

What Teachers Really Need to Know About Formative Assessment

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Chapter 1. The Fundamentals of Formative Assessment

This chapter looks at the essential principles of formative assessment and provides a preview of best practice. Our focus here is both the content and context of formative assessment: its basic elements and some of the reasons it has risen to prominence and gained support as an effective means of improving student learning.

Essential Principles

The information in this section has been gathered from numerous sources and aligned around three significant concepts: (1) formative assessment is student focused, (2) formative assessment is instructionally informative, and (3) formative assessment is outcomes based.

In an effort not to duplicate information available in other resources, I have condensed the elements and their definitions quite a bit. If you would like to read more about the fundamentals of formative assessment, I recommend “Working Inside the Black Box” (Black, Harrison, Lee, Marshall, & William, 2004); *Classroom Assessment for Student Learning: Doing It Right— Using It Well* (Stiggins, Arter, Chappuis, & Chappuis, 2004); and *Classroom Assessment and Grading That Work* (Marzano, 2006).

Formative Assessment Is Student Focused

Formative assessment is purposefully directed toward the student. It does not emphasize how teachers deliver information but, rather, how students receive that information, how well they understand it, and how they can apply it. With formative assessment, teachers gather information about their students' progress and learning needs and use this information to make instructional adjustments. They also show students how to accurately and honestly use self-assessments to improve their own learning. Instructional flexibility and student-focused feedback work together to build confident and motivated learners.

In brief: Formative assessment helps teachers

- Consider each student's learning needs and styles and adapt instruction accordingly
- Track individual student achievement
- Provide appropriately challenging and motivational instructional activities
- Design intentional and objective student self-assessments
- Offer all students opportunities for improvement

In practice: Students in Mrs. Chavez's English class are studying character development. They have read about Scout in *To Kill a Mockingbird* and Holden Caulfield in *The Catcher in the Rye*.

Early in the unit, Mrs. Chavez asks her students to define a character trait and give an example of someone in literature or in real life who demonstrates that trait. She gathers their examples in a list, which she posts in the classroom. This is valuable information about the starting point for the unit: in this case, it helps the teacher determine whether she needs to clarify the concept of character traits or can move on with the application of character traits to literature.

Based on the data her students provide, Mrs. Chavez decides to move forward. She arranges the class into random groups and asks each group to write all the character traits of Scout that they can think of

on individual yellow sticky notes—one trait per note—and then do the same for Holden Caulfield, this time using blue sticky notes. Then each group posts their responses on the original list of traits, alongside each character trait. Areas of agreement and disagreement are discussed. Mrs. Chavez uses a questioning strategy to elicit information and to clarify any lingering gaps in understanding or accuracy. Following this, students work on their own to create a T chart for each character, using the left side of the T to list life experiences and challenges and the right side to list how these factors have influenced traits and behaviors. Note that Mrs. Chavez has done very little lecturing or whole-class teaching to this point, making for a very student-focused lesson.

Formative Assessment Is Instructionally Informative

During instruction, teachers assess student understanding and progress toward standards mastery in order to evaluate the effectiveness of their instructional design. Both teachers and students, individually and together, review and reflect on assessment outcomes. As teachers gather information from formative assessment, they adjust their instruction to further student learning.

In brief: Formative assessment

- Provides a way to align standards, content, and assessment
- Allows for the purposeful selection of strategies
- Embeds assessment in instruction
- Guides instructional decisions

In practice: During a high school social studies unit on the development of American nationalism after the War of 1812, Mr. Sandusky uses a series of assessments to monitor his students' developing understanding of the presented material. Mr. Sandusky begins with a pre-assessment focused on content similar to what students will encounter in the final selected-response test. After reviewing the pre-assessment data, he concludes that his students either remember little of their prior learning about the material or haven't been exposed to these topics before. He had intended to begin the unit with a discussion of how the popularity of “The Star-Spangled Banner” fueled nationalistic spirit but decides to alter those plans somewhat by having students read articles about the War of 1812, grouping them by readiness and assigning purposefully selected readings. One group reads about the reasons the United States and Britain went to war, another reads about specific events that occurred during the war, and a third reads about Francis Scott Key. Each group reports out, sharing information with the rest of the class.

As the unit progresses, students keep track of their learning and assignments on a work-along, turning it in to Mr. Sandusky every day for a quick check. For example, they describe causes of the war, answer a question about Key's motivation to write “The Star-Spangled Banner,” and note the location of the battle he observed (Baltimore's Fort McHenry). This is followed by a Corners activity where students pick different lines of the song to analyze and respond to in terms of relevance to current events. Later, after a discussion of the diverse opinions on the War of 1812, the teacher asks students to report one pro and one con viewpoint. To probe students' understanding of the significant outcomes of the war, he asks the class to describe three specific changes in the power of the U.S. government that resulted from the war. In these activities, Mr. Sandusky works to align his formative assessment questions with the lesson's specific objectives, incorporate the questions into instruction, and use the information to guide future instruction.

Formative Assessment Is Outcomes Based

Formative assessment focuses on achieving goals rather than determining if a goal was or was not met, and one of the ways it does so is by helping to clarify learning goals and standards for both teachers and students. Teaching and learning are based on these standards. Students know the criteria for meeting the standards and are frequently shown exemplars. Teachers give frequent and substantive feedback to students about their progress, pointing out both strengths and areas that need improvement. Teachers plan steps to move students closer to learning goals. Work is assessed primarily on quality in relation to standards rather than student attitude or effort.

In brief: Formative assessment

- Emphasizes learning outcomes
- Makes goals and standards transparent to students
- Provides clear assessment criteria
- Closes the gap between what students know and desired outcomes
- Provides feedback that is comprehensible, actionable, and relevant
- Provides valuable diagnostic information by generating informative data

In practice: A curricular standard for 10th grade Biology requires that students understand the chemical basis of all living things. In her classroom, Ms. Jefferson asks students to track their progress toward the specific objective of describing, comparing, and contrasting the molecular structure of proteins, carbohydrates, and fats. The applied learning comes from explaining how these differences are exhibited by foods that students eat every day. Ms. Jefferson uses a signaling activity to get a baseline assessment of where her students stand; afterward, she delivers a traditional lecture, beginning the lesson (as she will all lessons) by stating the specific learning outcome students are expected to master and then focusing on transitioning students from what they know to what they need to know. Students keep a record of their learning by recording specific content knowledge in lab report notebooks. In one section, they draw the molecular structure of proteins, carbohydrates, and fats. Later in the unit, they watch a video and fill in a provided empty outline and then complete a lab in which they test a variety of foods for the presence of proteins, carbohydrates, and fats and report their findings in their lab notebooks. Ms. Jefferson reviews these notebooks regularly to monitor student progress and understanding, provide specific feedback, and inform her instructional decisions. Other formative assessment strategies she uses include Bump in the Road and Feathers and Salt.

A Brief History of Formative Assessment

As with most effective teaching methods and practices, individual teachers have probably used formative assessment throughout history. Indeed, we could claim Socrates as an early practitioner. Peppering his students with questions that probed and provoked, he used their responses to measure their learning and guide his instruction; this is the primary attribute of formative assessment.

Although teachers have long used strategies like the Socratic method and other forms of meaningful questioning, the term “formative assessment” is a relatively new one. Its contemporary use is often traced to Michael Scriven (1967), who used “formative” and “summative” to indicate differences in both the goals for collecting evaluation information and how that information is then used. Scriven explained that while a program is in the planning and developmental stages, it is still malleable, and the information gathered from evaluation can therefore contribute to change in the program. He called evaluation for this purpose of improving “formative.” Once a program has been created and

implemented, Scriven argued, evaluations can only yield information to determine whether the program has met its intended goals. Scriven called this final gathering of information a “summative evaluation.”

Benjamin Bloom was one of the first to apply the concepts of formative versus summative to educational assessment, helping to lay the foundations for the concept of mastery learning (Bloom, Hastings, & Madaus, 1971). The purpose of mastery learning was to ensure that students didn't move forward to the next level of learning until they had demonstrated mastery of the learning objectives set for the current level. This concept, in turn, became the basis for modular instruction, widespread in the 1970s, in which students learned from self-directed packets, or modules of instruction. When a student successfully completed one packet, he or she could move on to the next packet, proceeding through modules until all objectives were met. In theory, mastery learning resembles today's scaffolding, but in practice, students worked mostly in isolation without much teacher support or peer interaction.

In the decades following, formative assessment began to be more widely explored. States considered ways to embed it in standardized tests. Bloom continued his theoretical work, examining several issues relating to formative assessment. He identified two essential elements of formative learning: feedback for students and corrective conditions for all important components of learning (Bloom, 1977). He also argued that formative information could be used to divide the class into cooperative groups based on the corrections required. From this point, teachers could differentiate instruction to meet the needs of individual students through selected teaching strategies and corrective responses (Bloom, 1976).

In New Zealand, Terry Crooks studied the effect of classroom assessment practices on students and reported on their potential to emphasize what is important to learn and positively affect student motivation. Crooks (1988) asserted that classroom assessment “appears to be one of the most potent forces influencing education. Accordingly it deserves very careful planning and considerable investment of time from educators” (p. 476). Around the same time, Sadler (1989) reasoned that assessment is most effective when students can monitor the quality of their own work through specific provisions that are incorporated directly into instruction.

Perhaps the biggest step forward in the embrace of formative assessment came in 1998, when Paul Black and Dylan Wiliam completed a meta-analysis of more than 250 research studies on the topic. Their findings, published as “Inside the Black Box,” make a compelling case for formative assessment. Black and Wiliam's review concluded that “there is no other way of raising standards for which such a strong prima facie case can be made” (1998, p. 148).

“Inside the Black Box” led the way for many educational leaders to define and apply formative assessment in classrooms, not just in the United States but throughout the world. New Zealand, Australia, and Great Britain have been especially strong leaders in this movement. The recent groundswell in interest and information is creating an imperative to change how we think about and use assessment.

Evidence for Formative Assessment

The 1998 Black and Wiliam study provided evidence that formative assessment can make a difference in learning outcomes at all grade levels. This review of research studies, journal articles, and book excerpts concluded that “formative assessment shows an effect size of between .4 and .7, the equivalent of going from the 50th percentile to the 65th” (p. 141). An effect size is a comparison of a range of scores of students exposed to a specific practice to those of students who were not exposed to the practice. Black and Wiliam drew additional conclusions, each of which is worthy of further research:

- The success of formative assessment is highly related to how teachers use it to adjust teaching and learning practices.

- Effective learning is based on active student involvement.
- Enhanced feedback is crucial to improved outcomes.
- There is a link between formative assessment and self-assessment.

More information about the Black and Wiliam study is available through the Web site of Kings College London (www.kcl.ac.uk/schools/sspp/education/research/groups/assess.html).

At the National Research Council, Bransford, Brown, and Cocking's work *How People Learn* (1999) became the basis for the book *Knowing What Students Know* (Pellegrino, Chudowsky, & Glaser, 2001) and drew the following conclusions:

- An assessment plan must come first, not last, in the educational process.
- Assessment, by necessity, integrates knowledge, skills, procedures, and dispositions.
- Assessment as a diagnosis of student progress shifts the emphasis from summative to formative.

In a follow-up to "Inside the Black Box," Wiliam, Lee, Harrison, and Black (2004) examined the achievement of secondary students in math and science who were exposed and not exposed to formative assessment. Teachers involved in the study were trained and supported in their use of classroom-based formative assessment. The research team measured the effects of formative assessment on learning outcomes and found a mean effect size of 0.32 when exposed to the intervention. Also in 2004, Ruiz-Primo and Furtak measured the effect of three formative assessment strategies—eliciting, recognizing, and using information—in the science classroom. They found that the quality of teachers' formative assessment practices was positively linked to the students' level of learning.

The research base for formative assessment will continue to grow, and we look forward to additional data that can strengthen the case for assessing formatively, help confirm best practices for teachers, and pinpoint the most effective strategies for responding to data and for measuring formative assessment's effect on learning outcomes.

Moving Forward with Formative Assessment

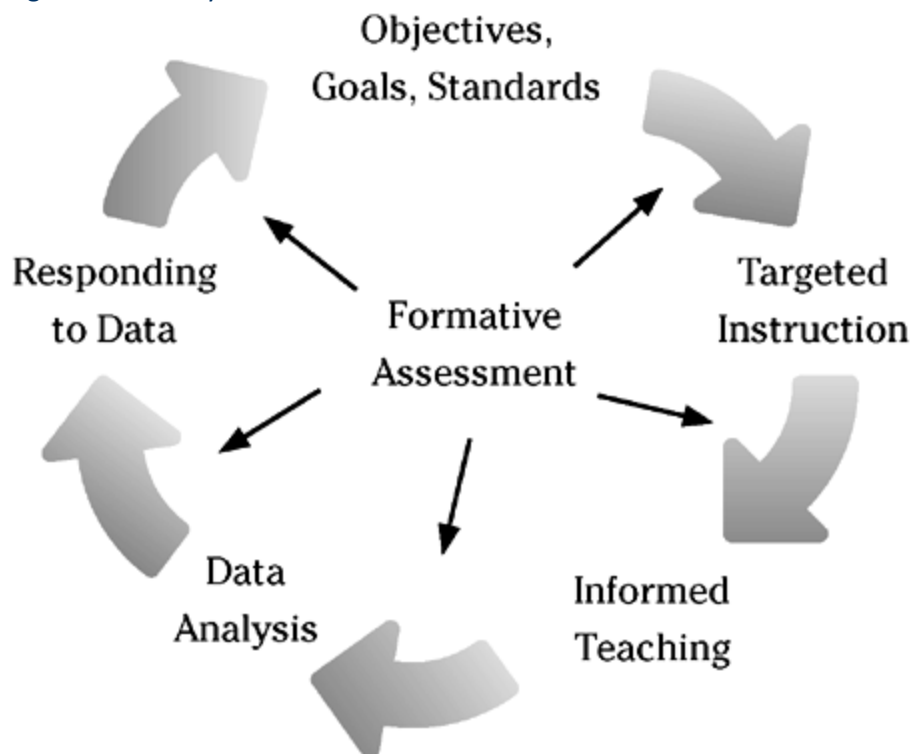
In recent years, recommendations for including high-quality formative assessment as an integral part of a larger and more balanced assessment system has come from many groups and organizations, among them the Joint Committee on Standards for Educational Evaluation (2002) and the National Council on Measurement in Education (1995). Content- and level-specific organizations, such as the National Council of Teachers of Mathematics, the National Science Teachers Association, and the National Middle School Association, have also endorsed formative assessment as a way to advance learning.

Although influential organizations and education thought-leaders have reached a general consensus about the benefits of formative assessment, teacher education and training efforts lag behind. As research has shown, teachers get little training or support in assessment and often turn to their untrained peers for information (Black & Wiliam, 1998; Shepard, 2000; Stiggins, 2001, 2002), and we are left with a gap between what we know is effective assessment practice and how most teachers use assessment in the classroom. This deficit in teacher knowledge and practice was the basis of my own doctoral dissertation, in which I concluded that secondary teachers continue to use traditional summative assessment that infrequently aligns with recommended strategies. Shepard (2000) summed it up well when she quoted this observation by Graue (1993): "Assessment and instruction are often conceived as curiously separate in both time and purpose" (p. 4). The key to high-quality formative

assessment is to intertwine the two. What teachers and students need is assessment and instruction that are conceived as a unit, employed as a unit, and applied as a unit.

The most important thing you can take away from this discussion of formative assessment is the understanding that no single principle makes assessment formative. It is through the weaving together of all the principles that high-quality formative assessment arises and the blending of assessment and teaching occurs. For a quick overview of what these components look like woven together, see Figure 1.1, which shows the general flow of formative assessment principles.

Figure 1.1. The Cycle of Instruction with Formative Assessment



Now let's consider what the cycle of instruction might look like in practice. A teacher preparing for a discussion of current events in an English, social studies, or other class might produce the following plan. (You may not be familiar with some of the plan's strategies, but I will present these in more detail in Part 2 of the book and in the lexicon of strategies in Appendix B.)

Objective, Goal, Standard: Differentiate fact from opinion in written text.

Formative Strategy: Signaling in response to simple sentences read aloud by the teacher.

Targeted Instruction: Identify points of fact as contrasted with expression of the author's opinion in a newspaper editorial.

Formative Strategy: A Corners activity in which the teacher reads more complex sentences and students express their response by going to Fact or Opinion corners. One student in each group presents the group's opinion, and the teacher leads a follow-up discussion.

Informed Teaching: The teacher gives examples of how writers extend fact into opinion along with guidelines for distinguishing fact from opinion. Students read selected text, color-code examples of fact and opinion, and record their responses in their work-alongs.

Formative Strategy: A Think–Pair–Share activity in which students create a color-coded T chart with facts on the left and opinions on the right. This is followed by a whole-class review of the charts to reach consensus.

Data Analysis: The teacher uses data gathered to chart individual and group learning outcomes and target areas of misunderstanding and areas where students need additional challenge.

Formative Strategy: A chart of students' progress, capturing and reflecting on data gathered during Signaling, Corners, the work-along, and the T chart.

Responding to Data: The teacher adjusts instruction and assessment as needed to readdress the objective more effectively.

Formative Strategy: Adjustment to content/resource level of difficulty, grouping students for additional practice or expanded learning, and differentiating the final assessment.

Finding the Balance in Assessment Systems

Large-scale accountability measures have been and will continue to be with us for a long time. The use of formative assessment does not preclude standardized testing but, rather, contributes to a balanced assessment system. Summative assessment has traditionally asked students to definitively express what they know. It's akin to asking, “Are we there yet?” or, “Have we arrived at the intended learning destination?” In comparison, formative assessment asks what route we are taking to reach the goal and in what way the teacher can assist in the journey.

Formative assessment gives teachers continual information on student progress—information that supports decisions about how much and what kind of learning, support, and practice students need to reach the goal. In this model, assessment data come from a variety of activities, rather than from a single assessment at the end. While formative assessment and summative assessment serve the same learning goals, the former is an ongoing process and the latter is a finale: the finish line at the end of the race.

The use of standardized tests alone as the measure of knowledge does not typically lead to improved learning. There is little evidence that standardized tests have raised student achievement except in a few narrow areas, primarily at the elementary level. SAT scores have been generally consistent for many years, and most state standardized test results have flattened out during the past few years. If we want better standardized scores or higher final achievement for our students, we must begin at the classroom level. Research shows that the pathways to school improvement are lined with formative assessment. Students need constructive feedback on how to achieve the targets and guidepost measures along the way, not simply feedback on whether they reached the targets or not. It is formative assessment rather than summative assessment that will make the greatest difference.

As you come to the end of this chapter, please take a moment to consider the questions you may have about the fundamentals of formative assessment. You may want to review any section of this chapter that was not clear to you or move on to Chapter 2, which answers many frequently asked questions about using assessment formatively. Your question may be addressed there.

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