

Synopsis The *PCI Reading Program* is a comprehensive sight-words based curriculum developed to teach students with developmental disabilities and significant learning differences to read. It is firmly grounded in effective, research-based methods, including errorless discrimination, positive reinforcement, controlled-vocabulary texts, and tactile reinforcement.

General Reading Research

In recent years, researchers, policy makers, and educators have worked to identify the best research-based practices for teaching the skill of reading. One point they all agree on is that learning to read is not a natural ability; this skill must be taught explicitly. “Speaking is a normal, genetically-hardwired capability; reading is not. No areas of the brain are specialized for reading. In fact, reading is probably the most difficult task we ask the young brain to undertake” (Sousa, 2005).

Further, research in reading strongly suggests the need for students to start with phonemic awareness and systematic, explicit phonics instruction. Based on this research and the report of the National Reading Panel, the use of a phonics-based core reading program in kindergarten and the early elementary grades is highly recommended. “Children who have phonemic awareness skills are likely to have an easier time learning to read and spell than children who have few or none of these skills. ... If children are to benefit from phonics instruction, they need phonemic awareness. ... [T]he findings of three decades of research confirm the importance and effectiveness of systematic phonics instruction, particularly in kindergarten and first- and second-grade classrooms” (Armbruster et al., 2001).

For students who struggle to read, it is becoming generally accepted that the first instructional step should be intensive early intervention through specific models, such as the three-tier intervention model (Vaughn et al., 2003), where instruction can be further individualized and phonetic rules can be reviewed and reinforced. Under the three-tier intervention model, students who continue to struggle with reading after the third tier of intervention would be considered for special education services. For these students, a different approach to reading focusing on sight-word instruction may be in order.

Sight Word Research

When high-quality phonetic approaches do not work, research suggests that a whole-word, visual discrimination approach using repetition and review may be the most effective way to teach reading. “[S]ome children may require additional instruction that is not tied directly to letter-sound manipulation or phonics. In fact, for some students, the most effective reading instructional tactic may be based on techniques that are not exclusively dependent on the alphabetic principle, but rather involve rote memory of whole words coupled with context clues in order to determine the meaning of new words. These non-alphabetic-principle techniques, taken together, may be thought of as sight-word instruction” (Bender & Larkin, 2003).

The research basis for teaching sight words is long and varied. Much of this research has focused on the fact that a relatively short list of high-frequency words makes up over half of the words used in written text. Thus, learning to automatically recognize a relatively small number of high-frequency words can make reading easier. Nation, for example, identified 2,000 frequently used words as the focus of direct instruction for English language learners. According to Nation’s analyses, these 2,000 words account for 90 percent of the words in conversations, 87 percent of the words in fiction, 80 percent of the words in newspapers, and 78 percent of the words in academic texts (Nation, 2001). Lists such as the Dolch Basic Sight Vocabulary List (Dolch, 1936), Kucera-Francis List (Kucera & Francis, 1967), and Harris-Jacobson Core List (Harris & Jacobson, 1972) show a high degree of consistency, identifying many of the same high-frequency words.

Moreover, research suggests that teaching students to automatically recognize words on sight can greatly improve fluency, and thus comprehension of text. For example, Perfetti and Hogoboom (1975) found that students who comprehend well are more rapid at oral word decoding than students who are less skilled at comprehending. This trend was true for both common words (those words found on sight-word lists) and for less common words.

It is important to note that many of the most frequently used words, including “the” and “would,” do not follow standard phonemic patterns. In addition, such words are abstract and do not carry much meaning. To learn a word that does not have a readily available image to go along with it, such as “is,” requires a great deal of repetition and review using a whole-word teaching method. Hargis and Gickling found that high-imagery words are more readily learned and stored in long-term memory. They suggested that low-imagery words need greater repetition or exposure than high-imagery words. Further, presenting these low-imagery words in phrases or sentences may be necessary to cement the words in memory (Hargis & Gickling, 1978).

Research-Based Practices for Students with Developmental Disabilities

Research has long suggested that for students with developmental disabilities, including mental retardation, and significant learning differences, sight-word approaches work effectively. “[S]ight word instruction has been highly effective across individuals for people with mild to moderate disabilities” (Browder & Xin, 1998). Of note is that Browder and Xin’s study was a meta-analysis of sight-word research published after 1980. These studies represented a wide range of ages, and the participants’ average IQ was 55.

Perhaps the most well-known program using a sight-word approach for students with developmental disabilities and learning differences is the *Edmark Reading Program*, which was made commercially available in 1972. Both pre- and post-publication studies featuring the *Edmark Reading Program* have proven that its techniques are effective in teaching students with developmental disabilities and learning differences, beginning readers of all ages, students for whom English is not their primary language, and students for whom phonetic-based approaches are not working. At its core, this reading program is based on the principles of behavioral psychology (Skinner, 1961), and it was developed in the 1960s and early 1970s by researchers from the University of Washington.

Multiple research studies have proven the effectiveness of the *Edmark Reading Program* in teaching students to read the 350 words taught in Levels 1 and 2. Key techniques include errorless discrimination, selective reinforcement, and direct instruction. However, since the program was created prior to the most recent research in reading and learning, the program does not address phonemic awareness or phonics in any way. This leaves some questions as to whether a student can successfully read materials outside Edmark’s controlled-vocabulary stories. For example, Vandever, Maggart, and Nasser (1976) compared the effectiveness of three reading programs, including the *Edmark Reading Program*. When tested on words not covered in the program, no group scored well, although the Edmark group scored the best out of the three programs studied.

The Need For A New Approach

In reviewing the research on teaching reading to students with developmental disabilities and significant learning differences, Haugen-McLane, Hohlt, and Haney (2007) determined the need for a contemporary sight-word-based reading program that built a base of high-frequency words for students and then used those words to teach basic phonemic patterns and decoding strategies. This led to the creation of the *PCI Reading Program*, a comprehensive leveled program for nonreaders of all ages.

Like other effective sight-word-based programs, the *PCI Reading Program* begins with errorless discrimination and mastery-based learning of a list of words. In Level One, 140

words are taught. Level Two teaches an additional 140 words, as well as basic reading skills such as inflectional endings and compound words. Then, in Level Three, the 280 words students have already learned are used to teach selected phonemic patterns and sounds. Ultimately, Level Three is envisioned as a support for students, bridging them from controlled-vocabulary program materials to reading materials outside of the program.

NOTE: For the purposes of this research summary, only Level One of the *PCI Reading Program* will be examined as it is the only level commercially available. As additional levels are released, updated research summaries will be published.

Research-Based Methods and Techniques

SHORT AND LONG TERM MEMORY

Level One of the *PCI Reading Program* incorporates a five-step lesson cycle. Within this cycle, a variety of techniques and learning modalities are used to teach each word. Every instructional strategy takes between 5 and 15 minutes to complete. This variety and time length was intentionally incorporated into the program to maximize students' working memory and promote both short- and long-term retention as shown by recent brain research. "An adolescent (or adult) normally can process an item in working memory intently for 10 to 20 minutes before fatigue or boredom with that item occurs and the individual's focus drifts. For focus to continue, there must be some change in the way the individual is dealing with the item. As an example, a person may switch from thinking about it to physically using it, or making different connections to other learnings. If something else is not done with the item, it is likely to drop from working memory" (Sousa, 2005).

ERRORLESS DISCRIMINATION

To learn a word in the program, students first practice visually discriminating it from one and then two other words. Using the effective technique of errorless discrimination (Sidman & Cresson, 1973), facilitators ensure a correct response by eliminating incorrect responses and having students repeat each word identification exercise until it is completed correctly. Through repetition and review, words are visually discriminated well over 20 times and are read in isolation at least five times before ever being presented in a phrase or sentence.

POSITIVE REINFORCEMENT

Throughout the program, students receive praise each time they identify, say, or read a word correctly. This frequent praise motivates the students to move forward and positively reinforces correct answers. Lessons are set up to be "no-fail" situations as students who incorrectly identify, say, or read a word are guided to the correct response before moving on to the next line. Many studies have shown the effectiveness of positive reinforcement in teaching both desired behaviors and basic academic skills. Of note are the studies on Applied Behavior Analysis as an effective technique for students with autism and other developmental disabilities (Maurice et al., 1996).

FERNALD TRACING METHOD

One of the key components of the *PCI Reading Program* is the Trace and Read Workbook. Students trace the target word five times, reading the word during and after the tracing. Tracing a word has long been viewed as an effective way to cement the word in short- and long-term memory. One of the major proponents of this method was Mary Fernald. “The target audience [for Fernald’s tracing method] is learners who have been exposed to reading instruction but are still nonreaders, particularly those who have reversal problems and/or poor visual discrimination and memory. The sequence is also appropriate for learners who have attention problems, because the tracing procedures require careful attention to the task. In addition to younger students, Fernald’s methods are appropriate for older students and adults. They are particularly useful for older nonreaders ...” (Sundbye & McCoy, 2001).

MANIPULATIVES

Hands-on techniques for teaching and reinforcing the words are used throughout the program. Students demonstrate their ability to read words and construct phrases and sentences using word and picture cards. The use of manipulatives in learning has been supported by brain research which shows that manipulating objects makes learning more concrete. Armstrong (1994) notes that it is important to “... integrate hands-on and kinesthetic learning activities into traditional academic subjects like reading, math, and science.”

ORAL VOCABULARY ENRICHMENT

The Real-World Connection in the Guided Word Practice lesson promotes oral-language development, integrating the critical skills of speaking and listening into the program. Research has found that speaking and listening vocabularies generally outpace reading vocabularies in students until the seventh or eighth grade. Enriching this oral vocabulary while teaching reading skills is essential to the growth of successful communication skills (Wolfe & Nevills, 2004).

COMPREHENSION

In addition to the three main parts of each Guided Word Practice lesson, every tenth lesson includes a comprehension activity that requires students to match words to pictures or pictures to words. Pre- and post-reading questions are also included for each book to help build and assess comprehension of the stories. In identifying the essential components of effective reading instruction, the National Reading Panel named phonemic awareness, phonics, vocabulary, fluency, and comprehension as the most crucial. Ultimately, students in the *PCI Reading Program* show that they not only automatically recognize a word but also comprehend it by matching controlled-vocabulary phrases and sentences to illustrated scenes.

CONTROLLED-VOCABULARY BOOKS

Level One includes 28 controlled-vocabulary books, one for every five words learned in the program. Students are invited to read a book after mastering each posttest. All the words in the book are carefully controlled to ensure student success and build self-esteem. Each of the most recently learned words appears at least twice in the book, and the remaining

previously learned words are used in the books as frequently as possible. In addition, the number and length of sentences per page slowly increases as the students move forward in the program. Controlled-vocabulary books are highly supported by the research. Hiebert and Fisher (2005) reported the outcome of two studies that lasted a semester or longer. In both studies, two groups of classrooms used “repeated reading” in which students reread selected text until a certain reading rate was met. One group read from a literature-based reading program, and the other group read from short texts that had been written to emphasize high-frequency and phonetically “regular” words. The increases in fluency for students who read the controlled-vocabulary texts were consistently greater than the increases in fluency for students who read from the literature-based program. Hiebert and Fisher concluded that students’ fluency was affected more by the degree to which the texts shared vocabulary than by the practice of repeated reading. They further suggested that a lack of controlled vocabulary for reading practice could present serious challenges for developing fluent reading.

PHONEMIC AWARENESS AND OTHER CRITICAL PRE-READING SKILLS

To promote success and prepare students for future levels of the *PCI Reading Program*, a Building Reading Skills binder has been included with five units representing critical pre-reading skills. Units include:

- Building Visual Skills
- Building Concepts of Print
- Building Attention
- Building Phonemic Awareness
- Building Memory

Lesson plans throughout the binder quote the research used to support the development of each particular skill. The unit on phonemic awareness focuses on the earliest levels of this skill: detecting the differences between sounds. Level Two of the *PCI Reading Program* will expand upon phonemic awareness skills to facilitate success in Level Three where onsets and rhymes will be the focus. As Bender and Larkin (2003) note, “children with reading problems . . . need specific instruction in phonemes, either prior to or coupled with instruction in phonics.”

Conclusion

Guided by a wide variety of recent reading and brain research, the *PCI Reading Program* incorporates the systematic use of effective instructional strategies and techniques to teach a base of sight words to students. As future levels of the program are developed, effective sight-word instruction will be blended with basic phonemic awareness and early phonics skills to create a system that truly helps nonreaders become successful, independent readers.

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