Article

Remedial and Special Education
Volume 30 Number 5
September/October 2009 269-282

10.1177/0741932508315054
http://rase.sagepub.com
hosted at
http://online.sagepub.com

Literacy for Students With Severe Developmental Disabilities

What Should We Teach and What Should We Hope to Achieve?

Diane Browder
Susan Gibbs
Lynn Ahlgrim-Delzell
University of North Carolina at Charlotte
Ginevra R. Courtade
West Virginia University
Maryann Mraz
Claudia Flowers
University of North Carolina at Charlotte

The purpose of this article is to propose a conceptual foundation for early literacy instruction for students with severe developmental disabilities. The two primary outcomes in the conceptual model are (a) enhanced quality of life through shared literature and (b) increased independence as a reader. Guidelines are offered for promoting shared literature by increasing opportunities for accessing literature and teaching access skills to students. For increasing students' independence as readers, recommendations are provided on teaching the components of reading outlined by the National Reading Panel. The proposed model will help develop guidance on the strategies for literacy instruction for students with severe developmental disabilities.

Keywords: *literacy; literacy instruction; students with severe developmental disabilities*

Although teaching students to read has been a long-term goal of American education, the recent emphasis on literacy has been unprecedented. In the past decade, the No Child Left Behind (NCLB; 2002) legislation and the Reading First initiative placed strong emphasis on providing students with scientifically based reading interventions. During this era, reports such as *Beginning to Read: Thinking and Learning About Print* (Adams, 1990); *Preventing Reading Difficulties in Young Children* (Snow, Burns, & Griffin, 1998); and *Put Reading First: The Research Building Blocks for Teaching Children to Read* (National Institute for Literacy, 2001) have provided converging evidence that learning to read is influenced by foundational, emergent literacy skills. NCLB set the expectation that all students would show adequate yearly progress (AYP) in reading and language arts starting in third grade.

NCLB (2002) and subsequent reauthorization of the Individuals with Disabilities Education Act (2004) required that students with disabilities be included in large-scale assessments and school accountability for AYP. In contrast, students with significant cognitive disabilities, capped at 1% of students who may be classified as proficient, could demonstrate AYP through alternate assessments judged against alternate achievement standards

Authors' Note: Support for this research was provided in part by Grant No. H324K040004 of the U.S. Department of Education, National Institute for Education Science. The opinions expressed do not necessarily reflect the position or policy of the Department of Education, and no official endorsement should be inferred. Please address correspondence to Dr. Diane Browder, Department of Special Education and Child Development, University of North Carolina at Charlotte, 9201 University City Blvd., Charlotte, NC 28223; e-mail: dbrowder@uncc.edu.

(U.S. Department of Education, 2003). Although this legislation brought students with significant cognitive disabilities, including severe developmental disabilities,[1] into the expectations for achieving literacy, it also left undefined what this alternative form might be.

Historically, students with severe developmental disabilities have had little focus on literacy. Qualitative research, including content analyses of textbooks (Katims, 2000) and ethnographic studies of children's school experiences (Kliewer, 1998), reveal a consistent lack of focus on reading. If reading instruction was provided at all, it typically focused on a list of specific sight words encountered in daily living. Recently, special educators have emphasized that for students with severe developmental disabilities to learn to read, they must receive intensive instruction (Erickson & Koppenhover, 1995; Kliewer & Landis, 1999). In contrast, not everyone would agree that this population can or should be taught to read.

There are at least three potential explanations why reading instruction has been deemphasized with this population. First, resistance to teaching literacy to this population may stem from a cultural denial of competence historically associated with marginalized groups (Kliewer, Biklen, & Kasa-Hendrickson, 2006). For example, to assume that individuals with an IQ below a certain cutoff score (e.g., 55) cannot learn to read would reflect such a bias. A second explanation for the lack of reading instruction may be the assumption that the population can only acquire some functional sight words versus learning decoding. In a comprehensive review of research on reading for this population, Browder, Wakeman, Spooner, Ahlgrim-Delzell, and Algozzine (2006) found that the vast majority of studies focused on sight words and only a few related to the other components of reading identified by the 2000 National Reading Panel (NRP; e.g., phonemic awareness, phonics, fluency, comprehension). A third explanation is that students' deficits in language and communication may seem to preclude reading instruction. Nearly all early reading programs assume participating students have some entry language skills. In fact, research with young children shows language skills and early reading success are strongly correlated (Baker, Simmons, & Kame'enui, 1998; Scanlon, & Velluntino, 1996; Snow et al., 1998).

For each of these arguments against teaching this population to read, there is a counterargument. First, cultural expectations for the competence of students with disabilities are increasing. This is the first time in the history of educating students with severe developmental disabilities that schools have been held accountable for this population's meeting state standards in academic content in reading and language arts. Many state Web sites on alternate assessment provide examples of literacy targets for this population (e.g., Colorado, http://www.cde.state.co.us/cdesped/download/pdf/Expanded_Standards_Reading.pdf; Massachusetts, http://www.doe.mass.edu/mcas/alt/rg/ela.pdf). Second, although there has been historically a strong emphasis on teaching little more than sight words, recent resources are providing guidance for broader approaches to literacy (Browder & Spooner, 2006; Downing, 2005; Ryndak & Alper, 2003). Third, although this population often does have communication challenges, advances in assistive technology create options for participation in literacy instruction not previously available to this population (Beck, 2002; Weikle & Hadadian, 2003). Finally, although a certain minimal IQ level may have been a strong predictor of past success in reading, new advances in the science of reading, especially in the area of early literacy skills, may offer a new path for learning. For example, phonemic awareness skills are strongly related to success in learning to read. Because there is little research on teaching these skills to this population (Browder et al., 2006), it is unknown whether students with moderate and severe developmental disabilities can acquire these early literacy skills and then learn to read. Students who do not learn to read may also benefit from early literacy instruction if it focuses on meaningful skills, such as access to stories.

Our purpose is to propose a conceptual foundation for literacy instruction. Although existing research and resources on early literacy provide a foundation for interventions for students with moderate and severe developmental disabilities, they require translation and additional direction. Most early literacy skills assume students have oral language. For example, in the research-based curriculum by Schickedanz and Dickinson (2005), students say initial phonemes (e.g., /s/), words of a rhyme, or guess objects that begin with a specific sound. These skills can be difficult for students with severe developmental disabilities. Students may be unable to pronounce the sound or word, be completely nonverbal, or use augmentative communication that does not contain the answer needed. To produce a phoneme using a voice output device, a student who is nonverbal must use some symbol to select the correct response (e.g., the letter *s*), which complicates learning. Because of their characteristic developmental delay, students with severe developmental disabilities will often be at an early literacy level during the elementary years versus the preschool period for which most of these curricula are designed. Some students may continue to function at an early literacy level into high school, but their curricular needs will be different from young children as they prepare to transition to adult living.

This creates a mismatch between the focus of most early literacy curricula and the chronological age and grade level of many students with severe developmental disabilities. The goal of early literacy programs is typically to build a bridge toward reading. Although this bridge is also important for students with severe developmental disabilities, consideration needs to be given to teaching skills that will have both current and long-term utility. A simplistic focus on phonemic awareness skills in isolation, for example, could leave the student in a state of perpetually getting ready to read, with few skills that transfer to daily life after high school. This is especially important because the rate of learning literacy skills for this population may be much slower than for children who are nondisabled.

The need exists for a conceptual foundation for literacy for this population. In this article, we propose a conceptual model of literacy for this population based on some overarching values. One value frequently articulated for students with severe disabilities is that all education should lead to enhanced quality of life (Westling & Fox, 2004). The gains students make in literacy should have direct benefit to their lives. These benefits may be either immediate (e.g., learning to recognize one's name to locate personal belongings) or long term (e.g., being able to decode text to gain meaning from a passage of interest). A conceptual model of literacy also should set the expectation that every student receive the opportunity to learn to read. The only way to determine who can learn to read is through teaching reading skills. For the student to have the greatest opportunity for success, this teaching should be based on scientific research on reading.

Education for students with severe developmental disabilities should also be chronologically age appropriate. This means there will need to be some change in the focus of instruction across the years of a student's school career. On the basis of these values, we offer a conceptual model of literacy with two primary outcomes. The first is to increase access to literature, and the second is to increase independence as a reader. We propose a rationale for these outcomes and provide recommendations for how to achieve them.

Outcomes for Literacy Instruction

Figure 1 shows the two proposed outcomes for literacy instruction of increased access to literature (both fiction and nonfiction) and increased independence as a reader. Figure 2 illustrates how the emphasis for these two outcomes changes over time. Access to literature, including the use of books, remains a constant priority across the life span, although the types of literature will change with the student's chronological age. In contrast, high emphasis is placed on teaching the student to read in the early elementary years, with little emphasis on functional reading. In the upper elementary and middle school years, the student receives some instruction in how to read but also more assistance in learning to recognize and apply sight words in functional activities, such as preparing a grocery list or following a job schedule. By high school, these functional activities assume most of

Figure 1
Model of Literacy for Students With Severe Developmental Disabilities

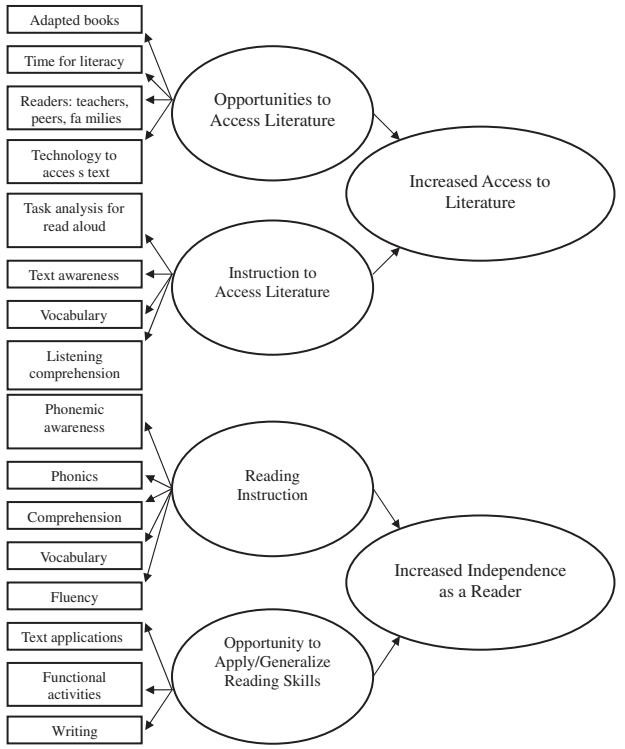
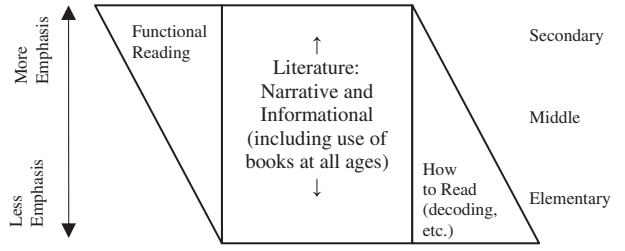


Figure 2
Model for Emphasis of Literacy Program of Different Age Levels



the literacy skill instructional time, with limited instruction in learning to read.

This model is intended to provide the "big idea" for reading instruction. Using this model, reading may be defined for individual students as either decoding text for oneself or through the assistance of a reader. When creating grade-level state standards for students with severe developmental disabilities, educators may reference these outcomes to define what they want students to achieve. Individual teachers may reference this model when generating reading goals for their students. This model does not focus on other strands of language arts, such as writing, research, and communication. Although these language arts standards should also be taught concurrent with reading, this model addresses the skill of gaining meaning from text to emphasize the value that all students receive reading instruction rather than just general language arts instruction.

Target Outcome 1: Increased Access to Literature

Since the mid-1970s, experts in severe disabilities, such as Brown, Nietupski, and Hamre-Nietupski (1976), have proposed that the ultimate criterion for the content taught to this population is that all skills promote functioning in inclusive community environments. This is sometimes called the "criterion of ultimate functioning." Inclusive community environments are contexts such as neighborhood schools, homes, jobs, recreation facilities, and public services, such as stores and restaurants. Because students with severe developmental disabilities may take longer to acquire new skills and may need opportunities to practice these skills in the context in which they are typically used, it is important to focus on skills with clear utility to daily living. These are often called functional skills. The functional activity for literacy is gaining meaning from text. The reason for accessing this text can vary widely, from getting support in a daily living activity (e.g., job schedule, cookbook), to gaining current information (e.g., magazine, newspaper), to learning about the world (e.g., science textbook), to understanding other people or other cultures (e.g., poetry, biographies); as a leisure pursuit (e.g., novel); or for self-improvement (e.g., books on diet and exercise). *Functional reading* is a term that has been used to refer to being able to identify text found in everyday life (e.g., menu items, restroom signs, job tasks). What has been notably missing in the functional reading model of literacy for students with severe developmental disabilities is reading for purposes other than basic utility (e.g., fiction, personal interests) and applying reading skills to books.

We propose that rather than postponing access to books until students know how to read or bypassing the use of books for this population altogether, books and other forms of literature become central to reading instruction at all grades of a student's school career. For this reason, "Literature" is the central and largest component of the model in Figure 1. If students are unable to read, access to this literature can be provided by reading aloud to students. Reading to students has been a long-standing core value of early childhood education as a means to promote early literacy. Reading to students and actively engaging them with the text has been referred to by a variety of terms: *shared reading*, *read alouds*, *book sharing*, *shared stories*. Morrow and Gambrell (2002) recommend reading to children daily using high-quality literature, including both narrative and expository works, and providing opportunities to discuss the text. Literature with young children shows that those who are read to daily score higher on measures of vocabulary, comprehension, and decoding (Vacca et al., 2006). Experts also propose that listening to stories and poems can promote an interest in reading (Burgess, Hecht, & Lonigan, 2002).

Students with severe developmental disabilities need the opportunity to gain these same benefits of being read to daily with supports to actively engage with the text. For example, students may need concrete referents such as objects for story concepts to have meaning, or they may need explicit instruction to use pictures to indicate understanding. Besides increased support, many students with severe developmental disabilities will need readers as a form of support to engage with text throughout their school career. Students with severe developmental disabilities learning to read may not achieve grade-level reading and may need readers throughout their school career to access information from the general curriculum.

The development of intensive beginning reading programs for this population is fairly recent (Browder, Ahlgrim-Delzell, Courtade, Gibbs, & Flowers, in press), and so it is not yet known how many students within this population can become independent readers. Gaining skills such as listening comprehension, tracking key phrases in texts, and using picture cues may be critical skills for students with severe developmental disabilities to engage with literature across their life span. Opportunities to share literature with another person, versus simply listening to the text being read, also may be essential to gaining meaning. Vygotsky (1978) proposed that the purpose of a read-aloud event is the construction of meaning from the interactive event between the adult and child. Similarly, in reading text aloud with students with severe developmental disabilities, the goal should be not just to verbalize the text but to interact with the student about the meaning

of the text. During the reading of literature, the reader may check for understanding (e.g., by asking, "What do you think will happen next?"), give the student opportunities to assist in the reading (e.g., by pointing to pictures, reading familiar or repeated lines), and provide activities to promote meaning (e.g., tasting apples while reading a book about Johnny Appleseed, viewing a video while reading a book on volcanoes).

Read alouds with students with severe developmental disabilities should differ both in content and style for older students. To be both age and grade appropriate, literature should be selected and adapted from the reading list for the student's assigned grade level even though it may not be his or her reading level. Beyond second grade, most books from the grade-level reading lists will be chapter books with few or no pictures. Some adaptation will be needed to make these books accessible in both the text and format. For example, text summaries may be used, and the book itself may be made easier to manage physically. If needed, the book may be adapted for visual impairments with enlarged text, raised pictures, or Braille.

The instruction to participate in these readings would also evolve across the grade levels. Young children often watch while the adult reads and displays the pages of a book to the children. Other times, children may view the book independently. Conversely, when older students read a chapter book together in class, each student has his or her own book. Young students may learn skills such as pointing to the picture of the main idea, turning the pages, and predicting what will happen next using pictures contained within the book. Older elementary students may begin to manage adapted chapter books by learning to locate the chapter and text, following picture cues to keep pace with the reader, and using picture response boards with picture symbols to answer comprehension questions. By middle school, students who do not master decoding text for themselves may continue to engage in shared readings, but stories will now have more mature themes and new vocabulary and require more abstract comprehension questions. As students move through the transition years, they should increasingly assume responsibility for the read aloud, for example, by choosing what to read and whom to ask to serve as a reader (or whether to use technology) and by setting a goal for reading.

Target Outcome 2: Increased Independence as a Reader

Although students with severe developmental disabilities may need to rely on people or technology to access text throughout their lives, a concerted effort should be made to teach as many students to read as possible. As stated earlier in this article, this population has not received intensive early reading instruction for a variety of reasons, so there is no way to know who or how many students with severe developmental disabilities will learn to read.

The NRP (2000) identified five components of beginning reading instruction based on research that include phonemic awareness, phonics, comprehension, vocabulary, and fluency. Browder et al. (2006) conducted a meta-analysis to determine the degree to which students with severe developmental disabilities have been taught the skills within the NRP reading components. Of the 128 studies identified with a purpose of teaching at least one component of reading, nearly all ($n = 117$) of those studies addressed word or picture vocabulary. Only a few addressed comprehension ($n = 23$) through having a student use a sight word in the context of a functional activity or task (e.g., Browder & Minarovic, 2000; Mechling & Gast, 2003). In a few others, individuals demonstrated comprehension through word-to-picture matching (e.g., Driscoll & Kemp, 1996; Rehfeldt, Latimore, & Stromer, 2003). Rarely have researchers tried to teach phonics to this population, but the few that exist show strong effect sizes (Barbetta, Heward, & Bradley, 1993; Barudin & Hourcade, 1990; Lane & Critchfield, 1998). Overall, this literature shows that students with severe developmental disabilities have learned specific reading skills when provided intensive, systematic instruction with prompting and feedback. What has been lacking are applications of these methods to more comprehensive approaches to reading.

The benefits of increased independence as a reader can be well worth the potential investment of time. This investment may increase skills students need to learn information in the general curriculum while in school. As adults, independent reading skills make activities such as shopping, using a computer, working a job, and completing a medical history more accessible. When students have learned to apply reading skills to passage reading, they have even wider access to activities such as reading to gain information or for pleasure.

Methods to Achieve the Outcomes

Outcome 1: Teaching Students to Gain Meaning From Text That Is Read Aloud

For students to achieve the benefits of access to literature, they must be able to comprehend text that is read aloud. Training teachers to implement read alouds effectively may be key for students to acquire these comprehension skills. In a study focused on young children,

Fisher, Flood, Lapp, and Frey (2004) examined the read-aloud practices of expert teachers to identify common factors. The researchers found seven components of an effective read-aloud: (a) Books chosen were appropriate to students' interests, (b) selections had been previewed and practiced by the teacher, (c) a clear purpose for the read-aloud was established, (d) teachers modeled fluent oral reading, (e) teachers were animated and used expression, (f) teachers stopped periodically and thoughtfully questioned the students to focus them on specifics of the text, and (g) connections were made to independent reading and writing. Rog (2001) notes that interactive reading encourages children to verbally interact with text, peers, and teachers. Koppenhaver, Erickson, and Skotko (2001) successfully taught parents to adapt read-aloud activities for their young children with Rett syndrome and severe developmental disabilities that, in turn, increased the children's communicative interactions with the reading material during the read-aloud time.

Although these skills may work well with young students with or without disabilities, some adaptation may be needed in how the lesson is presented for older students. In a recent study, Browder, Trela, and Jimenez (2007) demonstrated how teachers could acquire skills for reading aloud with older students with moderate and severe developmental disabilities. The researchers selected novels from the middle school reading list and then created adapted chapter books using text summaries and picture symbols for key vocabulary. The participating teachers learned to follow a task analysis to teach students to manage their books (finding the chapter, turning the pages), identify key vocabulary (e.g., *island*) both before and during the reading of the story, gain text awareness (e.g., text pointing, completing repeated story lines), and answer comprehension questions (for an example, see Table 1). All students increased their independent responses on a student version of the task analysis across multiple novels. Similar to the expert readers in Fisher et al. (2004), these teachers frequently engaged the students in discussions of the text and made connections to activities in the student's lives. In contrast to Fisher et al., the read alouds were made more age appropriate by having students follow along in their own books, using picture symbols rather than books with children's illustrations, and reading in an interesting and fluent yet age-appropriate manner.

One of the components of the Browder, Trela, et al. (in press) research was that teachers used repeated readings of the chapters of the adapted books. In research with young, typically developing children, Pappas (1991) found that children's comments and questions increased and became more interpretative after they listened to repeated readings of a story. For students with moderate and severe developmental disabilities to gain meaning from the literature of their grade level, repeated read alouds may be needed. Students may also need supplemental activities to grasp unfamiliar concepts. For example, in Browder, Trela, et al., teachers used attention getters for each chapter reading that related to the theme of the story (e.g., video of dolphins).

Table 1
Task Analysis for Teaching Students Skills to Engage With a Book

The teacher will
1. Provide an anticipatory set
2. Read the title and give the students an opportunity to point to or say the title
3. Read the author's name and give the students an opportunity to say or point to author's name
4. Model opening book and give at least one student an opportunity to open book (a) without being told, then (b) with prompts as necessary
5. Ask a prediction question and give each student an opportunity to answer the prediction question
6. Point to each word in chosen sentence while reading aloud and give each student an opportunity to point to chosen line in the text
7. Give students an opportunity to point to or say a vocabulary word
8. Give students an opportunity to anticipate and fill in a repeated story line
9. Give students an opportunity to anticipate turning the page without being told
10. Give each student an opportunity to answer a comprehension question

Although Browder, Trela, et al. (in press) trained teachers to implement literacy lessons, two other options for students to gain access to text are the use of technology and peer readers. Students may learn to activate a switch to play a book on DVD, computer, or iPod or use other forms of text readers. What will be critical in such applications is that the student still has opportunities to demonstrate comprehension of the audio format and to engage with printed text. Chard and Osborn (1999) recommend that the best read-aloud books are not the books with simple vocabulary and structure that students can read on their own but books that are characterized by less-common vocabulary, more-complex sentences, and concepts that add to children's real-world knowledge. Applying this same principle for students with severe developmental disabilities, teachers may use audiotapes for books that contain concepts familiar to the student (story about a family pet) but read alouds for literature that is less familiar (e.g., story about a different culture).

Although teachers are one option to read text with students with moderate and severe developmental disabilities, peers also may provide access to literature. The

use of peer supports can be especially beneficial to students with severe developmental disabilities receiving services in general education classrooms (Carter, Cushing, Clark, & Kennedy, 2005; Carter & Kennedy, 2006; Hunt, Soto, Maier, & Doering, 2003). To be an effective reader, including providing the opportunities to interact with the text, peers may need a task analysis to follow to engage the students with the text similar to the one used by Browder, Trela, et al. (2007).

Outcome 2: Teaching Students to Become Independent Readers

Phonemic awareness. The most compelling finding in the research on beginning reading is the significant relationship between phonemic awareness and reading acquisition (Ehri et al., 2001; NRP, 2000). Phonemic awareness is the ability to hear and manipulate *phonemes*, the smallest units of speech that affect meaning (Carnine, Silbert, Kame'enui, & Tarver, 2004). It is an auditory skill that does not involve viewing printed words. Children who have acquired phonemic awareness can, for example, tell you that changing /k/ in the word *cap* to /t/ changes the word from *cap* to *tap.* Years of scientific research suggest that children entering first grade with phonemic awareness skills will experience more success in learning to read than their peers who enter first grade with little or no phonemic awareness (e.g., Hiebert & Pearson, 2000; Lyon, 1998; Smith, Simmons, & Kame'enui, 1998; Troia, 1999). Furthermore, evidence suggests that phonemic awareness is strongly related to success in both reading and spelling (NRP, 2000).

Students with severe developmental disabilities may also benefit from training in phonemic awareness with two important modifications. First, students with severe developmental disabilities will probably need instruction in phonemic awareness to continue well into the elementary grades because of their developmental delay. Second, phonemes should be paired with printed letters and pictures from the onset of instruction so that nonverbal students have a visual referent for responding. For example, a typical phonemic awareness activity might be to have students say the first sound they hear in *monkey*. Although verbal students can articulate /m/, many students with severe developmental disabilities will need an alternative form for responding. One option would be to change the skill using pictures and asking, "What other word begins with the same first sound as *monkey*?" (providing an array of pictures from which to select a response). Another would be to use the letter *m* to indicate the phoneme. For example, the student might select the letter on a voice output device, and then the voice output device articulates /m/ for the student.

In addition to providing an accessible means of responding, using letters concurrent with training in phonemic awareness may promote the transition to phonics (sound– symbol associations) acquisition. In working with kindergartners who lacked phoneme segmentation skills and were nonreaders, Ehri et al. (2001) reported that students trained with letters learned to segment better than those who used blank counters or no visual referent. Students with severe developmental disabilities may also benefit from having letters as a concrete referent. Additional examples of how students can verbally and nonverbally demonstrate phonemic awareness skills are provided in Table 2.

Phonological awareness encompasses an understanding of larger units of sounds in spoken language, such as syllables, onsets, and rimes, in addition to phonemes. Phonological awareness includes an understanding of sound units such as words within sentences, syllables within words, and phonemes within syllables and words (Opitz, 2000). Students who are nonverbal may be able to indicate the number of syllables in a word in a variety of ways, for example, by clapping or blinking once for each syllable. Voice output devices with a progressive feature can also be activated once for each syllable. For example, it would take three switch hits for the device to say each syllable of *hamburger*.

Phonics and print awareness. In addition to phonemic awareness, literacy development is dependent on the ability to make connections between speech and print. Letter recognition has been well established as a predictor of reading success (Durrell, 1958). However, years of reading research continues to indicate that mastery of letter recognition alone does not result in reading success (Adams, 1990; NRP, 2000). Early readers need to make connections between the sounds of language and the symbols or printed letters that are used to represent those sounds. Those connections are necessary for accurate decoding. Students who are unable to accurately decode at least 90% of the words they encounter while reading tend to have difficulty understanding what they read (Mraz, Padak, & Rasinski, in press).

Print awareness, sometimes referred to as *concepts of print*, is the understanding of the forms and functions of print (Adams, 1990). Adams (1990) describes examples of print awareness as (a) understanding the difference between displays of words and nonwords, (b) being aware that print corresponds to speech, (c) understanding the function of spaces as boundaries between printed words, and (d) knowing that reading occurs from left to

Table 2
Phonemic Awareness Skills and Examples of How They Can Be Demonstrated Verbally and Nonverbally

Phonemic Awareness Skill	Verbal Demonstration	Nonverbal Demonstration
Segmentation of words	Verbally express the syllables in a word (*ham-bur-ger*)	Clap out the syllables in a word as the teacher says the word
Identify letter–sound correspondences	Verbally express the sound that a letter makes	Point to the letter that makes the sound the teacher is expressing
Identify the first sound in words	Verbally express the first sound in a word the teacher has read	Point to the first sound in the word a teacher has read
Identify words that begin with a specific first sound	Verbally express a word that begins with the same first sound the teacher has given	Point to a picture of a word that begins with the same first sound the teacher has given
Identify the letter sounds in words	Verbally express individual sounds in a word (/p/-/i/-/g/)	Point to the individual sounds in a word (*p-i-g*)

right. Along with the concept of print is the concept of word. The concept of word is defined as the ability to match spoken sounds with words in text (Morris, 1993). More recently, researchers describe print awareness skills as components of the alphabetic principle, which also includes alphabetic awareness and alphabetic understanding (Carnine et al., 2004; Moats, 1999). Alphabetic awareness is defined as (a) recognition of alphabet letters, (b) understanding that alphabet letters represent the sounds of spoken language, and (c) understanding the correspondence of spoken sounds to written language. Alphabetic understanding, the second component of the alphabetic principle, is the understanding that the left-to-right spelling of printed words represents the sounds of the words from first to last. Though the definitions of print awareness and the components of the alphabetic principle are similar, the first component of print awareness (i.e., understanding the difference between words and nonwords) may require direct instruction for students with severe developmental disabilities. In addition, instruction in picture identification is often necessary for these students before and during activities where the names of the alphabet letters and the sounds of the alphabet are being taught.

Print awareness also may be especially important for students with severe developmental disabilities. The beginning point for some students may be basic conventions of reading, such as choosing between two books, orienting the book, and turning the page while hearing a story read. Students may also expand text awareness with activities such as locating pictures on the page, pointing to highlighted text, and finding the title of the book. One strategy for students with severe developmental disabilities who do not yet have the concept of word is to have the student provide the missing word in a repeated story line. Although some young children's books have many repeated lines, books for older students can be adapted by creating a repeated line (e.g., the main idea of the chapter) and inserting this text into the pages of a book that is adapted for the student. Another strategy is to have students point to each word in the text as it is read. If verbal, the student may also begin anticipating the next word to be read.

Vocabulary. Learning to read is also dependent on vocabulary knowledge. Children must understand the meaning of words that are used by their teachers during instruction and words that are read to them or words that are independently read to acquire information (Beck, McKowan, & Kucan, 2002). The acquisition of vocabulary may be either expressive or receptive. Expressive vocabulary requires the learner to provide a specific definition or meaning of a given word. Receptive vocabulary requires the learner to understand the meaning of a word during conversation or when text is read aloud (Carnine et al., 2004). Vocabulary acquisition is not simply a matter of memorizing word definitions but rather a process of understanding the relationships among concepts to facilitate comprehension (Beck et al., 2002).

In the review of reading with students with severe disabilities, Browder et al. (2006) found strong evidence for using systematic prompting procedures, such as time delay, for students to recognize sight word vocabulary. In this procedure, the teacher presents each word with an immediate model of the response and gives the student the opportunity to repeat the model. On subsequent trials, the teacher's prompt is delayed by a few seconds so that the student can anticipate the correct response. For sight word learning to become true vocabulary knowledge, students need to learn the meanings of the words, for example, by pairing them with pictures or using the words to complete sentences. Students also need opportunities to engage with the vocabulary in passage reading to understand the

concepts presented. A student may learn to identify the word *myself* and be able to pair it with a picture of himself or herself but need opportunities to engage with autobiographical stories to understand concepts such as "I can do this myself" or, more abstract, "This is a way to understand myself."

Fluency. Fluency in reading has been described as the ability to translate letters to sounds to words fluently and without effort (LaBerge & Samuels, 1974). Fluency has been described as a bridge that connects decoding to comprehension. This bridge consists of three support structures: accuracy, automaticity, and prosody (Padak & Rasinski, in press). A fluent reader decodes accurately and automatically, giving no conscious attention to the letters and sounds in words (Pikulski & Chard, 2005). Prosody refers to the expectations of oral language, such as intonation, phrasing, and pitch, which are characteristic of fluent reading. Fluent readers are able to give all their attention to the meaning of text because they have mastered decoding through overlearning. The automaticity of decoding may be compared to driving a car. Once learners master driving, they no longer think through the processes of shifting gears or using brakes but perform such skills with automaticity. The development of fluency requires that students demonstrate a task accurately while performing the preskills of the task rapidly and effortlessly (Institute for the Development of Educational Achievement, 2004).

For students with severe developmental disabilities, checking for fluency can be complicated by communication challenges such as not being able to read aloud (nonverbal) or having speech impairments. Two goals for fluency might be to reduce student response time (e.g., number of seconds students need to find correct response on communication device) and to minimize errors. For example, Al Otaiba and Hosp (2004) described the use of a sight word fluency game using flash cards. Students were rewarded for reading more words or reading words faster.

Comprehension. Comprehension refers to the construction of the meaning of spoken communication or of text that involves an interaction between the reader and the message as the reader processes and interprets a given message (Snow, 2002). Comprehension requires that the reader be actively involved in applying thinking processes while attempting to construct meaning. While they read, effective readers apply strategies that aid them in constructing meaning, such as activating their background knowledge or schema for a topic they encounter in text or oral language (Klinger, Vaughn, Arguelles, Hughes, & Leftwich, 2004). Effective readers ask questions, make predictions, and create mental images while they read; they monitor their own comprehension, recognizing when they are not able to make adequate sense out of a given message.

Browder et al. (2006) found that most interventions for students with severe disabilities addressed comprehension through having the student use a sight word in the context of a functional activity (e.g., Browder & Minarovic, 2000; Fiscus, Schuster, Morse, & Collins, 2002; Kyhl, Alper, & Sinclair, 1999; Mechling & Gast, 2003). In others, individuals demonstrated comprehension through word-to-picture matching (e.g., Driscoll & Kemp, 1996; Eikeseth & Jahr, 2001; Mechling, Gast, & Langone, 2002; Rehfeldt et al., 2003). More expanded strategies will be needed for students both to apply to passage reading and when accessing literature through read alouds. For example, students need to be able to answer *wh* questions (who, what, where, why). To answer these questions, students who are nonverbal might select from an array of pictures.

Some students may need direct, systematic instruction to acquire this selection response. The teacher might begin by asking the question immediately after reading the line in the story that contains the answer. The picture selections for making the comprehension response might include illustrations from the book. Distracter pictures in the array might include implausible answers in early instruction (e.g., not pictures of people). Additionally, the teacher might use response prompting to guide the student to the correct response. Over time, comprehension might be shaped by (a) reading more text before presenting the question, (b) using more abstract pictures or word answers, (c) using plausible distracters, and (d) asking questions that require inference (e.g., "Why was the boy sad?"). Similarly, students may need systematic instruction to use other comprehension strategies, such as using a picture sequence to retell the story, using graphic organizers to compare events or characters, or making and confirming predictions about events in the story.

Developing the Literacy Program

Once educators have clear outcomes for literacy program and have identified methods to achieve these outcomes, they can build the components of a comprehensive literacy program. These components are shown in the small rectangles in Figure 1. First, to move toward the outcome of increased access to literature, students will need both opportunities for accessing literature and

instruction in how to access books. To use literature that is grade and age appropriate, books will need to be adapted, including the use of text summaries and key vocabulary. Students who do not yet read independently will need either a technological or human reader. Given the many sources of literature across the day in and out of school, recruiting peers and family members as readers as well as teachers will ensure the student has multiple resources for sharing books and other resources. The student also needs to acquire skills for independently accessing the text, such as using a switch to play an audiotaped book or book summary.

Students with severe developmental disabilities need instruction to gain meaning from these read alouds (see boxes linked to "Instruction to Access Literature" in Figure 1). This may include task analytic instruction for participating in the read aloud similar to that developed by Browder, Trela, and Jimenez (2007). For example, the student may need to learn to locate chapters, turn pages, find key vocabulary, and use picture cues. Text awareness can be further enhanced by having the student use a communication device to complete a repeated story line (e.g., main idea of the chapter printed on each page) or point to key words or phrases in the story as it is read. The student can develop vocabulary during these shared readings by identifying sight words and developing their meaning through passages and pictures. Students can become increasingly sophisticated in listening comprehension skills. State standards for the grade level may provide guidance for what skills to target. For example, when the grade-level expectation is to sequence events or identify the author's point of view, students with severe developmental disabilities may be taught these same comprehension skills if the literature is read aloud and response options are provided (e.g., pictures to place in sequence).

Whether these opportunities to access literature and instruction to do so lead to increased quality of life may depend on the extent to which the student learns to gain meaning from the text and the types of text chosen. We propose that grade-appropriate literature enhances students' lives by introducing them to the stories and themes that are part of their own and other cultures. These themes often are more mature than those found in young children's literature (e.g., coming of age, dealing with loss, changes in friendships) but are ones students will themselves experience.

For increased independence as a reader, we have proposed teaching the components of reading identified by the NRP (see boxes that link to "Reading Instruction" in Figure 1). Students also need opportunities to apply and generalize these reading skills (last three boxes in Figure 1). Generalizing newly learned skills to new situations with different people, materials, or settings is a well-recognized weakness of individuals with severe disabilities (Westling & Fox, 2004). Students need specific instructional procedures to improve the chances that newly acquired skills will transfer to new situations. Some studies with this population have taught students to generalize sight words to daily living skills (Browder, Hines, McCarthy, & Fees, 1984), weather reports (Browder, & Shear, 1996), and product warning labels (Collins & Griffen, 1996; Collins & Stinson, 1994). Students also need to learn to generalize skills to reading text. For example, students may be asked to clap every time someone says a word that starts with the /s/ sound during a game, story, poem, or song. They may also guess the next word on the page using their knowledge of letter sounds or use a symbol or sight word across stories (e.g., "How does John feel: happy or sad?"). Besides functional activities and applying skills to read text, a third way students can be taught to generalize their reading skills is through writing. Students may compose passages by selecting pictures, words, or phrases from an array of options even if they cannot type or handwrite words. In doing so, students gain additional understanding of the meanings of words and passages.

As students gain competence, they will probably use some combination of methods to read and access text. Ryndak, Morrison, and Sommerstein (1999) described the case study of a student who gained literacy skills while receiving instruction in general education settings. When this student was studying Shakespearean plays with her sophomore English class, she (a) independently read summaries of the stories adapted to her reading level, (b) practiced reading some specific sections of the plays to participate in class, (c) watched videotapes of the plays, and (d) made posters about the author and his plays. The student kept pace with the class by using her independent reading skills (text summaries), practicing new skills (lines of the play), and hearing text read (videos). She also began to create her own text summaries (the posters).

Figure 2 proposes a way to balance the amount of time devoted to each of these types of literacy activities. Most of literacy instruction should focus on gaining meaning from text using literature across all age groups, but the specific literature changes depending on the students' age and grade. Young students may participate in read alouds of children's books and information from science, social studies, and other school topics. In middle and high school, students will likely need summaries of novels and informational texts, as their reading skills may still be well below grade level. Although students at these ages are increasing their focus on transition to adult living, we propose that increased skill in the use of text

can contribute to this goal. By high school, this text may include passages such as job training manuals as well as novels from the grade level. Thus, although the amount of time accessing literature remains constant, the type of text changes to be grade and age appropriate.

In contrast, the amount of time spent gaining independence as a reader would change over time from a strong focus on the components of reading to functional reading. In the early grades, and even continuing through middle school, making the investment in teaching skills to decode words and read passages may make it possible for some students to become literate. Other students may progress as high as a first- or second-grade reading level, which will make it possible for them to read some passages (e.g., text summaries) without help. In contrast, as the focus on transition to adult living increases, if students have not mastered decoding, the time may be better spent in learning to identify and apply functional sight words (functional reading) such as menu words, store signs, street signs, and so on.

Summary and Needs for Future Research

Because of the prior overemphasis on teaching only functional sight words to students with severe developmental disabilities, educators need a new conceptual model for literacy. Research does not yet exist on whether the applications of effective reading strategies, such as promoting phonemic and text awareness, will lead to independence as a reader for this population. What is important is that students with severe developmental disabilities have the educational opportunity to learn to read in the early grades. At all grade levels, the core of the literacy program should be literature, including both narrative and information text. Students may be acquiring improved listening skills as this text is read but also can be active participants in the sharing of this text using assistive technology and recognition of key vocabulary words or pictures. As students move toward high school, this focus on literature continues through adapting novels for the students' current receptive language level. In contrast, supplemental skill instruction should shift from teaching the mechanics of reading to ensuring that students acquire and use functional sight words.

One purpose of this conceptual model is to offer a framework for future research on literacy for students with severe developmental disabilities. Research is needed on both effective instructional strategies and overall outcomes. For example, single-subject research is needed to build a foundation for teaching the components of reading beyond functional sight words. Currently, high-quality studies provide strong evidence for using systematic prompting and fading to teach students to identify words related to activities of daily living (Browder et al., 2006). Similarly, research is needed to demonstrate methods for teaching skills such as (a) text and print awareness, (b) comprehension of shared stories, (c) phonemic awareness, (d) reading phrases and paragraphs of text, and (e) fluent application of these skills. Studies are also needed that evaluate comprehensive reading programs that address all components of reading and longitudinal instruction. It may be difficult to identify gains for this population in a single year of instruction; instead, multiple years of intensive instruction may be needed for students to indicate success in beginning reading. Creative work may be needed to identify experimental designs well suited for evaluating reading success with comprehensive reading programs, given that this is a low-incidence population. Collaboration across regions of the country may be needed to identify an adequate sample size for large-scale studies of reading with this population. Qualitative research is also needed to determine the impact new approaches to reading have on the quality of life proposed in this conceptual model. For example, does participation in a literature-based program promote skills such as choice making and opportunities for social interaction with peers?

In conclusion, although recent advances in policy and research have created optimism that all students can learn to read, the potential for students with severe developmental disabilities to achieve these goals remains unknown because of the restricted nature of prior reading instruction for this population. This article provides a conceptual model for literacy that emphasizes access to literature as the meaningful ("functional") context for the application of emerging reading skills at all grade levels. Increased independence as a reader is the second goal, with a strong emphasis on teaching the components of reading to younger students and gradually shifting to functional sight words in the later grades. These goals need to be pursued within the larger context of promoting quality of life for this population, including increased inclusive opportunities, social relationships, and self-directed life choices.

Note

1. We use the term *developmental disabilities* to refer to students with intellectual disabilities and autism. We use the term *significant cognitive disabilities* when referring to federal policy such as No Child Left Behind.

References

Adams, M. J. (1990). *Beginning to read: Thinking and learning about print*. Cambridge, MA: MIT Press.

Al Otaiba, S., & Hosp, M. K. (2004). Providing effective literacy instruction to students with Down syndrome. *Teaching Exceptional Children*, *36*, 28–35.

Baker, S. K., Simmons, D. C., & Kame'enui, E. J. (1998). Vocabulary acquisition: Research bases. In D. C. Simmons & E. J. Kame'enui (Eds.), *What reading research tells us about children with diverse learning needs: Bases and basics* (pp. 183–218). Mahwah, NJ: Lawrence Erlbaum.

Barbetta, P. M., Heward, W. L., & Bradley, D. M. C. (1993). Relative effects of whole-word and phonetic-prompt error correction on the acquisition and maintenance of sight words by students with developmental disabilities. *Journal of Applied Behavior Analysis*, *26*, 99–110.

Barudin, S. I., & Hourcade, J. J. (1990). Relative effectiveness of three methods of reading instruction in developing specific recall and transfer skills in learners with moderate to severe mental retardation. *Education and Training in Mental Retardation and Developmental Disabilities*, *21*, 286–291.

Beck, J. (2002). Emerging literacy through assistive technology. *Teaching Exceptional Children*, *35*, 44–48.

Beck, J., McKowan, M., & Kucan, L. (2002). *Robust vocabulary instruction*. New York: Guildford.

Browder, D. M., Ahlgrim-Delzell, L., Courtade, G., Gibbs, S. L., & Flowers, C. (in press). Evaluation of the effectiveness of an early literacy program for students with significant developmental disabilities using group randomized trial research. *Exceptional Children*.

Browder, D. M., Hines, C., McCarthy, L., & Fees, J. (1984). A treatment package for increasing sight word recognition for use in daily living skills. *Education and Training of the Mentally Retarded*, *19*, 191–200.

Browder, D. M., & Minarovic, T. J. (2000). Utilizing sight words in self-instruction training for employees with moderate mental retardation in competitive jobs. *Education and Training in Mental Retardation and Developmental Disabilities*, *35*, 78–89.

Browder, D. M., & Shear, S. M. (1996). Interspersal of known items in a treatment package to teach sight words to students with behavior disorders. *Journal of Special Education*, *29*, 400–413.

Browder, D. M., & Spooner, F. (2006). *Teaching language arts, math and science to students with severe developmental disabilities*. Baltimore: Brookes.

Browder, D. M., Trela, K. C., & Jimenez, B. A. (2007). Training teachers to follow a task analysis to engage middle school students with moderate and severe developmental disabilities in grade-appropriate literature. *Focus on Autism and Developmental Disabilities, 22*, 206–219.

Browder, D. M., Wakeman, S., Spooner, F., Ahlgrim-Delzell, L., & Algozzine, B. (2006). Research on reading instruction for individuals with severe developmental disabilities. *Exceptional Children*, *72*, 392–408.

Brown, L., Nietupski, J., & Hamre-Nietupski, S. (1976). Criterion of ultimate functioning. In M. A. Thomas (Ed.), *Hey, don't forget about me! Education's investment in the severely, profoundly, and multiply handicapped* (pp. 2–15). Reston, VA: Council for Exceptional Children.

Burgess, S. R., Hecht, S. A., & Lonigan, C. J. (2002). Relations of the home environment (HLE) to the development of reading-related abilities: A one-year longitudinal study. *Reading Research Quarterly*, *37*, 408–426.

Carnine, D., Silbert, J., Kame'enui, E., & Tarver, S. (2004). *Direct instruction reading* (4th ed.). Columbus, OH: Merrill.

Carter, E. W., Cushing, L. S., Clark, N. M., & Kennedy, C. H. (2005). Effects of peer support interventions on students' access to the general curriculum and social interactions. *Research and Practice for Persons With Severe Disabilities*, *30*, 15–25.

Carter, E. W., & Kennedy, C. H. (2006). Promoting access to the general curriculum using peer support strategies. *Research and Practice for Persons With Severe Disabilities*, *31*, 284–292.

Chard, D. J., & Osborn, J. (1999). Phonics and word recognition instruction in early reading programs: Guidelines for accessibility. *Learning Disabilities Research and Practice*, *14*, 107–117.

Collins, B. C., & Griffen, A. K. (1996). Teaching students with moderate disabilities to make safe responses to product warning labels. *Education and Treatment of Children*, *19*, 30–45.

Collins, B. C., & Stinson, D. M. (1994). Teaching generalized reading of product warning labels to adolescents with mental disabilities through the use of key words. *Exceptionality*, *5*, 163–181.

Downing, J. E. (2005). *Teaching communication skills to students with severe disabilities* (2nd ed.). Baltimore: Brookes.

Driscoll, C., & Kemp, C. (1996). Establishing the equivalence of single word reading and language in children with disabilities. *Journal of Intellectual and Developmental Disability*, *21*, 115–139.

Durrell, D. D. (1958). Success in first-grade reading. *Journal of Education*, *148*, 1–8.

Ehri, L. C., Nunes, S. R., Willows, C. M., Schuster, B. V., Yaghoub-Zadeh, Z., & Shanahan, T. (2001). Phonemic awareness instruction helps children learn to read: Evidence from the National Reading Panel's meta-analysis. *Reading Research Quarterly*, *36*, 250–287.

Eikeseth, S., & Jahr, E. (2001). The UCLA reading and writing program: An evaluation of the beginning stages. *Research in Developmental Disabilities*, *22*, 289–307.

Erickson, K. A., & Koppenhaver, D. A. (1995). Developing a literacy program for children with severe disabilities. *Reading Teacher*, *48*, 676–684.

Fiscus, R. S., Schuster, J. W., Morse, T. E., & Collins, B. C. (2002). Teaching elementary students with cognitive disabilities food preparation skills while embedding instructive feedback in the prompt and consequence event. *Education and Training in Mental Retardation and Developmental Disabilities*, *37*, 55–69.

Fisher, D., Flood, J., Lapp, D., & Frey, N. (2004). Interactive read-alouds: Is there a common set of implementation practices? *Reading Teacher*, *58*, 8–17.

Hiebert, E., & Pearson, P. (2000). Building on the past, bridging to the future: A research agenda for the center for the improvement of early reading achievement. *Journal of Education Research*, *93*, 133–145.

Hunt, P., Soto, G., Maier, J., & Doerring, K. (2003). Collaborative teaming to support students at risk and students with severe disabilities in general education classrooms. *Exceptional Children*, *69*, 315–333.

Individuals With Disabilities Education Act Amendments of 2004, 20 U.S.C. §1400 et seq. (2004).

Institute for the Development of Educational Achievement. (2004). *Big ideas in reading*. Retrieved February 26, 2007, from http://reading.uoregon.edu/

Katims, D. S. (2000). Literacy instruction for people with mental retardation. Historical highlights and contemporary analysis. *Education*

and Training in Mental Retardation and Developmental Disabilities, *35*, 3–15.

Kliewer, C. (1998). Citizenship in the literate community: An ethnography of children with Down syndrome and the written word. *Exceptional Children*, *64*, 167–180.

Kliewer, C., Biklen, D., & Kasa-Hendrickson, C. (2006). Who may be literate? Disability and resistance to the cultural denial of competence. *American Educational Research Journal*, *43*, 163–192.

Kliewer, C., & Landis, D. (1999). Individualizing literacy instruction for young children with moderate to severe disabilities. *Exceptional Children*, *66*, 85–100.

Klinger, J., Vaughn, S., Arguelles, M., Hughes, M., & Leftwich, A. (2004). Collaborative strategic reading: "Real world lessons from classroom teacher." *Remedial and Special Education*, *25*, 291–302.

Koppenhaver, D. A., Erickson, K. A., & Skoto, B. G. (2001). Supporting communication of girls with Rett syndrome and their mothers in storybook reading. *International Journal of Disability, Development and Education*, *48*, 395–410.

Kyhl, R., Alper, S., & Sinclair, T. J. (1999). Acquisition and generalization of functional words in community grocery stores using videotaped instruction. *Career Development for Exceptional Individuals*, *22*, 55–67.

LaBerge, D., & Samuels, S. (1974). Toward a theory of automatic information processing in reading. *Cognitive Psychology*, *6*, 293–323.

Lane, S. D., & Critchfield, T. S. (1998). Classification of vowels and consonants by individuals with moderate mental retardation: Development of arbitrary relations via match-to-sample training with compound stimuli. *Journal of Applied Behavior Analysis*, *31*, 21–41.

Lyon, G. R. (1998). Why reading is not a natural process. *Educational Leadership*, *3*, 15–18.

Massachusetts Department of Education. (2001). *Resource guide to the Massachusetts Curriculum Frameworks for students with significant disabilities*. Retrieved August 31, 2006, from http://www.doe.mass.edu/mcas/alt/rg/ela.pdf

Mechling, L. C., & Gast, D. L. (2003). Multi-media instruction to teach grocery word associations and store location: A study of generalization. *Education and Training in Developmental Disabilities*, *38*, 62–76.

Mechling, L. C., Gast, D. L., & Langone, J. (2002). Computer-based video instruction to teach persons with moderate intellectual disabilities to read grocery aisle signs and locate items. *Journal of Special Education*, *35*, 224–240.

Moats, L. C. (1999). *Teaching reading is rocket science: What expert teachers of reading should know and be able to do*. Washington, DC: American Federation of Teachers.

Morris, D. (1993). The relationship between children's concept of word in text and phoneme awareness in learning to read: A longitudinal study. *Research in the Teaching of Reading*, *27*, 133–153.

Morrow, L. M., & Gambrell, L. B. (2002). Literature-based instruction in the early years. In S. B. Neuman & D. K. Dickinson (Eds.), *Handbook of early literacy research* (pp. 348–360). New York: Guilford.

Mraz, M., Padak, N. D., & Rasinski, T. V. (2008). *Evidence-based instruction in reading: A professional development guide to fluency instruction*. Boston: Allyn & Bacon.

National Institute for Literacy. (2001). *Put reading first: The research building blocks for teaching children to read*. Washington, DC: Author. Retrieved April 25, 2005, from http://www.nifl.gov/partnershipforreading/publications/PFRbooklet.pdf

National Reading Panel. (2000). *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction* (NIH Pub. No. 00–4754). Washington, DC: U.S. Department of Health and Human Services.

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

Opitz, M. (2000). *Rhymes and reasons: Literature and language play for phonological awareness*. Portsmouth, NH: Heinemann.

Padak, N. D., & Rasinski, T. V. (in press). *Evidence-based instruction in reading: A professional development guide to fluency instruction*. Boston: Allyn & Bacon.

Pappas, C. C. (1991). Fostering full access to literacy by including information books. *Language Arts*, *68*, 449–462.

Pikulski, J., & Chard, D. (2005). Fluency: Bridge between decoding and reading comprehension. *Reading Teacher*, *58*, 510–519.

Rehfeldt, R. A., Latimore, D., & Stromer, R. (2003). Observational learning and the formation of classes of reading skills by individuals with autism and other developmental disabilities. *Research in Developmental Disabilities*, *24*, 333–358.

Rog, L. J. (2001). *Early literacy instruction in kindergarten*. Newark, DE: International Reading Association.

Ryndak, D., & Alper, S. (2003). *Curriculum and instruction for students with significant disabilities in inclusive settings*. Boston: Allyn & Bacon.

Ryndak, D. L., Morrison, A. P., & Sommerstein, L. (1999). Literacy before and after inclusion in general education settings: A case study. *Journal of the Association for Persons With Severe Handicaps*, *24*, 5–22.

Schickedanz, J., & Dickinson, D. (2005). *Opening the world of learning*. Parsippany, NJ: Pearson Learning Group.

Scanlon, D. M., & Vellutino, F. R. (1996). Prerequisite skills, early instruction, and success in first-grade reading: Selected results form a longitudinal study. *Mental Retardation and Developmental Research Reviews*, *2*, 54–63.

Smith, S. B., Simmons, D. C., & Kame'enui, E. J. (1998). Phonological awareness: Instructional and curricular basics and implications. In D. C. Simmons & E. J. Kame'enui (Eds.), *What reading research tells us about children with diverse learning needs: Bases and basics* (pp. 129–140). Mahwah, NJ: Lawrence Erlbaum.

Snow, C. (2002). *Reading for understanding: Toward a research and development program in reading comprehension*. Santa Monica, CA: Rand.

Snow, C., Burns, M. S., & Griffin, P. (Eds.). (1998). *Preventing reading difficulties in young children*. Washington, D.C.: National Academy of Sciences.

Troia, G. A. (1999). Phonological awareness intervention research: A critical review of the experimental methodology. *Reading Research Quarterly*, *34*, 28–52.

U.S. Department of Education, Title I, Improving the academic achievement of the disadvantaged; Proposed Rule, 68 Fed. Reg. 13,796 (March 20, 2003).

Vacca, J., Vacca, R., Gove, M., Burkey, L., Lenhart, L., & Mckeon, C. (2006). *Reading and learning to read* (6th ed.). Boston: Allyn & Bacon.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Weikle, B., & Hadadian, A. (2003). Can assistive technology help us to not leave any child behind? *Preventing School Failure*, *47*, 177–180.

Westling, D. L., & Fox, L. (2004). *Philosophy and best practices for educating students with severe disabilities. In teaching students with severe disabilities* (3rd ed., pp. 30–58). Upper Saddle River, NJ: Pearson Education.

Diane Browder, PhD, is the Snyder Distinguished Professor of Special Education at the University of North Carolina at Charlotte. She has more than two decades of research and writing on assessment and instruction for students with severe disabilities. Recently, she has focused on progress in the general curriculum for this population. She is principal investigator for the Institute of Education Sciences–funded Project RAISE on early literacy for students with significant disabilities and the Office of Special Education Programs–funded Project on Reading, Writing, Math, and Science. She also works with Dr. Claudia Flowers as a partner in the National Center on Alternate Assessment with a focus on research in alignment.

Susan Gibbs, PhD, is a clinical assistant professor at the University of North Carolina at Charlotte. She has served as the reading research coordinator for the Behavior and Reading Improvement Center and as a research associate for Project RAISE. She has extensive experience in teaching introductory special education courses and in teaching literacy courses that prepare teachers to address reading instruction with children who have special needs. She has conducted extensive workshops on teaching reading with public school teachers and continues to provide training and support in emergent literacy and literacy for teachers of children with disabilities.

Lynn Ahlgrim-Delzell, PhD, is a research associate in the Department of Special Education and Child Development at the University of North Carolina at Charlotte. She has more than 25 years of experience working with individuals with disabilities in various capacities. Her current interests include assessment of literacy skills for students with significant developmental disabilities and other pertinent issues related to educational measurement and research design for this population.

Ginevra R. Courtade, PhD, is an assistant professor of Special Education at West Virginia University. Her current interests include academic instruction and positive behavior support for students with moderate to severe developmental disabilities.

Maryann Mraz, PhD, is an associate professor in the Reading and Elementary Education Department at the University of North Carolina at Charlotte. She is the author of numerous articles, chapters, and instructional materials related to literacy education. Her professional interests include literacy coaching, the professional development of teachers, and content area literacy. She is the coauthor of two books: *Teaching Literacy in Sixth Grade*, with Karen Wood, and *Evidence-Based Instruction in Reading: A Professional Development Guide to Phonemic Awareness* (2008), with Nancy Padak and Timothy Rasinski.

Claudia Flowers, PhD, is a professor in educational research, statistics, and measurement at the University of North Carolina at Charlotte. In the past 5 years, her research has focused on alignment issues of alternate assessments for students with significant cognitive disabilities. She has published in *Journal of Educational Measurement*, *Educational and Psychological Measurement*, *Applied Psychological Measurement*, *Research and Practice for Persons With Severe Disabilities*, and *Exceptional Children*.