

What Does Research Say the Benefits of Formative Assessment Are?

FOR most of the last century, assessment was seen as a way of finding out what students had learned. People argued about different forms of assessment, such as standardized tests versus portfolios, because they disagreed about what they thought was important in mathematics education, but they agreed that assessment was primarily about evaluating the effects of instruction. However, toward the end of the century, researchers began to look more systematically at the role assessment could play in actually enhancing student learning instead of just measuring it—a distinction that has been neatly captured as the difference between assessment for learning and assessment of learning (Gipps and Stobart 1997). The definition given by Black and his colleagues (2004) is as follows (p. 10):

Assessment for learning is any assessment for which the first priority in its design and practice is to serve the purpose of promoting pupils' learning. It thus differs from assessment designed primarily to serve the purposes of accountability, or of ranking, or of certifying competence. An assessment activity can help learning if it provides information to be used as feedback, by teachers, and by their pupils, in assessing themselves and each other, to modify the teaching and learning activities in which they are engaged.

Two reviews of research in this area (Natriello 1987; Crooks 1988) found that assessment practices could have substantial positive impact on students' attitudes and achievement, although the impact was more often negative. Further reviews of research by Bangert-Drowns and his colleagues (1991), by Kluger and DeNisi (1996), by Black and Wiliam (1998), and by Nyquist (2003) have clarified when assessment helps and when it hinders students' learning. Most recently, Wiliam (2007) has synthesized the research on how assessment can support the learning of mathematics specifically.

The available research evidence suggests that formative assessment produces greater increases in students' achievement than class-size reduction or increases in teachers' content knowledge, and at a fraction of the cost (Wiliam and Thompson 2007). The undoubted power of formative assessment and the strength of the research base have led to a plethora of products and services that describe themselves as "formative assessment," but in reality very few embody

the principles that the research has shown are essential to enhance students' learning (Shepard 2007).

In order to try to clarify the different uses of the term formative assessment, Wiliam and Thompson (2007) proposed the typology of formative assessment shown in table 1. The existing research base shows only that short- and medium-cycle formative assessments improve student achievement, whereas most of the formative assessments available commercially, such as benchmark or interim tests, are long-cycle formative assessments. As Popham (2006) notes, "In the future, evidence may show that benchmark or interim tests are instructionally beneficial in the short term. But research currently does not support that claim" (p. 87).

Table 1
Typology of Kinds of Formative Assessment

Type	Focus	Length
Long-cycle	Across marking periods, quarters, semesters, years	4 weeks to 1 year
Medium-cycle	Within and between instructional units	1 to 4 weeks
Short-cycle:	Within and between lessons	
day-by-day		24 to 48 hours
minute-by-minute		5 seconds to 2 hours

As well as the length of the formative assessment cycle, it is also important to be clear about what, exactly, constitutes formative assessment. Early work focused on the role of feedback and specifically what kinds of feedback would enhance learning. However, as researchers and teachers collaborated to implement these ideas in classrooms, it became clearer that effective use of formative assessment involved much more significant changes to the kinds of information collected from, and the kinds of feedback given to, students (Black et al. 2003). As a result of extensive interviews with, and observations of, teachers implementing formative assessment in their classrooms, Black and Wiliam (2005) proposed

that effective implementation of formative assessment required changes in the role of the teacher, changes in the role of the student, changes in the nature of student-teacher interaction, and changes in the relationship among the teacher, the student, and the subject discipline.

In order to provide a comprehensive framework for formative assessment, Wiliam and Thompson (2007) proposed that three processes were central:

- Establishing where learners are in their learning
- Establishing where they are going
- Establishing how to get there

By considering separately the role of the teacher, the student, and the student's peers, Wiliam and Thompson proposed that formative assessment could be built up of five "key strategies" as shown in figure 1. Each of the five strategies is discussed in an accompanying brief.

	Where the learner is going	Where the learner is right now	How to get there
Teacher	Clarifying and sharing learning intentions and criteria for success	Engineering effective classroom discussions, questions, activities, and tasks that elicit evidence of learning	Providing feedback that moves learners forward
Peer	Understanding and sharing learning intentions and criteria for success	Activating students as instructional resources for one another	Activating students as the owners of their own learning
Learner			

Fig. 1. Aspects of assessment for learning

Conclusion

Large-scale implementation of effective formative assessment is relatively new, and no formal evaluations of systemwide interventions have taken place to date. However, preliminary results suggest that the effects of formative assessment observed in relatively short-scale studies are maintained over longer periods of time. Wiliam and his colleagues (2004) found that over the course of a year, the rate of learning in classrooms where teachers were using short- and medium-cycle formative assessment was approximately double that found in other classrooms. Furthermore, teachers reported greater engagement by students in learning and increased professional satisfaction.

However, implementing effective formative assessment is not a simple matter. It requires sustained attention to teachers' professional development, and although the impact on students' achievement appears to be significant and reasonably rapid, it is far from a "magic bullet." That is perhaps why so many of those who cite the formative assessment research base recommend approaches such as benchmark or interim assessment that are easy to implement, but there is little, if any, evidence that such approaches to formative assessment have any impact on students' achievement. There is, however, evidence that sustained professional development focused on minute-by-minute and day-by-day formative assessment can improve students' engagement, enrich the daily experience of educators, and produce substantial increases in students' achievement.

By Dylan Wiliam
Judith Reed, Series Editor

REFERENCES

- Bangert-Drowns, Robert L., James A. Kulik, and Chen-Lin C. Kulik. "Effects of Frequent Classroom Testing." *Journal of Educational Research* 85, no. 2 (1991): 89–99.
- Black, Paul, Christine Harrison, Clare Lee, Bethan Marshall, and Dylan Wiliam. *Assessment for Learning: Putting It into Practice*. Buckingham, England: Open University Press, 2003.
- . "Working inside the Black Box: Assessment for Learning in the Classroom." *Phi Delta Kappan* 86, no. 1 (2004): 8–21.
- Black, Paul J., and Dylan Wiliam. "Assessment and Classroom Learning." *Assessment in Education: Principles, Policy, and Practice* 5, no. 1 (1998): 7–73.
- . "Developing a Theory of Formative Assessment." In *Assessment and Learning*, edited by John Gardner, pp. 81–100. London: Sage Publications, 2005.
- Crooks, Terence J. "The Impact of Classroom Evaluation Practices on Students." *Review of Educational Research* 58, no. 4 (1988): 438–81.
- Gipps, Caroline V., and Gordon Stobart. *Assessment: A Teacher's Guide to the Issues*. 3rd ed. London: Hodder & Stoughton, 1997.
- Kluger, Avraham N., and Angelo DeNisi. "The Effects of Feedback Interventions on Performance: A Historical Review, a Meta-analysis, and a Preliminary Feedback Intervention Theory." *Psychological Bulletin* 119, no. 2 (1996): 254–84.
- Natriello, Gary. (1987). "The Impact of Evaluation Processes on Students." *Educational Psychologist* 22, no. 2 (1987): 155–75.
- Nyquist, Jeffrey B. "The Benefits of Reconstructing Feedback as a Larger System of Formative Assessment: A Meta-analysis." Master's thesis. Vanderbilt University, 2003.
- Popham, W. James. "Phony Formative Assessments: Buyer Beware!" *Educational Leadership* 64, no. 3 (2006): 86–87.
- Shepard, Lorrie A. "Will Commercialism Enable or Destroy Formative Assessment?" In *The Future of Assessment: Shaping Teaching and Learning*, edited by Carol A. Dwyer. Mahwah, N.J.: Lawrence Erlbaum Associates, 2007.
- Wiliam, Dylan. "Keeping Learning on Track: Formative Assessment and the Regulation of Learning." In *Second Handbook of Mathematics Teaching and Learning*, edited by Frank K. Lester, Jr., pp. 1053–98. Greenwich, Conn.: Information Age Publishing, 2007.
- Wiliam, Dylan, Clare Lee, Christine Harrison, and Paul J. Black. "Teachers Developing Assessment for Learning: Impact on Student Achievement." *Assessment in Education: Principles, Policy, and Practice* 11, no. 1 (2004): 49–65.
- Wiliam, Dylan, and Marnie Thompson. "Integrating Assessment with Instruction: What Will It Take to Make It Work?" In *The Future of Assessment: Shaping Teaching and Learning*, edited by Carol A. Dwyer. Mahwah, N.J.: Lawrence Erlbaum Associates, 2007.