Pre-emptive formative assessment

David Carless, University of Hong Kong
dcarless@hkucc.hku.hk

Abstract

This paper seeks to unpack some dimensions of formative assessment not yet fully articulated in the existing literature. It introduces the term, pre-emptive formative assessment to denote teacher actions which attempt to clarify student understandings before misconceptions have resulted in ineffective learning outcomes and/or loss of marks in assignments or examinations. It is suggested that this dimension is common in practice but its principles and practice have not yet been fully analysed. The rationale for pre-emptive formative assessment stems from key issues in the provision of useful feedback, namely timeliness and the opportunity for students to act. An example of pre-emptive formative assessment is described and some key issues in its implementation discussed. The paper concludes by arguing that pre-emptive formative assessment is worthy of wider attention, and outlines some directions of further exploration and ongoing data collection.

Introduction

The research evidence in favour of formative assessment has been well-articulated (Black & Wiliam, 1998) yet classroom implementation remains an ongoing challenge. Particular issues are teachers' understandings and interpretations of formative assessment both in schools (Lambert & Lines, 2000) and in higher education (Yorke, 2003). This paper seeks to unpack some possible teacher actions to diversify their repertoire of formative assessment techniques. It is argued that there are dimensions of formative assessment that are common in practice but have not yet been fully conceptualised or discussed.

It is not my intention to review in detail definitions of formative assessment which have been previously well-explored (e.g. Black & Wiliam, 2004; Wiliam & Black, 1996; Yorke, 2003), but some opening clarifications are in order. For the purposes of the paper, I view formative assessment as a process of eliciting understandings from students and using them to enhance teaching and learning. The student is a key agent in this process (e.g. Cowie, 2005) and Black (1993) asserts that unless formative assessment leads to enhanced student learning, it cannot be regarded as being formative. The focus of this paper is, however, on teacher actions to facilitate formative assessment. The justification for this stance is that the teacher is a key mediator in enhancing student understanding and improvements in the implementation of formative assessment rest, to a large extent, on teachers' understandings of principles and practice in formative assessment.

A further essential preliminary concerns the interface between formative assessment and 'good practices' in interactive teaching. This paper positions itself as contributing to extending assessment beyond its measurement role, and views it as axiomatic that

pedagogy and assessment should be interlinked. Much formative assessment is at the boundary between classroom assessment and teaching. As Torrance & Pryor (1998) observe: "formative assessment is … a construct, a name given to what should more accurately be characterised as a social interaction between teacher and pupil" (p. 10). Similarly, Shepard (2005) sees formative assessment as similar to instructional scaffolding, in other words it is more about teaching than about what is commonly construed as 'assessment'. An issue that this paper seeks to address is that progress in the theory and practice of formative assessment may be enhanced by further clarifying what can be justifiably included within conceptualisations of formative assessment.

The paper draws on literature and practice with respect to both schooling and higher education, in line with the aim of putting forward general propositions. My purpose is to clarify some dimensions of formative assessment that have not yet been fully articulated, particularly by introducing the concept of *pre-emptive formative assessment,* a form of anticipatory intervention in support of learning. The discussion serves to broaden existing dimensions of formative assessment and increase flexibility of options which may, in turn, render formative assessment more attractive to practitioners and more feasible for implementation.

Experiences in the implementation of formative assessment

This section sets out some of the challenges for the successful implementation of formative assessment. According to Black & Wiliam (1998, p.20), formative assessment is not well understood by teachers and its implementation is weak. Implementing in the classroom theoretical insights from the literature is a particular challenge. For example, Smith & Gorard (2005) report on an attempt to carry out formative marking through comments without grades, derived from Butler (1988); this was largely unsuccessful due to lack of deep teacher understanding or sustained support in the school in which it was implemented.

Whilst there are pockets of successful implementation reported in schools: in the UK (e.g. Black et al., 2003); in Australia (e.g. Forster & Masters, 2004); and in New Zealand (Bell & Cowie, 2001a, b), large-scale implementation is a considerable challenge (Black & Wiliam, 1998). Prospects for the implementation of formative assessment are even more daunting in various international contexts where transmissive teaching and summative assessment have characteristically dominated e.g. Greece, (Mavrommatis, 1997); or Hong Kong, (Carless, 2005). In particular, large class sizes and heavy workloads often present a barrier to teachers' implementation of formative assessment. This might lead them to believe that formative assessment, whilst having a solid theoretical base, risks being somewhat impractical, too time-consuming and hence incompatible with the demands of schooling.

In higher education, Yorke (2003) writes of formative assessment being weakly understood and insufficiently theorised. Whilst again there are pockets of success, such as the celebrated work at Alverno College (Mentkowksi et al., 2000), there are a number of structural problems facing formative assessment. Knight & Yorke (2003) mention for

example, increasing staff-student ratios which reduce attention given to individuals; and modularisation increasing summative assessment at short intervals with less opportunity for formative feedback. Pryor & Crossouard (2005) put it as follows: "Within universities, especially the more prestigious ones, traditional forms of assessment have been largely taken for granted and developments in formative assessment ignored" (p.1). In other words, formative assessment is unlikely to be a priority for undergraduate teaching in research-intensive universities.

Some writers emphasise that formative and summative assessment should generally be kept apart (e.g. Knight & Yorke, 2003), whilst others see them as potentially complementary (e.g. Biggs, 1998; Harlen 2005). What is clear is that the influence of summative assessment looms over formative approaches (Harlen, 2005). Cultures of testing and accountability may crowd out formative assessment or prompt teachers to downplay it. Even teachers buying into the principles of formative assessment and trying to implement them with support from academics experience such tensions; as Black & Wiliam (2004) observe: "teachers seemed to be trapped between their new commitment to formative assessment and the different, often contradictory demands of the external test system" (p. 45). Broadfoot & Black (2004) advise that if formative assessment is to flourish, initiatives aimed at supporting a positive link between formative and summative are sorely needed. Pellegrino, Chudowsky & Glaser (2001) warn, however, that the more purposes a single assessment aims to serve, the more each purpose will be compromised.

Formative approaches to assessment may be particularly attractive to teachers and students when they are directed towards aiding performance in high-stakes tests. For example, McDonald & Boud (2003) demonstrate how training in self-assessment was more helpful in enhancing student performance in an examination than traditional test preparation strategies. Alternatively, in contemporary educational cultures where testing is frequent the enhancement of formative feedback on summative tests (Black et al., 2003) seems a potentially positive way forward. Interestingly, this strategy was developed by the participating teachers (rather than the researchers) as a way to enable formative strategies to operate alongside summative testing.

Key themes of this section and acting as an impetus for this paper are two elements. Firstly, there is a need to find ways to make formative assessment more attractive and manageable for practitioners, and secondly the value of establishing productive synergies between formative and summative forms of assessment.

Dimensions of formative assessment

This section discusses some dimensions of formative assessment that serve as a backdrop to the later conceptualisation of pre-emptive formative assessment. Formative assessment is examined here in terms of two different dimensions: firstly, planned versus interactive formative assessment and secondly, individual versus whole class approaches.

Planned versus interactive formative assessment

A number of writers (e.g. Bell & Cowie, 2001a; Knight & Yorke, 2003) have discussed the distinction between planned or formal formative assessment and interactive or informal formative assessment. Bell & Cowie (1999) carried out developmental work focused on formative assessment in science in years 7-10 (ages 11-14) with a group of ten New Zealand teachers. Planned formative assessment, as illustrated in Bell and Cowie's data, was used by teachers to obtain information from the whole class about progress in learning. The assessment was planned in that the teacher conducted a specific activity to obtain information after which follow-up action would be taken. For example, one teacher used quick tests at the beginning of a sequence of lessons to ascertain what students had learnt and remembered from previous lessons. This then informed the next stage of teaching.

Interactive formative assessment, according to Bell and Cowie, took place during student-teacher interactions so was unplanned and unpredictable. These exchanges were usually with individuals or small groups. On some occasions, teachers were reported to change from interacting with a group to addressing the whole class, when they judged this to be appropriate. This form of formative assessment could be regarded as a part of teaching and may not be viewed as formative assessment by some teachers. In contrast with planned formative assessment, information was ephemeral and not recorded. Different students did not receive identical treatment as they did with planned formative assessment, as usually only some students were engaged by teachers at any one time. Bell and Cowie observe that interactive formative assessment was challenging for beginning teachers or for more experienced teachers with a new class. The teachers in the study also reported that they did less interactive formative assessment when under stress, for example, feeling unwell; implementing a new curriculum; or under pressure from external summative examinations.

The dimension of interactive formative assessment provides a stimulus for the stance taken in this paper to extend notions of what can be included within conceptualizations of formative assessment.

Individual versus whole-class formative assessment
I would now like to extend the planned or interactive dimension to a further distinction between individual and whole-class formative assessment. One of the basic premises of formative assessment is that it should be focused on the needs of the learner (Black, 1998) and based on the progress of specific individuals (Harlen & James, 1997). Classroom realities, however, indicate that individualised learning and feedback is often not feasible in large classes and under pressure of time.

The previous section has indicated that planned formative assessment was usually directed towards the whole class, whilst interactive formative assessment was most often focused on individuals or small groups and sometimes directed towards the whole class. A distinction between individual and whole class formative assessment is a useful one, because it increases the possibilities to be added to the repertoire of the teacher. The recognition that formative assessment can be whole-class as well as individual can clarify

formative assessment processes and increase their acceptability to end-users who may feel that individualised attention is impractical in large classes.

The practicalities of classroom instruction necessitate teachers providing a balance between individual and whole-class formative assessment. Whilst the former can be more specific, allows more negotiation of meaning and is likely to promote more uptake, the latter can be more feasibly implemented in regular large-class contexts. Whole-class formative assessment merits inclusion within the variety of strategies in teachers' repertoires as it is more practical than labour-intensive individualised formative assessment methods.

The case for pre-emptive formative assessment

I now move to a conceptualisation of pre-emptive formative assessment. As a starting-point, pre-emptive formative assessment builds on constructivist learning principles, for example, that learning action must start from the learner's existing knowledge (Black & Wiliam, 2003) and that learning involves actively incorporating new insights into this existing knowledge framework. It is a strategy which has its basis in the centrality of feedback in the learning process (Hattie, Biggs & Purdie, 1996), and attempts to tackle the problem that much feedback comes too late to be of maximum benefit. Given that feedback is a resource-intensive process, this issue warrants further consideration.

Much written feedback which occurs after a task is completed is relatively ineffective because it does not provide much motivation or opportunity for a student to act upon the feedback. In higher education, the effectiveness of feedback has been extensively critiqued (see, Carless, 2006, for a recent review). A key problem is the failure to include iterative cycles of feedback and revision that normally characterise academic writing (Taras, 2006; Weaver, 2006). In view of these difficulties Gibbs & Simpson (2004), in a discussion of conditions under which assessment can support learning, identify timeliness and potential for student action as being key components of good feedback.

In schools, teachers have the advantage that they are in closer day-to-day contact with their students than their counterparts in universities. This means that verbal feedback can be provided more readily and there is evidence (e.g. Boulet, Simard & Demelo, 1990) that oral feedback may be more effective than written comments. Written feedback on homework or tests seems however, to be often brief and ineffective; school students have been found to pay little attention to teachers' written comments (Zellermayer, 1989), or find them difficult to interpret and act upon (Clarke, 2000).

In sum, we need better ways of providing feedback. Pre-emptive formative assessment seeks particularly to address the problem of timing in feedback processes. I define pre-emptive formative assessment as teacher actions which attempt to clarify student understandings before misconceptions have resulted in ineffective learning or performance and/or loss of marks in assignments. In other words, it is a form of anticipatory feedback in support of student learning, fulfilling Gibbs and Simpson's two relevant principles cited above.

Pre-emptive formative assessment can be contrasted with reactive formative assessment which arises in response to an incomplete understanding that has already occurred. Because the action is pre-emptive, there may be occasions where there is doubt as to the extent to which an issue fully applies to the current cohort, but I propose that the gains of timeliness and scope for student action outweigh this limitation. One of the potential advantages of pre-emptive formative assessment is that it is likely to be more motivating for students than reactive formative assessment in that problems can be tackled before a piece of work is submitted or an examination is taken. Given that students are often driven by an instrumental desire for higher grades (Becker, Geer & Hughes, 1995), pre-emptive formative assessment provides potential for supporting these goals. This provides a counterpoint to some of the challenges referred to earlier in this section, when feedback is received too late for it to be acted upon.

The basis for providing pre-emptive formative assessment may derive from various sources, some of them relatively formal, others more informal. Firstly, an instructor may be informed by knowledge of performance by students from a similar rather than the current cohort. It is common that when experienced teachers are preparing students for assignments or high-stakes examinations, they draw on the challenges faced by previous cohorts of students. A second option would be to carry out a diagnostic assessment in order to gauge understandings of a cohort of students. This option is likely to carry gains in precision, whilst being more labour-intensive in terms of preparing the diagnostic instrument and analysing its results. Thirdly, relevant data may accrue from previous summative assessments. Some assessment tasks may provide useful information about student progress in a given domain, and this data may be fed back into ongoing improvement of the learning process. Fourthly, with respect to a current cohort, the teacher may have been alerted to a potential misunderstanding amongst students and be eager to counter it. A fifth source of data for the teacher may arise from knowledge of the problems that students are likely to experience in a given domain, in other words, it can derive from teachers' pedagogical content knowledge (Shulman, 1987).

In terms of the dimensions discussed in the previous section, pre-emptive formative assessment may most commonly be planned and whole-class. It is planned in that a specific prepared activity is carried out relevant to a specified domain. As argued above, the data for this intervention may derive from experiences with the current cohort or previous ones. It is whole-class initially, whilst retaining the option of more individualised follow-up or interactive responses to student questions.

An illustration of suitable timing for pre-emptive formative assessment is the class, classes or longer period preceding a high-stakes assessment. In this way, pre-emptive formative assessment can be deployed to create synergies between formative and summative. For example, a common teacher strategy is for students to sit an internal practice or 'mock' test which usually duplicates the format and structure of an external examination. In such cases, a key issue is the depth and appropriacy of follow-up teacher and learner actions which take place between the practice and the actual external test.

The justification for pre-emptive interventions being formative assessment is that they are based on understandings elicited from students, with the purpose of enhancing their learning. In a similar way to the psychologist's tool, dynamic assessment (Lidz, 1996), pre-emptive formative assessment is about potential for subsequent learning more than current performance. As Shepard (2005) suggests, "Occurring in the *midst* [my emphasis] of instruction, formative assessment is a dynamic process in which … learners move from what they already know to what they are able to do next" (p. 66). In sum, pre-emptive formative assessment is an intervention during instruction which seeks to support ongoing student learning and performance by attempting to circumvent possible missteps before they occur and cost marks.

Why do we need the term pre-emptive formative assessment when there are already similar terminologies, such as instructional scaffolding, constructivist teaching, feedback or feedforward? The recognition that a common practice can be termed as a form of formative assessment is itself valuable and can assist formative assessment in becoming more acceptable to practitioners. Bell & Cowie (2001b) argue that one of the means of professional development for teachers in formative assessment is in terms of making the tacit, explicit. This is congruent with the aim of this paper to make explicit an aspect of teaching practice that appears common, yet has not been articulated in detail. Furthermore, pre-emptive formative assessment also serves to reinforce the message from Black and Wiliam's work that the term 'assessment' is not just about measuring but is fundamentally about improving student learning.

Implementing pre-emptive formative assessment

This section examines some strategies in the implementation of pre-emptive formative assessment and discusses an example from my own teaching. Pre-emptive formative assessment may be carried out by engaging students in an activity or task which relates to one which they need to do for a high-stakes assessment. For example, the task may be similar or parallel in terms of practising or rehearsing required skills. Or alternatively, the task may involve students in practising a sub-skill which forms part of a larger assessment task. A specific characteristic of the task is that it seeks to remediate difficulties likely to be experienced by a cohort of students.

To illustrate what I mean I provide an example used with undergraduate students, mindful of the limitation that this is an account of practice, not including empirical data collection. The task and topic relate to citations and referencing, a perennial challenge for university students. This is a modest topic but, for exemplification purposes, it is one which is generic and accessible. In the class before an assignment is due, some issues about referencing conventions are raised or guidelines provided, then a classroom task is carried out. Timing is particularly important, students have received this kind of input on academic writing before, but rarely at the moment where they shortly need to hand in an assignment. The task can take various forms, for example: proofreading and correcting a reference list; distinguishing between different kinds of references (journal articles, edited books, co-authored books); or compiling a short reference list on a given topic. The aim is to provide focused input and practice, predicated on pre-empting common

difficulties or partial understandings which may interfere with the compilation of students' own reference list for their assignment. In terms of the dimensions of formative assessment discussed earlier in the paper, the intervention is planned and whole-class, although retaining the option of more individualised or small group interaction and follow-up.

Learning is likely to be most effective when students are motivated to acknowledge that they need input in the domain of study. Students need to be made aware of the gap between the required knowledge or performance and their current level (cf. Sadler, 1989). A useful starting point for this kind of pre-emptive formative assessment is a question, problem or mini-task that serves to create a need for student learning or indicates to them that their knowledge of the given domain is only partial. For example, students could be asked a question, such as under what circumstances do you use 'et al.' rather than all authors in a citation? Such a question is likely to raise awareness that the domain contains various challenging elements which students may need to tackle.

Conclusion

Distinctions between formative assessment and 'good teaching' are not clear-cut. This paper has conceptualised an element of sound teaching practice as pre-emptive formative assessment, a form of instructional scaffolding worth acknowledging as within the repertoire of formative assessment techniques. A case has been made for timing as being a key concept in formative assessment, with pre-emptive formative assessment explicitly seeking to address the problem that much feedback occurs too late for it to be acted upon optimally.

As a final point, this paper attempts to provide a starting-point in terms of the development of pre-emptive formative assessment. An ongoing line of inquiry is to collect empirical data from schools on different forms of pre-emptive formative assessment through collaborative action research (cf. Torrance & Pryor, 2001). The following questions illustrate the themes currently under investigation: What are common types of pre-emptive formative assessment? What seem to be the most effective types of pre-emptive formative assessment? What teacher strategies can enhance student learning through pre-emptive formative assessment? What are the limitations of pre-emptive formative assessment and how might they be minimised? How might pre-emptive formative assessment be developed so that it becomes a tool for deep learning rather than an exercise in examination or assignment preparation?

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