cannot be said whether the student has moved his or her 'zone of proximal development' up the developmental gradient. The point is not a mere academicism. Where a programme requires a student to demonstrate competences sufficient to underpin subsequent independent study (as might be the case in, say, a taught EdD in which a taught Part I lays the groundwork for autonomous dissertation work in Part II), the examination board judging students' performances at Part I level may reach unjustifiably optimistic conclusions about capacities to succeed at Part II. The weak student may as a result struggle to cope with the demands of Part II, and could fail or become the beneficiary of a grudging pass.

The effect on assessors

The act of assessing (formally and informally; formatively and summatively) has an effect on assessors as well as on students. Assessors learn about the extent to which students have developed expertise, and can tailor their teaching accordingly. Sometimes the assessee will respond to an assessment with a challenge to the assessor. For example, this could happen when an 'expressive objective' (see Eisner 1985) leads to the production of work whose nature could not be predicted at the outset – the writing of a poem, the creation of a work of fine art, or a new critical slant on a writer's oeuvre are cases in point – and the assessee points out that the assessor has misconstrued the work's intentions, or its socio-cultural underpinning.

   The potential for the assessor to develop his or her disciplinary and/or pedagogic repertoire may be realised after a period of reflection (perhaps supported by a staff development programme), with the effect that the revised repertoire of the assessor becomes available for subsequent cohorts of students.

The effectiveness of formative assessment

A substantial review of formative assessment (Black and Wiliam 1998) showed that formative assessment 'works' – it is effective in promoting student learning across a wide range of educational settings (disciplinary areas, types of outcomes, levels). Although the bulk of the research reviewed relates to schools, there is some evidence from higher education as well. An important determinant of the effectiveness of formative assessment is the quality of the feedback received by learners.

   Black and Wiliam's review confirms a belief that underpins both higher education and education in general: formative assessment is critically

important for student learning. Without informative feedback on what they do, students will have relatively little by which to chart their development. This implicitly hints at the criterion of 'consequential validity' (Boud 1995). Boud's point is that, whilst feedback may have some effect in the short term, sight should not be lost of the potential impact in the longer term. When there is a positive deferred effect on learning, consequential validity is high – but if the feedback encourages learning counter to that desired (perhaps 'surface' learning) then the consequential validity is low.

The pressures on higher education are, however, threatening the use of formative assessment. These pressures, which are differentially salient across the world, include the following.

- An increasing concern with attainment standards, leading to greater emphasis on the (summative) assessment of outcomes.
- Increasing student/staff ratios, leading to a decrease in the attention being given to individuals.
- Curricular structures changing in the direction of greater unitisation, resulting in more frequent assessments of outcomes and less opportunity for formative feedback.
- The demands placed on academic staff in addition to teaching, which include the need to be seen as 'research active', the generation of funding, public service, and intra-institutional administration.

To these must be added the legacy of the dominant paradigm of the 20th century, which Shepard (2000) sees as reflecting behaviourist theories of learning, social efficiency and scientific measurement. Shepard's argument is that, whilst approaches to learning have moved in the direction of constructivism, approaches to assessment have remained inappropriately focused on testing.

A major challenge for higher education is to respond to the main 'message' of Black and Wiliam's review (formative assessment is, after all, a key tenet of good teaching) whilst accepting that it cannot revert to a perceived previous 'golden age' when student learning was better resourced. In fact, a widespread interest in student learning – and how this could be promoted by academic staff – began to accelerate significantly only a decade or so ago, so the previous age may well have been celebrated in a metal baser than gold.

How should effectiveness be judged?

There are two main questions that can be asked regarding formative assessment, which reflect different perspectives on the issue. First, 'Is what the assessor has done regarding feedback the best that could have been done (or –

more weakly – reasonable in the circumstances)?'; second, 'Did the formative assessment influence student behaviour?'

Whose perspective should be adopted? The assessor could argue that the feedback he or she gives regarding a student's work is formative in intention, even though the student does not learn from it. The intention is the important thing. From an assessor's point of view, formative assessment could – for instance – be taking place when an assessor comments on an assignment, even though the student subsequently merely notes the grade and ignores the comments. From the perspective of student learning, a case can be made that the feedback received is formative if (and only if) it has contributed to learning – this is the position adopted by Harlen and James (1997). This is a tautological expression which diverts attention away from the important aspects of process through which learning was influenced.

Validity can be claimed for both the teacher-centred and the student-centred perspectives, but it is important to be clear as to which is being adopted when formative assessment is under discussion or being researched.

Assessment is under-theorised

The assessment of educational programmes in higher education is under-theorised, but is theory necessary? It is, since theory provides a framework for the construction of assessments of various kinds. Untheorised assessment (as is widely used in higher education) increases the risk of partiality: as will shortly be argued in the case of formative assessment, theorisation is needed if some important aspects of assessment are not to be marginalised.

Whilst some might appeal in their search for theory to the apparent objectivity of the psychometric tradition of measurement, assessment in education diverges from that tradition in a number of respects.

- The performance being assessed at any one time is frequently multi-dimensional (see Sadler 1989).
- Measurement instrumentation is often *ad hoc* and lacks a theoretical base.
- Assessors typically do not have any substantial grounding in the theory (limited as it is) and practice of assessment.

Texts on assessment in higher education deal predominantly with summative assessment, and vary considerably in the extent to which the problems – in which can be discerned threats to validity and reliability – are acknowledged (see, for example, S. Brown and Knight 1994; G. Brown et al. 1997; Heywood 2000). The problems with summative assessment extend, automatically, to the cumulation of such assessments for awards.

Formative assessment – whilst suffering from conceptual and technical difficulties similar to those of summative assessment – differs from it in that it is dialogic, since the student receives feedback on his or her performance from the teacher and may have the opportunity to engage the teacher in discussion about the assessment. Whilst the validity of the assessment has to reach an acceptable level, the reliability is less important because the fundamental purpose of the activity is developmental rather than related to measurement. The exchanges between teacher and student are – in an ideal world – mutually hermeneutic, in that each is seeking to interpret and understand the communications of the other with the aim that the student will become better equipped to deal with future challenges of varying kinds.[4] For this reason, formative assessment is potentially richer in terms of theorising than is summative assessment.

Theorising formative assessment

In the assessment literature there is little theorisation relating to formative assessment. A number of books appear not to recognise the need for theory. Gipps (1994) does acknowledge the need, but made less progress in the direction of theorising assessment in general than the title of her book suggests. S. Brown and Knight (1994, p. 38ff) probably go furthest in the direction of theory where they list a number of assumptions relating to students, the assessment task, and teachers, on which formative assessment depends.

Part of the problem may reside in the duality of meaning of the word 'assessment'. On one hand an assessment is an outcome of the act of assessing: the grade and/or comment attached to a piece of work. On the other hand, it is a process that involves the assessor, the piece of work or behaviour in question, and the student: formative assessment is quintessentially process-oriented.

Black (1998), writing of school education, suggests that a fully developed theory of formative assessment would need to include the following.

1. A general learning theory with an emphasis on constructivism.
2. Models for the epistemology of each subject and hence of learning progress.
3. A theory of the cognitive acts of learning through feedback.
4. Analysis of self- and peer-assessment of the particular learning processes and interactions that these involve.
5. Study of the effects of different types of feedback on self-esteem, self-attribution and readiness to learn.
6. Student/teacher and pupil/peer interactions in learning as a case of social discourse.

This is a mixed collection of considerations which are difficult to bring together in a coherent way. Items 1 and 3 can be fitted together, since 3 can be construed as a component of 1. However, although the prevailing educational *Zeitgeist* favours constructivism over behaviourism, formative assessment can be undertaken perfectly well within a behaviourist framework, as Torrance (1993) notes. Items 4, 5 and 6 are stated in terms of empirical inquiry rather than theory, though each has an underlying – though unstated – theoretical substrate.

Cowie and Bell (1999) draw a distinction between planned and 'interactive' formative assessment which is broadly similar to the formal/informal distinction made earlier in this article. In fact, the models that they use to illustrate the distinction differ only in the extent to which the assessor is being proactive or reactive as regards the task being undertaken. Both models can be boiled down into a repeating sequence of

> Pupil's action (elicited by the teacher or not)
> → observation
> → interpretation
> → teacher's action.

Much of the planned formative assessment that was observed by Cowie and Bell, however, seemed to have been conducted with teacher-oriented requirements, such as testing the class's general level of understanding and 'getting through the curriculum', in mind. Pupils' consequential action is given little attention.

Perhaps because Cowie and Bell's models emerged from an observational study, some important theoretical constructs – such as the teacher/assessor's knowledge of the pupils' developmental stages and the epistemology of the subject discipline – were not represented in the models, although there are a number of points in their text where their existence can be detected.

A theory of formative assessment has to be much broader than Cowie and Bell suggest, going beyond Black's (1998) suggestions to include

- the epistemological structure of the relevant subject discipline(s);
- the ontology of students (subsuming both psychopathology and development);
- theoretical constructs relating to learning and assessment;
- the professional knowledge of the educator/assessor (which will subsume not only his or her disciplinary knowledge but also his or her knowledge of student development at the generic and specific levels, and – further – knowledge of assessment methodology and of the psychology of giving and receiving feedback); and
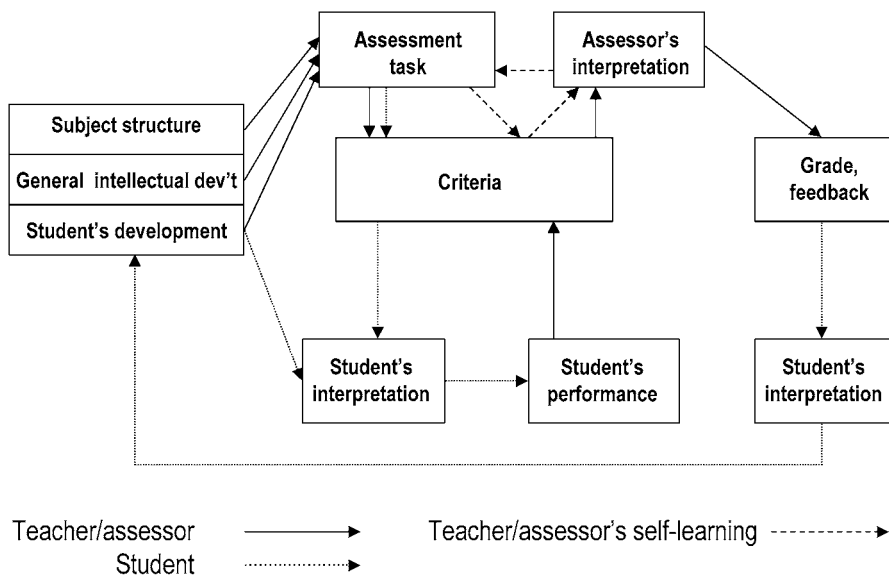- theory relating to communication and interpretation.

Figure 1. An illustration of the process of formative assessment in respect of a formal task.

This theoretical perspective is captured to some extent in the sequence of events that should take place when a submitted piece of work is being assessed formatively. Figure 1 is, to all intents and purposes, a subset of Laurillard's (1993, p. 102ff) 'conversational framework' for teacher/student interaction.

Ideally, a formal assessment task is constructed by the assessor, bearing in mind the structure and progression of the subject discipline(s) involved, an appreciation of the sequencing of intellectual and moral development progression of students as set out by writers such as Perry (1998, originally 1970) and Kohlberg (1964), and a knowledge of the current level of intellectual development of his or her students. The students' understanding of the assessment task is enhanced through the specification of assessment criteria.[5] The student interprets and responds to the assessment task according to his or her knowledge of the subject and the level of his or her intellectual development, bearing the assessment criteria in mind. The student's performance is assessed (interpreted) by the assessor against the specified criteria, and feedback is given through grades and/or commentary. At this point there is potential for dialogue between student and assessor. How the student interprets the assessment, together with his or her psychological state and disposition regarding subsequent action are key influences on learning. Regarding feedback, Sadler (1998, p. 82) – apparently unwittingly – raises an issue that needs more consideration than is appropriate here: is feedback

which is differentiated with reference to the student's level of performance inequitable – or appropriate for the development of learning?

The importance of the student's reception of feedback cannot be over-stated. Research on children has shown that they vary considerably in the way that they face up to difficulty and failure. Dweck and co-workers (e.g. Dweck and Leggett 1988; Elliott and Dweck 1988) contrast children who are 'mastery-oriented' with those who are 'helpless'. The former are charac-terised by a positive and resilient orientation to problems, seeing them as challenges from which learning might stem, whereas the latter have a negative orientation, see failure as a reflection on their (perceived low) ability, and give up easily. These differences are related to personality, however, and not to intelligence. However, self-perception of the extent to which intelligence is mutable does play a part in determining outcomes, as Dweck (1999) has shown in her synoptic survey of the field (which spans schoolchildren and college students).[6]

Also important is the goal which the individual is pursuing, since this provides a framework for interpreting, and responding to, events that occur. Elliott and Dweck differentiated between 'performance goals' (where the child was concerned with the question 'Is my ability adequate?') and 'learning goals' (where the central question for the child was 'What is the best way to increase my skill?').[7] Failure produced different effects: for children working to learning goals, it was merely task information to be assimilated or accommodated (using Piagetian terminology), whereas for children working to performance goals it was a crushing blow.[8] Similar effects have been observed in adults (Brunson and Matthews 1981), where 'Type A' undergraduates (extremely competitive, aggressive and with a sense of time-urgency) would, when faced with repeated failure in respect of the challenges in front of them, lapse into helplessness and give up responding.

As students move through their programmes of study the demands on them are likely to become more complex – for example, when undertaking a final year project (or, later, a research degree). Developmentally, they will be expected to become increasingly able to handle complexity. The same may well apply beyond the higher education institution. The potential for things to go wrong increases with the complexity of the problem, and the successful learner has a capacity to cope with disconfirming evidence (i.e. negative feed-back regarding what he or she has done) and move on. Here an orientation towards Dweck's 'learning goals', rather than 'performance goals' will stand the learner in good stead.

Learned dependence

Assessment, both formative and summative, can discourage students from developing to their full potential. Although discouraged students may not go as far as developing 'learned helplessness' (Peterson et al. 1993), they may develop 'learned dependence', with respect to which Boud (1995, p. 39) writes:

> Too often staff-driven assessment encourages students to be dependent on the teacher or the examiners to make decisions about what they know and they do not effectively learn to be able to do this for themselves.

Learned dependence is present when the student relies on the teacher to say what has to be done and does not seek to go beyond the boundaries that he or she believes to be circumscribing the task. Feedback, whether formal or informal, is interrogated for what it can tell about the teacher's expectations, and becomes part of a vicious spiralling-in towards 'performance goals'. This is 'playing it safe', being 'cue-conscious' (Miller and Parlett 1974) and identifying the rules perceived to be operating and then accepting them. Active 'cue-seekers' can also – and paradoxically – exhibit a form of learned dependence, 'playing it clever' by hunting for hints that will help them to maximise, in grade terms, the return on their investment of effort. Although the hunt is for clues about how to approach impending assessments, it is likely also to encompass clues relating to significance of matters within a discipline's epistemology. Again, performance goals may be elevated above learning goals.

The vast majority of academic staff have little more than a lay under-standing of psychology. An awareness of the potential consequences of comments and commentaries could help formative assessment to become more of a supportive act through intervention bearing on the student's cognition regarding the outcomes of his or her work, even if serious criticisms of the work have to be made.

Some students are particularly vulnerable to a sense of personal failure. For instance, the student who has entered higher education through an access course in which close interaction with teachers has provided ongoing supportive feedback may construe a poor summative performance in the more detached environment of higher education as reflecting adversely on his or her ability, and lose confidence as a result: 'I am a failure' may erroneously come to dominate over something like 'I didn't understand what was expected of me', for example. Such a reaction is edging towards learned helplessness.

The performance indicators in respect of higher education in the UK that were published for the first time by the Higher Education Funding Council

for England (HEFCE 1999) show – as have succeeding publications of these indicators – that social class and mature entry are strongly associated with non-completion (which is at its highest outside the universities that were established prior to 1992).[9] Both of these characteristics are linked, probably differently, to unfamiliarity with expectations regarding the higher education learning experience, but that unfamiliarity may be the trigger towards learned helplessness and discontinuation of study. Bandura (1997) argues that the demands placed on students should not constitute large cognitive jumps, since perceived failure to make good progress towards a distant goal can be demoralising:

> The less individuals believe in themselves, the more they need explicit, proximal, and frequent feedback of progress that provides repeated affirmations of their growing capabilities. (Bandura 1997, p. 217)

There are significant implications for curriculum design here. For example, if institutions were to emphasise formative assessment at the end of the first semester of full-time study, instead of using summative assessments in a partially diagnostic way, students might feel more supported and not disheartened – with beneficial effect on both students and the institution (whose income is affected by non-completion).

However, student psychopathology is sometimes too powerful for even supportive feedback to overcome, as the following quotation from a survey of 'non-completers' shows:

> I didn't have enough confidence to take part in the tutorials, and I spoke to my teachers and they were all easier with me but I didn't like voicing my opinions in case everyone thought I was stupid, and I became very unhappy. [. . .] I just lost all confidence in myself even though my teachers told me I was a really good student, I didn't believe them. I thought they were lying. (Student reading Joint Arts: from Yorke 1999, p. 15)

This student left the institution concerned, having refused an offer of counselling.

Formative assessment in the broader context of higher education

Teachers are, in general, more *au fait* with the structure and progression of the subject discipline than they are with matters of student development. Whilst the work of the constructivist Jean Piaget on developmental stages has been influential in school education, all students should – by the time they enter higher education – have progressed to the highest Piagetian level

– that of formal operational thinking. Amongst the contributions of others, the work of Kohlberg (1964), Perry (1998/1970), and King and Kitchener (1994) takes student development further, in that each identifies a dimension of intellectual development which Perry saw as ranging from dualistic to relativistic thinking, but which might better be construed in terms of a super-ordinate dimension running between acquiescence to authority and personal autonomy.[10]

Although these developmentalists' work has been in the public domain for some years, its integration into higher education curricula appears to have been limited. This is a little surprising since, across the world, a neo-vocationalist turn has been given to higher education as governments demand that their higher education sectors serve more explicitly their national economies (see, for examples of this kind of thinking, the Dearing Report [NCIHE 1997] in the UK and the West Report in Australia [West 1997]). A weakness of the Dearing Report was that it emphasised four 'key skills' (communication, numeracy, the use of information technology and 'learning how to learn') and lost sight of the broader construct of 'capability' (Stephenson 1998) which can be summarised as the ability to operate successfully in the world – be this at work, in voluntary service or generally in the home and community.

The graduate leaving an institution in a massified higher education system will not often be able to prosper in a cocoon of his or her subject discipline, distanced from the realities of the world. A medical doctor will almost inevitably come face to face with ethical issues relating to drugs or the rationing of medical care. A graduate in industry could face issues relating production processes to pollution in the environment or the use of a company's output for anti-humanitarian purposes. A social scientist or educationalist will be likely to face problems relating to equity . . . and so on. What these circumstances have in common for graduates is an implicit (at times explicit) tension between, on one hand, acquiescence to what is taking place and, on the other, the possibility of taking a stand that could be organisationally unpopular and personally disadvantageous. They imply, strongly, that higher education – irrespective of the subject discipline – should help students to develop the capacity to make moral judgments and then to act accordingly. This is difficult territory for students – and will be so for staff who have hitherto seen their role in terms of the subject discipline rather than student development.

Ausubel (1968) pointed out the importance of knowing what the student's level of cognitive development was, and the need for this knowledge to be taken into account in teaching. This is a more general and action-oriented version of Vygotsky's (1978) zone of proximal development [ZPD]. Eventually, the hope is that the student will be able to operate autonomously in

the original ZPD (thus making it no longer a ZPD, and creating a new ZPD further up the developmental gradient). Ausubel's point can reasonably be expanded to encompass the student's position on the acquiescence/authority dimension. Experience suggests that most programmes in higher education are based on a set of general assumptions in which the subject discipline, rather than student development, is dominant.

Researching formative assessment

Whilst formative assessment is of critical importance for student learning, it is difficult in practice to be sure of the relationship between cause and effect unless the action-feedback-learning-new action spiral is very tightly circumscribed and controlled. Circumscription and control might satisfy the requirements of an experimental design, but will not address the ecological validity of the 'untidier' reality of most learning environments. So when McKeachie (1997, p. 405) asserts, in contrast to Black and Wiliam (1998), that feedback 'does not correlate particularly well with student achievement' he may be implicitly acknowledging that the learning in higher education that follows formative assessment is overdetermined – that is, whilst the formative assessment may have contributed to the learning, extraneous events have also had their impact. Where student learning takes place in naturalistic environments, there are more determining causes than a researcher can possibly know.

However, correlational studies will not capture the richness of formative assessment in the way that Mentkowski and Associates (2000) were able to do in their longitudinal study of learning at Alverno College in the US. These authors implicitly make a compelling case for formative assessment in their distillation of an accumulation of research experience:

> Students observed that feedback was given in such a way that they did not feel it was rejecting or discouraging or placing an unbalanced focus on negative aspects of performance. Instead, they experienced it as supportive criticism ... [and] as an important support for learning and motivation.
>
> [...] Students observed that feedback procedures assisted them in forming accurate perceptions of their abilities and establishing internal standards with which to evaluate their own work. For some students, positive interactions with faculty or peers appeared to have been an important factor motivating achievement in the absence of grades. Students responded ... to their teachers' expectations and personal recognition. (Mentkowski and Associates 2000, p. 82)

Table 1. Features of a theory of effective formative assessment

Assessors are aware of
- the epistemology of the discipline,
- stages of student intellectual and moral development,
- the individual student's knowledge and stage of intellectual development,
- the psychology of giving and receiving feedback.

Assessors communicate with ('with' is preferable to 'to' here) students regarding how their work might subsequently develop.

Students actively seek to elicit the meaning from formative comment.

Students are prepared to act on the basis of their developed understandings.

In studying formative assessment in primary schools, Torrance and Pryor (1998, 2001) have developed an action research methodology that has a double potential for higher education. First, by examining the complexity of classroom interactions and teachers' interpretations, it points towards broad understandings about where formative assessment might promote student learning, and where it might do the opposite. Two outcomes from their 2001 article illustrate problem areas: teachers in primary schools engaged in their project discovered that

> in many cases their teaching seemed to close down opportunities for exploring student understanding rather than opening them up (Torrance and Pryor 2001, p. 621)

and they commented that their feedback was more detailed regarding topics on which they felt secure, and more general when they were less confident of their ground (ibid., p. 625). The second aspect of potential is its engagement of teachers in reflective practice.

Qualitative studies will not give rise to size-effect data of the kind summarised by Black and Wiliam (1998), but would provide higher education with a more fully grounded understanding of formative assessment than is currently available in the literature. The findings could be linked to outcome data, though the problems of doing this are admittedly considerable because of the overdetermination of outcomes and of the need to meet ethical and legal standards.

The preceding sections of this article suggest that the effectiveness of formative assessment in higher education depends on the presence of at least the features listed in Table 1. These features can be seen as forming an outline of a theory of formative assessment.

Assisting the enhancement of pedagogic practice

Reflection

Even though theory relating to formative assessment is underdeveloped, pedagogic practice relating to assessment can be enhanced by reflection. Although the concept of 'reflection' has been subjected to considerable scrutiny and debate since Schön's (1983) pioneering work, Cowan (1998) offers a useful discussion of reflection,[11] distinguishing three aspects – the retrospective 'reflection-on-action', the contemporaneous 'reflection-in-action', and the prospective 'reflection-for-action' – all of which have implications for practice and theory.

In this article, reflection is taken to have a wide span, from the individual teacher simply working to improve his or her practice in assessment to a more collective engagement that, in addition to the improvement of practice, encompasses the further development of theory.

The enhancement of individuals' practice

Many teachers in higher education reflect, as a matter of professional routine, on their practice as educators in their subject discipline. A few go further, and explore the literature on practice and theory and integrate this into the way they approach the tasks of formative assessment. Yet, of the various aspects of curriculum implementation, assessment is probably the least developed across higher education.

Internationally, greater attention has been given in recent years to the development of academic staff as educators, and 'in-house' developmental programmes have burgeoned. Reflection relating to formative assessment is a needed component of such programmes. Although they assess their learners formatively, teachers may simply not recognise their activities as comprising formative assessment (as Cowie and Bell (1999), noted in schools), or they may be missing opportunities to maximise formative impact. Heightening teachers' awareness of what they are in fact doing can contribute to their development as reflective practitioners: Swann and Ecclestone (1999, p. 76) show, for example, that working reflectively on the provision of more effective feedback to students led to improvements in lecturers' ability to grade work.

An aside on the need for care in using concepts and methodologies

However, those running staff development programmes need to be aware of the limitations of the concepts and methodologies that they bring into play. The taxonomies of Bloom (1956) and Biggs and Collis (1982) constitute cases in point.

Bloom's (1956) *Taxonomy of Educational Objectives* relating to the cognitive domain has influenced many educationalists over the years – more so than the companion volumes relating to the affective and psycho-motor domains (Krathwohl et al. 1964; Harrow 1972, respectively). Each of these taxonomies is hierarchical, with any higher level subsuming all objectives beneath them in the hierarchy (although the hierarchy may not be clear-cut, as Harrow acknowledges). Whilst the taxonomy relating to the cognitive domain has proved useful for analyses of cognitive demand, whether at the stage of constructing curricula or of assessing students' performance, it has to be used with reference to the epistemological level of the subject material. 'Comprehension', for example, can be identified – in, say, Chemistry – at various educational levels from school to higher education, but carries very different meanings as progressively more content is subsumed.

In their book, Biggs and Collis (1982) describe the SOLO [Structure of the Observed Learning Outcome] Taxonomy based on Piaget's theory of stage development. However, by the end of the book Piagetian theory is apparently abandoned, and the Taxonomy's Piagetian origins are nowhere to be found in Biggs' (1999) book on teaching in higher education. Biggs and Collis (1982, p. 214) write 'As the individual learns throughout life ... the concepts of SOLO apply again and again to each new learning episode': in other words, SOLO is applicable – within reason – at any stage of development. Like the Bloom Taxonomy, the SOLO Taxonomy has a practical utility value but data acquired through its application can only be interpreted with reference to the academic level at which it is used.

These two taxonomies contrast with stage-based developmental theories such as those of Piaget, Perry, Kohlberg, and King and Kitchener. The stage-based theories provide the researcher with developmental markers that can be turned into research variables, whereas the taxonomies have to be qualified with respect to the academic level at which they are being used before variables can be derived from them.

The collective enhancement of practice

It has been alleged, *inter alia*, that educational research in the UK has been fragmented and lacking in cumulation. Although the charge was levied against school-related research, it could apply equally well to higher education.[12] There is a need for a programmatic approach to the development of pedagogy in higher education through which the potential efficacy of pedagogic interventions across a range of contexts can be discerned (in this article, the focus is on formative assessment, but the point has general applicability).

Quantitative, quasi-experimental, research methods are difficult to employ satisfactorily when educational settings vary, often quite considerably. Qualitative (often action) research has a particular power to produce evidence that stimulates deeper[13] reflection and – if handled programmatically – has the potential for developing the theory and practice of formative assessment to an extent that analogous activities by individuals (or even institutionally-based groups of individuals) cannot.

The work of Mentkowski and Associates (2000) points to two important aspects of formative assessment that are particularly susceptible to programmatic qualitative investigation – the assessors' and the students' perceptions of the process. What do the assessors believe that they are doing in a variety of formal and informal settings, and to what extent are these beliefs concordant with the students' experiences? Research could, for example, establish the salience to the assessor of the location of the task in the epistemology of the subject concerned; of stage-based theories of intellectual and moral development (or at least some primitive version of these); and of the individual student's current state of knowledge and development. In addition, research could establish how assessors construe formative assessment and act on their construings. From the student angle, qualitative inquiry could establish how students react to being assessed formatively,[14] and perhaps where they believe that the process could be made more effective.

Concluding comments – and a challenge

This article has reiterated the arguments of others – that formative assessment is vitally important to student learning. It is fundamentally a collaborative act between staff and student whose primary purpose is to enhance the capability of the latter to the fullest extent possible. The theoretical constructs that underpin formative assessment are not widely appreciated amongst lecturers in higher education, and hence this article offers a number of points which may be helpful to staff concerned with the enhancement of pedagogy – and perhaps with researching it.

Whilst this article has concentrated on formative assessment, the shadow of summative assessment has never been far away. At some point, an academic is very likely to have to switch role from that of supporter of learning to assessor of achievement. As Ramsden (1992) points out, the teacher/assessor has to appreciate, and cope with, this difficult duality of role in which the acts of collaboration in learning are followed by the need to make judgments regarding the student's consequent development. The resolution is, perhaps, Vygotskian. If the student has moved to the upper end of the pre-existing zone of proximal development, then he or she should be able

to do unaided what previously needed knowledgeable support. A summative assessment should then be a test of independence.

The widely-felt pressures on higher education have been militating against formative assessment. Yet if formative assessment is as important to higher education as this article has claimed, space needs to be made in curricula for more (and better) formative assessment rather than less (see Knight 2000, for a fuller discussion). This will imply, for many, a radical reconstruction of curricula since any increase in resourcing given to formative assessment will have to be 'paid for' by decreases elsewhere. One likely candidate for reduction is formal lecturing, which is not a particularly effective method for enhancing student learning (Bligh 1998) – and some aspects of which can be covered through greater exploitation of the rapidly-developing communications technology. As Sadler (1998, p. 77) observes, 'Substantial modification to the learning environment through changes to regular classroom practice involves turning the learning culture around'. In thinking about learning culture, the critically important role of formative assessment should not be overlooked. In developing their curricula, much will depend on the determination of higher education institutions to confront some cherished traditions in teaching and learning.

Acknowledgements

Notes

1. Baume and Yorke (2002) note the use of feedback on draft materials in respect of a course leading to accreditation as a teacher in higher education.
2. The reduction in the power differential between assessor and assessee may also have played a part.
3. Laurillard (1993, p. 61ff) makes a distinction between feedback that constitutes a commentary subsequent to the action (extrinsic) and that which takes place within the context of the action (intrinsic).
4. Without making reference to hermeneutics, Tittle (1994) gives attention to interpretation in her broad survey of the dimensions of theory that have to be taken into account when establishing a framework for assessment activity. A problem with Tittle's overview, however, is the relative lack of guidance regarding choices to underpin assessment practice: if one prefers a particular constellation of theories, what are the implications for action?
5. The potential for staff/student coherence in understanding of the assessment task is further increased when the students are provided with examples of the criteria in use, such as

when previously assessed material is made available. Baume and Yorke (2002) give, in passing, an example of this practice.

6. As an example of the point, about one third of a group of students in a study reported by Ecclestone and Swann (1999, p. 383) seemed to have a view of their ability (measured by A-Level examination scores) as immutable, and because of this did not expect to be able to improve their work.

7. One might speculate here regarding connections with convergent and divergent thinking (Hudson 1966), and with convergent and divergent assessment (Torrance and Pryor 1998, 2001) as noted earlier.

8. Summaries of this work can be found in Sylva (1994) and in Dweck (1999).

9. See Yorke (2001).

10. There are other theorists whose work overlaps with those cited above. Pascarella and Terenzini (1991) summarise a number of these, and Mentkowski and Associates (2000) indicate something of the ways in which such theorists might be related. Further, Mentkowski and Associates indicate that there are a number of potential labels for superordinate constructs in this area.

11. In his book Cowan refers to students' learning, but his perspective can easily be translated into the realm of academic practice.

12. For a discussion of the allegations and responses from the educational research community, and commentary regarding the applicability of the debate to higher education, see Yorke (2000).

13. 'Deeper' because the act of engaging in research implies prior reflection on the need for, and the form of, that research.

14. Or quasi-summatively, as when 'final', judgmental, language is used in assessments that are intended to be formative (see Boud 1995, pp. 44–45).

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