

Formative Assessment Techniques to Support Student Motivation and Achievement

KATHLEEN M. CAULEY and JAMES H. McMILLAN

Abstract: Formative assessment can have a powerful impact on student motivation and achievement. This article discusses five key practices that teachers can use to gather important information about student understanding, provide feedback to students, and enable students to set and attain meaningful learning goals. Each of the techniques can enhance student motivation as well as achievement.

Keywords: formative assessment, motivation, feedback

Formative assessment is currently a “hot topic” among teachers and administrators and is now recognized as one of the most powerful ways to enhance student motivation and achievement. Research has accumulated that shows a positive relationship between formative classroom assessment and student motivation and achievement on both classroom and large-scale assessments (Brookhart 1997, 2007; Black and Wiliam 1998a; McMillan 2004). Too often, however, formative assessment is perceived as simply gathering information from students and using it to improve learning. Formative assessment is actually far more, and by using its specific techniques, teachers can realize just how valuable formative assessment can be for student learning. So, what are these specifics, and how do they work to motivate students and improve learning? First, we must consider what formative assessment is and is not to provide a foundation for a discussion of specifics.

Formative assessment is a process through which assessment-elicited evidence of student learning is gathered and instruction is modified in response to feedback. Popham points out that both teachers and

students can drive instructional changes; specifically, “assessment-elicited evidence of students’ status is used by teachers to adjust their ongoing instructional procedures or by students to adjust their current learning tactics” (2008, 6).

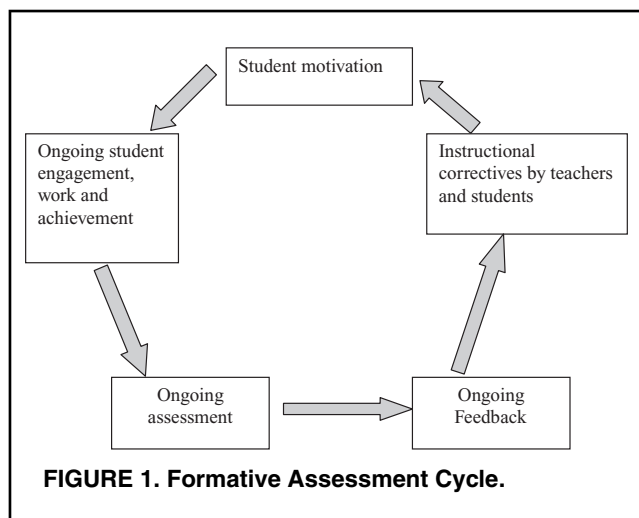
Three components are key to this definition: evidence of students’ knowledge and understanding, the nature of the feedback given to students, and shifts in the way that students learn.

One way to think about formative assessment is to contrast it with summative assessment. In summative assessment, evidence only records current student achievement. Although formative assessment can be performed after a test, effective teachers use formative assessment during instruction to identify specific student misunderstandings, provide feedback to students to help them correct their errors, and identify and implement instructional correctives. Ongoing formative assessment is conducted primarily through informal observations and oral questions posed to students while content is being taught or reviewed. If the information from the observations and questions to students is accurate, the teacher identifies instructional adjustments that can help improve student learning. In this way, formative assessment is integrated with instruction and ideally provides a seamless process of assessment followed by instruction, followed by further assessment and instruction (see figure 1).

It is also useful to think about formative assessment as a set of characteristics that are present in varied degrees in any situation. That is, some assessments may only show evidence of student performance and feedback, while others demonstrate use of many more characteristics. How formative assessment is used depends on how it is defined and operationalized. Table 1 lists

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eleven possible characteristics and examples of practices, spanning from low-level to high-level formative assessment. *Low-level* formative assessment is rudimentary and either excludes some characteristics or just introduces each characteristic as an explicit component to be fully developed. *High-level* formative assessment is marked by a complete dedication to fully integrating the characteristics into teacher and student practice. As long as the environment in which formative assessment is practiced is supportive and trusting, a classroom that demonstrates these characteristics at a high level

will have the most positive effect on motivation and learning.

Formative assessment, then, is a planned process to the extent that the teacher consciously and constantly absorbs evidence of student performance and then uses this information productively, resulting in increased student motivation and engagement. Students learn more through formative assessment for four primary reasons:

1. Frequent, ongoing assessment allows both for fine-tuning of instruction and student focus on progress.
2. Immediate assessment helps ensure meaningful feedback.
3. Specific, rather than global, assessments allow students to see concretely how they can improve.
4. Formative assessment is consistent with recent constructivist theories of learning and motivation.

Formative assessment provides valuable information to both students and teachers. Stiggins (2005) notes that students use available information to decide if learning is worth the effort. If students believe learning is important, they will exert greater effort. Students who believe learning is not worth the effort tend to give up. Stiggins' (2008) model of "assessment FOR learning" provides students with clear standards, examples of strong and weak work, and feedback so that students can set personal learning goals. Assessment FOR learning informs students about their own learning and their daily progress in meeting their goals.

TABLE 1. Variations of Formative Assessment Characteristics¹

Characteristic	Low-level Formative	High-level Formative
Nature of the evidence	Mostly objective, standardized	Varied assessment, including objective, constructed response, and anecdotal
Structure	Mostly formal, planned, anticipated	Informal, spontaneous, "at the moment"
Participants	Teachers	Teachers and students
Feedback	Mostly delayed (e.g., give a quiz and give students feedback the next day) and general	Mostly immediate and specific for low achieving students, delayed for high achieving students
When conducted	Mostly after instruction and assessment (e.g., after a unit)	Mostly during instruction
Instructional adjustments	Mostly prescriptive, planned (e.g., pacing according to an instructional plan)	Mostly flexible, unplanned
Choice of instructional tasks	Mostly teacher determined	Teacher and student determined
Nature of teacher-student interaction	Most interactions based primarily on formal roles	Extensive, informal, trusting, and honest interactions
Role of student self-evaluation	Little or none	Integral
Type of motivation	Mostly extrinsic (e.g., passing a competency test)	Mostly intrinsic
Attributions for success	External factors (teacher; luck)	Internal, unstable factors (e.g., moderate student effort)

¹Adapted from McMillan (in press).

Formative feedback affects the kind of achievement goals students internalize. Achievement goals fall into two categories: performance goals and mastery goals [Order switched to match the order of subsequent explanation]. A performance-goal orientation (also called an ego-involved orientation) emphasizes comparison of students' abilities. Teachers promote performance goals by making student evaluations public, attributing performance to individual ability, and rewarding students who outperform others. In contrast, a mastery-goal orientation emphasizes learning, understanding, improving, mastering new skills, and taking on challenges. Teachers promote mastery goals by evaluating student progress, providing students opportunities to improve, treating mistakes as part of the learning process, varying evaluation methods, and making evaluation private (Ames 1992; Patrick et al. 2001; Meece, Anderman, and Anderman 2006). Students adopt mastery goals when evaluation (a) is tied to progress toward individual goals, (b) takes into account active participation, and (c) provides positive feedback on strategy use (Ames 1992; Kaplan and Maehr 1999). Such evaluation techniques are also characteristic of effective formative assessment.

Students who pursue mastery goals share many positive achievement characteristics. For example, research has shown that these students use deeper cognitive strategies than other students and relate new learning to prior knowledge (Anderman, Austin, and Johnson 2002). Research also suggests that these students tend to be more persistent when facing challenging tasks (Meece, Anderman, and Anderman 2006). These characteristics are also indications of intrinsically motivated students.

Students who pursue performance goals typically demonstrate more debilitating achievement characteristics. For example, research suggests that these students are more likely to procrastinate, use superficial strategies, and, with some groups, display cheating behaviors (Meece, Anderman, and Anderman 2006). Performance-goal-oriented students typically show great concern with how their abilities are judged by others and the recognition (or lack thereof) that may result. These characteristics are associated with extrinsic motivation.

Specifically, then, what can teachers do to ensure that their formative assessment results in greater student motivation and learning? Five key practices can support appropriate formative assessment.

Provide Clear Learning Targets

Formative assessment is most effective when students have a clear idea of what teachers expect of them. Stiggins (2005, 2007) notes that when students have clear learning targets and models of strong and weak student work, and when feedback is contin-

uous, students have a foundation that helps them to understand what they are learning, set goals, and self-assess. These formative assessment practices encourage students and give them a greater sense of ownership in instructional activities. Students can also phrase standards or expectations in their own words or create their own definitions of quality work (Bruce 2001).

Teachers can improve the clarity of student learning targets by providing examples of both weak and stellar work (Sadler 1989; Chappuis 2005; Stiggins 2008). Examples are powerful because they enable students to more fully understand where they are going and why the teacher provides feedback. Furthermore, providing clear expectations enables students to set realistic, attainable goals. From a mastery-goal perspective, these targets allow them to set task goals, which focus on learning and meeting standards, as opposed to goals that focus on how they compare to other students. An emphasis on task goals improves students' intrinsic motivation and, when combined with other formative assessment practices, also further supports the adoption of mastery goals.

Offer Feedback about Progress toward Meeting Learning Targets

Feedback to students that focuses on developing skills, understanding, and mastery, and treats mistakes as opportunities to learn is particularly effective. By showing students specific misunderstandings or errors that frequently occur in a content area or a skill set, and showing them how they can adjust their approach to the task, students can see what they need to do to maximize their performance. Feedback about their progress in learning gives students hope and positive expectations for themselves. Table 1 indicates that low-achieving students require feedback that is highly specific and immediate, while high-achieving students work best with delayed feedback.

What does effective feedback for formative assessment look like, and how and where should it be given? Consider the "quick-and-quiet" type of feedback. These individual, extemporaneous comments are given spontaneously and focus on a single aspect of the student's work. Quick-and-quiet feedback often occurs during seatwork while a teacher monitors student work. For example, when teaching a mathematical concept such as subtraction, the teacher might provide practice problems. While roaming the room, the teacher would look for evidence that students are following the correct steps and, if necessary, would ask students if they understood those steps. The teacher might first want to ask the student for clarification (e.g., "Please explain to me how you are doing this problem") or supply a clue about what response would be best (e.g., "Remember that borrowing involves both placeholders"). Feedback is thus

paired with a new instructional approach that offers the student a different way of understanding the mathematical concept of borrowing. Similarly, in reviewing student work on a project, a teacher might remind students of particular criteria to consider in completing their work.

Normative feedback, which relies on teacher comparisons of students, should be avoided, because it tends to motivate students for extrinsic reasons, promotes performance goals, and can lower expectations for success. Consequently, formative assessment works best when the teacher avoids grading practices and comments that show students how their performance compares to other students and uses informative comments instead. If the only feedback students receive is a final grade (e.g., for a unit of instruction, midterms, finals, or external tests), they cannot see how their efforts improve skills, which may lower expectations for success in the future. Furthermore, the evaluative comments and judgments of ability that are prevalent in comparisons can be debilitating for students (Elliott and Dweck 1988). To promote mastery goals, feedback from formative assessments should reduce social comparisons and instead emphasize progress toward achieving learning targets (Maehr and Anderman 1993). For example, a teacher might tell a struggling student, "That's okay, we're just starting this topic. Try to think of it this way. You'll get it as we work with it more" or "You're almost there. Keep working at it."

Task-specific comments influence students' interest and commitment more positively than either grades or praise (Butler and Nisan 1986). An example of this type of comment might say, "You have included quite a few examples in your paper. Can you think of any more unusual examples?" Both high- and low-achieving students who receive private feedback demonstrate more engagement and a lower focus on how their abilities and successes compare to others' accomplishments (Brookhart 2008; Butler 1987). In contrast, both high- and low-achieving students who received grades and praise on their written work showed an increase in ego-involved, or performance, orientation, contributing to extrinsic motivation (Butler 1987).

Additionally, feedback that is based on normative standards of ability-based performance emphasizes the hierarchy of ability in a classroom (Kaplan and Maehr 1999). A normative standards approach facilitates social comparison, [ego goals], and anxiety, and promotes group stereotypes. In contrast, formative assessment strategies measure progress from and improvement over past performance. This type of assessment is based on specific and absolute standards and rewards students who collaborate across groups. Evaluative criteria should employ a variety of practices that reduce feelings of fear of failure and reward students who learn from their mistakes (Kaplan and Maehr 1999). Stiggins

(2005) argues that, when used effectively, assessment FOR learning—one formative strategy—usually triggers an optimistic response from students—they are eager to keep trying and know what to do differently the next time they attempt a task. Showing students how to improve the quality of their work in a concrete fashion raises expectations for success.

Attribute Student Success and Mastery to Moderate Effort

Feedback to students in formative assessment can also influence how students attribute their successes. *Attributions* are the reasons students cite to explain their successes or failures, such as ability, luck, help from others, and lack of effort. Students commonly attribute their successes to their individual efforts; this attribution is highly effective in the classroom because it places students in control. Effort attributions suggest that the student is capable of learning.

In the classroom, teachers provide students with important attribution cues through feedback. Teachers can unknowingly reduce student motivation by communicating a lack of belief in their abilities. This impression is created when teachers offer any of three types of feedback: expressing pity after a student failure; offering praise for a success (particularly in an easy task); and offering unsolicited help, which high-achieving students do not require (Graham 1990). Although these kinds of feedback have their place in the classroom, if overused, they can lead students to make detrimental low ability attributions. Students who believe that their successes are due primarily to their effort and ability will have stronger motivation and staying power to complete challenging work.

Thus, when giving feedback for formative assessment activities, teachers should attribute results to student efforts and then explore changes in instruction and learning tasks, which suggests that a lack of success is also related to a factor that a student can modify. Formative assessment without effort attributions and instruction modifications that support developing understanding can leave students feeling hopeless. Examples of the right kinds of feedback include: "It looks like the extra effort that you put into studying has paid off" and "Look how you've improved since you tried a different strategy."

Encourage Student Self-Assessment

Formative assessment allows a high level of student self-assessment. Student self-assessment involves much more than simply checking answers; rather, it is a process in which students monitor and evaluate the nature of their thinking to identify strategies that improve understanding (McMillan and Hearn 2008). Self-assessment is a three-step process in which students judge their own work (self-monitor), identify discrepancies between current and desired performance

(self-evaluation), and identify and implement further learning activities to enhance their understanding or skills. While teachers provide feedback, they can encourage self-assessment by asking students questions that help them focus on self-monitoring (e.g., "What are you thinking now about how well you are learning?"). Teachers can then lead students to analyze the most and least effective aspects of their work (McTighe and O'Connor 2005). Examples include "How does your conclusion compare to the rubric?" and "What study strategy do you think worked best?"

Students receive the most benefit from individual activities if they are encouraged to correct their work before turning it in (Bruce 2001). They can also learn to self-assess from models provided by teachers (Black and Wiliam 1998b; Sadler 1989; Chappuis 2005) and by practicing peer assessment (Black et al. 2004; Leahy et al. 2005). Bruce (2001) and Chappuis (2005) also note that student self-reflection and goal setting are key aspects of self-assessment. With time and training, students will gradually assume more responsibility for evaluating how close they are to the learning target, identifying what they need to improve, and selecting learning tactics to reach the target.

Self-assessment also supports mastery goals through the notion of developing student autonomy. Students who practice self-assessment are in control of their learning, and that too can support the development of mastery goals. In addition, self-assessment helps students understand the expectations for the task and the steps necessary to meet the learning goal. When students work toward meeting clear learning targets, they have high expectations for success.

Finally, self-assessment encourages student decision making about what to do and when to do it. Teacher feedback can facilitate this process by providing choices for students and asking questions such as "What do you think you need to do now to better understand the meaning of the story?" and "Do you think you should read the story again now or as part of your homework? Why?"

Help Students Set Attainable Goals for Improvement

Feedback from formative assessments can help students set attainable learning goals. Goals that refer to specific performance standards are most effective, because self-efficacy is substantiated as students observe their progress toward the goal (Shunk and Swartz 1993). *Self-efficacy* is the belief an individual holds about their ability to perform the task at hand. High self-efficacy is present when students are confident that when they expend appropriate effort, they can be successful. Progress toward the goal conveys an increase in skill level to the students (Shunk and Swartz 1993). Teacher feedback about the value of a chosen strategy and student progress in mastering a task improves self-efficacy. High

self-efficacy can occur when students receive rewards that are contingent on performance rather than on task engagement, because performance indicates task mastery (Shunk 1991).

Conclusions

Formative assessment and, in particular, feedback and instructional correctives, can be a powerful technique to support student motivation and achievement. As teachers incorporate more formative assessment techniques into their day-to-day instruction, they will have information which they can use to modify their instruction. Teachers can also use this information about student understanding to help students self-assess and improve their own performance. When students focus on improvement and progress, they are more likely to adopt mastery goals and develop high self-efficacy and expectations for success. When students and teachers attribute student successes to effort, this attributions supports future successes. Formative assessment's emphasis on instructional modifications and student improvement supports student motivation and enables them to maintain high engagement and achievement. Using formative assessments effectively is indeed key to student motivation and achievement.

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