Executive Summary

The U.S. House of Representatives and Senate bills (H.R. 1350 and S. 1248) contain substantial revisions central to the reauthorization of the Individuals with Disabilities in Education Act (IDEA) and proclaim significant changes in how learning disabilities will be identified. This affects services and special education determinations.

This landmark legislation places emphases on instruction, early intervention, and building success by requiring “specially designed” instruction to meet the unique needs of students with disabilities. IDEA 2004 (see www.wrightslaw.com for further details) includes increased focus on the use of scientifically-based instructional practices and programs and peer-reviewed research. Local educational agencies may use a process to determine if students respond to scientific, research-based intervention as part of evaluation procedures to determine a specific learning disability. This process benefits children with disabilities as well as any children who enter school at risk of failure. Concentrating on research-based intervention legislation ensures that students qualify for special education services rather than failing to receive appropriate instruction.

This report highlights the unique and successful use of Direct Instruction among special education populations. It is divided into four parts:

- Part I describes methods and approaches that research implies will benefit special education students. It indicates that direct, explicit instruction is the most effective way to improve skills of students who are significantly behind peers.
- Part II provides a description of procedures used to review the Direct Instruction and special education populations studies. Data confirms that students predicted to have low achievement benefit greatly from Direct Instruction.
- Part III summarizes studies using Direct Instruction with students who have high-incidence disabilities from pre-school to high school. Thirty-seven studies were found across academic areas. In 34 of the 37 studies, students who were taught with Direct Instruction fared better than students who used other programs.
- Part IV describes eight studies using Direct Instruction for students who have low-incidence disabilities. These studies show that students with more severe disabilities can learn at high levels with systematic, research-proven programs such as Direct Instruction.

In all, 45 studies were found across student disability categories with over 90 percent noting positive effects for Direct Instruction programs.
Overview

Because special education students fall significantly behind peers in academic, behavioral, and/or functional living skills, intensive instruction is crucial for their academic success.

Though the level of intensity will likely differ for individual students, research shows that explicit, individualized, and validated instruction—like that offered by Direct Instruction programs—is key for optimal learning opportunities among students who have special needs.

IDEA (Individuals with Disabilities Education Act, reauthorized in 1997 and amended in 2004) requires specially designed instruction for students with disabilities. Specially designed instruction pertains to adapting content, methodology, or delivery of instruction to meet students’ needs and to ensure their access to the general curriculum [34 CFR 300.24(b) (3) as cited in Bateman & Linden, 1998]).

Special Education

Special education has been defined as “individually planned, specialized, intensive, goal-directed instruction” (Heward, 2003, pg. 38).

This instruction may differ in terms of

How it is provided:
- One-on-one
- Small groups

Where it is provided:
- Resource room
- Separate classroom
- Residential school

What curriculum is used:
This combination of features makes special education effective for students with disabilities.

Achieve Maximum Benefits With Individualization and Validation

Two critical elements of effective special education are individualization and validation (Fuchs, 1996; Fuchs & Fuchs, 1995):

- **Individualization** refers to developing instruction with an individual student’s needs in mind—as the student’s needs change, so does the treatment (Fuchs, 1996). Thus, **progress monitoring** is a key aspect of individualization.
- **Validation** pertains to rigorous experimental studies that have been conducted over time yielding converging evidence. “When practiced most effectively and ethically, special education is [also] characterized by the use of research-based teaching methods” (Heward, 2003, pg. 38).

Therefore, curricular programs selected for students who have special needs should provide evidence of sufficient field-testing or results from experimental studies. This ensures that instructional time yields maximum benefits. In addition, programs should meet the needs of each student by monitoring individual student performance through:
- Placement testing.
- In-program progress monitoring.
- Mastery tests.
- Review opportunities.

Set Special Education Apart Through Intensive, Explicit Support

Special education differs from general education (Torgesen, 1996) because it is typically more:

- Explicit – All skills are taught directly.
- Systematic – Instruction is purposeful, well-organized, and hierarchical.
- Intensive – Students receive more interactions and experience significant time on task.
- Supportive – Students need encouragement, feedback, and positive reinforcement.

Programmatic Scaffolding is central to quality special education. Students initially need considerable support and then diminishing support as they learn to perform skills independently (Glavin, 2003).

Vaughn and Linan-Thompson (Vaughn & Linan-Thompson, 2003, pg. 142) note that instruction is more effective for students with mild disabilities when:

- Task difficulty is controlled (i.e., examples are sequenced to ensure success; tasks are matched to students’ skills).
- Groups are small and interactive.
- Instruction is direct and explicit, with clear modeling and guided practice activities.
- Progress monitoring is ongoing.
- There is focus on foundational skills.

According to Halle, Chadsey, Lee, and Renzaglia (2004), instruction for students with more severe disabilities should be:

- Systematic, meaningful, and functional.
- Delivered using frequent opportunities for students to respond and receive feedback.
- Focused on mastery learning.
- Measured using progress monitoring to ensure data-based decision making.

While the level of explicitness, intensity, and support may vary, explicit instruction seems to be the key to optimize learning opportunities for students with special needs (see Vaughn & Linan-Thompson, 2003 for further details).
Effective Instruction

Build Understanding Through Systematic, Explicit Instruction

Explicit or direct instruction (lowercase “d,” “i”) offers a systematic method of teaching with emphasis on (Rosenshine, 1987, pg. 34):

- Proceeding in small steps.
- Checking for student understanding.
- Achieving active and successful participation by all students.

Rosenshine (1986) provided highlights of research on explicit instruction of well-defined knowledge and skills such as math procedures, grammatical rules, and vocabulary. These highlights include daily instruction techniques such as:

- Presenting new material in small steps, giving clear and detailed explanations of the skill(s) to be learned (modeling), often checking for student understanding through strategic questioning.
- Providing repeated opportunities for students to practice in an active manner and to obtain feedback on their performance (guided practice).
- Monitoring student learning through varied exercises (i.e., seatwork).
- Providing continual practice opportunities until students are performing skills independently and with ease (independent practice).
- Reviewing previous week’s lesson at the beginning of each week and reviewing what students have learned over the past four weeks at the end of each month.

Explicit instruction can be summarized as unambiguous, clear, and direct teaching (Arrasmith, 2003). Show students what to do, provide opportunities to practice with feedback, and then provide opportunities to apply these skills on their own over time.

According to Harris & Graham (1996), explicit instruction is not:

- Trial-and-error learning.
- Discovery.
- Exploration.
- Facilitated learning.
- A constructivist approach where teachers assist performance rather than directly provide knowledge/information to students.

Accomplish More in Less Time With Explicit Instruction

Students who qualify for special education services must be accelerated in their learning to catch up with their grade-level peers. Thus, you must do more in less time.

The most effective way to decrease the learning time for special needs students is through direct and explicit teaching of skills. Initially, you take full responsibility for student learning but gradually relinquish responsibility as students become successful. “This progression can be seen as a continuum that moves from teacher modeling, through guided practice using prompts and cues, to independent and fluent performance by the learner” (Rosenshine, 1986, pg. 69).

Use the Carefully Sequenced Lessons of Direct Instruction to Accomplish More in Less Time

One explicit, teacher-directed model of effective instruction is Direct Instruction (DI) as exemplified in programs authored by Siegfried Engelmann. Direct Instruction can be distinguished from other models of explicit instruction/direct instruction by its focus on effective instructional delivery and curriculum design.

Guiding principles of Direct Instruction include the belief that every child can learn if carefully taught and that anyone can teach successfully when given effective programs and instructional delivery techniques. Thus, ultimately it is you who is responsible for student learning (see Tarver, 1999 for further details).

The goal of Direct Instruction is to do more in less time—accelerating student learning by carefully controlling instruction. A typical Direct Instruction lesson includes:

- Explicit, carefully sequenced instruction (a model of what students will do).
- Scaffolding before students complete a task on their own (guided practice).
- Frequent opportunities for students to practice skills (independent practice).
- Repeated practice over time (review).

<table>
<thead>
<tr>
<th>FALL 2014—SPRING 2015 RIT SCORE GROWTH</th>
<th>Average Growth of Intensive Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected Growth</td>
<td>Actual Growth</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------</td>
</tr>
<tr>
<td>4.1</td>
<td>3.4</td>
</tr>
<tr>
<td>8.5</td>
<td>3.1</td>
</tr>
<tr>
<td>6.5</td>
<td></td>
</tr>
</tbody>
</table>

Expected Growth | Actual Growth
Build Success through the Design and Delivery of Direct Instruction

The Unique Elements of Direct Instruction Make the Difference

Most academic programs require modifications to meet the needs of students who receive special education services (Carnine et al., 2004). These modifications include:

- Identifying the most important tasks to teach in order to cover priority topics.
- Providing clear directions on how to structure active student responses and teacher feedback.
- Determining where students should be placed and how to monitor progress.
- Adjusting the rate of instruction to ensure adequate practice and mastery.
- Controlling the vocabulary/syntax used to ensure student understanding.

These modifications take time and energy to complete; essentially, programs must be changed to meet the unique needs of students who struggle. In contrast, Direct Instruction programs do not require teacher modification to achieve student success. The design and delivery of Direct Instruction programs make them effective and uniquely designed for special education populations. Direct Instruction programs feature a unique program design, instructional organization, and presentation techniques that make them highly successful for special education populations.

Direct Instruction is Proven Effective for Students with Special Needs

Elements of Direct Instruction That Make the Difference

“More than any other commercially available instructional program, Direct Instruction is supported by research” (Watkins & Slocum, 2004, pg. 57). Several independent reviews of research add to this strong support with a particular focus on students with special needs (Carnine, Silbert, Kame'enui, & Tarver, 2004). For example:

- White (1988) found 25 investigations where Direct Instruction was compared to some other treatment. Not one of the 25 studies showed results favoring the comparison groups; 53 percent of the outcomes significantly favored Direct Instruction with an average effect size of .84 (considered a large magnitude of change from pre- to post-assessments).
- Adams and Engelmann (1996) analyzed 37 research studies that compared Direct Instruction to other treatments. When those studies involving special education students (n = 21) were analyzed separately, the mean effect size was .90 (considered a large magnitude of change from pre- to post-assessments).
- Forness, Kavale, Blum, and Lloyd (1997) conducted an analysis of various intervention programs for students receiving special education services and found Direct Instruction to be one of only seven interventions with strong evidence of success.

Positive effects on at-risk populations have been noted by the American Federation of Teachers (1999), American Institutes of Research (Herman et al., 1999), and the Center for Research on the Education of Students Placed at Risk (Borman, Hewes, Overman, & Brown, 2002). Direct Instruction offers sufficient validation as noted by Fuchs (1996) to warrant its use with special education populations.

Thus, it is no surprise that Direct Instruction is often referred to as a program for special education or at-risk students; however, it is important to note that Direct Instruction is appropriate for talented and gifted students, grade-level students, and those with diverse language backgrounds or “learning styles” (Watkins & Slocum, 2004).

Three main components of McGraw-Hill Education Direct Instruction programs—program design, instructional organization, and presentation techniques—make them uniquely effective for special education populations.

Program Design

- **Careful Content Analysis** The content in Direct Instruction programs is carefully analyzed to identify central concepts, rules, strategies, and “big ideas” (those strategies that promote generalization of learning). Thus, teachers do not have to develop lessons or modify curriculum to help students gain proficiency in areas critical to success.
- **Clear Communication** The instructional language used in Direct Instruction programs is carefully written to be clear and consistent to reduce student confusion. “Teacher talk” is kept to a minimum and phrases used in teaching routines are repeatedly used. Instructional examples are introduced and carefully planned to promote student success. Teachers do not have to invent “learner friendly” instruction.
- **Clear Instructional Formats** Direct Instruction formats are teaching routines that model new content, provide guided practice, and implement independent practice opportunities. As students master skills, formats evolve to accommodate their progress and growing independence. These formats are “written, tested, rewritten, restated—polished in a cycle of classroom field testing and revision that ends only when trials show that 90 percent of students grasp a lesson the first time around” (AFT, 1999, pg. 4). Teachers do what they do best—teach—rather than develop instructional plans to try to ensure student success day after day.
- **Sequencing of Skills** In Direct Instruction programs, skills are taught in a cumulative and carefully integrated scope and sequence to help students reach mastery level and generalize their learning to new, untaught situations (AFT, 1999). Students learn “rules” before exceptions and easy skills before more difficult ones. Appropriate scaffolding is utilized, moving students from teacher-directed activities to independent ones.
- **Track Instruction** Each Direct Instruction lesson consists of multiple “tracks” (strands) and skills to teach the tracks. Rather than introduce skills in isolation, multiple tracks are taught in unison, and each is related to provide efficient instruction. Tracks ensure that:
  - Lessons are made up of several relatively short exercises.
  - Difficult tasks are interspersed with easier ones.
  - New skills are interspersed with well-practiced skills.
  - Practice is distributed so that students do not “forget” skills over time.

In track instruction, errors are reduced, and skill integration is enhanced.
Instructional Organization

- **Instructional Grouping**: Direct Instruction programs are generally presented to small groups—and can be used one-on-one—to provide intensive instruction when promoting individual student growth. Students are placed in a group according to skill level and move in the program depending upon how rapidly they acquire skills and concepts.

- **Instructional Time**: Direct Instruction lessons encourage rapid and constant interactions between teachers and students to maximize engagement. The objective is to keep students focused and provide plenty of academic learning time—time that students are engaged with a high degree of success because academic learning time is “one of the strongest predictors of student achievement” (Watts and Slomc, 2004, pg. 42).

- **Continuous Assessment**: Student progress is carefully monitored to ensure academic success and to allow program individualization, a key element of effective special education (see Fuchs, 1996; Fuchs & Fuchs, 1995). Placement tests ensure that students are taught at their optimal instructional levels. Ongoing, in-program assessments help track progress and make data-informed instructional decisions, and mastery (goal) criteria help to document achievement and monitor grade-level benchmark progress.

Presentation Techniques

Seven aspects of Direct Instruction presentation techniques for delivering instruction (also called teacher/student interactions) help to achieve superior outcomes with special education populations.

- **Active Student Participation**: Every minute of instruction provides students with many opportunities to actively respond. Students participate orally through unison (choral) responses, individual turns, and in writing. Active participation ensures that each student gains ownership of concepts and skills, and it reduces off-task behavior. When Direct Instruction programs are implemented correctly, there is no time to misbehave.

- **Unison Responding**: Unison or choral responding is a key feature of Direct Instruction programs. Instructional signals cue students to respond together, ensuring that each student practices all content. This feature is crucial for those students who struggle. It provides the maximum opportunity for students to practice each skill as it is being taught. Even error corrections are taught to the entire group. Students are not singled out in any way and feel “safe.” The lesson continues to move smoothly. All students practice the correct response again, and everyone remains engaged.

- **Signals**: Unison responding requires clear signals to “cue” students to respond together. Direct Instruction programs include a variety of signals to elicit student responses. Signals help to control pacing and provide adequate think time before students answer. Signaling is an effective technique for minimizing students’ tendency to guess or blur out incorrect answers and for increasing accuracy of response.

- **Instructional Pacing**: In a well-paced lesson, the dialogue between teacher and students occurs as a rapid interchange, allowing a smooth transition between activities. Direct Instruction teachers adjust pacing, so that is quick enough to keep students attending and on task but not so fast that they begin to guess and make errors.

- **Error Corrections**: Students must receive immediate corrective feedback when they make errors. All errors are corrected as soon as they occur using pre-planned correction procedures within each Direct Instruction program. Corrections are typically a “model-lead-test and re-test” sequence wherein the teacher shows students how to perform a task, practice it with them, test their knowledge, and then come back to check understanding after a little time has passed.

- **Teaching to Mastery**: Direct Instruction programs are engineered so that every student can perform every skill without making a mistake. The exception is that students begin each new activity ready to achieve at least 80 percent accuracy on their first try, with 100 percent accuracy after error correction. Individual turns and in-program assessments confirm that each student has mastered the activity. Teaching to mastery communicates that what is learned today is important because it will be needed tomorrow.

- **Motivation**: Success is motivating to even the most challenging students. Direct Instruction lessons keep students focused and engaged.

New information in each lesson is minimal, while the majority—80 to 90 percent—is review and application. Students make few errors, success rates are high, and enthusiasm for learning is enhanced. The early introduction of Direct Instruction in these areas led to its use among students with special needs today. From 1968 to 1976, Direct Instruction was part of the largest educational study in U.S. history: Project Follow Through. After the success of Head Start with at-risk preschool students, Project Follow Through was designed to compare educational approaches to determine best practice for instruction of low income, at-risk children in kindergarten through third grade.

Much of the Project Follow-Through research took place prior to national legislation requiring special education for students with disabilities. Although many children with severe disabilities were not included in schools at that time, students with mild disabilities—learning disabilities, language delays, behavior problems, and slightly lower IQs—were typically taught in general education classrooms.

Summary

Research shows strong evidence of success when Direct Instruction programs are used with students with special needs. In fact, Direct Instruction is one of only seven interventions proven effective (Forness, Kavale, Blum & Lloyd, 1997). With its research-supported design and systematic delivery, Direct Instruction is often referred to as a program for special education or at-risk students.

Direct Instruction programs are structured for success, and successful students are motivated to continue the path of achievement.
Overview

This research includes an analysis of published investigations where Direct Instruction programs were used with special education populations. Specifically, the review centered on two populations of students with special needs:

1. **High-incidence disabilities**
   - Learning disabilities
   - Communication disorders
   - Behavior disorders
   - Mild developmental disabilities

2. **Low-incidence disabilities**
   - Autism
   - Traumatic brain injuries
   - Moderate to severe developmental disabilities

Investigations were grouped within special education population areas by academic program (i.e., language, reading, spelling, writing, and mathematics), where appropriate. This research includes tables of study details. Each table identifies:

- The study’s researchers and year of publication.
- Direct Instruction programs used.
- Number of participating students.
- Participant information including disability, mean age and age range, and intelligence quotient (IQ) and IQ range.
- Research design.
- Research purpose.
- Intervention details.
- Outcome measures.
- Findings.

If information is missing from the tables, it was not provided in the studies.

Search procedures for the articles in this review included:

- Ancestral searches of references in key Direct Instruction texts including Research on Direct Instruction: 25 Years Beyond DISTAR (Adams & Engelmann, 1996), Designing Effective Mathematics Instruction: A Direct Instruction Approach (Stein, Silbert, & Carnine, 1997), Direct Instruction Reading (Carnine et al., 2004), and Introduction to Direct Instruction (Marchand-Martella et al., 2004).
- ERIC and PsycINFO computerized searches using terms related to Direct Instruction.
- Examination of references listed in SRA-produced research overviews, including Corrective Reading (Grossen, 1998), Reading Mastery® (Schieffer, Marchand-Martella, Martella, & Simonsen, 2002), spelling programs (Simonsen, Gunter, & Marchand-Martella, 2001), and mathematics programs (Przychodzin, 2004).

Project Follow Through

**Background**

A number of independent reviews of research show that Direct Instruction is effective for teaching students with special needs (e.g., Adams & Engelmann, 1996; AFT, 1999; Borman et al., 2002; White, 1988). However, Direct Instruction was not initially used for students with special needs. Direct Instruction was first introduced to:

- Teach young, at-risk children.
- Accelerate learning.
- Prevent failure.
- Close gaps.
- Elevate the learning of those with lower IQs.

The early introduction of Direct Instruction in these areas led to its use among students with special needs today. From 1968 to 1976, Direct Instruction was part of the largest educational study in U.S. history: Project Follow Through. After the success of Head Start with at-risk preschool students, Project Follow Through was designed to compare educational approaches to determine best practice for instruction of low income, at-risk children in kindergarten through third grade.

Much of the Project Follow Through research took place prior to national legislation requiring special education for students with disabilities. Although many children with severe disabilities were not included in schools at that time, students with mild disabilities—learning disabilities, language delays, behavior problems, and slightly lower IQs—were typically taught in general education classrooms.
Part III: Direct Instruction Research with Students with High-Incidence Disabilities

Overview
This section reviews studies specific to students with high-incidence disabilities. Thirty-seven studies were used spanning the mid-1970s to 2005:

- The participants in the majority of these studies (n = 22) were students with learning disabilities; 16 of these 22 studies specifically identified participants as learning disabled; the remaining six studies were earlier investigations, some taking place in other countries but the descriptions of the participants matched those of students with learning disabilities.
- Seven of the 22 investigations not only included students with learning disabilities but also those with behavior disorders, mild cognitive disabilities, other health impairments, and/or traumatic brain injuries.
- One study’s participants were low socioeconomic status (SES) children with mild cognitive disabilities.
- Eight studies included preschoolers who were not yet categorically identified. These children were often described as language or developmentally delayed.
- Five studies identified school-aged students simply as mildly disabled, developmentally delayed, or eligible for special education.

These 37* studies also investigated a range of Direct Instruction programs including:

- DISTAR (Reading, Language, and Arithmetic) (n = 9)
- Reading Mastery® (n = 5)
- Horizons (n = 1)
- Corrective Reading (n = 17)
- Language for Learning (n = 1)
- Language for Writing (n = 1)
- Reasoning and Writing (n = 1)
- Spelling Mastery (n = 2)
- Morphographic Spelling (now called Spelling Through Morphographs) (n = 2)
- Connecting Math Concepts (n = 1)

*The number of studies does not equal 37 because some studies included more than one Direct Instruction program or more than one age group.

Summary
These results provide evidence that Direct Instruction is appropriate for and effective with a wide variety of students. In reading, the group with the lowest IQ scores (under 70) improved nearly as much each year in reading as students with much higher IQ scores. In math, the results were even more pronounced—the growth rate for all groups of students corresponds to one grade equivalent for each year in school. In addition, because students in Project Follow-Through were taught in small groups, the gains of students with lower IQ scores were not made at the expense of other students.

Results
It is not surprising that the higher IQ students started with higher achievement in reading and math than the lower IQ students, nor is it surprising that at the end of third-grade students with higher IQs ended with higher achievement.

However, the surprising result was that students in all IQ groups had the same pattern of growth from kindergarten to third grade. Those students with low IQs maintained consistent gains and gained the same amount per year as those with higher IQs. These year-by-year results for the six IQ groups are illustrated in Figure 1 (reading) and Figure 2 (mathematics).

Students With Diverse Learning Needs
In the earliest efforts to assess the effectiveness of Direct Instruction for students with disabilities, Gersten, Becker, Heiry, and White (1984) classified the data from 1,500 Direct Instruction Follow-Through students into six IQ groups. Then achievement gains made by students in each of the groups were compared statistically to see if the growth patterns from year to year differed for high IQ students as compared to low IQ students.
TABLE 1: LANGUAGE RESEARCH WITH PRESCHOOLERS WITH HIGH-INCIDENCE DISABILITIES

<table>
<thead>
<tr>
<th>Study</th>
<th>DI Program</th>
<th>(N) Participants</th>
<th>Research Design/Purpose</th>
<th>Intervention Details</th>
<th>Outcome Measures</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cole &amp; Dale (1986)</td>
<td>DISTAR Language</td>
<td>(98) Preschool children with language delays</td>
<td>Experimental — Pretest-posttest control group</td>
<td>Instruction implemented for 15 weeks; 4 hours a day, 5 days per week (preschool) and 5.5 hours a week for 180 school days.</td>
<td>Statistically significant differences were noted between pretest and posttest for both groups on every measure except for the PPVT-3 (oral expression scores). No statistically significant difference existed between the effectiveness of the programs was found.</td>
<td></td>
</tr>
<tr>
<td>Cole, Dale, Mills, &amp; Jenks (1983)</td>
<td>DISTAR language</td>
<td>(76) Children ages 3 to 7 years, mean IQ = 67</td>
<td>Experimental — Pretest-posttest control group</td>
<td>Instruction implemented over a 4 year period.</td>
<td>Higher performing children gained more from Mediated Learning. Lower performing children benefited more from Mediated Learning.</td>
<td></td>
</tr>
<tr>
<td>Dale &amp; Cole (1988)</td>
<td>DISTAR Language</td>
<td>(85) Children B = 61, ages 3 - 5 years</td>
<td>Experimental — Pretest-posttest control group</td>
<td>Instruction implemented over a 4 year period.</td>
<td>No statistically significant differences were noted between the two programs on any measures. Higher performing children gained significantly more from the Direct Instruction program although those gaps were wider.</td>
<td></td>
</tr>
<tr>
<td>Melville &amp; Metallic (2002)</td>
<td>Language for Learning</td>
<td>(10) Preschool children (3 to 5 years of age)</td>
<td>Quasi-experimental — Nonrandomized control group</td>
<td>Investigating the medium and long-term effects of the Language for Learning program with standard early childhood education programs with preschoolers with and without developmental delays.</td>
<td>Language for Learning implemented for 18 weeks.</td>
<td>Children with disabilities instructed with Language for Learning made greater gains than the comparison group on all three measures. Children without disabilities made greater gains on all three measures; however, there was a statistically significant increase on the PPVT-3 for the DI versus the comparison group.</td>
</tr>
</tbody>
</table>
Haring and Krug (1975) investigated the efficacy of DISTAR Reading supplemented with precision teaching compared to traditional reading instruction. Low socioeconomic status (SES) students with mild cognitive disabilities (mean IQ = 72.3) who were in self-contained special education placements participated in this study. Interestingly, not only did the students who received DISTAR Reading supplemented with precision teaching perform better on standardized reading posttests—as compared to the students who did not receive instruction—but also one-third of these students returned to general education classrooms due to adequate reading levels. (Note: None of the students who received regular classroom instruction returned to general education placements.)

O’Connor and Jenkins (1995) found that Reading Mastery supplemented with spelling resulted in improved reading of words from Reading Mastery as well as improved scores on tests of word identification and decoding of pseudo-words.

More recently, Cooke, Gibbs, Campbell, and Shalvis (2004) compared reading achievement of students with mild disabilities taught with the accelerated versions of Reading Mastery (Fast Cycle) and Horizons (Fast Track). Both groups made significant gains on the state literacy exam and the reading subtests of the Woodcock Johnson—Revised: Tests of Achievement. A comparison of the two groups showed small differences favoring the Reading Mastery students; however, these differences were not statistically significant.

Only one of the 10 studies found that a comparison group outperformed the students who were taught with Direct Instruction reading programs. Marston et al. (1995) examined six promising interventions for elementary students with mild disabilities. The interventions were implemented for only 10 weeks and students taught with computer-assisted learning, reciprocal teaching, and generic direct instruction outperformed students taught with Reading Mastery.

### TABLE 2: READING MASTERY/DISTAR RESEARCH WITH STUDENTS WITH HIGH-INCI DENCE DISABILITIES

<table>
<thead>
<tr>
<th>Study</th>
<th>DI Program</th>
<th>(N) Participants</th>
<th>Research Design/ Purpose</th>
<th>Intervention Details</th>
<th>Outcome Measures</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizons</td>
<td>DISTAR Reading</td>
<td>120</td>
<td>Experimental — Pretest-posttest</td>
<td>1 year study comparing DISTAR reading to basal only.</td>
<td>Reading Mastery Test Revised (RM) word and segmenting subtests.</td>
<td>Students who received Reading Mastery had significantly higher word and segmenting scores compared to the control group.</td>
</tr>
<tr>
<td>Cooke &amp; Jenkins &amp; Finney (1983)</td>
<td>DISTAR Reading</td>
<td>60</td>
<td>Experimental — Pretest-posttest</td>
<td>Six students, 4 years, 3 months, control group received basal only.</td>
<td>Reading Mastery Test Revised (RM) word and segmenting subtests.</td>
<td>Students who received Reading Mastery had significantly higher word and segmenting scores compared to the control group.</td>
</tr>
<tr>
<td>O’Connor, Landis, &amp; Wilk (1981)</td>
<td>Reading Mastery</td>
<td>60</td>
<td>Experimetal — Pretest-posttest</td>
<td>Six students, 4 years, 3 months, control group received basal only.</td>
<td>Reading Mastery Test Revised (RM) word and segmenting subtests.</td>
<td>Students who received Reading Mastery had significantly higher word and segmenting scores compared to the control group.</td>
</tr>
<tr>
<td>O’Connor, Landis, &amp; Wilk (1981)</td>
<td>Reading Mastery</td>
<td>60</td>
<td>Experimental — Pretest-posttest</td>
<td>Six students, 4 years, 3 months, control group received basal only.</td>
<td>Reading Mastery Test Revised (RM) word and segmenting subtests.</td>
<td>Students who received Reading Mastery had significantly higher word and segmenting scores compared to the control group.</td>
</tr>
</tbody>
</table>
Corrective Reading Research

Sixteen studies were found that included Corrective Reading with students with high-incidence disabilities. As seen in Table 3 (on pg. 20), most participants were specifically identified as having learning disabilities or whose descriptions matched the definition of learning disabilities (i.e., other countries). Most investigations were conducted in elementary and/or middle school settings. One study investigated the effects of the amount of teacher training on student performance.

Eight of these studies compared the relative effectiveness of Corrective Reading to other programs. Results showed that students who received Corrective Reading significantly outperformed comparison groups in all but one of these studies (Lewis, 1982). Results of one of two studies conducted by Lewis found that both the Corrective Reading group and English Colour Code (a reading intervention program) group outperformed the school’s own remedial program. However, results of the second study found that gains for all three groups were similar.

Six studies evaluated the effectiveness of Corrective Reading by comparing pretest and posttest scores. Each of these studies reported that students who received Corrective Reading made gains. Polloway, Epstein, Polloway, Patton, and Ball (1986) found that students with learning disabilities and developmental disabilities made significantly greater gains with Corrective Reading than they had made in the previous year when they were taught with different materials.

One study (i.e., Edlund & Ogle, 1988) investigated different levels of teacher training for implementation of Corrective Reading and Morphographic Spelling (currently published as Spelling Through Morphographs) as well as two non-Direct Instruction programs. Teachers in the control group studied the manuals on their own. One group received six weeks of training and another group got one week of training. The students instructed by each group of teachers were pretested and posttested. The students whose teachers studied the manuals on their own (control group) demonstrated losses in reading and spelling. Students whose teachers had six weeks of training fared better than the students whose teachers received one week of training.

Finally, Marchand-Martella, Martella, Orlob, and Ebey (2000) examined the issue of implementation of Corrective Reading at the high school level, where scheduling and grouping are often challenging. The authors found that high-school students in Honors English, when properly trained, could effectively teach Corrective Reading to freshman in special education. This study suggests that with careful training, parents, volunteers, and peers can effectively tutor struggling readers using the Corrective Reading program.

Six studies were found that included Corrective Reading with students with high-incidence disabilities.
## Table 3: Language Research with Preschoolers with High-Incidence Disabilities

<table>
<thead>
<tr>
<th>Study</th>
<th>DI Program</th>
<th>(N) Participants</th>
<th>Research Design/Goal</th>
<th>Intervention Details</th>
<th>Outcome Measures</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arthur (2006)</td>
<td>Corrective Reading</td>
<td>12 (N)</td>
<td>Learning disabilities (3) and normal students (9)</td>
<td>(10) 5- and 6-year-olds</td>
<td>Test of Language Competence (TLC)</td>
<td>Experimental group had significantly better test scores on the TLC.</td>
</tr>
<tr>
<td>Bauer et al. (1998)</td>
<td>Corrective Reading</td>
<td>8 (N)</td>
<td>Learning disabilities (7) and normal students (1)</td>
<td>(10) 5-year-olds</td>
<td>Test of Language Competence (TLC)</td>
<td>Experimental group had significantly better test scores on the TLC.</td>
</tr>
<tr>
<td>Bennett, Krable, Researcher, &amp; Jackson (1996)</td>
<td>Corrective Reading</td>
<td>20 (N)</td>
<td>Learning disabilities (15) and normal students (5)</td>
<td>(15) 5-year-olds</td>
<td>Test of Language Competence (TLC)</td>
<td>Experimental group had significantly better test scores on the TLC.</td>
</tr>
<tr>
<td>Campbel (1994)</td>
<td>Corrective Reading</td>
<td>10 (N)</td>
<td>Learning disabilities (9) and normal students (1)</td>
<td>(9) 5-year-olds</td>
<td>Test of Language Competence (TLC)</td>
<td>Experimental group had significantly better test scores on the TLC.</td>
</tr>
<tr>
<td>Delayed (1996)</td>
<td>Corrective Reading</td>
<td>12 (N)</td>
<td>Learning disabilities (11) and normal students (1)</td>
<td>(11) 5-year-olds</td>
<td>Test of Language Competence (TLC)</td>
<td>Experimental group had significantly better test scores on the TLC.</td>
</tr>
<tr>
<td>Edelman &amp; DiPaola (1996)</td>
<td>Corrective Reading</td>
<td>12 (N)</td>
<td>Learning disabilities (11) and normal students (1)</td>
<td>(11) 5-year-olds</td>
<td>Test of Language Competence (TLC)</td>
<td>Experimental group had significantly better test scores on the TLC.</td>
</tr>
<tr>
<td>Geisinger &amp; Gingerich (2002)</td>
<td>Corrective Reading</td>
<td>12 (N)</td>
<td>Learning disabilities (11) and normal students (1)</td>
<td>(11) 5-year-olds</td>
<td>Test of Language Competence (TLC)</td>
<td>Experimental group had significantly better test scores on the TLC.</td>
</tr>
<tr>
<td>Heinzelmann (2004)</td>
<td>Corrective Reading</td>
<td>12 (N)</td>
<td>Learning disabilities (11) and normal students (1)</td>
<td>(11) 5-year-olds</td>
<td>Test of Language Competence (TLC)</td>
<td>Experimental group had significantly better test scores on the TLC.</td>
</tr>
<tr>
<td>Lewis (2002)</td>
<td>Corrective Reading</td>
<td>12 (N)</td>
<td>Learning disabilities (11) and normal students (1)</td>
<td>(11) 5-year-olds</td>
<td>Test of Language Competence (TLC)</td>
<td>Experimental group had significantly better test scores on the TLC.</td>
</tr>
</tbody>
</table>

## Table 3, Continued

<table>
<thead>
<tr>
<th>Study</th>
<th>DI Program</th>
<th>(N) Participants</th>
<th>Research Design/Goal</th>
<th>Intervention Details</th>
<th>Outcome Measures</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lloyd et al. (2008)</td>
<td>Corrective Reading</td>
<td>12 (N)</td>
<td>Learning disabilities (11) and normal students (1)</td>
<td>(11) 5-year-olds</td>
<td>Test of Language Competence (TLC)</td>
<td>Experimental group had significantly better test scores on the TLC.</td>
</tr>
<tr>
<td>Marchlewski, Markowski, &amp; Markowski (2003)</td>
<td>Corrective Reading</td>
<td>12 (N)</td>
<td>Learning disabilities (11) and normal students (1)</td>
<td>(11) 5-year-olds</td>
<td>Test of Language Competence (TLC)</td>
<td>Experimental group had significantly better test scores on the TLC.</td>
</tr>
<tr>
<td>Paulson, Easton, Patrick, &amp; Beilin (1996)</td>
<td>Corrective Reading</td>
<td>12 (N)</td>
<td>Learning disabilities (11) and normal students (1)</td>
<td>(11) 5-year-olds</td>
<td>Test of Language Competence (TLC)</td>
<td>Experimental group had significantly better test scores on the TLC.</td>
</tr>
<tr>
<td>Specter &amp; Ausman (2004)</td>
<td>Corrective Reading</td>
<td>12 (N)</td>
<td>Learning disabilities (11) and normal students (1)</td>
<td>(11) 5-year-olds</td>
<td>Test of Language Competence (TLC)</td>
<td>Experimental group had significantly better test scores on the TLC.</td>
</tr>
<tr>
<td>Sanderman &amp; Lussier (1996)</td>
<td>Corrective Reading</td>
<td>12 (N)</td>
<td>Learning disabilities (11) and normal students (1)</td>
<td>(11) 5-year-olds</td>
<td>Test of Language Competence (TLC)</td>
<td>Experimental group had significantly better test scores on the TLC.</td>
</tr>
<tr>
<td>Thompson (1996)</td>
<td>Corrective Reading</td>
<td>12 (N)</td>
<td>Learning disabilities (11) and normal students (1)</td>
<td>(11) 5-year-olds</td>
<td>Test of Language Competence (TLC)</td>
<td>Experimental group had significantly better test scores on the TLC.</td>
</tr>
<tr>
<td>Thrane (2001)</td>
<td>Corrective Reading</td>
<td>12 (N)</td>
<td>Learning disabilities (11) and normal students (1)</td>
<td>(11) 5-year-olds</td>
<td>Test of Language Competence (TLC)</td>
<td>Experimental group had significantly better test scores on the TLC.</td>
</tr>
</tbody>
</table>
Direct Instruction Writing and Spelling Research

Our search identified five studies using Direct Instruction spelling and writing programs (See Table 4 on pg. 23). The participants in four studies were students with learning disabilities whose age ranged from eight to 11 years. Two studies, in addition to students with learning disabilities, included students with behavior disorders and traumatic brain injuries. One study identified participants as special education resource room students in grades three through five.

Three studies investigated Direct Instruction spelling programs. Darch and Simpson (1991) compared the effectiveness of 40 lessons of Spelling Mastery and found that the students who received Direct Instruction significantly outperformed those students who were taught using another program. In a study that took place in Australia using Morphographic Spelling, Maggs, McMillan, Patching, and Hawk (1981) found that students whose academic problems fit our description of learning disabilities made gains of over 11 months after only eight months of instruction. More recently, Owens et al. (2004) investigated the efficacy of Spelling Mastery taught by a paraprofessional. They found that the paraprofessional was successful in implementing Spelling Mastery as determined by observations of her teaching and the improvement of her students. This study suggests another instructional delivery option for special educators.

The Direct Instruction writing programs Language for Writing and Reasoning and Writing were developed later than the reading and spelling programs; thus, there is limited, although strong, evidence of their success (Fredrick & Steventon, 2004). Anderson and Keel (2002) investigated the effects of Reasoning and Writing Level C fourth and fifth grade students with learning disabilities and behavior disorders. Students were shown to make significant gains in only six weeks. Recently, Martella and Waldron-Soler (in press) conducted a year-and-a-half program evaluation of Language for Writing that included 21 special education elementary students. All students were pretested and posttested using the Test of Written Language-3 (TOWL-3). Students in special education made educationally significant gains; in particular, these students closed the gap between their performance and that of the normative sample.

TABLE 4: WRITING AND SPELLING RESEARCH WITH STUDENTS WITH HIGH-INCIDENCE DISABILITIES

<table>
<thead>
<tr>
<th>Study</th>
<th>DI Program</th>
<th>(N) Participants</th>
<th>Research Design/ Purpose</th>
<th>Intervention Details</th>
<th>Outcome Measures</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anderson &amp; Keel</td>
<td>Language for Writing</td>
<td>(45)</td>
<td>Pre-experimental — One group pretest-posttest</td>
<td>20 lessons of Reasoning and Writing were taught in 5 weeks.</td>
<td>Test of Written Language-2 (TOWL-2)</td>
<td>Educationally important gains were found.</td>
</tr>
<tr>
<td>Darch &amp; Simpson</td>
<td>Spelling Mastery</td>
<td>(28)</td>
<td>Experimental — Four groups pretest-posttest</td>
<td>Two groups Spelling Mastery and visual imagery; another group received 3 weeks, 6 months, and 11 months instruction.</td>
<td>Pre-test and post-test on 25 lessons.</td>
<td>All students improved significantly.</td>
</tr>
<tr>
<td>Maggs, McMillan, Patching, &amp; Hawk</td>
<td>Morphographic Spelling</td>
<td>(25)</td>
<td>Experimental — One group pretest-posttest</td>
<td>30 min. daily instruction in morphographic spelling, 8 months, 60 lessons, compared fidelity, checklists, and observation to previous instruction.</td>
<td>Generalization and Spelling Test.</td>
<td>Remedial students made 9.91 months growth on Spelling Test.</td>
</tr>
<tr>
<td>Marsella &amp; Waldron-Soler</td>
<td>Language for Writing</td>
<td>(50)</td>
<td>Pre-experimental — One group pretest-posttest</td>
<td>8 months, all 140 lessons taught; performance on 80% of words equal or better than 95% accuracy.</td>
<td>Test of Written Language-2 (TOWL-2).</td>
<td>Remedial students made 9.91 months growth on Spelling Test.</td>
</tr>
<tr>
<td>Owens, Fredrick, &amp; Steventon</td>
<td>Spelling Mastery</td>
<td>(45)</td>
<td>Single-case — Multiple baseline across participants</td>
<td>All students received Spelling Mastery instruction, no significant differences were found.</td>
<td>CBM of spelling, spelling and spelling achievement.</td>
<td>Remedial students made 9.91 months growth on spelling achievement.</td>
</tr>
</tbody>
</table>
Direct Instruction
Mathematics Research

We found one study on mathematics instruction conducted by McKenzie, Marchand-Martella, Moore, and Martella (2004) using the prepublication program, Connecting Math Concepts-K, with typically developing three- to five-year-old children and those with developmental delays (see Table 5 on page 25). Positive findings were noted on various measures after completing 30 lessons of this program.

It should be noted that Cole et al. (1993) described in Table 1 used DISTAR Arithmetic as part of an intervention package for preschoolers, however, specific math measures were not used; therefore, this study was not summarized here.

When I first introduced Connecting Math Concepts to my students (after a few months of another series), they began referring to it as the ‘good math.’ Each day as I would say it was time for math, they would ask whether we were going to do the ‘good math’ or the ‘icky math.’ I finally collected the other math books from them and told them we would be doing only the ‘good math’ from now on. I never went back.

Teacher, Kingston, Illinois

Areas of Emerging Research

Little research has been done examining the academic impact of serious emotional disturbance (SED). Low graduation rates associated with academic failure are common for these students (Greenbaum et al., 1996). Educators have begun to look at Direct Instruction as positive behavior support for students with SED. Colvin, Greenberg, and Sherman (1993) reviewed two unpublished studies with Corrective Reading and Reading Mastery Fast Cycle used to teach students with SED. These studies found that students taught with the Direct Instruction curricula not only made gains in reading but also made substantial gains in behavior measures. Although the studies that Colvin and his colleagues cited were not carefully controlled experimental research, they do suggest that further research needs to be conducted investigating the relationship between the structure and design of Direct Instruction and gains in reading and behavior.

Summary

Direct Instruction programs have been shown to be effective with a wide range of children with high-incidence disabilities from preschool to high school. Although the majority of the participants in the studies were students with learning disabilities, students with developmental delays, language delays, mild cognitive disabilities, and behavior disorders also have been shown to benefit from Direct Instruction. Reading Mastery and Corrective Reading have been researched fairly extensively, demonstrating their efficacy for students with mild disabilities. Further research is needed in the areas of writing and mathematics instruction.

### TABLE 5: MATH RESEARCH WITH PRESCHOOLERS WITH HIGH-INCIDENCE DISABILITIES

<table>
<thead>
<tr>
<th>Study</th>
<th>DI Program</th>
<th>(N) Participants</th>
<th>Research Design/ Purpose</th>
<th>Intervention Details</th>
<th>Outcome Measures</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>McKenzie, Marchand-Martella, Moore, &amp; Martella (2004)</td>
<td>Connecting Math Concepts-K (CMC-K)</td>
<td>16</td>
<td>Pre-experimental, one group pretest-posttest</td>
<td>Investigating the efficacy of CMC-K</td>
<td>Cognitive Domain of the Battelle Developmental Inventory; CMC placement test</td>
<td>Students with developmental delays made significant gains on the Battelle; all students were ready to begin Connecting Math Concepts A.</td>
</tr>
</tbody>
</table>

These studies found that students taught with the Direct Instruction curricula not only made gains in reading but also made substantial gains in behavior measures. Although the studies that Colvin and his colleagues cited were not carefully controlled experimental research, they do suggest that further research needs to be conducted investigating the relationship between the structure and design of Direct Instruction and gains in reading and behavior.
Overview

Eight investigations were found. These studies spanned the mid-1970s to 2004. The majority of these investigations included students with developmental disabilities (n = 4). Some studies also included students with:

- Traumatic brain injury or TBI (n = 1)
- Moderate intellectual disabilities and autism/moderate intellectual disabilities (n = 1)
- Intellectual disabilities (n = 1)
- Those identified as “educationally subnormal” (n = 1)

Our analysis is presented in one table (Table 6 on page 27) given the small number of studies found. The eight studies* examined a range of Direct Instruction programs including:

- DISTAR Reading (n = 4)
- Language (n = 4)
- Arithmetic (n = 1)
- Corrective Reading (n = 2)
- Reading Mastery® (n = 1)

Participants ranged in age from six to 16 years (mean age = 10) and had IQ scores between 30 and 81 (average IQ of participants = 52, which is approximately three standard deviations below the mean of 100). Such scores, coupled with other factors, lead to the classification of moderate to severe developmental disabilities for a number of the participants.

The research review uncovered common themes despite the various classifications of students with low-incidence disabilities. One theme pertained to the low expectations we often have for this population. Perhaps because of the low levels of vocabulary, deficits in language and communication skills, and a history of repeated failure with “typical” curricula, low expectations for how these individuals acquire complex skills exist. Another common theme involved the use of less sophisticated interventions.

The Direct Instruction studies did not support these themes; students were held to high standards using sophisticated interventions resulting in generalizable skills. Overall, all eight studies showed positive effects for this population of students.

*Note: The number of studies does not equal eight given that some studies included more than one Direct Instruction program.

<table>
<thead>
<tr>
<th>Study</th>
<th>DI Program</th>
<th>(N) Participants</th>
<th>Research Design/Intervention Details</th>
<th>Outcome Measures</th>
<th>Findings</th>
</tr>
</thead>
</table>
| Broyee, Wind, & Wheat (1975) | DISTAR Reading I | 6 | Preexperimental, One group, pre-planned, controlled study on five children with moderate to severe intellectual disabilities. | Pretested DI/Mastery Test, Guttman Language Ability Test. Mastery Analysis of School District Language Test. | N/A |}
| Gang, Singer, Clarkey, & Tish (1992) | Corrective Reading: Comprehension B | 2 | Preexperimental, One group, pre-planned, controlled study on two children with severe intellectual disabilities. | Pretested DI/Mastery Test, Guttman Language Ability Test. Mastery Analysis of School District Language Test. | N/A |}
| Gregory & McLeod (1992) | DISTAR Reading | 6 | Experimental & Control Group, pre-test, post-test design. | Mastery in language and mathematics. | N/A |}
| McPeek, Mashburn, & Lott (1990) | DISTAR Language | 12 | Experimentation — Pretest-posttest, 3-year period. | Mastery in language and mathematics. | N/A |}
| Young, Baker, & Stahl (1990) | DISTAR Arithmetic | 5 | Single-case — Multiple baseline design. | Mastery in language and mathematics. | N/A |
DISTAR Reading Research

The search found two studies that involved DISTAR Reading. As shown in Table 6 on page 27, researchers identified the participants in these studies as students with developmental disabilities (i.e., Bracey, Maggs, & Morath, 1975) or those who were "educationally subnormal" (Gregory & Warburton, 1983). One common theme expressed in these investigations related to the notion that these individuals could not ever be expected to learn to read or read very well (e.g., they should be provided only with sight words). These studies set out to show that students with developmental disabilities could learn to read. Additionally, these studies focused on how rapidly these students could learn to read. Overall, the two studies showed students with low incidence disabilities could learn sophisticated reading strategies such as decoding words and sentences (i.e., using phonic analysis strategies as opposed to sight words). Furthermore, the studies showed the students learned to read at an accelerated pace.

Bracey et al. (1975) showed the robust effects of DISTAR Reading with six institutionalized students with IQ scores ranging from 30 to 40. These students had various speech difficulties and were unable to read any words. DISTAR Reading (Reading Mastery) asks students to identify sounds, blend these sounds into words, and say the words the fast way. Results showed these students made significant improvements in learning to read words. The authors called attention to teaching generalizable decoding strategies to this population of students because "not every word needs to be taught directly to the students, as with a sight word approach" (pg. 88).

As a charter school, we offer a range of educational programming. Approximately half of the students are typically developing while the other half have been diagnosed as having autism spectrum disorder. In Reading Mastery® Classic II and III, I group my students by instructional performance level, not their label. Having (typically developing) peer models has turned out to be very advantageous. The students with autism have access to high levels of language, good examples of reading behavior, and can imitate the positive classroom/learning behaviors of their peers. Our students with autism really need constant repetition to retain the skills.

Teacher, Columbus, Ohio

DISTAR Reading and Language Research

The search yielded two studies that combined DISTAR Reading and Language programs with students with developmental disabilities (i.e., Booth, Hewitt, Jenkins, & Maggs, 1979). The researchers implemented an extensive five-year investigation with 12 students. Results showed an average language gain of 34 months for 32 months of instruction. At the end of the study, most students read at third- to fourth-grade levels.

Gersten and Maggs (1982) investigated the long-term effects of an intensive five-year program in DISTAR Reading I–III in Sydney, Australia. Twelve children with developmental disabilities ranging in age from six years, 10 months to 12 years, six months received instruction in DISTAR Language and Reading an average of 30 minutes per day. The Stanford-Binet Intelligence Test (pretest and posttest) and Peabody Picture Vocabulary Test, Balldie Language Ability Test, and Neale Analysis of Reading Ability (posttest only) were administered. Results indicated statistically significant gains on the Stanford-Binet Intelligence Test. There were significant differences between the children with developmental disabilities in this study and children without disabilities from the normative sample in Sydney on nine of the 66 objectives on the Balldie Language Ability Test (five favoring children with developmental disabilities, four favoring children without disabilities).

We used Language for Learning with three students with autism spectrum disorder. Although the students showed some initial problems—such as trying to imitate the finger snap—all three students learned to follow the Language for Learning format after four to five lessons. Not only did the students benefit from the specific content of the lesson, they also practiced taking turns and working together in a small group. They were never distracted during a lesson. The program helped them attend to me and the lesson, a strong indication that Language for Learning captured the students’ interest.

Teacher, Middletown, Pennsylvania

Corrective Reading Research

The search produced one study demonstrating the effectiveness of Corrective Reading. Similar to the DISTAR Reading studies, the investigation examined the degree to which students with severe disabilities could learn to read. Flores, Shippen, Alberto, and Crowe (2004) analyzed whether six students with moderate intellectual disabilities could learn letter-sound correspondences to decode words. Corrective Reading, Decoding A was used with modifications to the instructional sequence and formats to accommodate the students’ needs (e.g., some students used augmentative communication devices). Results demonstrated that five of the six students learned to identify all targeted letter-sound correspondences and blend letter sounds. Another positive finding showed that these students could sound out and blend words composed of the targeted letter sounds.
Research Involving the Combination of Programs

One interesting investigation used combinations of Direct Instruction programs (see Table 6 on page 27). Glang, Singer, Cooley, and Tish (1992) provided two case studies conducted with students with traumatic brain injuries. In the first case study, an eight-year-old student received instruction in Corrective Reading, Comprehension A (lessons in reasoning from the deduction strand) and Corrective Mathematics (two different exercises involving math story problems and math facts). Results showed that this student could complete more reasoning problems after receiving instruction. Further, he demonstrated an increased number of correctly answered story problems and his rate per minute of correctly completed facts almost doubled with instruction. Figure 4 illustrates the results of this student in mathematics.

In the second case study, Glang et al. (1992) targeted instruction using DISTAR Language (sentence repetition) and Reading Mastery (letter sounds) for a six-year-old student with a traumatic brain injury who experienced difficulty with visual motor skills, attention, and memory. Substantial improvement was evident in both statement repetition and sound identification skills.

DISTAR Arithmetic Research

The search located one study demonstrating how DISTAR Arithmetic can benefit students who have intellectual disabilities. Young, Baker, and Martin (1990) analyzed the effects of the Discrimination Learning Theory (DLT). DLT added specific response cards where students indicated their responses through the use of cards in a match-to-sample format. Five students received instruction in DISTAR Arithmetic I and DISTAR Arithmetic I coupled with DLT. The DLT plus DISTAR Arithmetic I phase produced higher percentages of academic engagement and mastery test scores as compared to DISTAR Arithmetic I alone. The students had limited verbal skills and responded in two to three word utterances; therefore, the match-to-sample format used during DLT served as an effective adaptation of the DISTAR Arithmetic I program.

Areas of Emerging Research

One area of research that offers promise in the area of Direct Instruction involves students who are hard-of-hearing or deaf or who have visual impairments or blindness. Students in these populations have traditionally displayed poor educational progress. For instance, students with hearing loss and deafness generally lag behind their same age peers in academics even though they possess average intelligence (Heward, 2003). A long-term study of students who are deaf or hard-of-hearing suggests Direct Instruction programs can make dramatic differences in the educational performance of students with hearing loss (Kraemer, Kramer, Koch, Madigan, & Steely, 2001).

Students who attended high school in Irvine, California in self-contained classrooms received several Direct Instruction programs (Corrective Reading Series – Decoding and Comprehension, Spelling Through Morphographs, Spelling Mastery, and Expressive Writing). Grade 12 students made grade level gains of:
- 3.0 years in total language.
- 2.5 years in reading comprehension.
- 3.8 years in spelling when compared to end-of-year testing in grade eight.

Over the same period, the Gallaudet Center for Assessment and Demographics (CADS) reported that self-contained students demonstrated yearly grade level gains of:
- 0.0 years for total language.
- 0.0 years for reading comprehension.
- 1.3 years for spelling.

Grade level gains for all CADS students who were deaf or hard-of-hearing (including mainstreamed students) were:
- 0.3 years for total language.
- 0.4 years for reading comprehension.
- 0.9 years for spelling.

On average, students who spent four years in Direct Instruction programs were at the:
- 7.2 grade level in total language.
- 5.7 grade level in reading comprehension.
- 7.0 grade level in spelling.

The students who received Direct Instruction outperformed the national averages for students who are deaf and attending self-contained classrooms by:
- 4.4 years in total language.
- 2.8 years in reading comprehension.
- 2.2 years in spelling.

Finally, the students taught using Direct Instruction programs outperformed the CADS average for all students who were deaf or hard-of-hearing (including mainstreamed students) by:
- 2.7 years in total language.
- 1.2 years in reading comprehension.
- 0.9 years in spelling.
Deaf Students Using Direct Instruction
Make Significant Reading Gains

Similarly, Trezek (2002) asked, “Does Direct Instruction in phonics benefit deaf students? If so how?” Trezek discussed the findings of the National Reading Panel (NICHD, 2000) and highlighted the importance of phonological processing and its role in learning to read. She presented evidence that students who are deaf can access phonological information even though they cannot do so through audition. For instance, students might rely on speech reading or cued speech.

Trezek described a pilot study showing how deaf students who received instruction from Direct Instruction reading programs (Corrective Reading, Decoding B2 and C) gained 1.2 to 2.5 grade levels in basic reading and comprehension measures after only seven months of instruction. Although the implementation of the DI programs used by Trezek (2002) and Kraemer et al. (2001) produced gains, both studies report making some adaptations and modifications to the programs to accommodate the students’ needs. Adaptations included extending the time to present the lesson to practice pronunciations, reviewing previously presented concepts, and using pictorial representations of selected vocabulary.

Direct Instruction Shows Great Promise for Visually Impaired Students

Students with visual impairments represent another low incidence population that benefits from Direct Instruction programs. The Arkansas School for the Blind implemented Reading Mastery, Connecting Math Concepts, Language for Learning, Spelling Mastery, and Spelling Through Morphographs in the elementary grades and Corrective Reading Decoding and Comprehension, and Corrective Mathematics in the secondary grades (Hunt, Woolly, & Moore, 2001). Although the authors do not share specific outcome data, they do report after examining which students needed Braille, large print, or standard print, “Most beginning Direct Instruction programs are already written in larger than standard print and would, therefore, work for several students with little adaptation” (pg. 33).

Although these studies show great promise for students with hearing loss and visual impairments, systematic experimental studies published in quality peer-reviewed journals remain the benchmark by which educators judge efficacy through scientific validation.

I was skeptical about Reading Mastery, but like any teacher, I was willing to try it for the sake of the students. After a week of one hour per day, my students were rapidly improving, and I was a happy teacher.

Special Education Teacher, Brookhaven, Mississippi

Summary

Direct Instruction programs show clear evidence of their efficacy with students who have low-incidence disabilities. Many of these students had IQs in the 30 to 50 range, yet the majority of these students learned to read and master language skills otherwise thought unattainable. Studies about Direct Instruction show evidence of rapid learning gains. It seems that students with more severe disabilities can learn at high levels when provided with systematic, research-validated programs such as Direct Instruction.
References


34

35


Proven Results. Direct Instruction Works.

Nearly 50 years of research validate the efficacy of the Direction Instruction approach for all types of students in a range of instructional settings.

mheonline.com/disuccess