What Is It?

Direct Instruction (usually abbreviated as DI) is one specific model of teacher-directed explicit instruction. It is distinguished from other approaches to explicit teaching, or direct instruction (di), by its emphasis on both the importance of instruction (how a student is taught) and the importance of curriculum design (what the student is taught, in what order). The central elements of the DI philosophy are:

- Teachers are responsible for student learning.

- Curriculum design is a critical variable in student achievement.

The goal of DI is to accelerate student learning by maximizing efficiency in the design and delivery of instruction. Efficiency is achieved when students generalize beyond the specific material in the lesson. In DI, curriculum design is the key to assuring generalizations. DI curriculum design principles are based on Engelmann's theory of learning and generalization, which posits that:

- The student does not first learn something in a concrete singular sense and then generalize to some larger set. Even the initial learning is a generalization.

- Generalizations can be taught explicitly and systematically by using examples and non-examples to communicate critical samenesses among sets of exemplars.

- Generalizations represent efficiency.

For Whom Is It Intended?

DI is intended for all students from whom we can expect reasonably high levels of academic achievement. DI has been used successfully with a broad range of students, including those with learning disabilities. Specific DI programs have been developed in a number of subject areas and at various grade-levels.

How Does It Work?

Over 50 specific DI programs have been published for teaching language, reading, writing, spelling, mathematics, and science. These programs range from a basal series for regular classroom instruction and for remedial settings, to a videodisc series for teaching core concepts in mathematics and science. Each program contains detailed descriptions of both the content to be presented and the procedures to be used to teach that content effectively.

Curriculum Features. Scripted lessons provide carefully worded explanations, carefully selected and sequenced examples, and carefully structured demonstrations. The lessons are designed to ensure clear communication of preselected generalizations that have many applications and that provide foundations for increasingly complex learning.

The DI reading curricula are representative of other DI programs. The reading curricula provide many examples of generalizations that students learn en route to becoming independent readers. Phonemic awareness and phonics generalizations are emphasized in the beginning stages of reading instruction. General strategies for isolating, blending, and identifying phonemes in spoken words are taught before letter-sound correspondences. Gradually, letter-sound correspondences are introduced (in a logical sequence) and integrated with the phonemic awareness skills. Letter-sounds are taught in conjunction with blending and sounding-out strategies and high utility sight words so that students can start to read stories before all letter-sound corre-spondences are mastered.

Automatic decoding is achieved by daily practice of reading words in isolation. Fluency is achieved by repeated readings of decodable passages to specified levels of accuracy and rate. As passage reading becomes fluent, the emphasis shifts from decoding to comprehension instruction. Included among the comprehension strategies taught are: distinguishing between relevant and irrelevant evidence; identifying contradictions;

using analogies (comparisons) to communicate relationships; distinguishing between literal and inferential questions; and identifying cause and effect.

High-application generalizations emphasized in other DI curricula are: morphographic spelling patterns; connections among the elements of number families; sameness in the applications of ratios and proportions to solve a variety of problems; and how convection plays a central role in various earth science phenomena.

Delivery Features. Delivery techniques and classroom management procedures are described in teacher materials that accompany each DI program. DI delivery features include: rapid pacing, choral group responding mixed with individual turns, corrective feedback and re-teaching, reinforcement, review and practice, and progression from teacher-directed instruction to independent application. Students are generally taught in homogeneous skill groups. Ongoing mastery testing is used to monitor student progress, and student groupings change as students progress at different rates.

How Adequate Is The Research Knowledge Base?

Direct instruction has been the focus of considerable validation and feasibility research. A high level of effectiveness has been demonstrated by individual research studies, research reviews, and technical reports of informal studies:

- Data from Project Follow Through (with disadvantaged students in grades K-3) showed superior results for DI when compared to other models of instruction on measures of basic skills, cognitive-conceptual skills, and affective skills. Follow-up studies with Follow Through students revealed lasting advantages through high school for students taught with DI in grades K-3 (see references 2 & 5).

- A recent review of 34 research studies comparing DI interventions to a variety of other instructional programs showed that (a) 87% of the post-treatment means favored DI, compared to only 12% that favored non-DI approaches, and (b) 64% of

statistically significant outcomes favored DI, compared to only 1% that favored non-DI approaches and 35% that favored neither (see reference 1).

- Statistical integration of the data from the 34 studies referred to above showed large DI gains for (a) both regular education and special education students, and (b) both elementary and secondary students. Large DI gains were found (c) in a variety of academic subjects, (d) whether gains were measured using norm-referenced or criterion-referenced measures, and e) whether the studies lasted up to 1 year or over 1 year.

- Six of the 34 studies discussed above were targeted at improving the reading and/or math skills of students with learning disabilities. The average post-treatment performance of these students was more than one standard deviation above that of the comparison groups. Similar large positive effects were reported in three other sources: an earlier integrative analysis of the effects of DI in special education (see reference 7), a recent integrative analysis of the most effective intervention programs in special education (see reference 4), and an integrative analysis of the effects of DI videodiscs for teaching math and science (see reference 3).

- Over 50 studies validate various specific features of DI programs, including the selection and sequencing of instructional examples, the specific wordings that facilitate learning and prevent mis-learning, feedback on oral reading errors during repeated readings, pacing, the size of instructional groups, and teacher attention and other forms of reinforcement.

How Practical Is It?

Each DI program is described thoroughly in a set of teacher materials tailored specifically to the target content/skill domain. The materials include scripted lessons as well as procedures for measuring and monitoring individual and group progress. These materials greatly shorten the time and effort required for teachers to learn to use DI effectively. Although assuring ease of use and reliability of implementation, the DI instructional materials are seen by some teachers as highly constraining

and incompatible with their established instructional practices. A second practical limitation of the DI approach is that, although it is intended as a general instructional approach, the approach cannot be used readily to teach skills or content in areas for which detailed instructional materials and scripts have not yet been developed. The effectiveness of on-site teacher adaptations of DI materials has not been established.

How Effective Is It?

In sum, our review of the work on DI indicates that it is an effective and reliably implementable instructional approach for students with LD in those skill and content domains studied to date. Thus, practitioners should Go For It as a viable instructional option where warranted. Our only qualifications are that practitioners and administrators will need to ascertain the fit of DI with their own educational philosophy and teaching practices. They should also be aware that on-site modifications to the DI approach are not advisable until further research clarifies which components of the complete instructional 'package' are essential for effective learning.

What Questions Remain?

Questions have been raised about the efficacy of DI for students of different ages with different skill levels and/or different learning problems. Many people assume that DI (a) may be used successfully to teach disadvantaged students, but not students with LD, (b) may be used successfully to teach a variety of low-performing students, but not average- and high-performing students, (c) may be used successfully with elementary students, but not with middle or high school students and adults, (d) may be used effectively to teach decoding but not reading comprehension, (e) may be used effectively to teach rudimentary academic skills, but not higher-order cognitive skills, and (f) may be used successfully to increase academic achievement, but not to increase motivation or self concept. Not one of these assumptions is supported by research on DI (see reference 6).

However, two important questions do remain. The first question has to do with the efficacy of DI practices at the middle and high school levels, since published DI curricula are not available for many of the subjects taught at those levels. Until recently, published DI programs for students beyond the elementary grades were designed to be used primarily for remedial or corrective instruction in reading, math, and spelling, and efficacy studies have shown them to be effective with that group. Within the last decade, a series of DI videodisc programs for teaching math and science and a two-volume U.S. History textbook have been developed and used with diverse groups of students. Early research on those programs indicates positive effects equal to, if not greater than, those for some of the earlier DI programs.

The second question has to do with how students who have been taught with DI in the elementary grades fare in middle and high schools where DI is not used. The answer is, we don't know. We do know, however, that middle and high school special education students with academic learning problems make tremendous gains in reading, spelling, and math when taught with existing DI curricula. We also know that disadvantaged students taught with DI in grades K-3 in Project Follow Through continued to show the benefits of that DI approach in high school, though the benefits diminished the longer the students spent in traditional curricula. We still need to explore how to provide effective DI at these higher grade levels.

How Do I Learn More?

Information about Direct Instruction Programs:

- Association for Direct Instruction (ADI), PO Box 10252, Eugene Oregon 97440.

- *Effective School Practices.: A DI journal.* Bonnie Grossen, Editor, PO Box 10252,Eugene, Oregon 97440.

- Engelmann, S., & Carnine, D. (1991). *Theory of instruction: Principles and practices.* ADI Press.

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About the Alert Series

The *Alert* Series is a joint publication of CEC's Division for Learning Disabilities and Division for Research. The series is intended to provide an authoritative resource concerning the effectiveness of current practices intended for individuals with specific learning disabilities. Each *Alert* issue will focus on a single practice or family of practices which is widely used or discussed in the LD field. The *Alert* will describe the target practice and provide a critical overview of the existing data regarding its effectiveness for individuals with learning disabilities. Practices judged by the *Alert* Editorial Committee to be well-validated and reliably implementable are featured under the rubric of **Go For It**. Those practices judged to have insufficient evidence of effectiveness are featured as **Exercise Caution**. For more information about the *Alert* series and a cumulative list of past *Alert* topics, visit the *Alerts* page on the CEC/DLD website: **http://www.cec.sped.org/dv-menu.htm**

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