Connecting Formative Assessment **RESEARCH** to **PRACTICE**

An Introductory Guide for Educators

Practice

Research

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Contents

Introduction

This Connecting Research to Practice brief is intended to enhance the knowledge and build the capacity of state, district, and school personnel to implement effective formative assessment practice. To accomplish this goal, the brief defines formative assessment, examines the research, and outlines the components needed to develop a high-quality, research-based formative assessment plan in a state, district, or school.

What Is Formative Assessment?

For several years, there have been varying and often conflicting viewpoints and definitions of what formative assessment is—is it a product, is it a process, is it something that can be bought? One source of confusion about this issue has come from products and services sold by curriculum and assessment vendors, touted as "formative assessment." Any test that can be given more than one time per year could be misconstrued as being formative, and many districts and states have bought into this concept in significant ways in recent years. Most state education agencies (SEAs) also have begun the process of exploring or building a more "balanced assessment" approach to their state accountability models, incorporating "formative assessments" into their strategic design. With the call for a multiple-measures approach rather than a one-time, high-stakes test to determine student achievement, and the compelling research behind formative assessment practices, the demand for formative assessments has increased. The need to be clear about what formative assessment is has never been more magnified.

The research literature even offers multiple, sometimes conflicting, definitions of formative assessment that evoke a range of perspectives among teachers, school principals, and district leaders. For example, formative assessment has been referenced as a process for making instructional adjustments based on feedback about student performance (Council of Chief State School Officers, 2007; Popham, 2006) as well as a set of tools to monitor student progress during learning (Dunn & Mulvenon, 2009; Stiggins, 2002). In addition, formative assessment often is defined by its purpose or

usage, qualifying any set of activities or tools as "formative" when the information is used to inform or adapt instruction (Black & Wiliam, 1998a; Perie, Marion, Gong, & Wurtzel, 2007). The stance reflected in this policy brief is consistent with an emerging consensus that is building among most of the recognized researchers and experts in the field.

Heritage, Kim, Vendlinski, and Herman (2009) define formative assessment as "a systematic process to continuously gather evidence and provide feedback about learning while instruction is under way" (p. 24). Popham (2008) adds a critical clarification: formative assessment is always a *planned* process; it does not happen accidentally. Other definitions extend the concept of formative assessment as a *process* by incorporating assessment tools when they can be seamlessly integrated into classroom activities (Heritage, 2007) for the explicit purpose of gathering feedback to inform instruction or learning. Taken together, formative assessment is a process in which teachers use various tools and strategies to determine what students know, identify gaps in understanding, and plan future instruction to improve learning.

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Any form of assessment from performance-based to multiple-choice items can be used in formative assessment practice. They also can include journals, checklists, rubrics, written papers, graphic organizers, Socratic questioning, and other evidence-eliciting techniques. It can range from a five-second assessment to a scoring guide reviewed periodically by students and teachers while producing a product. The purpose of the assessment items, tasks, or activities must be that they are windows into the students' cognitive processes. Assessments that allow students to show their thinking, and allow teachers to best elicit evidence about these cognitive processes, is where the emphasis should be.

Commonly Used Assessments in Schools

Prior to further discussion on the topic of formative assessment, it is important to explore other major forms of assessment and understand the differences between them. With the introduction of the No Child Left Behind (NCLB) Act and more stringent statewide accountability systems, districts began prioritizing their need for data to predict student performance on annual high-stakes tests, monitor performance on standards-based skills, diagnose specific learning needs, and target instruction for individuals and groups of students. As districts and schools began utilizing different types of assessment, their intended purposes and fit within a larger balanced approach to assessment became less clear in practice (Torgesen & Miller, 2009). For example, many popular interim assessment products used by districts today are called "formative," but they do not necessarily meet the criteria for effective formative assessment practice as defined by the research.
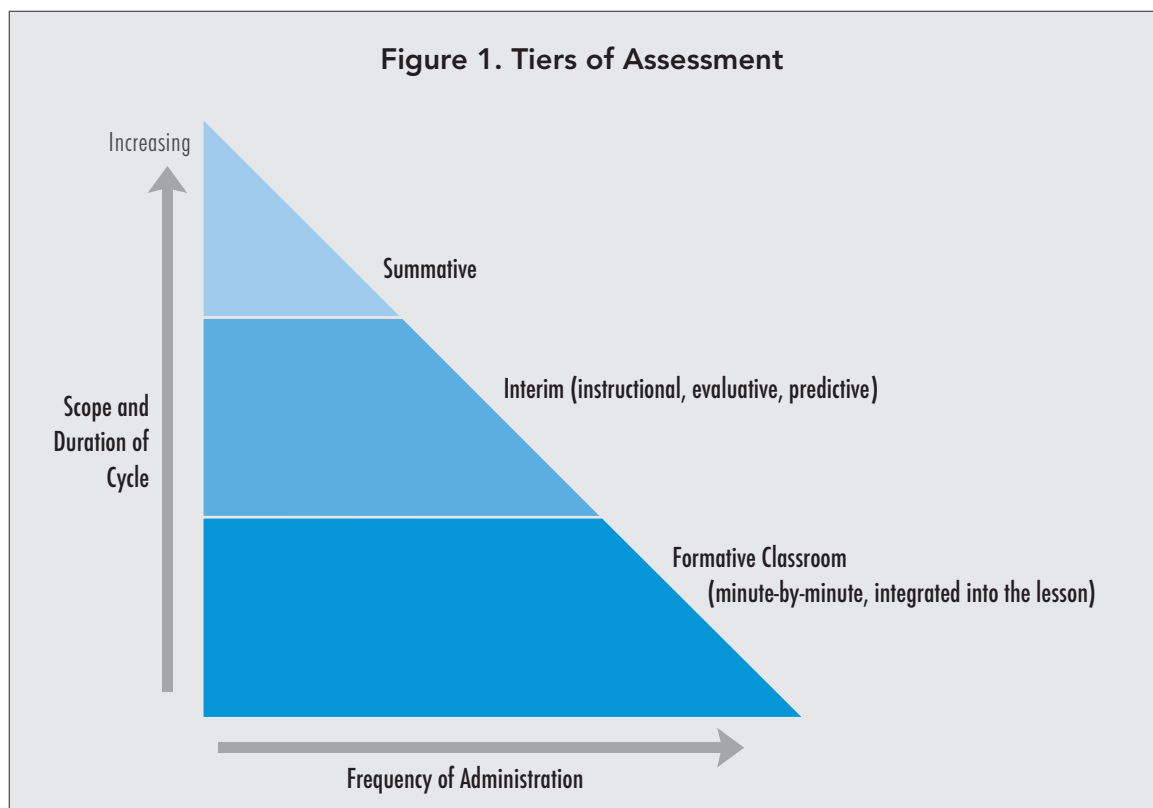
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Following are brief descriptions of summative, interim, and formative assessments. These tiers of assessment are shown in Figure 1. The graphic shows the length of the cycle that each form should naturally fit within. For example, formative assessments typically require shorter cycles covering less chronological time. Summative and interim assessments would be given less frequently over longer periods of learning. Figure 1 also shows how often these assessments should be administered, with formative assessment suggested as having the highest frequency of the three forms.

The key characteristics of each assessment tier are described as follows:

- Summative assessments are synonymous with most one-time, high-stakes tests. From NCLB-mandated exams to end-of-course tests, they most often are associated with accountability at the school, district, or state level. Although many times they are multiple-choice tests, there is no rule or requirement for this format because portfolios, written essays, or extended-response items can be summative. The results typically are used to measure mastery of a prescribed set of standards or content and as part of an accountability system or to otherwise inform policy (Perie et al., 2007).

- Interim assessments are commonly known as medium-cycle assessments. They fall between summative and formative assessments, are typically given multiple times during the year, and are administered at the school or district level. The results are intended for use at the teacher or student level to inform instruction and identify whether standards are being mastered in a timely fashion. However, the data are designed to be aggregated beyond the classroom and used for data-driven decisions throughout the school and district (Perie et al., 2007).

- Formative assessments are the most instructionally sensitive types of assessment and are considered an ongoing activity or process. They are embedded within instructional activities and are linked directly to current teaching and learning activities in the classroom. The teacher determines the specific assessment given to each student or group based on their particular areas of need or the concepts being taught, and the data are used to differentiate or individualize instruction. The results help diagnose student progress, identify gaps in knowledge and understanding, and determine how to help teachers and students improve student learning (Perie et al., 2007).

Figure 1. Tiers of Assessment

Increasing

Scope and Duration of Cycle

Summative

Interim (instructional, evaluative, predictive)

Formative Classroom (minute-by-minute, integrated into the lesson)

Frequency of Administration

Formative Assessment Strategies

Heritage (2007) categorizes formative assessment into three broad strategies, as follows:

- "On-the-fly," in the sense that the teacher changes course during a lesson to address misconceptions before proceeding with the designed instructional sequence.

- "Planned-for interaction," where the teacher decides beforehand how he or she will draw out students' thinking during the course of instruction.

- "Curriculum-embedded," where tools and activities are embedded in the ongoing curriculum to garner feedback at key points in the learning process. Examples of curriculum-embedded assessments might include journaling on a particular scientific topic or identifying real-life examples and nonexamples of geometric shapes to demonstrate understanding.

All three assessment strategies share several characteristics that, when considered together, make them unique to other assessments. Specifically, these types of formative assessments are planned activities, purposefully implemented to gather evidence of learning. They are conducted unobtrusively as a natural part of the instructional activity, and "short-cycle," occurring during a lesson or unit of study and providing near-immediate feedback to the teacher.

Four Essential Elements of the Formative Assessment Process

The formative assessment process can be divided into four essential elements:
(1) identifying the learning gap, (2) feedback, (3) student involvement, and
(4) learning progression (Heritage, 2007).

- *Identifying the gap*, based on Royce Sadler's seminal work (1989), involves understanding the difference between what students know and what they need to know, and where instruction will be most effective to meet desired learning goals. Once a teacher identifies the "just right gap," (Sadler, 1989) he or she can then provide the necessary instructional support to help student progress toward the learning goal and engage in appropriate cognitive growth activities.

- *Feedback* flows to and from the teacher and his or her students. Feedback provides critical information that the teacher needs to pinpoint the current status of a student's learning and informs next steps in the learning process. Feedback is then provided to the student in the form of clear and descriptive information so that it can be used to improve learning. Feedback not designed and intended to close the instructional gap does not meet the formative assessment definition of feedback (Sadler, 1989).

- *Students must be actively involved* in their own learning and the assessments they are engaged in. This happens best by collaboration between the teacher and fellow students to develop a shared knowledge about their current learning status and what they need to do to progress in their learning. Doing so builds metacognitive skills, which students need to monitor their learning and determine when they need assistance.

- *Learning progressions* break down a larger learning goal into smaller subgoals. It is necessary for helping teachers locate students' current learning status in relation to a continuous set of skills needed to master the learning standard. Once a teacher has identified student locations on the learning progression continuum, he or she can work with the students to set short-term learning goals and clarify the criteria that students must meet for success.
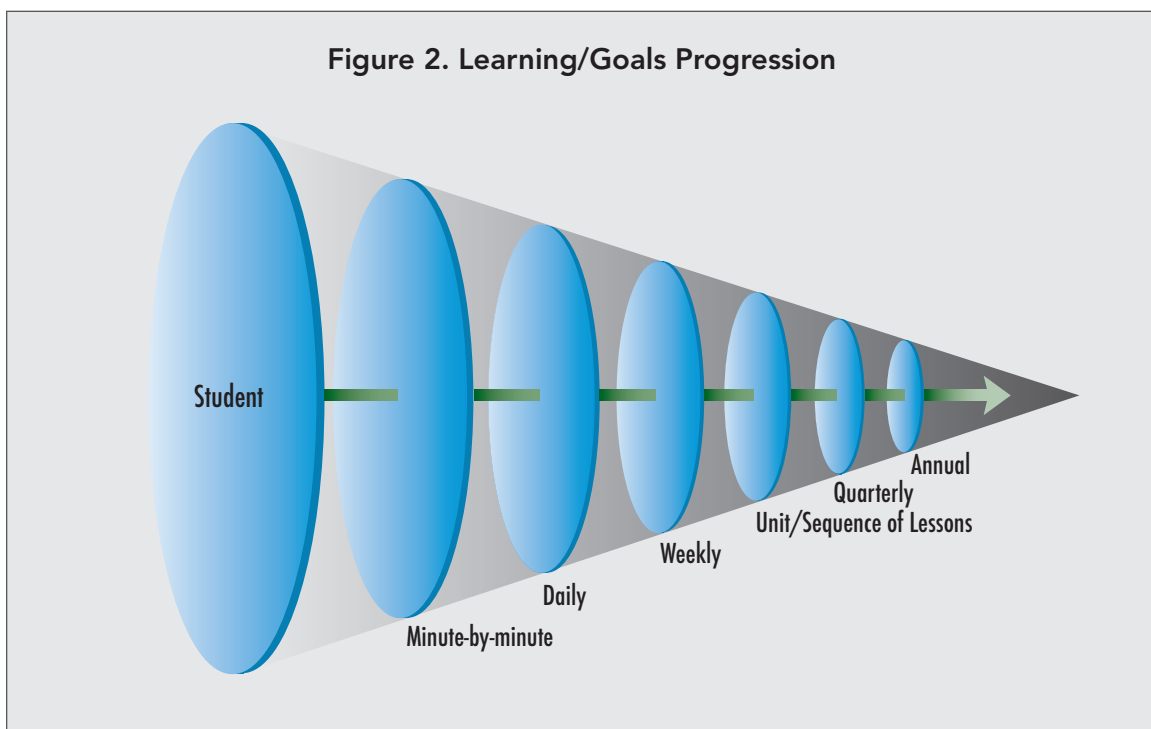
More on Learning Progressions

Forster and Masters (2004) describe learning progressions as "a description of skills, understanding and knowledge in the sequence in which they typically develop: a picture of what it means to 'improve' in an area of learning" (p.1), typically represented visually on a vertical progress map. Popham (2008) defines learning progressions as a "carefully sequenced set of building blocks that students must master en route to a more distant curricular aim. The building blocks consist of subskills and bodies of enabling knowledge" (p. 83). Learning progressions are used for planning out formative and summative assessment strategies in that they carefully lay out the progression of concepts and skills students need over time (more than one year, for example) and that will lead to deeper connections among a larger network of concepts and skills. They should be detailed enough to focus teachers on the appropriate learning that needs to occur, provide information on students' acquisition of these skills so that appropriate instructional and assessment actions can be taken, and explain where students should be on this continuum.

If the learning targets are clearly defined, classes of students will be on a continual movement toward these targets, gathering skills and knowledge along the way. Teachers will continue to assess their students with frequency, but these assessments should get more refined and focused as students approach the agreed-upon learning goal.

Figure 2 illustrates Heritage's (2008) "learning goals/progression" concept and helps us understand this important concept more globally. When teachers begin to meet the students where they are at developmentally at the beginning of a year, semester, or lesson/unit, this may require assessing on a broader range of levels of skills. Through continual evidence gathering and fine tuning of student instruction, teachers can begin to narrow their differentiated focus and begin to move toward the specific learning goals they have for the students. Although it is impossible to have all students at the exact same level, it is important to understand that properly articulated learning progressions, and their subsequent assessments, will allow teachers to understand where their students are at and allow them to refine that process with more granularity to move students toward their goals throughout the year.

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Figure 2. Learning/Goals Progression

Student

Minute-by-minute

Daily

Weekly

Unit/Sequence of Lessons

Quarterly

Annual

Teachers need to be engaged in a continuous process of gathering evidence, making judgments, and adjusting/differentiating instruction with all students when a class, course, or unit begins. The frequency with which students are assessed, are engaged in forms of self-assessment, and teachers are making adjustments forward or backward are all part of teaching and assessing effectively with learning progressions. Many experts (Hattie & Timperley, 2007; Sadler, 1989) believe that the timeliness, flexibility, and ongoing nature of formative assessment techniques are most helpful in informing instruction for teachers and closing achievement gaps for students, preparing students for the short- and long-term formative and summative benchmarks they need to attain.

What Does the Research Base Say About Formative Assessment?

One of the earliest researchers of formative classroom assessment was Benjamin Bloom. His groundbreaking work on the need to address the variance in student achievement was to vary (or differentiate) the instructional and assessment delivery to students. Although known mostly for his book *Taxonomy of Educational Objectives* (1956), Bloom's "mastery learning" concept and research (Bloom, 1968; Bloom, 1971) incorporated feedback processes after students took brief unit assessments to direct their individual and group learning needs. After these initial assessments, students received appropriate and differentiated follow-up instruction or activities, followed again by more formative assessment, until the class completed a unit (Bloom, Hastings, & Madaus, 1971). Meta-analyses (Kulik & Kulik, 1989) and other research (Guskey & Pigott, 1988) on mastery learning showed evidence of academic gains and improved student learning attributes, such as improved confidence and attitudes toward learning.

Influenced by earlier and less comprehensive but equally compelling reviews (Crooks, 1988; Natriello, 1987), the definitive study of, and research supporting, formative assessment came from Dylan Wiliam and Paul Black (1998a) of the United Kingdom.

Inside the Black Box: Raising Standards Through Classroom Assessment was a research review of 250 empirical studies on classroom-based assessment practices and their impact on a mixed set of student populations from a variety of academic settings and grade ranges. In their review, Black and Wiliam (1998b) found that student gains impacted by formative assessment practices were "among the largest ever reported for educational interventions" (p. 61).

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In analyzing studies conducted on students from many countries ranging from prekindergarten through college, the average effect sizes (average test score gains compared to the range of scores from a "typical" group of students on the same test) from those receiving formative assessment treatments were between 0.4 and 0.7. Effect sizes measure the strength of the relationship between two variables. Common effect size guidelines put an effect size of 0.2 in the "small" category. A "medium" effect size is 0.5. A "large" effect size is 0.8. In *Inside the Black Box*, Black and Wiliam compare an effect size of 0.7 as comparable to an entire nation raising their score on an international mathematics test from "the middle of the pack of 41 countries (e.g., the United States) to one of the top five" (p. 141). An effect size of 0.4 would move an "average" student's score into an upper percentile range.

Many subsequent studies investigated specific aspects of formative assessment techniques and their academic learning benefits. In 2006, Wiliam reported that teachers given supports to implement formative assessment techniques were able to rapidly close student achievement gaps by 50 percent. A more recent study (Dunn & Mulvenon, 2009), though, challenged research claims of some of the more seminal studies, most specifically Black and Wiliam's *Inside the Black Box*, and their reliance on Fuchs and Fuchs' (1986) meta-analysis. Dunn and Mulvenon claimed that the findings from the two seminal studies did not definitively prove that certain levels of academic achievement were possible through the use of formative assessment processes. The heavy reliance on "fair" and "poor" quality studies and the generalization of findings to the student population at large, with its significant inclusion (83 percent) of "handicapped" students was "inappropriate" (p. 5). In other words, higher quality studies with a broader representation of student populations may have led to slightly smaller effect sizes.

Although the authors identified several methodological issues with the Black and Wiliam study, they concurred that there is evidence supporting the use of formative assessment and called for more high quality studies to further strengthen the research base.

Kingston and Nash's (2009) recent findings sought out studies that had been more clearly aligned with K–12 forms of formative assessment and analyzed their impact. The meta-analysis found median effect sizes of 0.25, "large enough to indicate formative assessment can be a significant and readily achievable source of improved student learning" (p. 16). In a related study, Hattie and Timperley (2007) found that when effective communication principles were adhered to, an effect size of 0.79 was calculated. In their meta-analysis of feedback, they determined that the most effective place for assessment-related feedback is during processing (i.e., when students are analyzing their strategies for doing/completing work) and that feedback at the self-regulation level helps them to internalize their thinking and get better at assessing themselves and knowing when to ask for assistance.

Implementing Research-Based Formative Assessment Systemwide

Applying formative assessment approaches systemically across schools and districts can be a challenge in that they are not based on a product, technology, or system that can easily be installed or implemented. Changing the relationship between teachers and students, and managing the multitude of these interactions and relationships, is at the heart of effective formative assessment processes and, hence, requires the professional development needed to train, empower, and support the teachers, principals, and district administrators charged with overseeing the quality of such a systemic change. A systemic approach that takes all key stakeholders—students, teachers, and education leaders—into consideration has the best chance for success.

The Students' Role

Students should be integral partners in the formative assessment process. In fact, they may be the key factor in optimizing its successful implementation. For example, students have to make the decision if they want to learn and improve academically. If they are unsure of the path to follow, don't have the necessary information to improve, or lack the confidence to succeed or even try, then teachers have even more work to do. But if students know what success looks like and receive constructive, data-based feedback on how they can adjust their thinking in a positive, supportive manner, their confidence and willingness to commit to the hard work of learning should increase. This is an essential aspect of the formative assessment process.

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Students should formally be engaged in the defining and developing of scoring rubrics for projects and performances (Stiggins, Arter, Chappuis, & Chappuis, 2004). So that they can better reflect on their own thinking, it can be helpful to explain to them, in language that they understand, how best to connect their current thinking to the learning target and demonstrate mastery of concepts and performance. In addition, it is critical to take the time to help students see what quality work and performance look like so that these standards aren't a mystery to them.

Students also need to begin to compare their work to these quality standards laid out by the teacher and in the learning progressions. Many times, students' judgment of their own academic work, and of their peers, is clouded by personal, social, and emotional factors. Becoming better self-assessors is crucial, and moving students to the place where they can identify metacognitive strategies to improve their own work, or provide similar feedback on their peers' work, is ideal. Helping students to see assessment as a process for self-improvement, as opposed to a punitive or ranking mechanism, can aid in producing these desired effects. It is imperative, however, that assessments that allow these kinds of interactions to happen are developed.

The Teacher's Role

Many experts, especially Stiggins (2002), have argued that the lack of "assessment literacy" among teachers, principals, and educators in general is at the heart of the issue. Various analyses (Schafer, 1993; Stiggins, 2002) of the effects of formative assessment show that both teachers and administrators graduating from certification programs lack the necessary skills to make formative judgments about students. Colleges of education, in partnership with state education agencies, local education agencies, and regional offices of education, will need to improve and redesign how our current and future teachers and administrators learn about assessment. Formative assessment research and techniques should be a significant portion of the new knowledge-based skills that are required of graduates. In addition, with so much recent activity in the area of formative assessment professional development and research, there are tangible actions that teachers can take right now to improve their instructional and assessment techniques.

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Heritage (2007) argues that to use formative assessment correctly, teachers will need to optimize their knowledge in their domain area, pedagogical content, assessment knowledge, and knowledge of students' previous learning. These skills border on mastery-level teaching, but in many ways these are expectations of quality formative assessment practices. In fact, in a recent study, Heritage et al. (2009) found that teachers had the skills to use data and draw inferences but fell short with respect to planning "the next instructional steps" (p. 31). When done correctly, though, significantly enhanced learning can take place. Sadler's (1989) analysis and research delved into the instructionally appropriate way of making effective qualitative judgments using formative assessment techniques. When teachers struggle to make high-quality evaluative judgments and fail to foster self-assessment, students' achievement suffers.

The marriage of learning progressions and high-quality formative assessment strategies will answer the following key questions to guide instructor feedback (Hattie & Timperley, 2007):

- Where am I going (what are the goals)?

- How am I going (what progress is being made toward the goal)?

- Where to next (what activities need to be undertaken to make better progress)?

The better teachers become at managing these three key questions, the better formative assessment practices, and their instructional benefits, will take hold. Improving the quality and pacing of questioning is a skill that teachers need to practice regularly. Although the asking of questions with "yes" and "no" responses or the raising of hands for understanding are familiar techniques that nearly all teachers have used, they should be analyzed for frequency and effectiveness. Alternatives to these approaches, such as asking students to explain their answer(s), can be better windows into students' thinking and their ability to move forward to solve subsequent problems. Questions that require complex answers and that provide examples of metacognition can elicit the type of evidence that formative assessment requires. To take that technique even further, there is supporting research (Rowe, 1974) that touts that the longer a teacher pauses after asking questions, the level of complexity rises in student responses, increasing the opportunity to analyze student thinking.

> Improving the quality and pacing of questioning is a skill that teachers need to practice regularly.

This is not simple for teachers to do and certainly is not a skill set that most teachers bring to their first classrooms. In fact, teachers need ongoing professional development and support in fostering not only better instructional skills but also formative assessment skills, such as questioning techniques that provide higher quality feedback. Recent research (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009) found that 50 hours or more of professional development is needed to effectively change teacher practice.

The Role of Schools and Districts

In a recent case study, Wylie and Lyon (2009) noted that teacher professional development is not sufficient without considering the larger system in which teachers find themselves. While teachers need sustained opportunities within and outside of their classrooms to develop, practice, reflect upon, and refine their formative assessment practice, administrators must know how to support their teachers' growth within a larger systemic context. Wylie and Lyon identified four ways in which a sustained focus on formative assessment could affect the experiences of teachers' and their schools:

- The implementation of formative assessment may result in changes to both the explicit classroom rules and implicit classroom expectations.

- Formative assessment might interrupt other classroom/school policies.

- Formative assessment has a critical student component and impacts more than just what the teacher does.

- Engaging teachers in formative assessment can be a powerful way to reenergize experienced teachers.

> The need to reallocate resources to ensure that teachers have concentrated time and support to build their knowledge of formative assessment within professional learning communities is critical, and they cannot do it without a supportive culture and network to reinforce best practices.

Schools and districts will need to invest in high-quality, sustained formative assessment professional development programs for teachers to make this comprehensive approach work in the classroom. The need to reallocate resources to ensure that teachers have concentrated time and support to build their knowledge of formative assessment within professional learning communities is critical, and they cannot do it without a supportive culture and network to reinforce best practices.

Districts can take the following tangible steps now to begin to implement research-based formative assessment strategies in their schools and districts that can yield positive results:

- Clarification of terms and misperceptions about formative assessment practices need to be addressed. Getting all key staff to come to agreement on what they mean by research-based formative assessment and other types of assessments can help end confusion and optimize the effectiveness of each form.

- Reviewing the research thoroughly and then coming to a consensus on what formative assessment is and how to do it are important steps in launching a successful formative assessment program.

- Identification of current formative assessment strategies, tools, and/or supports in place that can be enhanced to begin to bring more quality formative assessment to classroom instruction, school improvement processes, professional learning communities, and professional development.

- Understanding exactly what key staff want quality formative assessment to look like and what best practices constitute are important. Taking the time to define this, committing to investigating professional development resources to help bring this to life in classrooms, and engaging in open, ongoing professional learning community discussions with key stakeholder groups is critical. Moving in this direction will lead to significant changes in instructional practices and policies, and staff buy-in and assistance with designing the next steps at all levels is important.

Development of formative assessments shouldn't be done haphazardly. Collaborative development work done by classroom teachers with an understanding of age-appropriate pedagogy and subject-specific content experts is recommended. So that there is a coherent, comprehensive development strategy with alignment of curriculum, instruction, and assessment, involving a school- or district-based assessment specialist and curriculum directors should not be overlooked. Involving content-area facilitators or coaches in the development and implementation processes is also important.

Districts also need to review their policies and practices to ensure that barriers to progress in research-based formative assessment practices are removed. Long-standing grading and marking policies can be an area that bring conflict in this realm and have a negative impact on student learning (Black, Harrison, Lee, Marshall, & Wiliam, 2004). Additional time to support formative assessment practices, which are closely aligned with best practices instructional techniques, should also be allocated.

Conclusion

With a significant body of evidence behind it, and strategies and techniques designed to empower students and teachers in the assessment and learning processes, implementing research-based formative assessment practice can engage students in reaching their full potential and closing their own achievement gaps and improve the quality of instruction in a way that brings teachers and students closer together through assessment. The time to more fully embrace this promising strategy for improving student learning, especially for at-risk students, is now. This brief will be helpful in aiding education leaders to strategize on a research-based, systemic approach and building the confidence of teachers interested in improving their formative assessment skills.

References

Black, P., Harrison, C., Lee, C., Marshall, B., & Wiliam, D. (2004). Working inside the black box: Assessment for learning in the classroom. *Phi Delta Kappan, 86*(1), 8–21.

Black, P., & Wiliam, D. (1998a). Inside the black box: Raising standards through classroom assessment. *Phi Delta Kappan International, 80*(2), 139–144.

Black, P., & Wiliam, D. (1998b). Assessment and classroom learning. *Assessment in Education, 5*(1), 7–74.

Bloom, B. S. (1968). Learning for mastery. *Evaluation Comment (UCLA-SCIEP), 1*(2), 1–12.

Bloom, B. S. (1971). Mastery learning. In J. H. Block (Ed.), *Mastery learning: Theory and practice.* New York: Holt, Rinehart and Winston.

Bloom, B. S., Hastings, J. T., & Madaus, G. F. (1971). *Handbook on formative and summative evaluation of student learning.* New York: McGraw-Hill.

Council of Chief State School Officers. (2007). *Formative assessment and CCSSO: A special initiative—a special opportunity.* Washington, DC: Author.

Crooks, T. J. (1988). The impact of classroom evaluation practices on students. *Review of Educational Research, 58*(4), 438–481.

Darling-Hammond, L., Wei, R. C., Andree, A., Richardson, N., & Orphanos, S. (2009). *Professional learning in the learning profession: A status report on teacher development in the United States and abroad.* Dallas, TX: National Staff Development Council. Retrieved December 3, 2009, from http://www.nsdc.org/news/NSDCstudy2009.pdf

Dunn, K. E., & Mulvenon, S. W. (2009). A critical review of research on formative assessment: The limited scientific evidence of the impact of formative assessment in education. *Practical Assessment, Research & Evaluation, 14*(7), 1–11. Retrieved December 3, 2009, from http://pareonline.net/pdf/v14n7.pdf

Forster, M., & Masters, G. (2004). Bridging the conceptual gap between classroom assessment and system accountability. In M. Wilson (Ed.), *Towards coherence between classroom assessment and accountability: The 103rd yearbook of the National Society for the Study of Education, Part II* (pp. 51–73). Chicago: The University of Chicago Press.

Fuchs, L. S., & Fuchs, D. (1986). Effects of systematic formative evaluation: A meta-analysis. *Exceptional Children, 53*(3), 199–208.

Guskey, T. R., & Pigott, T. D. (1988). Research on group-based mastery learning programs: A meta-analysis. *Journal of Educational Research, 81*(4), 197–216.

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research, 77*(1), 81–112.

Heritage, M. (2007). Formative assessment: What do teachers need to know and do? *Phi Delta Kappan, 89*(2), 140–146. Retrieved December 2, 2009, from http://www.pdkintl.org/kappan/k_v89/k0710her.htm

Heritage, M. (2008). *Learning progressions: Supporting instruction and formative assessment.* Washington, DC: Council of Chief State School Officers. Retrieved December 2, 2009, from http://www.ccsso.org/publications/details. cfm?PublicationID=366

Heritage, M., Kim, J., Vendlinski, T., & Herman, J. (2009). From evidence to action: A seamless process in formative assessment? *Educational Measurement: Issues and Practice, 28*(3), 24–31.

Kingston, N., & Nash, B. (2009, April). *The efficacy of formative assessment: A meta-analysis.* Paper presented at the annual meeting of the American Educational Research Association.

Kulik, J. A., & Kulik, C. C. (1989). Meta-analysis in education. *International Journal of Educational Research, 13*(2), 221–340.

Natriello, G. (1987). The impact of evaluation processes on students. *Educational Psychologist, 22*(3), 155–175.

Perie, M., Marion, S., Gong, B., & Wurtzel, J. (2007). *The role of interim assessments in a comprehensive assessment system.* Washington, DC: The Aspen Institute. Retrieved December 3, 2009, from http://www.nciea.org/publications/ PolicyBriefFINAL.pdf

Popham, W. J. (2006). Phony formative assessments: Buyer beware! *Educational Leadership, 64*(3), 86–87. Retrieved December 3, 2009, from http://www.ascd.org/ publications/educational_leadership/nov06/vol64/num03/Phony_Formative_ Assessments@_Buyer_Beware!.aspx

Popham, W. J. (2008). *Transformative assessment.* Alexandria, VA: ASCD.

Rowe, M. B. (1974). Wait-time and rewards as instructional variables, their influence on language, logic, and fate control: Part one—wait-time. *Journal of Research in Science Teaching, 11*(2), 81–94.

Sadler, D. R. (1989). Formative assessment and the design of instructional systems. *Instructional Science, 18*(2), 119–144.

Schafer, W. D. (1993). Assessment literacy for teachers. *Theory Into Practice, 32*(2), Assessing Tomorrow's Teachers. 118–126. London: Lawrence Erlbaum Associates (Taylor & Francis Group).

Stiggins, R. J. (2002). Assessment crisis: The absence of assessment for learning. *Phi Delta Kappan, 83*(10), 758–765.

Stiggins, R., Arter, J., Chappuis, J., & Chappuis, S. (2004). *Classroom assessment for student learning: Doing it right–using it well.* Portland, OR: Assessment Training Institute, Inc.

Torgesen, J. K., & Miller, D. H. (2009). *Assessments to guide adolescent literacy instruction.* Portsmouth, NH: Center on Instruction at RMC Research Corporation. Retrieved December 1, 2009, from http://centeroninstruction.org/files/ Assessment%20Guide.pdf

Wiliam, D. (2006, July). *Does assessment hinder learning?* Speech delivered at the ETS Europe Breakfast Salon. Retrieved December 3, 2009, from http://www.mission-21. com/ec/images/williams_speech.pdf

Wylie, C., & Lyon, C. (2009, August 3). What schools and districts need to know to support teachers' use of formative assessment. *Teachers College Record.*

Online Resources

REL Midwest—Materials and Presentations Provided at 8/14/2009 Event

- Connecting Research to Practice event: **Understanding Formative Assessment and Utilizing It to Improve Classroom Instruction** archive
http://www.learningpt.org/rel/archive/081409_
UnderstandAndUseFormativeAssessment.php

General—Websites With Links to Research, Books, Professional Development, and Other Resources on Formative Assessment

- ETS Assessment Training Institute
http://www.assessmentinst.com/

- WestEd and CRESST Assessment and Accountability Comprehensive Center
www.aacompcenter.org

- ASCD (formerly the Association for Supervision and Curriculum Development)
http://www.ascd.org/SearchResults.aspx?s=formative%20
assessment&c=1&n=10&p=0

- Council of Chief State School Officers—Formative Assessment for Students and Teachers
http://www.ccsso.org/projects/scass/Projects/Formative_Assessment_for_
Students_and_Teachers/

- Council of Chief State School Officers—Formative Assessment Professional Development Resources
http://www.ccsso.org/projects/scass/projects/formative_assessment_for_
students_and_teachers/11472.cfm

Suggested Reading List
for Practitioners

Bailey, A. L., & Heritage, M. (2008). *Formative assessment for literacy: Grades K–6.* Thousand Oaks, CA: Corwin Press.

Black, P., Harrison, C., Lee, C., Marshall, B., & Wiliam, D. (2003). *Assessment for learning: Putting it into practice.* New York: Open University Press.

Black, P., Harrison, C., Lee, C., Marshall, B., & Wiliam, D. (2004). Working inside the black box: Assessment for learning in the classroom. *Phi Delta Kappan, 86*(1), 8–21.

Gardner, J. (Ed.). (2006). *Assessment and learning.* London: Sage Publications, Ltd.

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research, 77*(1), 81–112.

Popham, W. J. (2008). *Transformative assessment.* Alexandria VA: ASCD.

Stiggins, R. J., Arter, J., Chappuis, J., & Chappuis, S. (2006). *Classroom assessment for student learning: Doing it right–using it well.* Portland OR: Assessment Training Institute, Inc.

Wylie, E. C. (Ed.). (in press). *Tight but loose: Scaling up teacher professional development in diverse contexts.* Princeton, NJ: ETS.

Connecting Formative Assessment
RESEARCH to PRACTICE

An Introductory Guide for Educators

Written by

Nick Pinchok, Senior Consultant–Assessment and Standards

W. Christopher Brandt, Ph.D., Senior Research Associate

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