LEARNING DISABILITIES

According to the U.S. Department of Education, students with specific learning disabilities (SLD) account for nearly one half of students being served by special education under the Individuals with Disabilities Education Act (IDEA). There is a general consensus in educational and psychological literature that students with SLD have specific cognitive or psychological deficits that cause them to evidence academic deficits; however, the specific nature of these deficits has been highly debated. What is known, however, is that academic deficits that are a result of a learning disability are hidden, often lifelong, and at times may be profound. Students with SLD generally demonstrate deficits in one or any combination of three basic academic skill sets: reading, written language, and math.

This entry begins with an introduction to the current federal definition of learning disabilities with a short discussion related to the evolution of the federal definition over the past 30 years. Next, characteristics of students with SLD will be presented; specific information on learner characteristics and challenges for each subgroup of SLD (reading, written language, and math) will be provided. Lastly, common service delivery models will be discussed, and information on educational implications for students with SLD will be provided.

Past and Current Definitions

Federal Definition

Specific learning disability was first defined under IDEA in 1975. The initial definition of SLD was as follows:

> a severe discrepancy between achievement and intellectual ability in one or more of the areas: (1) oral expression; (2) listening comprehension; (3) written expression; (4) basic reading skill; (5) reading comprehension; (6) mathematics calculation; or (7) mathematic reasoning. The child may not be identified as having a specific learning disability if the discrepancy between ability and achievement is primarily the result of: (1) a visual, hearing, or motor handicap; (2) mental retardation; (3) emotional disturbance, or (4) environmental, cultural, or economic disadvantage. (USOE, 1977, p. G1082)

Since then, many scholars have criticized the 1975 SLD federal definition for several reasons. First, the definition does not indicate that learning disabilities can, for some individuals, occur over the life span. Second, it does not indicate that students with SLD represent a heterogeneous group of students, each with unique academic deficits and learning needs. Third, and perhaps most important, the requirement of a discrepancy between IQ and achievement has been highly debated. Furthermore, research conducted over the past 20 years has shown that the discrepancy model has weak validity and reliability for identifying students with SLD.

The Achievement-Discrepancy
Model of Identification

A main premise of the discrepancy model used in the determination of SLD is that the students who evidence a discrepancy between their IQ and achievement are distinct in cognitive processing than students who are solely low achievers in reading, math, or both. However, empirical research conducted since the 1975 federal definition has shown that there are no clear or significant differences in cognitive performance between discrepant students and those who are considered to be low achieving.

The use of cognitive assessments such as IQ tests have also been criticized by many scholars as inadequate, mainly because such approaches have not proven to be reliable or equitable across ethnic groups for correctly identifying students with learning disabilities. There has been little evidence to suggest that students who demonstrate a discrepancy between IQ and achievement have different developmental prognoses than children who are simply low achieving. Additionally, scholars have argued that focusing on IQ does not provide information about specific processing deficits or educational outcomes of students. Furthermore, IQ information does not provide relevant information regarding specific educational interventions for students who are having difficulties with reading or math.

Discrepancy models of identification have also been seen as inadequate in the way in which they have been implemented in the schools. Because of the nature of IQ tests, which in general require students to be of certain age, students are by and large not identified as SLD until middle or late elementary years. This model of identification has been called by many the "wait to fail" method, as it is difficult to identify students with a discrepancy between their intelligence and academic performance until they reach middle elementary grades. Once students reach these grades, it is difficult to implement programs that will help them "catch up" with their normal-achieving peers. Research has demonstrated that even very intense remedial interventions with this age group are not extremely successful. Not surprisingly, the "wait to fail" model does not readily allow for a closing in the achievement gap between normally performing students and those identified with learning disabilities. Instead, most students identified in middle elementary grades show very small gains in academic performance and remain in special education throughout their school career.

In sum, there are three critical problems associated with the IQ discrepancy model of identification:

1. Students are not identified early enough to receive effective intervention.

2. There are no meaningful differences between students who are identified with SLD and those identified as low achieving.

3. Intelligence tests do not provide information as to what intervention is necessary to remediate the students' reading difficulties.

Prevalence of Children
With Learning Disabilities

Nationally, the occurrence of children identified as receiving special education services has been reported as slightly less than 5% of the total number of school-age children. It is important to note, however, that within the general population of students with disabilities, the largest category comprises students with a specific learning disability; this subgroup constitutes approximately 50% of all students with disabilities. Furthermore, the rate of growth for this category has grown tremendously with the number of students identified with SLD, nearly tripling since 1975.

Response to Intervention

In an attempt to address these critical issues within identification, response to intervention has been suggested as an alternative to the IQ discrepancy model for SLD identification. Frank Gresham has defined responsiveness to intervention (RTI) as the change in behavior or performance as a function of an intervention. Over the past 20 years there has been a growing body of research showing the usefulness of the RTI model as both a diagnostic tool for SLD and an early prevention model for students who may be at risk for reading failure. In general, RTI research has focused on reading disabled populations. Many researchers have identified RTI as a valid way to operationalize and diagnose learning disabilities, more specifically, reading disabilities.

In essence, the core of RTI is effective instruction in the general education settings and consistent progress monitoring to determine students' response to the provided instruction. "Treatment resisters" are

students who do not respond to the provided high-quality instruction and are ultimately students who, after a series of decision-making processes, are identified for evaluation for special education services. Students with reading disabilities have been targeted for this model because decades of reading research has shown that prereading skills, such as phonological awareness, alphabet knowledge, and decoding, are essential for successful reading achievement in later elementary grades. This extensive line of research has identified early skills necessary for reading, which makes reading development and reading disabilities identification a natural match for RTI, a method that is grounded in early intervention and prevention of future learning difficulties.

No Child Left Behind

The reauthorization of the Elementary and Secondary Schools Act (No Child Left Behind Act of 2001, P.L. 107–110) has created an instructional environment with successful reading as the primary goal of early elementary school. For example, the Reading First program requires implementation of scientifically based reading instruction within a multitiered model of instruction in general education settings. These policy changes, coupled with the reauthorization of the Individuals with Disabilities Education Act (IDEA), have led to a shift in the definition of learning disabilities, as schools are no longer required to use the discrepancy model of identification. Instead, the wording reflects the following:

> In determining whether a child has a specific learning disability, the LEA *shall not* be required to take into consideration whether a child has a severe discrepancy between achievement and intellectual ability. (Section 614 (b)(6A)).

Further, the act states:

> In determining whether a child has a SLD, the LEA *may* use a process that determines if the child responds to scientific, research-based intervention as part of the evaluation procedures described in paragraphs 2 and 3 (of Section 614). (Section 614 (b)(6B)).

The reauthorized IDEA allows RTI data to be used in the identification and eligibility determination of students with SLD, essentially as an alternative to the discrepancy model. In addition, it allows school districts to allocate more funds for early intervening services for students who are not eligible for special education, but who have educational or behavioral needs that qualify them as at risk for school failure.

RTI models align with Reading First, in that they are designed around a three-tiered model of instruction, with tier 1 being high-quality, general education instruction for all students; tier 2 including supplemental instruction for student who are struggling; and tier 3, an even more intense intervention for students who are still nonresponsive after tier 2 instruction has been implemented. Students may be considered for special education if they are dually discrepant, that is, if they are performing below the level of their peers and their learning rate is lower than that of peers.

Characteristics of and Challenges Faced by Students With Specific Learning Disabilities

Reading Disabilities

In general, reading disabilities are divided into two levels: word-level disorders and text-level disorders. Word-level disorders are further divided into decoding disorders and fluency disorders. Text-level reading disabilities are related to reading comprehension difficulties. Furthermore, it has been demonstrated that reading disabilities are persistent and different from developmental lag of reading skills seen in some children. Additionally, the majority of children (74%) identified as reading disabled in third grade remain disabled in ninth grade.

Decoding Disorders

Word-level decoding disorders are often called *dyslexia* and generally manifest themselves in the deficiency in a person's ability to decode single words. Empirical literature suggests that word-level decoding disorders are caused by difficulties in *phonological processing*, that is, the ability to understand speech sounds (*phonemes*) and process the individual sounds to make words.

In general, decoding deficiencies lead to profound difficulties with reading and reading comprehension. Furthermore, it is suggested that students who are not able to decode words with ease have a difficult

time comprehending text, as the majority of their concentration is dedicated to decoding words and not understanding the meaning of the text.

Fluency Disorders

Fluency is the ability to read words accurately and quickly. The National Reading Panel defined *reading fluency* as "the ability to read a text quickly, accurately, and with the right expression." When readers are fluent, most words are recognized automatically; therefore, fluency disorders are often seen as a consequence of decoding difficulties. However, there is research to suggest that fluency disorders can be present when decoding disorders are present. Explanation for fluency disorders in the absence of decoding disorders are usually related to poor attention or poor allocation of cognitive resources.

Fluency is often seen as the bridge between decoding and successful comprehension of text, because if students can recognize words rapidly and with ease, more concentration can be spent on inferring meaning from text.

Comprehension Disorders

Comprehension is a specialized type of reasoning that is conditioned and bound by the content and cognitive requirements of written text. Comprehension requires that students construct coherent representations of text by rapidly recognizing words, accessing a network of semantic relations associated with these words, and, guided by syntax, detecting or constructing meaningful relationships among words. Comprehension requires a complex set of processes beyond processes that are required for accurate decoding and fluent word reading. Although accurate comprehension assumes fluent word reading, it is not necessarily sufficient for successful reading comprehension. There is some research to suggest that some students evidence comprehension disorders with an absence of decoding and fluency disorders.

Written Language

Writing

The literature is clear that the writing process is composed of three main subprocesses: planning, sentence generation, and revision. Students with weaknesses in writing may exhibit additional difficulties in tasks such as outlining in a logical sequence, composing simple to complex sentences, and integrating word-level writing to sentence or paragraph forms. Additionally, children with a writing disorder may evidence extremely poor handwriting; this may be attributed to the inability to perform the requisite motor movements, also known as *dysgraphia.*

Spelling

Students with an SLD may experience challenges in their ability to correctly spell words. This difficulty may be due to students being unable to merge the relationship between spoken and written language to improve their literacy development. The skill set of poor spellers may be improved, however, with explicit instruction of letter patterns and multiple opportunities for practice.

Math Disabilities

A math disability, or *dyscalculia*, refers to students who evidence conspicuously poor skills at using basic computational processes to solve equations, including mathematical thinking and problem-solving skills. The ability to successfully execute each of these skills requires the ability to successfully manipulate multiple processes, such as retrieval in computation and language-based tasks involved in problem solving.

Metacognition

Metacognition refers to one's awareness of how one thinks and how one monitors what one thinks. Unlike typical learners, students with SLD often display difficulties in monitoring their learning and utilizing strategies or problem-solving skills. This inability to know a large number of strategies and understand how to use them efficiently is a characteristic often experienced by students with SLD.

Instructional Approaches for Students and Educators

The settings within which students with SLD are educated, and the implementation of effective instructional approaches used, have been an area of great controversy over the years. Settings within which students with SLD may be educated include inclusive classes, resource support programs, separate class placement, and separate school placement. Additionally, there are several instructional recommendations

that have been validated in the literature to specifically address and improve skill deficits for students with SLD. These settings and instructional recommendations will be discussed in detail according to group type (early intervention, elementary and middle school levels, and secondary and transition level), and suggestions will be provided to provide necessary information for the improved academic successes of those students who, with the right supports in place, can learn.

Service Delivery Settings

Service delivery settings lie on a continuum, which ranges from highly supported and separate (separate class or school) to highly integrated with the general education (inclusive class). Support for students with disabilities being educated for as much of the school day as possible is protected by the IDEA least restrictive environment provision. This policy has been further improved to mandate that students with disabilities not only be included but also make progress in the general curriculum. Placement settings include the least restrictive placement, resource room, separate class, and, finally, separate schools. The least restrictive placement (most inclusive setting) is identified in the *Reports to Congress* as a "regular class" or where special education services are delivered to a student for less than 21% of his or her school day. Further down the continuum are more restrictive environments that include settings in which a student receives services outside of a general education classroom for more than 21% of the school day. These include a "resource room" placement where students receive services outside the general education classroom from 21% to 60% of the school day. Next is a "separate class" setting. This setting includes students who receive services outside of a general education classroom for more than 60% of their school day. Lastly, there is a separate school category. Although there is some evidence that may support students with disabilities being educated outside a general education classroom with instructional methods that may not be readily available in a general education classroom, evidence strongly supports the idea that students with learning disabilities be educated in a general education classroom for most of their school days.

Current figures report the educational placement of students with SLD include 49% of students in regular class 80% to 100% of their time, 37% of students in regular classes 40% to 79% of their time, 13% of students in regular class 0% to 39% of their time, and the remaining 1% in residential, separate facilities, or home or hospital programs.

Instructional Approaches

Much work has been done in the past few decades to contribute greatly to what is known about how to educate students with SLD. Joseph Torgesen specified that special education differs from general education for students with learning disabilities when it is more explicit, intensive, and supportive. This includes instructional approaches that are characterized as being explicit, carefully designed, and closely related to the area of instructional need (e.g., reading, spelling, math). Furthermore, many instructional approaches have been found to improve the academic performance of students with SLD. These include embedded learning opportunities of key skills with multiple exposures and opportunities for engagement, differentiated instruction that involves actually differentiating educational content, and learning strategies instruction to provide students with SLD the means to become independent learners requiring fewer instructional supports. Other instructional approaches include scaffolded instruction, guided practice, modeling, reciprocal questioning, and feedback during instruction. Instruction can be further extended with the use of graphic devices, visual and verbal devices, and memory devices. Variations in instructional grouping that have been found to be beneficial include cooperative learning, peer learning, and structured small-group practice. Continual student monitoring is critical. The information collected during student monitoring of learning should be used to guide and deliver further instruction. Following is a brief description of these interventions or teaching methods that have been found to be beneficial for students with SLD.

Teaching Methods

Scaffolded Instruction

Scaffolded instruction is a process engaged in between teachers and their students whereby student understanding of a new concept is improved on through thoughtful dialogue directed by his or her teacher. Teachers who practice scaffolded instruction aim to extend their students' knowledge by beginning with highly teacher-mediated instruction of new

concepts or materials, always moving toward more independent or highly student-contracted learning.

Guided Practice

Similar to scaffolded instruction, guided practice focuses on the teacher acting as an educational coach and builds on a specific strategy or skill that has been described and modeled by the teacher. This is an opportunity for the teacher to shift the focus of instruction from being heavily teacher-mediated to more student-directed learning.

Modeling

Modeling is an opportunity for a teacher to use a "think aloud" process of instruction of a new concept or skill. This process is where the teacher, using student language, motors through the completion of the task being taught. This process allows the students to hear, in their own language, how a skill is initiated and completion is self-regulated. Essentially, it allows for students with SLD to see and hear how good thinkers think. Furthermore, it lends itself to providing greater opportunities for students with SLD to internalize the requisite processes to successfully complete a task.

Reciprocal Questioning

Reciprocal questioning is a process engaged in by two or more individuals where mutual learning is facilitated in a cooperative learning environment. This process allows for students to ask and respond to questions with each other to further their learning. It also allows for the teacher to provide individual feedback while the other students are engaged in their activities.

Feedback

Feedback is an approach that allows teachers to check for understanding of the group or with an individual. Typically, feedback is provided during an instructional phase during which students are actually working on completing a skill or task. With feedback, the teacher is providing necessary guidance through dialogue to facilitate learning by helping students get past an area of challenge. It helps students to become "unstuck" should they be completing a task incorrectly. The information gathered during feedback is critical to both student and teacher, as it also serves to help the teacher focus the instruction to ensure learning by all.

Devices to Improve Learning

Various types of devices can be used to enhance the teaching of a particular skill or concept. Devices have been used by effective teachers for many years and are helpful across different levels of students with SLD. Devices allow for a student to construct a deeper understanding of the information, but they are not enough when used in isolation. Teachers need to be explicit in their discussion of devices as simply a means to the end, the end being greater understanding of the underlying concept.

Graphic Devices

Graphic devices allow for students to see a visual representation of an abstract or complicated concept. Graphic devices are widely used. Common forms include maps, graphs, or Web diagrams to display cause and effect, comparison and contrast, problem and solution, hierarchical relationships, and sequence.

Verbal Devices

Verbal devices can also be used to enhance learning by making an abstract concept more concrete. This can be done by explaining the concept using an analogy to what is already familiar to the student. Using an analogy allows for the student to see the relationships between what is known and what he or she is attempting to learn.

Memory Devices

Memory-enhancing devices, or *mnemonics*, help students with SLD to remember and also retrieve necessary information. Common uses of these devices can include helping students remember lists of information and definitions of words. An example includes remembering the names of the Great Lakes with the mnemonic HOMES (Huron, Ontario, Michigan, Erie, and Superior). What is critical for success with memory devices is linking the mnemonic to information being learned.

Grouping Variations

Variations in traditional models of instruction have been shown to be effective for students with SLD. These models include cooperative learning, peer-assisted learning, and structured small-group instruction. Cooperative learning provides opportunities for

peer interaction and group participation by having students come together to practice skills learned. Class-wide peer tutoring is a structured peer learning process. Each student has a role and is taught the responsibilities of the role of tutor or tutee. Specific content material is chosen by the teacher, and students are paired and work together in each of the roles. Small-group instruction has been shown to be beneficial for students in the early intervention model as well as those in elementary, middle, and high school. Evidence in these areas suggest that lower student-to-teacher ratios may improve learning outcomes for students with SLD. Furthermore, smaller groups may allow for better customization of instruction to the individual needs of the students involved because of reduced variability among the students.

Learning Strategy Instruction

Learning strategies are an effective way to teach students with SLD to become more effective learners. Essentially, strategy instruction is teaching students how to learn and then how to demonstrate what they know. Based on what is known today, educators may no longer assume that their students have the requisite sets of skills required to complete academic tasks before them. These tasks include taking tests; writing sentences, paragraphs, or essays; and organizing their information. There are three underlying principles of effective strategy instruction. These include, first, *cuing* a student to do something. Second, a strategy should provide a means to remember the steps required. Third, the strategy should address an area of difficulty for the student. For example, the paraphrasing strategy is a strategy designed to teach students to paraphrase written material for better comprehension. The strategy uses the mnemonic RAP (Read a paragraph, Ask yourself what is the main idea and what are the details, and Put the main idea and details in your own words). The sequence of the steps outlined in combination with the teaching procedures or stages of acquisition can help students become more independent in their reading and generalize the strategy use to other settings. Learning strategies help students with SLD become effective, efficient, and independent learners.

In sum, much work has been done to contribute to what we know about teaching students with SLD. It is important to note, however, that even with this knowledge, many students still do not respond to this instruction. This may be attributed to the rate and intensity of implementation or fidelity of the instruction. Providing supports for students with SLD can improve their ability to be successful at various skills and academic tasks and facilitate their independent learning. Furthermore, these academic supports can be implemented in a range of settings, the least restrictive being a general education-inclusive classroom.

Nanette S. Fritschmann and Emily J. Solari

See also *Diagnostic and Statistical Manual of Mental Disorders*; Disabilities; Individuals with Disabilities Education Act; Least Restrictive Placement

Further Readings

Bradley, R., Danielson, L., & Hallahan, D. (2002). *Identification of learning disabilities: Research to practice.* Mahwah, NJ: Lawrence Erlbaum.

Fletcher, J. M., Lyon, G. R., Fuchs, L. S., & Barnes, M. A. (2007). *Learning disabilities: From identification to intervention.* New York: Guilford Press.

Gresham, F. M. (2002). *Responsiveness to intervention: An alternative approach to the identification of learning disabilities.* Mahwah, NJ: Lawrence Erlbaum.

Lenz, B. K., Deshler, D. D., & Kissam, B. R. (Eds.). (2004). *Teaching content to all: Evidence-based inclusive practices in middle and secondary schools.* Boston: Pearson Education.

MacMillan, D., & Siperstein, G. (2002). Learning disabilities as operationally defined by schools. In R. Bradley, L. Danielson, & D. Hallahan (Eds.), *Identification of learning disabilities: Research to practice.* Mahwah, NJ: Lawrence Erlbaum.

McLeskey, J., Hoppey, D., Williamson, P., & Rentz, T. (2004). Is inclusion an illusion? An examination of national and state trends toward the education of students with learning disabilities in general education classrooms. *Learning Disabilities Research & Practice*, *19*(2), 109–115.

No Child Left Behind Act of 2001, P.L. No. 107–110, 115 Stat. 1425 (2002).

Vaughn, S., & Fuchs, L. S. (2003). Redefining learning disabilities as inadequate response to instruction: The promise and potential problems. *Learning Disabilities Research and Practice*, *18*(2), 137–146.

Vaughn, S., & Linan-Thompson, S. (2003). What is special about special education for students with learning disabilities? *The Journal of Special Education*, *37*(3), 140–147.

Zigmond, N., Jenkins, J., Fuchs, L. S., Deno, S., Fuchs, D., Baker, J., et al. (1995). Special education in restructured schools: Findings from three multi-year students. *Phi Delta Kappan*, *76*, 531–540.

Zipperich, M. (1995, January). Teaching web making as a guided planning to improve student narrative writing. *Remedial and Special Education*, *16*(1), 3–15.