

# SUMMARIES OF RESEARCH SYNTHESSES

*and Other Seminal Documents on Formative Assessment*

## CCSSO FAST SCASS

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Formative assessment is now being given a great deal of attention, much of which has been stimulated by various research syntheses and articles on the topic. The purpose of this document is to summarize the key findings or points of the most significant of these works. The effectiveness of good formative assessment practices is well documented in the research literature, and so it is important for educators to understand just what those practices are, as well as what they are not. It is not the intent of this document to include all the literature that could be found on formative assessment – there is too much. Instead, the items chosen to be listed below are those which members of the FAST SCASS consider seminal pieces.

### Research Syntheses

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The FAST SCASS research committee contemplated doing a comprehensive review of the research on formative assessment. However, it ultimately decided to not conduct such a review for two main reasons. First, several significant research syntheses had already been completed, and there seemed to be no good reason to replicate those efforts. Second, one of the reasons to undertake a comprehensive review was the knowledge that there exists a significant body of research on instructional techniques and the assumption that assessment components associated with instructional techniques could yield results relevant to the committee's interest in formative assessment. However, in pursuing that logic, it became clear that the focus of that research was on the instructional techniques themselves and not on the nature of the associated assessments, the kind of information they produced, and what was done with that information. For example, there are some significant reviews of the research on homework. However, that research seems to focus on things like the amount of homework assigned and whether it is done in school or at home, and does not focus on homework as a vehicle for formative assessment as defined by the FAST SCASS. Thus, the research committee decided to merely summarize the summaries of research specifically dealing with formative assessment and directly related topics.

Bangert-Drowns, R., Kulik, J., & Morgan, M. (1991). The instructional effect of feedback in test-like events. *Review of Educational Research*, 61, 213-238.

This article reports the results of a meta-analysis of 58 effect sizes from 40 reports of research on feedback. It addresses the impact on achievement of such factors as the nature of feedback, timing of feedback, and the type of instruction with which the feedback was associated. Among other findings, it concludes that immediate feedback and feedback that is more than “right-wrong” are associated with larger gains.

Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education: Principles, Policy & Practice*, 5(1), 7-74.

In recent years, when people refer to the research that revealed the significant impact of good formative assessment practices on student learning, it's the research summarized in this article to which those people are referring. The article also presents a more detailed and theoretical analysis of the nature of feedback, which provides a basis for a discussion of the development of theoretical models for formative assessment and of the prospects for the improvement of practice.

Brookhart, S. M. (2005, April). Research on formative classroom assessment. Paper presented at the annual meeting of the American Educational Research Association, Montreal.

This is a comprehensive review of the research literature on formative assessment that begins with an interesting historical perspective on the expanding concepts in the definition of formative assessment. The review of research is organized by four topics in the current expanded definition: the nature of classroom assessments and teachers' assessment practices, teachers' use of formative assessment (feedback and instructional decisions), student self assessment, and the relationship between classroom assessments and student motivation. The final section of the review addresses the effects of formative classroom assessment on learning.

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

Crook's interest was in the impact of classroom evaluation practices on learning strategies, motivation, and achievement. His recommendations for classroom practice are consistent with those coming out of the more recent research on formative assessment and deal with deep, versus rote, learning; effective feedback; and peer and self assessment.

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

This article provides a conceptual analysis of feedback and reviews the evidence related to its impact on learning and achievement. This evidence shows that although feedback is among the major influences, the type of feedback and the way it is given can be differentially effective. A model of feedback is then proposed that identifies the particular properties and circumstances that make it effective, and some typically thorny issues are discussed, including the timing of feedback and the effects of positive and negative feedback. Finally, this analysis is used to suggest ways in which feedback can be used to enhance its effectiveness in classrooms.

Kluger, A.N., & DeNisi, A. (1996). The effects of feedback interventions on performance: a historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin*, 119(2), 254-284.

Not for the casual reader, this article sheds light on the variable effects of feedback on student performance. For example, one of the author's important findings is that feedback is more effective if focused on the task, and not on the student.

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

Natriello was interested in how evaluation practices affect student motivation and achievement. His conclusions, consistent with more recent research findings, pertain to, among other things, the need for clear attainable standards, focus in feedback on tasks and not comparisons of students, and differentiated feedback.

Shute, V.J. (2007). *Focus on formative assessment*. (ETS Report No. RR-07-11). Princeton, NJ: Educational Testing Service.

This paper reviews the corpus of research on feedback, with a particular focus on formative feedback—defined as information communicated to the learner that is intended to modify the learner's thinking or behavior for the purpose of improving learning. The nature of feedback, timing of feedback, learner characteristics and a variety of other factors are considered. Of particular interest is a set of guidelines for generating formative feedback that appears near the end of the report.

(available online at <http://www.ets.org/Media/Research/pdf/RR-07-11.pdf>)

(similar version also in *Review of Educational Research*, 78(1), 153-189)

## Other Documents of Interest

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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), 9-21.

This is a report on one study that has attempted to put formative assessment concepts into practice with 24 secondary school mathematics and science teachers in England. Through the use of improved questioning techniques, feedback focusing on how to improve rather than grading, and involving students in peer-assessment and self-assessment, teachers found that the motivation and attitudes of their students improved, and the students achieved higher scores on externally set tests and examinations than other students at the same schools.

Black, P. & Wiliam, D. (1998). Inside the black box: Raising standards through classroom assessment. *Phi Delta Kappan*, 80(2), 139-148.

Probably the most cited document on formative assessment, this article identifies efforts to raise student achievement levels that failed because they focused on standards and accountability while ignoring what teachers and students do in the classroom. The authors then proceed to summarize the research evidence that improving formative assessment practices significantly improves student performance and to describe how to go about developing better formative assessment skills of teachers.

(available online at <http://www.pdkintl.org/kappan/kbla9810.htm>)

Boston, C. (2002). The concept of formative assessment. *Practical Assessment, Research & Evaluation*, 8(9).

This item, in a peer-review electronic journal, very briefly describes formative assessment and some significant research related to it. It is cited here because it identifies several resources for teachers.

(available online at <http://pareonline.net/getvn.asp?v=8&n=9>)

Dixon, H. and Williams, R. (2003). Teachers' understanding and use of formative assessment in literacy learning. *New Zealand Annual Review of Education*, 12:2002.

This article reports on teachers' understandings about and use of formative assessment with years one to eight children in the areas of reading, written language, and oral language. It concludes that while teachers appear to have increased their theoretical understanding of formative assessment, their descriptions of practice omit a number of critical components which are essential to successful learning for children.

(available online at [http://www.tki.org.nz/r/assessment/research/pdf/DixonWilliams\\_NZ%20Annualreview\\_article19Dec03.pdf](http://www.tki.org.nz/r/assessment/research/pdf/DixonWilliams_NZ%20Annualreview_article19Dec03.pdf))

Heritage, M. (2007). Formative assessment: What do teachers need to know and do? *Phi Delta Kappan*, 89(2).

Formative assessment practices, if implemented effectively, can provide teachers and their students with the information they need to move learning forward. This article discusses the core elements of formative assessment, conceptualizes their integration, and considers the knowledge, skills, and attitudes that teachers need in order to implement formative assessment practices effectively.

McMillan, J.H. (2007). *Formative classroom assessment: Theory into practice*. New York: Teachers' College Press.

The chapters in this book are by such notables as Stiggins, Wiliam, Brookhart, Guskey, and Cizek.

Schafer, W.D. (1993). Assessment literacy for teachers. *Theory into Practice*, 32(2), 118-126, Copyright 1993 College of Education, The Ohio State University.

This article is a research-based discussion of assessment topics covered in teacher training courses and of what teachers really need to know. Of particular interest is the identification of 12 grading practices that interfere with learning. If a school were to successfully address those 12 items, good formative assessment would be going on and student learning would be greatly enhanced.

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

Three conditions for effective feedback are identified and their implications discussed. A key premise is that for students to be able to improve, they must develop the capacity to monitor the quality of their own work during actual production. This in turn requires that students possess an appreciation of what high quality work is, that they have the evaluative skill necessary for them to compare with some objectivity the quality of what they are producing in relation to the higher standard, and that they develop a store of tactics or moves which can be drawn upon to modify their own work. It is argued that these skills can be developed by providing direct authentic evaluative experience for students. Instructional systems which do not make explicit provision for the acquisition of evaluative expertise are deficient, because they set up artificial but potentially removable performance ceilings for students.

Sadler, D.R. (1998). Formative assessment: Revisiting the territory. *Assessment in Education: Principles, Policy & Practice*, 5(1), 77-84.

This article is a response to the 1998 review by Black and Wiliam. Generally agreeing with positions of Black and Wiliam, Sadler elaborates on the nature of effective feedback and goes even further in identifying the various skills, the knowledge, and the expertise the effective teacher brings to the task of formative assessment.

Shepard, L.A. (2005, October). *Will commercialization enable or destroy formative assessment?* (Original title: *Formative assessment: Caveat emptor*). Paper presented at the ETS Invitational Conference 2005: The Future of Assessment, Shaping Teaching and Learning, New York.

This paper is both a research review and a consumer advocacy piece. In it, Shepard distinguishes between the formative assessment that a vast body of research indicates can lead to impressive gains in student learning and the interim and benchmark tests publishers have chosen to call “formative” as well. The latter do not have a research base touting their benefits, but Shepard points out that such tests can provide information that is useful for the evaluation and improvement of instructional programs.

Shepard, L.A. (2005). Linking formative assessment to scaffolding. *Educational Leadership*, 63(3), 66-70.

Formative assessment and instructional scaffolding are essentially the same thing. Formative assessment uses insights about a learner's current understandings to alter the course of instruction and thus support the development of greater competence. Scaffolding refers to supports that teachers provide the learner during problem solving—in the form of reminders, hints, and encouragement—to ensure successful completion of a task. Four strategies illustrate the strong connection between formative assessment and research on learning: eliciting prior knowledge, providing effective feedback, teaching for transfer of knowledge, and encouraging student self-assessment.

Stiggins, R. (2005). From formative assessment to assessment for learning: A path to success in standards-based schools. *Phi Delta Kappan*, 87(3).

Stiggins begins by describing the traditional role of schools, sorting and ranking students, in which assessment is used to motivate students, usually through intimidation. He then explains the new mission of schools – to assure that all students reach some minimal level of performance with respect to academic achievement standards. He further describes three strategies being used to accomplish this goal: more frequent summative (interim) testing, more effective data management, and assessment FOR learning (formative assessment as defined by CCSSO).

(available online at [http://www.pdkintl.org/kappan/k\\_v87/k0512sti.htm](http://www.pdkintl.org/kappan/k_v87/k0512sti.htm))

Stiggins, R. (2006). Assessment for Learning: A key to motivation and achievement. . *EPhi Delta Kappa EDGE*, 2(2), 3 - 19.

Stiggins discusses the concept of a balanced assessment system as a means to serve schools in their new role, “places where all students are expected to meet increasingly rigorous academic standards.” From that perspective, he explains how (1) assessments must go beyond providing merely scores and corresponding judgments about student learning, (2) educators must use evidence gathered through assessments to inform instructional decisions and to encourage students to try to learn, and (3) assessment systems must serve many users.

(available online at <http://www.ets.org/ati/forms/KappanEdgeArticle.pdf>)

Wiliam, D. (2007). Keeping learning on track: Classroom assessment and the regulation of learning. In F.K. Lester Jr. (Ed.), *Second handbook of mathematics teaching and learning*, 1053-1098, Greenwich, CT: Information Age Publishing.

A project of the National Council of Teachers of Mathematics, this document is a treatise on formative assessment presented to the mathematics education community. Thus, it is a discussion of the discipline-independent principles of formative assessment (along with the research literature underlying them), but with a focus on the learning of mathematics. The discussion is organized by five key strategies (almost steps) of formative assessment dealing with sharing learning intentions and criteria of success, gathering evidence of learning, providing feedback to advance learning, and activating students as instructional resources via self assessment and peer assessment.

## Additional Readings

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Bailey, Alison L. and Margaret Heritage (2008), *Formative Assessment for Literacy: Grades K-6*. Thousand Oaks, CA: Corwin 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

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

Heritage, M. & A. Bailey (Eds.) (2006) *Educational Assessment, Special Issue: Assessing to Teach*, 3-4(11).

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

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

Organisation for Economic Co-operation and Development. (2005). Formative assessment: Improving student learning in secondary classrooms. Centre for Educational Research and Innovation.

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

Stiggins, R.J., Arter, J., Chappuis, J, and Chappuis, S (2006) *Classroom Assessment FOR Student Learning: Doing it right—Using it well*. Portland OR: ETS Assessment Training Institute.

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

