

NATIONAL CENTER ON ACCESSING THE GENERAL CURRICULUM

NCAC

Curriculum-Based Evaluations

Effective Classroom Practices Report

This report was written with support from the National Center on Accessing the General Curriculum (NCAC), a cooperative agreement between CAST and the U.S. Department of Education, Office of Special Education Programs (OSEP), Cooperative Agreement No. H324H990004. The opinions expressed herein do not necessarily reflect the policy or position of the U.S. Department of Education, Office of Special Education Programs, and no official endorsement by the Department should be inferred.



Curriculum-Based Evaluations

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Introduction

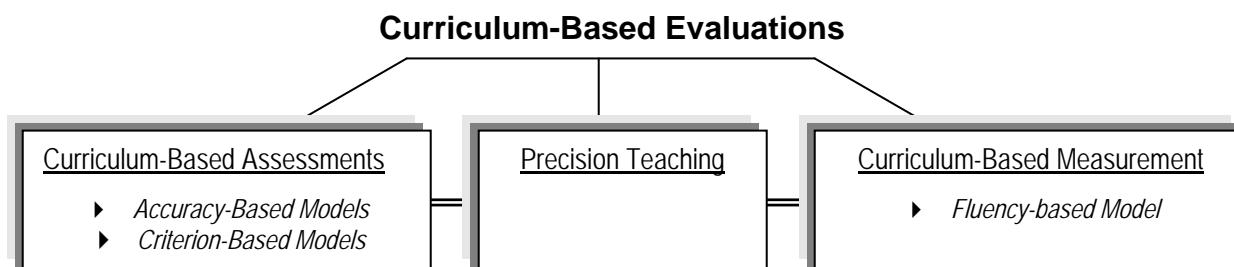
Academic assessment is a long-standing tradition in education. Assessment usually involves measurement of student progress for the purpose of informing. One level of informing is identification or eligibility decision-making, a second level is that of informing instruction. Traditional assessment instruments have limitations which restrict their application for instructional program planning. Alternative assessment procedures appearing in educational literature in the last 20 years are Curriculum-Based Evaluations (CBE). Whereas standardized commercial achievement tests measure broad curriculum areas and/or skills, CBE measures specific skills that are presently being taught in the classroom, usually in basic skills. Several approaches to CBE have been developed. Four common characteristics exist across these models:

1. The measurement procedures assess students directly using the materials in which they are being instructed. This involves sampling items from the curriculum.
2. Administration of each measure is generally brief in duration (typically 1-5 mins.)
3. The design is structured such that frequent and repeated measurement is possible and measures are sensitive to change.
4. Data are usually displayed graphically to allow monitoring of student performance.

Typically, CBE is used in the subject areas of math, reading and spelling, but has also been found effective in other areas. CBE can be used in general education as well as special education classroom settings. It became clear in the 1985 special issue publication of *Exceptional Children* journal that there are different approaches to assessing students using curriculum materials. The two most prominent features that differentiate the CBE models are (a) the purpose of the assessment, and (b) research support for testing procedures and decision-making.

Definition

Curriculum-Based Evaluations are best defined by Deno (1987) as “any set of measurement procedures that use direct observation and recording of a student’s performance in a local curriculum as a basis for gathering information to make instructional decisions” (in Shinn, 1989; p. 62).



The Table below provides a brief description of types of Curriculum-Based Evaluations. The left hand column lists characteristics common to these measurement systems. Readers may refer to the table to make comparisons and contrast these evaluation tools.

DIBELS

Characteristics	Curriculum-Based Assessment (CBA)	Precision Teaching	Curriculum-Based Measurement (CBM)	
Authors	Paolucchi-Whitcomb; Gickling; Blankenship; Idol-Maestas	Lindsley et al.	Deno et al.	
Sampling Plan	Items selected from the identified curriculum domain	Repeated measures based on fluency & accuracy	Items sampled from the identified curriculum domain & randomly selected for measure	Items are author selected and randomly sequenced for the 5 literacy subset measures
Application	Evaluation and instructional planning	Evaluation and instructional planning	Measures used to aid eligibility, placement and diagnosis. Provides <i>multi-referenced</i> data sources	Designed to identify literacy skills difficulties and provide teachers with information to reduce the risk of reading problems
Assessment Focus Areas	Basic skills: reading and math	Broad focus of measurement areas, basic skills, behavior, etc.	Basic skills: reading, spelling, math, written expression - Critical thinking skills	Assess early reading skills
Target grade level	Grades 1-6	Grades K-12	Grades K-8	Grades preschool, kindergarten, first, second and third grade
Development	Teacher made	Teacher made	Teacher made using guidelines	Sampling of items created by authors versus a curriculum of instruction
Scoring	Teacher scored	Teacher scored	Standardized administration & scoring. Some simultaneous administration and scoring	Standardized administration & scoring. Simultaneous administration and scoring. Fluency measures
Results/Display	Varies, teacher preference	Graphic display on semi-logarithmic charts	Uses <i>graphs</i> to display results. Guides <i>many</i> educational decisions	Graphically or numerically displayed to view individual, class or normative information
Response Mode	Students either answer out loud to teacher, write or select response	Production responses	Generates <i>production</i> responses	Production responses
Administration	Teacher administers test individually to each student	Teacher administers test individually to each student	Standardized administration and scoring procedures Produces <i>reliable</i> and <i>valid</i> data	Each measure from DIBELS is teacher administered for a 1 or 2 minute time period
Frequency	Multiple times to assess learning	Multiple measures	Is <i>repeated</i> over time. Long duration (weeks to a year)	Twice yearly (fall/winter, spring) to monitor literacy skills

Identifying Components/Features

Curriculum-Based Assessment

Accuracy-Based CBA

Gickling and several associates are noted to have pioneered the movement of tying assessment directly to the curriculum. The premise of this approach focuses on testing students on the relationship between what is known and what is unknown. The model is task analytic in nature, focusing on teacher analysis of the demands and linking back to instructional materials. The major focus of the assessment procedures is special education instructional planning. The developers' goal is to provide teachers with a level of specificity about student performance so as to pinpoint where to begin instructionally. Thus teachers are able to eliminate any instructional mismatch between learner skills and curriculum demands.

Criterion-Referenced Models

The work of Blankenship (1985) and Idol (1983) exemplifies this model of Curriculum-based assessment. Similar to Gickling's accuracy-based model, the primary purpose of these measures is to provide teachers with information for instructional considerations. As Blankenship (1985) stated "The essence of the approach is the linking of assessment to curriculum and instruction" (p. 234). The process for development and use of the measures begins by identifying/writing curriculum objectives. This is followed by selection of items from the curriculum to include in the measure. Then a performance level or criterion is established. Finally, students are tested for mastery of each objective. Measures have been researched and tested in the domains of math, reading, spelling, science, dictionary skills, direction following, and use of study skills. Specific measurement procedures and data collected vary depending on the academic area and objective evaluated. This model of CBA is primarily designed for continuous assessment of short-term objectives.

Precision Teaching

Ogden Lindsley developed Precision Teaching beginning in 1964. It is not typically referred to as CBA, but it has many of the same characteristics inherent to curriculum-based evaluations. Precision Teaching has its roots in free-operant conditioning laboratories. Free operant means that "students are free to respond at their own pace without having restraints placed on them by the limits of the materials or the instructional procedures of the teachers" (Lindsley, 1990b, p. 10). Precision teaching is best described as a tool for "basing educational decisions on changes in continuous self-monitored performance frequencies displayed on 'standard celeration charts'" (Lindsley, 1992a, p. 51). As such, it does not prescribe what should be taught or even how to teach it: Precision Teaching is not so much a method of instruction as it is a precise and systematic method of evaluating instructional tactics and curricula. Curriculum items are used for assessment in this approach also. There is a much broader focus on the subject areas tested using the Precision Teaching method. Areas such as independent living skills as well as social and academic behavior can be assessed. The guiding principles of Precision Teaching include, (a) the focus on directly observable behavior, (b) frequency as a measure of performance, (c) the standard celeration chart, and (d) the learner knows best.

Curriculum-Based Measurement

Deno, Mirkn, and colleagues at the University of Minnesota, Institute for research on Learning Disabilities (IRLD), studied potential measurement procedures of curricular measures beginning in the late '70s throughout the '80s and continue to this day. Curriculum-Based Measures (CBM) were developed to function as “academic thermometers” to monitor students’ growth in basic academic skills domains. They are a set of simple, short-duration fluency measures most frequently applied to reading, spelling, written expression, and mathematics. Criteria that best describe CBM include that measures are: (a) tied to the curriculum of instruction, (b) of short duration to facilitate frequent administration, (c) focus on direct and repeated measures of student performance, (d) capable of development of multiple forms, (e) inexpensive to create and produce, and (f) sensitive to student achievement change over time (Marston, 1989). Additionally, CBM provides teachers with data that are useful for a number of educational purposes including eligibility determination, screening, and multi-referenced decision-making (i.e., individual, criterion and norm referencing). A significant characteristic of CBM is the development of measures that have high technical adequacy. Thus, the measures are devised with standard development, administration and scoring procedures to maintain high reliability and validity.

Dynamic Indicators of Basic Early Literacy Skills

Roland Good and Ruth Kaminski at the University of Oregon developed Dynamic Indicators of Basic Early Literacy Skills (DIBELS) to assess students’ early literacy skills. Based on the research of early literacy, the authors developed measures to evaluate student mastery/knowledge of early indicators of reading acquisition. These tools include five measures to determine if a student is in need of additional instructional support. The first measure is Initial Sounds Fluency (ISF) where students are shown 12 pictures and are asked to identify the beginning sound. ISF is used primarily with kindergarteners as it measures the most basic literacy skills. Letter Naming Fluency (LNF) is the second measure in which students are given a page containing upper- and lower-case letters. Students have to name as many letters as they can. The third measure, Phoneme Segmentation Fluency (PSF) is one in which students hear distinct words and are asked to verbally produce the individual phonemes. The fourth measure is Nonsense Word Fluency (NWF) where students see written VC and CVC nonsense words. They are asked to verbally produce the individual sound of each letter or read the whole word. The fifth measure, DIBELS Oral Reading Fluency (ORF), consists of a standardized set of reading passages. Students are given one minute to read the passage out loud. Typically, students are tested once in the fall and once in the spring to determine what instructional modifications should be made based on the results of the measures.

Implications for Access to the General Curriculum

Many of these Curriculum-Based Evaluation systems had their beginnings in the special education domain. In some cases, research began specifically in the self-contained special education classroom. In others, the roots of the measurement system sprang from the desire to most appropriately integrate students with disabilities into the general education classroom. The tools described here under the name of Curriculum-Based Evaluations have all had important roles and made contributions in research and practice in the general education class.

Initially, these tools provided an alternative to standardized norm-referenced measures. In many cases, the use of the tools was to more accurately provide information to teachers at the eligibility and planning stages in special education. However, several forms of CBE have repeatedly been found as valuable tools for monitoring the progress of students in the curriculum of instruction, most often the general education curriculum (specifically, CBM and PT). Using the progress-monitoring device, teachers are able to formatively evaluate student performance in an academic skill area, specific to their curriculum of instruction. Formative evaluation allows teachers to evaluate the adequacy of skills development. If progress is deemed inadequate, interventions should be implemented. On the other hand, if students perform beyond expectations, or criteria, the teacher has the information to make curriculum adjustments and challenge the student in their appropriate level (zone of proximal development).

Evidence of Effectiveness

Decades of research have been conducted on the varying forms of Curriculum-Based Evaluations presented here, more than can be reported here. This section serves as an overall summary of research findings. As an illustration of application and acceptance, several states have mandated evaluations using CBA as a component of the pre-referral intervention process (e.g., Louisiana, Pennsylvania). Research has been conducted on the tools themselves with applications to both special and general education settings. In general, these measures have been most frequently applied and research for students with disabilities, regardless of placement.

Curriculum-based assessment

Other than in content validity, there is little evidence regarding the technical adequacy for accuracy-based CBA measures. This is most likely a result of the process prescribed by the authors—there is no standardized procedure. Gickling and Havertape state, “We prefer the data be collected and recorded systematically but do not have a preference about how this is to be done” (1981, p. 21).

Precision teaching

Lindsley and his colleagues have conducted thorough research on the implementation and usage of Precision Teaching. The majority of research studies surround the question of student change over time in specific areas related to fluency and accuracy. As with CBM, additional research has been conducted in which the tools of precision teaching have been used as dependent measure. One of the most widely cited successful applications of Precision Teaching was conducted in Montana during a four year span, in which teachers incorporated 20 to 30 minutes of daily Precision Teaching into a curriculum that was otherwise identical to other schools in the district. Students receiving the Precision Teaching advanced 19-40 percentile points higher on the Iowa Test of Basic Skills than control students (Binder & Watkins, 1990).

Curriculum-based measurement

Shinn estimated that over 150 articles have been published since 1988 on the evaluation system known as Curriculum-Based Measurement (1998). Initially, the focus of this research was on the technical adequacy and use of CBM as a viable and accurate tool for classroom teachers to measure long term objectives of students with and without

disabilities. Research has been conducted on applications of CBM in various settings, special and general education, as well as integrated settings. Many researchers have studied the potential of computer applications of CBM these include, computer development of multiple measures, computer scoring, and computer graphing of student performance. Similarly, application of CBM as a diagnostic tool has been studied to help teachers with error analysis and in overall teacher decision-making. More recently, CBM has been identified as dependent measure in research studies such as interventions, curriculum studies, and inclusion issues (Shinn, 1998).

Links to Learn More About...

▶ Curriculum-Based Assessment & Curriculum-Based Measurement

CBA and CBM Compare and Contrast

www.teacherstoolkit.com/classroom1.htm

CBA and CBM are compared and contrasted on this Web site. This is a good site for educators who are new to Curriculum-Based Evaluation as basic differences between CBA and CBM are described. A few articles and books are referenced.

CBA Techniques

www.johnvenn.com/assessment.htm

The author of this site, John Venn, is a professor of education at the University of North Florida and is a good resource for teachers who are interested in implementing CBA in their classrooms. Venn lists in-class assessment and alternative grading strategies. He stresses how CBA techniques are quick, easy and that any teacher can use them.

CBM Manual for Teachers

www.interventioncentral.org/pdfdocs/cbaManual.pdf

This Web site was created by Jim Wright from Syracuse city schools. This manual was designed for use in a CBM teacher-training course. Wright covers many common questions about CBM and explains the answers. He uses a number of graphs to show students' progress over time.

Extended Reading, Writing and Mathematics

www.edprogress.com/

This Web site offers videos, reporting systems and assessment software to educators. The Extended Reading, Writing and Mathematics (ExRWM) off grade assessments are available for teachers to order.

National Consortium on Oral Reading Fluency (NC-ORF)

nc-orf.uoregon.edu/

NC-ORF is a joint effort between researchers at the University of Oregon, Texas A & M University and the Center for Applied Special Technology. A number of articles regarding improving students' verbal fluency are listed. Resources on how to graph, administer and score oral reading fluency are also available.

Products Online

<http://www.edformation.com/>

This Web site offers a variety of products available for purchase including AIMSweb Benchmark, AIMSweb Progress Monitor, Standard Reading Assessment Passages and AIMSweb Training Materials. Software demonstrations for the AIMSweb Benchmark and Progress Monitor are available online.

Stanley Deno's Homepage from the University of Minnesota

www.education.umn.edu/EdPsych/Faculty/Deno.html

Deno explains how CBM works and testimonials from educators are used to illustrate how they have implemented CBM into their classrooms. Select recent publications from 1997 to the present are also referenced on this site.

The National Association of School Psychologists Web site

www.nasponline.org/publications/cq276cba.html

In this article the authors, Matthew K. Burns, Lara L. MacQuarrie and Donna T. Campbell, explain some fundamental differences between curriculum-based assessment and curriculum-based measurement. A number of articles on CBM/CBA are referenced.

► About DIBELS**DIBELS Benchmark Assessment Paper**

www.uoregon.edu/~rhgood/dibels_html/workshop/DIBELS_Handout_6.pdf

This is a DIBELS Benchmark Assessment Paper by Roland H. Good III and Cheri Cornachione. The authors discuss the big ideas in early literacy skills. A sample of schedules for assessment for kindergarten and first grade is provided. The authors explain the procedures for administering and scoring the measures. Many examples are included to help illustrate how these measures work in the classroom.

DIBELS—Official Site at the University of Oregon

dibels.uoregon.edu/index.php

This site provides a good introduction to DIBELS and explains reasons for using DIBELS in the classroom. DIBELS measures can be downloaded for free. There is a section labeled measures in which all five types of early literacy measures are discussed with regard to the levels and how to implement the measures in the classroom. Examples are given from grades kindergarten through third on how to use each specific measure.

Pilot Study Using DIBELS Measures

www.cpsboe.k12.oh.us/general/curriculum/earlylitrcy.html

The Cincinnati Public School District developed a pilot study where 400 teachers were trained in using DIBELS measures. This Web site describes how this district has successfully implemented DIBELS to improve early literacy. There are now 900 teachers in the district who are DIBELS-trained. Teachers are happy with the results and students are reported to have stronger reading skills. The scores on the Ohio 4th Grade Proficiency Test, taken in March 2001, were higher than the 2000 scores in all five subject areas.

Project Central

www.usf.edu/cbm/dibels.htm

Project Central offers training and measurement tools for academic success and assessment at the University of Central Florida. Various research studies in the effectiveness of DIBELS are presented. Some teachers in the central Florida area share their enthusiasm using DIBELS in their classrooms.

Roland Good at the University of Oregon

www.uoregon.edu/~rhgood/hmpage.htm

Roland Good is one of the leaders in the research and development of the DIBELS measurement structure. Various sites about early literacy skills are linked to this site including Early Childhood Research Institute on Measuring Growth and Development. The goal of this institute is to produce a measurement system to gauge the skills in children with disabilities. There is also a link to the DIBELS Web site at the University of Oregon.

► About Precision Teaching**All About Precision Teaching**

www.teonor.com

This site provides links to full-text articles on Precision Teaching. The man who developed Precision Teaching, Ogden Lindsley, has written a large number of these articles.

Athabasca University

<http://psych.athabascau.ca/html/387/OpenModules/Lindsley/introa.html>

This is the site for a psychology course on learning. A biography of Ogden Lindsley is provided, as is a brief history of Precision Teaching. Precision Teaching is defined and the guiding principles are discussed. Applications and exercises are helpful tools for educators who wish to employ PT in their classrooms.

Cambridge Center for Behavioral Studies

www.behavior.org/education/index.cfm

This is the Web site of Cambridge Center for Behavioral Studies in Concord, Massachusetts. The mission of this organization is to bring solutions from behavioral science to real-world challenges. The center is involved in finding successful teaching methods. Precision Teaching is one of the methods cited on this Web site. There are links to PT articles.

Implementation of Precision Teaching

www.haughtonlearningcenter.com/methods_subpage.html

The director of a program in CA, Elizabeth Haughton, has been a leader in PT for more than three decades. "Precision Teaching uses daily measures of each student's performance on every skill being taught to make decisions about teaching effectiveness, and to assess the effects of program changes on individual learning."

References

Bennet, D. E. & Davis, M. A., (2001). The development of a computer-based alternate assessment system. *Assessment for Effective Intervention, 26(3)*, 15-34.

The authors describe an alternate assessment system involving computerized software that helps teachers track student performance data. This system is used with students with moderate to severe disabilities.

Binder, C., & Watkins, C. L. (1990). Precision teaching and direct instruction: Measurably superior instructional technology in schools. *Performance Improvement Quarterly, 3(4)*, 74-96.

Blankenship, C.S., (1985). Using curriculum-based assessment data to make instructional decisions. *Exceptional Children, 52*, 233-238.

This article, like the Deno '85 article, are part of a special issue of *Exceptional Children* devoted to Curriculum-Based Assessment. Blankenship describes the essential features of CBA and provides suggestions for development. She places a special emphasis on describing how teachers can use CBA for curriculum placement, materials, and instructional procedures.

Deno, S. L., (1985). Curriculum-based measurement: the emerging alternative. *Exceptional Children, 52(3)*, 219-232.

Deno introduces CBM as an alternative assessment approach that is both valid and reliable. He discusses the advantages and disadvantages of informal observation and also standardized commercial achievement tests.

Deno, S. L. (1992). The nature and development of curriculum-based measurement. *Preventing School Failure, 36(2)*, 5-10.

In this article, Deno describes the uses of CBM in the classroom. He discusses the disadvantages of commercial achievement tests. Deno also compares CBM to other curriculum-based assessment approaches and notes the distinctions between CBM and CBA.

Deno, S. L., (1997). Whether thou goest...perspectives on progress monitoring. In J. W. Lloyd, E. J. Kameenui, & D. Chard. (Eds.) *Issues in Educating Students with Disabilities*. Mahwah, N.J.: L. Erlbaum Assoc.

Deno explains that typically the primary function of assessment is to sort students into groups for decision making purposes. He thinks that the primary function of assessment should be to track individual growth. This article focuses on two progress monitoring approaches called mastery monitoring (progress measurement) and general outcome measurement (performance measurement).

Elliott, J., Lee, S. W., & Tollefson, N. (2001). A reliability and validity study of the dynamic indicators of basic early literacy skills-modified. *School Psychology Review, 30* (1), 33.

Kindergartners who were identified at-risk for reading failure were tested using the DIBELS techniques of the letter naming fluency and the sound naming fluency to assess their literacy level.

Foegen, A., Espin, C. A., Allinder, R. M., & Markell, M. A. (2001). Translating research into practice: preservice teachers' beliefs about curriculum-based measurement. *Journal of Special Education, 34*(1), 226-236.

The authors conducted a study in which pre-service teachers were asked their opinions about the validity and utility of CBM. Subjects were shown one of two videotaped presentations on CBM. There were no significant differences between the two types of format, statistical or anecdotal. The subjects had more positive beliefs about the utility of CBM than of the utility of CBM.

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

The authors describe an approach for formulating individualized educational programs called aptitude treatment interaction (ATI). Through a meta-analysis, it was found that using ATI significantly increased mildly handicapped students' school achievement.

Fuchs, L. S., Fuchs, D., Hamlett, C. L., Phillips, N. B., & Bentz, J. (1994). Classwide curriculum-based measurement: helping general educators meet the challenge of student diversity. *Exceptional Children, 60*(6), 518-537.

This purpose of this study was to examine how effective CBM is in a general education mathematics class. The participants in the study were divided into three groups: CBM with classwide reports that summarize information and provide recommendations for instruction, CBM with reports but without recommendations and the control group (no CBM). The results show that the teachers who received reports and instructional recommendations had the students with the highest achievement.

Fuchs, L. S. & Fuchs, D. (1999). Monitoring student progress toward the development of reading competence: a review of three forms of classroom-based assessment. *School Psychology Review, 28*(4), 659-671.

The authors review three types of alternate classroom-based assessment used in monitoring student progress toward becoming competent readers. These types of classroom-based assessment include mastery measurement, CBM and DIBELS. The strengths and limitation of each type are discussed in detail.

Gickling, E. E., & Thompson, V. P. (1985). A personal view of curriculum-based assessment. *Exceptional Children*, 52(3), 205-218.

Gickling and Thompson look at the advantages of using CBA as an alternate to traditional assessment methods. The authors discuss limitations of standardized testing. The three central themes of CBA include the following: curriculum provides the most basic and meaningful avenue for classroom assessment; curriculum places explicit demands upon the learner; and curriculum must be controlled if academic success is to be achieved.

Green, S. K. (2001). Use of CBM oral reading in the general education classroom. *Assessment for Effective Intervention*, 26(3), 1-13.

Green examined the results of a fourth grade teacher's implementation of CBM in her general education classroom. In this study, oral reading performance was measured monthly and students and parents were notified on the student's progress. Three key elements were identified in the teacher's use of CBM; standardization, reduced time requirements and qualitative inferences.

Good, R. H. & Kaminski, R. A. (1996). Assessment for instructional decisions: Toward a proactive/prevention model of decision-making for early literacy skills. *School Psychology Quarterly*, 11 (4), 326-336.

Good and Kaminski provide a case study to illustrate how DIBELS is used to monitor student progress. Two measures, phonemic segmentation fluency and onset recognition fluency, are explained in great detail. The authors describe how the problem-solving model is used with the DIBELS model.

Gunn, B., Biglan, A., Smolkowski, K., & Ary, D. (2000). The efficacy of supplemental instruction in decoding skills for Hispanic and non-Hispanic students in early elementary school. *The Journal of Special Education*, 34 (2), 90-103.

This study measured oral reading fluency in 256 students in kindergarten, first and second grades. One group received supplemental reading instruction and the other group did not. The students were assessed in the fall of the first year of the study and also in the spring of the first and second year. In the spring of the first year, the students who received supplemental instruction performed better on word attack skills than the students in the control group. In the spring of the second year, the students in the supplemental instruction group performed better on word attack, word identification, oral reading fluency, vocabulary and reading comprehension.

Howell, K. W. & Nolet, V. (2000). Tools for assessment. In *Curriculum-Based Evaluation, Teaching and Decision Making*. 3rd Ed. Scarborough, Ontario: Wadsworth/Thompson Learning.

The editors describe how CBM is used in the curriculum-based evaluation process. CBM box plots and report cards are provided along with instruction for interpreting these data.

Idol-Maestas, L. (1983). *Special educator's consultation handbook*. Rockville, MD: Aspen.

Kaminski, R. A. & Good, R. H. (1998). Assessing early literacy skills in a problem-solving model: Dynamic indicators of basic early literacy skills. In M. R. Shinn (Ed.) *Advanced Applications of Curriculum-Based Measurement*. New York, NY: The Guilford Press.

In this chapter, Kaminski and Good explain some advances in early literacy intervention. They stress that applying the problem-solving model to DIBELS is integral to the assessment process. Kaminski and Good recognize six fundamental differences between DIBELS and CBM.

Lindsley, O. R. (1990b). Precision teaching: By teachers for children. *Teaching Exceptional Children*, 22(3), 10-15.

Lindsley's article is the leading article in a special issue of *Teaching Exceptional Children*. The creator and author presents the four founding policies of precision teaching. He then provides the reader with several contributions by teachers as to how they have implemented and used the results of the evaluation procedure, and as a result become for effective teachers.

Marston, D. B., (1989). A curriculum-based measurement approach to assessing academic performance: What it is and why do it. In M.R.Shinn *Curriculum-Based Measurement: Assessing Special Children*. New York, NY: The Guilford Press

Doug Marston has created this chapter in which clear explanations of Curriculum-Based Measurement is provided. Marston explains alternative testing models based on the curriculum. Additionally, the author addresses the issues of technical adequacy in assessments and the failures of traditional systems of evaluating student performance.

Shapiro, E. S. (1992). Use of Gickling's model of curriculum-based assessment to improve reading in elementary age students. *School Psychology Review*, 21(1), 168-176.

Shapiro discusses Gickling's model of CBA in relation to improving reading skills in elementary school students. Four case examples of elementary school students are presented to illustrate how CBA and the folding-in technique increase these students' level of reading.

Shinn, M. R. & Bamonto, S. (1998). Advanced applications of curriculum-based measurement: "Big ideas" and avoiding confusion. In M. R. Shinn. (Ed.) *Advanced Applications of Curriculum-Based Measurement*. New York, NY: The Guilford Press.

Shinn and Bamonto have written the initial chapter in the text and provide valuable background and historical information regarding Curriculum-Based Measurement. They address the components of the measurement system, big ideas about CBM as a dynamic indicator of progress, and a summary of important research that led to the development of CBM as it is used today. Research is ongoing as CBM continues to develop.

Shinn, M. & Marston, D. (1985). Differentiating mildly handicapped, low-achieving, and regular education students: a curriculum-based approach. *RASE*, 6(2), 31-38.

Shinn and Marston conducted a study of fourth, fifth and sixth graders in special education classes, Chapter 1 classes and regular education classes. They discuss how students are identified for eligibility to receive special education services and examine the students' academic performance between the three groups.

Shinn, M. Baker, S., Habedank, L., & Good, R. H. (1993). The effects of classroom reading performance data on general education teachers' and parents' attitudes about reintegration. *Exceptionality*, 4(4), 205-228.

The students in this study were given CBM in oral reading and maze scores. The authors evaluate teachers and parents attitudes regarding reintegration of special education children into the regular education classroom. Special education teachers also rated each student's readiness to reintegrate into the regular education classroom.

Smith, S. B., Baker, S., & Oudeans, M. K. (2001). Making a difference in the classroom with early literacy instruction. *Teaching Exceptional Children*, 33 (6), 8-14.

There has been a considerable amount of research on developing early literacy, but there have not been many effective methods to help students develop literacy skills. Smith, Baker and Oudeans state that two themes must be present in a classroom for change to take place. The first theme is that the teacher should acquire a deep instructional understanding of the rationale for the changes that are being considered. The second theme is there should be a school-based assessment system that provides frequent information on how well the children are learning.

Thurlow, M. L., House, A. L., Scott, D. L., & Ysseldyke, J. E. (2000). Students with disabilities in large-scale assessments: state participation and accommodation policies. *Journal of Special Education*, 34(3), 154-163.

The authors review state policies regarding accommodations in large-scale assessments that are available to students with disabilities. It was found that states typically offer more accommodation on criterion-referenced tests than norm-referenced tests.

Tindal, G. (1989). Curriculum-based measurement. In J. L. Graden, J. E. Zins, & M. J. Curtis (Eds.) *Alternative Educational Delivery Systems: Enhancing Instructional Options for All Students*.

This book chapter describes the characteristics of four different types of curriculum-based evaluation, which include the Illinois/Vermont Approach, the University of Washington Approach, the University of Nevada Approach and the University of Minnesota Approach. This is a benchmark paper on CBM and CBA. Different uses of CBM/CBA are also discussed.

Tindal, G. & Germann, G. (1985). Models of direct measurement in the determination of eligibility, monitoring of student progress, and evaluation of program effects. *B. C. Journal of Special Education*, 9(4), 365-382.

Two different measurement-evaluation systems, Precision Teaching and Data Based Program Modification are compared in this article. Determination of eligibility, monitoring student progress and evaluation of program effects are discussed in regards to each system.

Ysseldyke, J. & Olsen, K. (1992). The nature and development of curriculum-based measurement. *Preventing School Failure*, 65(2), 175-185.

Ysseldyke and Olsen describe different forms of alternate assessment and how teachers can implement them in the classroom. The authors discuss four methods to collect data: observation, recollection, record review and testing.