Accelerating Student Learning in Kindergarten Through Grade 3:

Five Years of OSEP-Sponsored Intervention Research

Ingrid Oxaal, *U.S. Department of Education*

In this article the author provides the context for the 5 years of research conducted by the National Center on Accelerating Student Learning (CASL) and an introduction to key aspects of the work of the researchers. The following topics are discussed: methodology, student responsiveness to interventions, explicit and pragmatic instruction, implementation and adoption of interventions, and disseminating information about effective practices.

The principal investigators of the National Center on Accelerating Student Learning (CASL) at kindergarten through Grade 3 invited me to write an introduction to this special issue, which presents four articles summarizing four programs of work they have accomplished during the past 5 years. I am proud to have had the opportunity to associate with this stellar group of researchers. For many years, they have made important individual contributions to the field of special education. Working together to create CASL, they have developed an extraordinarily collaborative program of research. They regularly demonstrate their dedication to providing quality research in reading, writing, and mathematics to benefit all children, and particularly children with disabilities. The quality of collegiality that we have experienced during CASL's 5 years has been exceptional.

CASL was funded by the U.S. Department of Education, Office of Special Education Programs (OSEP), Research to Practice Division (RTP), in recognition of the need for early intervention research that cuts across both content domains and instructional strategies. The goal is to provide explicit and comprehensive instruction in mathematics, reading, and writing for children in Grades K through 3, especially for children with disabilities and those at risk for disabilities. National statistics indicating that students are not progressing adequately, the passage of the Individuals with Disabilities Act Amendments of 1997 (IDEA '97) mandating access to the general education curriculum for children with disabilities, and inclusion of students with disabilities in high-stakes testing require improvement in reading, writing, and mathematics instruction for children with disabilities.

Statistics on reading, writing, and mathematics indicate serious deficits in these subjects for many children. The 2003 National Assessment of Educational Progress (NAEP) reported that 37% of the nation's fourth graders failed to achieve at the basic level in reading and 23% were below the basic level in mathematics. Twenty-six percent of fourth graders were below basic in writing in 2002. Several researchers have documented that children reading below grade level by third grade continue that trend into high school (Francis, Shaywitz, Stuebing, Shaywitz, & Fletcher, 1996; Lyon, 1996; Torgesen & Burgess, 1998). Furthermore, according to the National Longitudinal Transition Study of Special Education Students (1995), between 1987 and 1990, 30% of secondary students with learning disabilities (LD) left school by dropping out or by being suspended or expelled. Because an estimated 80% to 90% of children with LD have been referred for special education services based on a reading skill disability (Fletcher et al., 2002; Kavale & Reese, 1992; Lerner, 1989), it is likely that many of these high school dropouts had reading skill deficits that often lead to poor self-esteem and motivation. Children with reading difficulties or at risk for reading disabilities should be identified well before the age of 9 to maximize successful intervention (Lyon, 1996). The Committee on the Prevention of Reading Difficulties in Young Children (1998) recommended that the federal government continue to fund research to increase the efficacy of reading instruction in kindergarten and the primary grades.

Mathematics problems are also widespread and persistent. In the 1997 International Evaluation of Educational Achievement, U.S. eighth graders performed more than 2 years behind children from the high-scoring countries (Stedman, 1997). For students with disabilities, the situation is even bleaker. More than half of students with LD have Individualized Education Program (IEP) goals in math (Kavale & Reese, 1992). Research illustrates that sixth graders with LD compute basic addition facts no better than nondisabled third graders (Fleischner, Garnett, & Shepherd, 1982) and that high school students with disabilities are, on average, 3.6 years behind ex-

Address: Ingrid Oxaal, U.S. Department of Education, Office of Special Education Programs, Research to Practice Division, 550 12th St., SW, Room 4154, Washington, DC 20202-2600; e-mail: Ingrid.Oxaal@ed.gov

pected grade-level performance (Blackorby, Chorost, Garza, & Guzman, 2003). Unfortunately, as with reading and writing problems, math failure begins early and persists throughout the school years (Carnine, 1991).

Thus, Lynn Fuchs and Doug Fuchs, at Vanderbilt University, joined forces with Karen Harris and Steve Graham, at the University of Maryland, and with Joanna Williams, at Columbia University's Teachers College, to design a center to systematically develop and test the effectiveness of comprehensive instructional interventions in reading, writing, and mathematics. An important related goal was to disseminate effective strategies to teachers and parents. The center has focused on such strategies and instructional features as peer-mediated learning, continuous progress monitoring, theme-based reading comprehension strategies, and self-regulated strategy development (SRSD); a common outcome of key interest is fluency, transfer, and maintenance of skills and abilities. Each of the researchers had conducted research using one or more of these strategies or features prior to the establishment of CASL. Because CASL researchers felt that more explicit, comprehensive, and integrated interventions were needed for students who struggle and for those with disabilities, they regularly convened to share knowledge about effective instructional strategies. Each year, they combined new features in their research to determine how to accelerate learning for students in the early grades. Although the researchers emphasize that no single approach is a panacea for promoting student academic success (Harris, Graham, & Mason, 2003; Williams, 1996), each of the components studied can contribute to effective teaching and learning.

The CASL program of research has also been shaped by several important goals, which include (a) conducting methodologically strong studies, (b) addressing students who are not responsive to interventions, (c) designing explicit and pragmatic instruction, (d) addressing implementation and adoption issues, and (e) disseminating information about effective practices. I briefly describe each of these below.

Methodologically Strong Studies

CASL researchers designed a systematic program of large-scale, classroom research using multiple methods, including randomized experimental group designs. They asked related questions, designed to inform practice or further research, that require qualitative or case study designs. The researchers also carefully monitored treatment fidelity, used the appropriate unit of analysis for their designs, and reported effect sizes in addition to statistical significance.

Students Unresponsive to Interventions

Even when implementation is adequate and statistical significance and meaningful effect sizes are demonstrated, interventions often fail to meet the needs of some students. Some of these students do improve their performance; however, they continue to fall far short of the expectations for their grade level. For example, Fuchs, Fuchs, Mathes, and Simmons (1997) demonstrated statistically significant effects for students with LD on a variety of reading measures; nevertheless, 2 of every 10 students failed to make substantial progress. Other studies have also demonstrated that not all students are equally responsive to intervention (Slocum, 1998). However disappointing, it is not surprising, given that students with disabilities have multifaceted problems, including skill deficits that affect their success in reading, mathematics, and writing; deficits in domain-relevant background knowledge; and poor self-regulation, metacognition, task persistence, and motivation. Seldom are interventions designed to focus in a comprehensive way on the multifaceted difficulties experienced by many children with and without disabilities. To reach these students, CASL researchers, during the course of their 5-year research plan, combined research-based instructional components and strategies to increase comprehensiveness of their interventions that had already demonstrated statistical significance and meaningful effect sizes.

Explicit and Pragmatic Instruction

Some theories of teaching and learning postulate that students will develop abilities such as mathematical problem solving, comprehending expository text, writing for a variety of purposes, or decoding words through immersion in rich environments without explicit and scaffolded instruction. CASL researchers, however, have found that for many children, and especially children with learning and behavioral disabilities, explicit, scaffolded instruction is necessary and can and should be provided within the context of a meaningful learning environment (Harris et al., 2003; Williams, 2003). For example, Lynn Fuchs and Doug Fuchs, in the area of mathematics, and Joanna Williams, in reading comprehension, have designed explicit and scaffolded instruction in problem-solving strategies that enables students to learn to recognize the underlying meaning of the math problem or text structure. With such a pragmatic and explicit approach, student performance has improved. Likewise, Karen Harris and Steve Graham have developed a set of self-regulation and composition strategies that help students not only to improve their writing skills but also to improve performance in many other classes and settings. These writing and self-regulation strategies are taught as explicitly and with as much support as students need until they can use them independently.

Implementation and Adoption of Interventions

Interventions may be shown to be effective with children during a study, but this does not automatically ensure that the

same effects will be achieved when implemented by teachers in their own classrooms without researcher support. Teachers may not accept interventions with procedures that are complex and require more training than is available, or they may not like particular critical aspects of an intervention and therefore omit them. Classroom settings are often not organized to support implementation. Thus, CASL researchers included teachers in the development of interventions to help ensure that the interventions would be acceptable to the teachers who would ultimately be expected to implement them. Otherwise, interventions may not be adopted, and even if they are, they will have little probability of accurate implementation (Fuchs, Roberts, Fuchs, & Bowers, 1996). Further, special and general education teachers, rather than project personnel, have implemented the interventions in their own classrooms. CASL researchers supported teachers as they learned to use new interventions, and they obtained teacher and student feedback to ensure that teachers used the strategies with integrity and found them acceptable and helpful.

Disseminating Information About Effective Practices

An extension of the CASL researchers' collaboration with teachers has been their attention to enhancing a link between their research and practice. Although disseminating information to teachers and schools is not the primary focus of a research center, both RTP/OSEP and CASL seek to ensure that knowledge about effective interventions and how to use them gets out to teachers so that these interventions can be implemented more broadly in classrooms across the nation. This information has been disseminated in a variety of ways, including through the CASL newsletter, quarterly articles in *Teaching Exceptional Children,* the CASL Web site at www.vanderbilt.edu/CASL (which includes free manuals and articles that can be downloaded or ordered, as well as the CASL newsletter in downloadable format), conference workshops and presentations, ongoing interactions with teachers at the project schools, and collaboration with other OSEP-sponsored projects that provide technical assistance and information.

The strategies, instructional features, and themes that are described here delineate the programmatic focus CASL has maintained in research on reading skills, reading comprehension, writing, and mathematics. Each of the articles in this special issue focuses on one of CASL's four research programs, highlighting the findings of 5 years of research. Joanna Williams summarizes the research she has completed on narrative and expository text comprehension. Doug Fuchs and Lynn Fuchs describe a series of studies focusing on reading skills as well as narrative reading comprehension in Grades K through 2. Steve Graham and Karen Harris provide an overview of their experimental and descriptive research on spelling, handwriting, and composing, and Lynn Fuchs and Doug Fuchs summarize CASL's mathematics research program that focused on mathematical problem solving.

NOTE

The opinions expressed herein do not necessarily reflect the policy of the U.S. Department of Education, and no official endorsement should be inferred.

REFERENCES

Blackorby, J., Chorost, M., Garza, N., & Guzman, A. (2003). The academic performance of secondary students with disabilities. In M. Wagner (General Editor), *The achievements of youth with disabilities during secondary school* (National Longitudinal Transition Study–2). U.S. Department of Education, Office of Special Education Programs. Retrieved March 20, 2004 from http://www.nlts2.org/pdfs/achievements-ch4.pdf

Carnine, D. (1991). Direct instruction applied to mathematics for the general education classroom. In J. W. Lloyd, N. N. Singh, & A. C. Repp (Eds.), *The Regular Education Initiative: Alternative perspectives on concepts, issues, and models* (pp. 163–175). DeKalb, IL: Sycamore.

Committee on the Prevention of Reading Difficulties in Young Children, the Commission on Behavioral and Social Sciences and Education, and the National Research Council. (1998). *Preventing reading difficulties in young children.* Washington, DC: National Academy Press.

Fleischner, J. E., Garnett, K., & Shepherd, M. J. (1982). Proficiency in basic fact computation of learning disabled and nondisabled children. *Focus on Learning Problems in Mathematics, 4,* 47–56.

Fletcher, J. M., Lyon, G. R., Barnes, M., Stuebing, K. K., Francis, D. J., Olson, R.K., et al. (2002). Classification of learning disabilities: An evidence-based evaluation. In R. Bradley, L. Danielson, & D. P. Hallahan (Eds.), *Identification of learning disabilities: Research to practice*. Mahwah, NJ: Erlbaum.

Francis, D. J., Shaywitz, S. E., Stuebing, K. K., Shaywitz, B. A., & Fletcher, J. M. (1996). Developmental lag versus deficit models of reading disability: A longitudinal, individual growth curves analysis. *Journal of Educational Psychology, 88,* 3–17.

Fuchs, D., Fuchs, L. S., Mathes, P., & Simmons, D. (1997). Peer-assisted learning strategies: Making classrooms more responsive to student diversity. *American Educational Research Journal, 34,* 174–206.

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.

Harris, K., Graham, S., & Mason, L. (2003). Self-regulated strategy development in the classroom: Part of a balanced approach to writing instruction for students with disabilities. *Focus on Exceptional Children, 35*(7), 1–14.

Individuals with Disabilities Education Act (IDEA) Amendments of 1997, P. L. 105–117, June 4, 1997.

Kavale, K. A., & Reese, J. H. (1992). The character of learning disabilities: An Iowa profile. *Learning Disability Quarterly, 15,* 74–94.

Lerner, J. W. (1989). Educational interventions in learning disabilities. *Journal of the American Academy of Child and Adolescent Psychiatry, 28*(3), 326–331.

Lyon, G. R. (1996). The future of children: Special education for students with disabilities. *Learning Disabilities, 6,* 54–76.

National Center for Education Statistics. (2003). *The nation's report card.* Retrieved March 24, 2004, from http://nces.ed.gov/nationsreportcard

Slocum, T. (1998, February). *Assessing the long-term effects of early direct instruction*. Paper presented at the sixth annual Pacific Coast Research Conference, La Jolla, CA.

SRI International. (1995). *The national longitudinal transition study: Summary of findings.* Retrieved March 24, 2004, from http://www.sri.com/policy/cehs/publications/dispub/nlts/nltssum.html

Stedman, L. C. (1997). International achievement differences: An assessment of a new perspective. *Educational Researacher, 26,* 4–15.

Torgesen, J. K., & Burgess, S. R. (1998). Consistency of reading-related phonological processes throughout early childhood: Evidence from longitudinal–correlational and instructional studies. In J. Metsala & L. Ehri (Eds.), *Word recognition in beginning reading.* Hillside, NJ: Erlbaum.

Williams, J. (1996, April). *Research and instruction in reading comprehension: Continuities and discontinuities.* Paper presented at the meeting of the American Educational Research Association, New York City.

Williams, J. (2003). Teaching text structure to improve reading comprehension. In H. L. Swanson, K. R. Harris, & S. Graham. (Eds.), *Handbook of learning disabilities* (pp. 293–305). New York: Guilford Press.