Annotated Bibliography of Selected Curriculum-Based Measurement Articles

Research has demonstrated that when teachers use curriculum-based measurement (CBM) to inform their instructional decision making, students learn more, teacher decision making improves, and students are more aware of their own performance (e.g., Fuchs, Deno, & Mirkin, 1984). CBM research, conducted over the past 30 years, has also shown CBM to be reliable and valid (e.g., Deno, 1985; Germann & Tindal, 1985; Marston, 1988; Shinn, 1989). The following is an annotated bibliography of selected CBM articles.

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

- Provides background on and illustrates the use of CBM in special education as an alternative to standardized tests and/or informal observation.

Deno, S. L., Fuchs, L. S., Marston, D., & Shin, J. (2001). Using curriculum-based measurement to establish growth standards for students with learning disabilities. *School Psychology Review, 30,* 507–526.

- Examines the effects of curriculum-based measurement on academic growth standards for students with learning disabilities (LDs) in the area of reading. The reading abilities of 638 learning disabled students in grades 1–6 were evaluated. Results show that rate-of-growth differences existed at first grade concerning students with learning disabilities and general education control students, but by fifth and sixth grades, a sharp drop in the learning slopes for general education control students resulted in virtually identical growth rates for the two groups. The observed reading progress was similar to results reported in several previous studies. Findings suggest that it is possible to set growth standards for both general and special education students using CBM.

Fuchs, D., Roberts, P. H., Fuchs, L. S., & Bowers, J. (1996). Reintegrating students with learning disabilities into the mainstream: A two-year study. *Learning Disabilities Research and Practice, 11,* 214–229.

- Reports a study that evaluated the short- and long-term effects of three variants of a case-by-case process for readying students to move successfully from resource rooms to regular classrooms for math instruction. Preparation for this transition included use of curriculum-based measurement and transenvironmental programming, each alone and in combination. Teachers using the more complex variants of the case-by-case process were more successful at moving students across settings and fostering greater math achievement and positive attitude change, especially while the students were still in special education. At 1-year follow-up, about half of the students either never were reintegrated or were moved to the mainstream temporarily, only to be returned to special education.

Fuchs, L. S., & Deno, S. L. (1991). Paradigmatic distinctions between instructionally relevant measurement models. *Exceptional Children, 57,* 488–501.

- Explains how CBM differs from most other forms of classroom-based assessment.

Fuchs, L. S., & Deno, S. L. (1994). Must instructionally useful performance assessment be based in the curriculum? *Exceptional Children, 61,* 15–24.

- Examines the importance of sampling testing material from the students' instructional curricula; concludes that sampling from the curriculum is not essential; and proposes three features critical to ensure the instructional utility of measurement.

Fuchs, L. S., Deno, S. L., & Mirkin, P. K. (1984). Effects of frequent curriculum-based measurement of evaluation on pedagogy, student achievement, and student awareness of learning. *American Educational Research Journal, 21,* 449–460.

- Examines the effects of repeated curriculum-based measurement and evaluation. Data indicate that when CBM is implemented, teachers' instructional decisions are influenced by students' progress, instructional structure increases, and students are more aware of goals and progress.

Fuchs, L. S., & Fuchs, D. (1992). Identifying a measure for monitoring student reading progress. *School Psychology Review, 58,* 45–58.

- Summarizes the program of research conducted to explore CBM reading measures other than reading aloud.

Fuchs, L. S., & Fuchs, D. (1996). Combining performance assessment and curriculum-based measurement to strengthen instructional planning. *Learning Disabilities Research and Practice, 11,* 183–192.

- Explores the coordinated use of performance assessment and curriculum-based measurement to help teachers plan effective instruction.

Fuchs, L. S., & Fuchs, D. (1998). Treatment validity: A unifying concept for reconceptualizing the identification of learning disabilities. *Learning Disabilities Research and Practice, 13,* 204–219.

- Summarizes a substantial portion of the research base on the technical features and instructional utility of CBM; and provides a framework for using CBM within a treatment validity approach to LD identification, within which students are identified for special education when their level of achievement and rate of improvement is substantially below that of classroom peers and when, despite intervention efforts, they remain resistant to treatment.

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,* 659–671.

- Describes and critiques three classroom-based assessment models for monitoring student progress toward becoming competent readers.

Fuchs, L. S., & Fuchs, D. (2000). Curriculum-based measurement and performance assessment. In E. S. Shapiro & T. R. Kratochwill (Eds.), *Behavioral assessment in schools: Theory, research, and clinical foundations* (2nd ed., pp. 168–201). New York: Guilford.

- Summarizes research on CBM of math computation, math concepts and applications, and math problem solving.

Fuchs, L. S., & Fuchs, D. (2002). Curriculum-based measurement: Describing competence, enhancing outcomes, evaluating treatment effects, and identifying treatment nonresponders. *Peabody Journal of Education, 77,* 64–84.

- Summarizes research on curriculum-based measurement within four strands: studies demonstrating the psychometric tenability of CBM; work showing how teachers can use CBM to inform instructional planning; research examining CBM's potential use in evaluating treatment effects; and work summarizing CBM's contribution to identifying children who fail to profit from otherwise effective instruction.

Fuchs, L. S., Fuchs, D., & Hamlett, C. L. (1993). Technological advances linking the assessment of students' academic proficiency to instructional planning. *Journal of Special Education Technology, 12,* 49–62.

- Summarizes the program of research conducted on computer applications for CBM.

Fuchs, L. S., Fuchs, D., & Hamlett, C. L. (1994). Strengthening the connection between assessment and instructional planning with expert systems. *Exceptional Children, 61,* 138–146.

- Summarizes the program of research conducted on expert systems used in conjunction with CBM to enhance teachers' capacity to use classroom-based assessment to improve planning and increase student learning.

Fuchs, L. S., Fuchs, D., & Hamlett, C. L. (in press). Using technology to facilitate and enhance curriculum-based measurement. In K. Higgins, R. Boone, & D. Edyburn (Eds.), *The Handbook of Special Education Technology Research and Practice.* Whitefish Bay, WI: Knowledge by Design, Inc.

- Describes a research program conducted over the past 18 years to examine how CBM technology can be used to enhance implementation.

Fuchs, L. S., Fuchs, D., Hamlett, C. L., Phillips, N. B., & Karns, K. (1995). General educators' specialized adaptation for students with learning disabilities. *Exceptional Children, 61,* 440–459.

- Reports a study that examined general educators' specialized adaptation for students with learning disabilities, in conjunction with peer-assisted learning strategies and curriculum-based measurement. Findings revealed that (1) teachers who were provided with support to implement adaptations engaged differentially in specialized adaptation, and their thinking about how they planned for their students with LDs changed and (2) although some teachers implemented substantively important, individually tailored adjustments, others relied on adaptations that were uninventive and limited.

Fuchs, L. S., Fuchs, D., Hamlett, C. L., & Stecker, P. M. (1991). Effects of curriculum-based measurement and consultation on teacher planning and student achievement in mathematics operations. *American Educational Research Journal, 28,* 617–641.

- Reports an experimental study contrasting CBM, CBM with expert systems, and standard treatment; results show the importance of helping teachers translate classroom-based assessment information via instructional consultation.

Fuchs, L. S., Fuchs, D., Hamlett, C. L., Thompson, A., Roberts, P. H., Kubek, P., & Stecker, P. S. (1994). Technical features of a mathematics concepts and applications curriculum-based measurement system. *Diagnostique, 19*(4), 23–49.

- Reports a study investigating the reliability and validity of a CBM system focused on the concepts and applications mathematics curriculum; results support the technical adequacy of the CBM graphed scores as well as the CBM diagnostic skills analysis.

Fuchs, L. S., Fuchs, D., Hamlett, C. L., Walz, L., & Germann, G. (1993). Formative evaluation of academic progress: How much growth can we expect? *School Psychology Review, 22,* 27–48.

- Reports normative information on CBM slopes in reading, spelling, and math expected for typically developing students.

Fuchs, L. S., Fuchs, D., Hosp, M., & Hamlett, C. L. (2003). The potential for diagnostic analysis within curriculum-based measurement. *Assessment for Effective Intervention, 28*(3&4), 13–22.

- Describes recent efforts to develop a reading diagnostic analysis to be used in conjunction with CBM, for informing teachers how to refocus their instruction to address individual needs.

Fuchs, L. S., Fuchs, D., Hosp, M., & Jenkins, J. R. (2001). Oral reading fluency as an indicator of reading competence: A theoretical, empirical, and historical analysis. *Scientific Studies of Reading, 5,* 239–256.

- Considers oral reading fluency as an indicator of overall reading competence. The authors examine theoretical arguments for supposing that oral reading fluency may reflect overall reading competence, review several studies substantiating this phenomenon, and provide a historical analysis of the extent to which oral reading fluency has been incorporated into measurement approaches during the past century.

Fuchs, L. S., Fuchs, D., Karns, K., Hamlett, C. L., Dutka, S., & Katzaroff, M. (2000). The importance of providing background information on the structure and scoring of performance assessments. *Applied Measurement in Education, 13,* 83–121.

- Reports development of a curriculum-based measurement problem-solving assessment system, reliability and validity data supporting use of that system, and effects of a study examining the effects of test-wiseness training on scores for low-, average-, and high-performing students.

Fuchs, L. S., Fuchs, D., Karns, K., Hamlett, C. L., Katzaroff, M., & Dutka, S. (1997). Effects of task-focused goals on low-achieving students with and without learning disabilities. *American Educational Research Journal, 34*(3), 513–544.

- Reports a study that examined the effects of a task-focused goals (TFG) treatment in mathematics, using curriculum-based measurement. CBM students reported enjoying and benefiting from CBM, chose more challenging and a greater variety of learning topics, and increased their effort differentially. Increased effort, however, was associated with greater learning only for low achievers in TFG without learning disabilities.

Fuchs, L. S., Fuchs, D., Karns, K., Hamlett, C. L., & Katzaroff, M. (1999). Mathematics performance assessment in the classroom: Effects on teacher planning and student learning. *American Educational Research Journal, 36*(3), 609–646.

- Reports the findings of a study examining teachers' use of a curriculum-based measurement problem-solving system. Teachers were assigned randomly to CBM or control conditions; teachers administered and scored three performance assessments at monthly intervals and planned instruction in response to the assessment feedback. Teachers' knowledge of performance assessment, their curricular focus, and their instructional plans were described. Outcomes on three types of problem-solving assessments for low-, average-, and high-performing students were assessed.

Germann, G., & Tindal, G. (1985). An application on curriculum-based assessment: The use of direct and repeated measurement. *Exceptional Children, 52,* 244–265.

- Presents a direct and repeated measurement and evaluation system for developing effective educational programs. Describes a continuous database across all educational decisions, including initial problem selection, program planning, program implementation and evaluation, and program certification.

Gersten, R., & Dimino, J. A. (2001). The realities of translating research into classroom practice. *Learning Disabilities Research and Practice, 16,* 120–130.

- Synthesizes key findings to assist in the translation of research into classroom practice. Provides guidelines for how effective instructional practices might be implemented, supported, and sustained in schools. Excerpts from a case study are presented to show how a research-based instructional approach translates into classroom practices in a local school district that tailors the approach to the realities of the local situation.

Hosp, M. K., & Hosp, J. (2003). Curriculum-based measurement for reading, math, and spelling: How to do it and why. *Preventing School Failure, 48*(1), 10–17.

- Provides a rationale for collecting and using CBM data as well as providing specific guidelines for how to collect CBM data in reading, spelling, and math. Relying on the research conducted on CBM over the past 25 years, the authors define what CBM is and how it is different from curriculum-based assessment. Authors describe in detail how to monitor student growth within an instructional program using CBM data in reading, spelling, and math. Reasons teachers should collect and use CBM data are also discussed.

Marston, D. (1988). The effectiveness of special education: A time-series analysis of reading performance in regular and special education settings. *The Journal of Special Education, 21,* 13–26.

- Studies the impact of regular and special education on students with mild disabilities by analyzing their slope of improvement on weekly CBM reading scores. The data suggest that special education is a significant educational intervention and that CBM data provide a useful evaluation tool. Also provides an analysis of the instructional environment in both the regular and special education settings.

Phillips, N. B., Hamlett, C. L., Fuchs, L. S., & Fuchs, D. (1993). Combining classwide curriculum-based measurement and peer tutoring to help general educators provide adaptive education. *Learning Disabilities Research and Practice, 8,* 148–156.

- Provides an overview of the math Peer Assisted Learning Strategies (PALS) methods for practitioners, with a brief summary of an efficacy study.

Shinn, M. R. (Ed.). (1989). *Curriculum-based measurement: Assessing special children.* New York: Guilford Press.

Stecker, P. M., & Fuchs, L. S. (2000). Effecting superior achievement using curriculum-based measurement: The importance of individual progress monitoring. *Learning Disabilities Research and Practice, 15,* 128–134.

- Examines the importance of designing students' programs based on individual progress-monitoring data, using curriculum-based measurement. Results indicate that students for whom teachers tailored instructional adjustments based on those students' own CBM data performed significantly better on a global achievement test than did their peers whose instructional adjustments were not based on their own assessment data.

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