

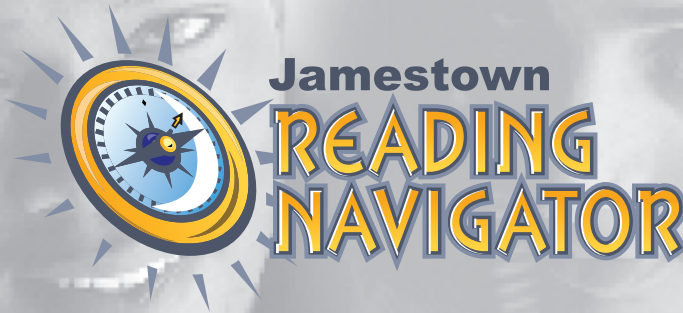
PROGRAM RESEARCH

Scientifically Based Progress Monitoring Using Curriculum-Based Measurement (CBM): General Outcome Measurement to Improve Student Achievement in Jamestown Reading Navigator

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Good teachers recognize the importance of assessing students over time to monitor progress and improve student learning. It makes sense that when students are tested on what they are expected to learn, teachers can evaluate what was and wasn't learned. Teachers routinely test students weekly on assigned spelling words or chart reading progress by using end-of-unit tests that accompany published series. Teachers give matching or multiple-choice quizzes on weekly vocabulary words or informally ask questions about what students have read.

Unfortunately, for too many teachers, their progress monitoring efforts are tied too much to common sense and not enough to the science of progress monitoring. The emphasis has been on summative evaluation versus formative evaluation and on mastery monitoring techniques versus general outcome measurement strategies. The problem isn't teachers' lack of interest and motivation. The problem is (a) a lack of training, especially as part of their licensure programs, and (b) education's failure to give teachers the right tools for formative evaluation. Teachers must either develop their own progress monitoring tests or presume that publishers are providing them with quality, efficient, and efficacious tools.

Jamestown Reading Navigator provides teachers with solutions to the problem of well-intentioned, but insufficient progress monitoring. It provides teachers with formative evaluation tools and general outcome measurement strategies. Unique to *Jamestown Reading Navigator* is the use of Curriculum-Based Measurement (CBM) (Deno, 1985; Fuchs & Fuchs, 1992, 1999; Shinn, 1989; Shinn, 1998) that meets the highest standards for scientifically based progress monitoring.

Distinguishing Formative and Summative Evaluation

Formative evaluation is the assessment of progress *during* instruction for purposes of determining whether students are learning or whether the instruction needs to be modified. Formative evaluation answers the question *Is the student learning, and if not, what needs to be changed?* The purpose of formative evaluation is to inform instruction and enable intervention when a student is not progressing.

This evaluation strategy is especially important for at-risk students. For many teachers, progress monitoring is summative, not formative. Summative evaluation takes place *after* instruction. Summative evaluation answers the question *Has the student learned?* The purpose of summative evaluation is to judge or grade the student.

One way that formative and summative evaluation can be distinguished is that formative evaluation occurs more frequently (e.g., weekly) than summative evaluation (e.g., at the end of a quarter). However, that distinction can best be made by how teachers use the information (Deno, 1986; Deno, Espin, & Fuchs, 2002; Fuchs & Fuchs, 2004). A teacher who tests students on vocabulary words at the end of the week may be using either formative or summative evaluation. If the teacher assigns a grade and students move to the next unit of vocabulary words regardless of performance, then the assessment is summative. If the teacher moves the students who have achieved a standard of performance to the next unit while those who have not attained it are provided modified instruction, then the assessment is formative.

Distinguishing Mastery Monitoring and General Outcome Measurement

When teachers monitor progress, their methods must fall into one of two “families” of progress monitoring: (a) mastery monitoring or (b) general outcome measurement (Fuchs & Deno, 1991; Fuchs & Fuchs, 1999). When teachers use mastery monitoring, they test students using items derived from the instructional unit or objective they are teaching (e.g., CVC words or Unit 16). Teachers are most familiar with the kinds of formative evaluation that fit under the family of mastery monitoring. Unfortunately, mastery monitoring is currently the weakest of the two progress-monitoring families. The primary advantage of mastery monitoring is *instructional validity*, that is, teachers can evaluate what content students know and what content needs continued instruction.

Despite this important advantage, mastery monitoring is based on a number of often unsupported assumptions, including that the unit or mastery tests are reliable and valid, sensitive to improvement, and tied to a curriculum sequence that has been validated. Because students are tested on exactly what is taught in the unit or objective, mastery monitoring typically doesn’t test for retention of previously taught content, nor does it test students for generalization. For many students with learning needs, problems with retention and generalization are the two most frequently reported weaknesses.

Compounding these potential disadvantages are problems with feasibility and logistics. For teachers, each time a student changes units or objectives, the progress monitoring test is different. If formative evaluation is used, students will be at different points in the curriculum sequence and teachers may lose track of which students’ progress should be monitored on which test. Fortunately, computerized mastery monitoring such as the method employed by *Jamestown Reading Navigator* can reduce the feasibility and

logistics complications by effectively compiling which skills any particular student has mastered or not mastered. High instructional validity is attained, but potential weaknesses are inherent in using mastery monitoring alone. These limitations can threaten conclusions about student learning.

However, when teachers use general outcome measurement, they are testing students in a broader achievement domain (e.g., reading, spelling) using standard measures of equal difficulty on a critical single-test behavior. CBM is a type of general outcome measurement. In CBM reading, students are assessed using Maze passages or an oral reading measure (Reading Curriculum-Based Measurement; R-CBM). For the Maze passages, students read a portion of grade-level text silently for 3 minutes and select one of three choices for systematically deleted words. Only one of the choices preserves meaning. For R-CBM students read aloud for 1 minute and the number of words read correctly are counted. Students are not tested on specific units or objectives, but on content that represents the broader domain of Grade 4 or Grade 4 reading.

Although teachers employ general outcome measurement, less frequently, it has the strongest empirical support with clear evidence of its impact on student learning (Fuchs & Deno, 1991; Fuchs & Fuchs, 1999). And while its weakness is poor instructional validity (i.e., it is not diagnostic), its advantages are that it continuously assesses for retention and generalization and is logistically feasible because its assessment methods and content remain consistent.

How Does CBM Work?

As a member of the general outcome measurement family, CBM works when students read graded materials of equal difficulty over time. The reading CBM measures are a sample of standardized and short-duration tests (1–5 minutes) used by educators to evaluate their instructional interventions in the basic skills of reading, mathematics, spelling, and written expression (Shinn, 1989; Shinn, 1998). CBM was developed by Stanley Deno and others at the University of Minnesota Institute for Research on Learning Disabilities (IRLD) more than 25 years ago to give teachers simple tools to write IEP goals and monitor progress (Deno, 1985, 1986, 1995, 2003; Deno & Mirkin, 1977). More than a quarter century of scientific evidence has demonstrated that CBM provides reliable and valid measures of *general achievement* (e.g., general reading achievement) that are sensitive to student improvement and that improve student achievement when used to monitor progress (Deno, Fuchs, Marston, & Shin, 2001; Fuchs, 1986; Fuchs & Fuchs, 1999, 2004).

Where do these simple and short tests fit in an era where test construction has become highly sophisticated and students take a variety of significantly longer and more comprehensive tests each day? In the mid-1980s CBM researchers and trainers gathered to find a simple way to communicate the intent

of CBM because it was so different from standard educational practice. The outcome of the discussion was the big idea that CBM can be represented by the mnemonic *DIBS*, or *dynamic indicators of basic skills*. Basic skills are the broad academic domains vital to school success. When DIBELS was developed years later, it expanded on the DIBS mnemonic and replaced Basic Skills with Early Literacy Skills (ELS).

CBM is *dynamic* in that the measures are designed to be sensitive to the short-term effects (4–10 weeks) of instructional interventions, to assess change. Because the measures are sensitive to improvement, they make excellent tools for progress monitoring, whether it is required by an IEP annual goal, a short-term goal as part of a Response-to-Intervention (RTI) process, or as part of progress monitoring of all students. Because the tests are short (1–5 minutes) in addition to being sensitive to improvement, they can be administered frequently, even one to two times per week, to allow learning to be assessed routinely without a significant loss of instructional time or personnel resources.

The *I* in DIBS is the most controversial. CBM measures are designed to serve as *indicators* of an achievement area. This judgment must be made by accumulated *construct validity evidence*. The selection of the specific CBM test behaviors, scoring methods, and test durations is the result of an ongoing program of research that demonstrates its usefulness in making problem-solving decisions. Beginning in 1978, an extensive program of federally funded research was undertaken to identify key behaviors that would meet the technical requirements and serve as simple, but general, measures of academic performance.

Most of the research has been conducted on CBM reading; see Marston (1989) and Good and Jefferson (1998) for extensive summaries. Evidence has been garnered with respect to construct validity (Fuchs & Fuchs, 1992; Fuchs, Fuchs, Hosp, & Jenkins, 2001; Hosp, 2005; Shinn, Good, Knutson, Tilly, & Collins, 1992) as well as traditional conceptions of criterion-related validity, including correlations with other accepted published measures (Deno, Mirkin, & Chiang, 1982; Fuchs, Fuchs, & Maxwell, 1988) and teacher ratings (Fuchs, Fuchs, & Deno, 1982).

CBM has been validated as an effective tool for goal setting and progress monitoring and for improving achievement in students with reading needs. Numerous studies by Lynn Fuchs and Doug Fuchs (Fuchs, 1998; Fuchs, Deno, & Mirkin, 1984; Fuchs, Fuchs, Hamlett, & Ferguson, 1992; Fuchs, Fuchs, Hamlett, & Stecker, 1991; Fuchs, Hamlett, Stecker, & Ferguson, 1988) have shown that when teachers use CBM to write data-based goals, monitor the effects of their instructional programs, and adjust their interventions when the data show few positive effects, student achievement improves. Typical effect sizes, the standard deviation gains in achievement attained by members of the treatment group versus controls, exceed .70 (Fuchs, 1986; Fuchs & Fuchs, 2004).

Summary

Jamestown Reading Navigator provides teachers with contemporary formative progress monitoring tools with which to evaluate the progress of their students. In addition to providing mastery monitoring tools that are computerized to maximize instructional validity and reduce logistics complexity, teachers are provided with Curriculum-Based Measurement (CBM), a scientifically based general-outcome tool that has consistently resulted in impressive achievement gains in students with learning needs.

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