

# Direct Instruction

## NEWS

ADI Effective School Practices

SARA G. TARVER, Editor, University of Wisconsin, Madison

## *Direct Instruction: A Theoretically Complex Approach That Produces Success, After Success, After Success*

This issue begins with a lesson in logic by Zig. To illustrate illogical conclusions made by many researchers of the last 20 years, he uses the analogy: Dalmatians are to spots as effective beginning reading programs are to their features. He points out that it is illogical to think that the true statement, "If a dog is a Dalmatian, it has spots," means that, "If a dog has spots, it is a Dalmatian." Likewise, it is illogical to think that the true statement, "If a beginning reading program is effective, it has phonemic awareness, phonics, etc.," means that, "If a program has phonemic awareness, phonics, etc., it is an effective reading program."

In his usual style, Zig zeroes in on one of the most important matters of the day and explains clearly the rampant confusion about "research based" recommendations.

One of the important points that Zig makes has to do with the relationship between successful programs and "individual student needs." If a program is effective with the full range of students, then it must be accommodating individual needs. It may not be accommodating individual needs in the ways espoused by some advocates of "individual needs," but then the practices advocated by many of those advocates have never been shown to benefit an individual. We all hear every day that ONE program (even a highly successful one) cannot possibly meet every individual's needs, there-

fore we must use a variety of programs (including those with no evidence of success) to meet the full range of individual needs. That is sound-good rhetoric that leads to decisions that are not in the best interest of children. We need to remember to examine the results for specific programs and determine whether each program is successful (or unsuccessful) with the full range of students. If a program is successful with the full range of students, we can rest assured that effective individualization is a built-in feature of the program.

As further explained by Zig, individualization is a built-in feature of Direct Instruction programs. And the research results for those programs show clearly that Direct Instruction benefits the full range of students, including the kinds of special education students described by Dixon and the ESL students described by Hempenstall in this issue.

And the research demonstrating Direct Instruction's effectiveness continues to mount. Included in this issue of *DI News* are seven stories included in a McGraw-Hill report, a newspaper report of success at Barton School in Milwaukee, a report of success at Louisa May Alcott School in Cleveland, and a story of success in elementary and middle schools in Cumberland County in Virginia.

As many of you know, it is not always easy to get approval to begin a Direct Instruction implementation in a school district. A lot of information sharing, persuasion, and sometimes some arm-

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## Direct Instruction News

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## Contribute to DI News:

*DI News* provides practitioners, ADI members, the DI community, and those new to DI, with stories of successful implementations of DI, reports of ADI awards, tips regarding the effective delivery of DI, articles focused on particular types of instruction, reprints of articles on timely topics, and position papers that address current issues. *The News'* focus is to provide newsworthy events that help us reach the goals of teaching children more effectively and efficiently and communicating that a powerful technology for teaching exists but is not being utilized in most American schools. Readers are invited to contribute personal accounts of success as well as relevant topics deemed useful to the DI community. General areas of submission follow:

**From the field:** Submit letters describing your thrills and frustrations, problems and successes, and so on. A number of experts are available who may be able to offer helpful solutions and recommendations to persons seeking advice.

**News:** Report news of interest to ADI's members.

**Success stories:** Send your stories about successful instruction. These can be short, anecdotal pieces.

**Perspectives:** Submit critiques and perspective essays about a theme of current interest, such as: school restructuring, the ungraded classroom, cooperative learning, site-based management, learning styles, heterogeneous grouping, Regular Ed Initiative and the law, and so on.

**Book notes:** Review a book of interest to members.

**New products:** Descriptions of new products that are available are welcome. Send the description with a sample of the product or a research report validating its effectiveness. Space will be given only to products that have been field-tested and empirically validated.

**Tips for teachers:** Practical, short products that a teacher can copy and use immediately. This might be advice for solving a specific but pervasive problem, a data-keeping form, a single format that would successfully teach something meaningful and impress teachers with the effectiveness and cleverness of Direct Instruction.

**Submission Format:** Send an electronic copy with a hard copy of the manuscript. Indicate the name of the word-processing program you use. Save drawings and figures in separate files. Include an address and email address for each author.

**Illustrations and Figures:** Please send drawings or figures in a camera-ready form, even though you may also include them in electronic form.

Completed manuscripts should be sent to:

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Acknowledgement of receipt of the manuscript will be sent by email. Articles are initially screened by the editors for placement in the correct ADI publication. If appropriate, the article will be sent out for review by peers in the field. These reviewers may recommend acceptance as is, revision without further review, revision with a subsequent review, or rejection. The author is usually notified about the status of the article within a 6- to 8-week period. If the article is published, the author will receive five complimentary copies of the issue in which his or her article appears.

*Theoretical Approach...*  
*continued from page 1*

twisting are required. I know that DI advocates are often looking for someone to talk to their school boards about Direct Instruction because I have often been asked to do so and so has Jerry Silbert. In this issue, we include Jerry's address to a school board in the hope that it will be helpful to those of you who find yourselves in the position of needing to "make the case."

Because reading instruction is of paramount importance to our children, most of our articles and success stories focus on reading achievement. We must remember, however, that math instruction is also important and that

many of the debates about reading instruction have their parallels in debates about math instruction. In this issue, we include three articles about math. In his article, Scott Inch makes an interesting case for the role of practice. Don Crawford elaborates the kinds of practice that will enable all students to learn their math facts. Mary Scarlato presents evidence of the positive effects of direct instruction math tutoring on the test scores of two Latino brothers.

Understanding the logic, principles, and theory of Direct Instruction isn't easy. As anyone who has read *Theory of Instruction* (Engelmann & Carnine, 1991, revised edition) knows, the theoretical underpinnings are exceedingly

complex. Of course, examples like those in Zig's Dalmatians article can foster that understanding. So can the paper by Martin Kozloff (in this issue) which describes Direct Instruction as applied philosophy.

In this issue, we also call to the attention of our readers two new textbooks about Direct Instruction: *Direct Instruction Reading* (Carnine, Silbert, Kame'enui, & Tarver, 2004, Fourth Edition) and *Introduction to Direct Instruction* (Marchand-Martella, Slocum, & Martella, 2004). Hopefully, these textbooks will help college professors communicate the complexities of Direct Instruction clearly and effectively. **ADI**

**BRYAN WICKMAN, Executive Director, Association for Direct Instruction**

## *ADI News*

It is with great trepidation that I am writing my first column for the *Direct Instruction News*. If it turns out well, it was all my idea. If I get anything other than wonderful and supportive comments, this was all our Managing Editor, Amy Griffin's idea. My hope is that via this brief communication we can keep you informed of the many activities of the Association.

Nancy Marchand-Martella has resigned her position as an ADI Board Member. Nancy has energetically and thoughtfully served on the ADI Board since 1999. She took strong interest in our publications and was instrumental in creating our research journal, *The Journal of Direct Instruction*. Nancy will continue to serve as co-editor of that publication, which we are very appreciative of. Thank you for your service, Nancy.

While Nancy will be missed, the equally capable Dr. Cathy Watkins will fill the remainder of Nancy's term.

Cathy is with California State University, Stanislaus, where she is a professor in the Department of Advanced Studies in Education and Co-Director of the Center for Direct Instruction. She has a strong leadership role in the national Association for Behavior Analysis as well as the regional affiliate, Cal ABA. We look forward to her contributions to the organization.

ADI has another summer of great training opportunities. We have brochures for each of our regional conferences available at our website. Of particular interest is the 30th National Direct Instruction Conference and Institutes to be held July 18–22 here in Eugene, Oregon. This year we will have several special events to mark our 30th Anniversary. Special Keynote speaker will be Chris Doherty, Director of Reading First in the U.S. Department of Education. Of course we also look forward to all of the excellent sessions as well as a chance to hear Zig Engelmann.

We have run a series of Direct Instruction Leadership trainings this spring. These well-attended sessions help administrators and lead teachers understand the fundamentals of running a DI implementation. Molly Blakely and Ed Schaefer have conducted this session for the past 6 years and consistently receive excellent evaluations. Plans for the fall are to offer several more Leadership trainings as well as to conduct six Peer Mentoring trainings. Look for dates to appear on our website in late spring.

If you are attending the Council for Exceptional Children Conference in New Orleans this April come by the ADI booth in the Exhibition Hall. Other DI-type vendors to look for include SRA, J/P Associates, Educational Resources Inc., and Funnix.com.

ADI will also be displaying at the Association for Behavior Analysis convention in Boston, May 28–31.

If you have any questions or comments about any aspect of ADI, please drop me an email to [brywick@adihome.org](mailto:brywick@adihome.org). Thanks for your continued support. **ADI**

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## *The Dalmatian and Its Spots*

### Why research-based recommendations fail Logic 101.

At least part of the problem educators have in establishing effective instruction has to do with the illogical recommendations that researchers make.

This illogical reasoning occurs in just about all research-based recommendations since 1985, when *Becoming a Nation of Readers* was published. This illogical practice is the confusion about what follows from a true statement. Here's a noneducational example:

If a dog is a Dalmatian, it has spots. Therefore, if a dog has spots, it is a Dalmatian.

The first statement is true. The second statement doesn't follow from the first.

The probable response from most readers is that nobody could be naive enough not to recognize this flaw. English setters, some terriers, sheepdogs, and many mutts have spots. Unfortunately, there are many educational parallels to the argument that all dogs with spots are Dalmatians. Here's one:

If a beginning-reading program is highly effective, it has various features: phonics, phonemic awareness, and so on. Therefore, if a program has these features, it will be highly effective.

Current reform practices revolve around this logic, but the logic is as flawed when it refers to effective programs as it is when it refers to Dalmatians.

Here's how the flawed reasoning occurs. Investigations like that of the 2000 report of the National Reading Panel start by sorting through research studies to identify specific programs that work. Call this group of programs Dalmatians.

Next, the investigators analyze the group of Dalmatians to identify their

common features. Call each feature a spot. They find that the more effective beginning-reading programs have common features (phonics, phonemic awareness, decodable text, oral practice formats, and others). So they have formulated the true statement parallel to: If a program is a Dalmatian, it has spots. (If it is an effective program, it has the common features A through N.)

Next, investigators formulate their flawed recommendations, which assert (or imply) that if a program has phonics, phonemic awareness, decodable text, oral practice formats, and so forth, it will be highly effective. In other words, the investigators' conclusion is parallel to the conclusion, If a dog has spots, it is a Dalmatian.

The conclusion has no logical basis. There is a lot more to a Dalmatian than having spots, and a lot more to programs that generate superior outcomes than having the features that are specified in recommendations. The additional features would include the amount of new material introduced on each lesson, the nature of the reviews that children receive, the ways in which the program tests mastery, the number of times something is presented in a structured context before it occurs in other contexts, and many more technical details about how the material is sequenced and field-tested.

But the investigators do not simply flunk Logic 101. They set the stage for a daisy chain of illogic. Because the analysis has removed spots from Dalmatians, they are no longer Dalmatian spots, just spots. So the analysis moves from a more careful articulation of each Dalmatian (effective program) to an elaboration of spots, now freed from the constraints of the effective program.

Phonemic awareness is a spot. The analysis of the spot goes something like this: "Let's see, there are different types of phonemic-awareness activities. There's oral blending, rhyming, alliteration, segmentation, phoneme insertion, and phoneme deletion. Therefore, any combination of these activity types would meet the requirement of phonemic awareness, and the best versions of phonemic awareness would have all types."

If researchers conduct experiments to validate their notion of phonemic awareness, they typically don't compare their results with those of a highly effective program in terms of total time required and the performance outcomes. They are satisfied if their intervention results in a gain in performance on some standardized measure.

Note that the illogical formula for the design of programs would create benefits for districts that were using programs that had no spots. A program constructed from spots would probably produce results better than those of the programs the districts are using. So if a little better is what districts want, that's what the "spots first" reasoning will probably deliver. Unfortunately, the criteria become a double-edged sword that may reject truly effective programs.

The full circle of the daisy chain occurs when a state takes these "research based" recommendations and uses them as adoption criteria for programs that are supposed to be effective, but rejects a true Dalmatian because it does not meet the "standards" the state has set. For instance, a "standard" might indicate that the program had to have the full range of

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phonemic-awareness exercises (including activities that are ill-suited for beginning at-risk students, like phoneme deletion). If effective program X does not have all of them, it fails to meet a “research based” standard, even though it is highly effective and there is no evidence that the adopted programs are effective.

Not only is this type of reasoning possible, it happens with frightening regularity. For instance, California’s *Ventura County Star* carried an article on March 15, 2003, titled “Effective Reading Program Must Go.” A school in the district, it said, “was the only school in Ventura County and one of 109 in the state to get the citation...for showing exemplary progress.” The district was replacing the program with one that has no strong data of effectiveness, but that had been adopted by California because it meets the state “standards.”

The county superintendent justified the move this way: “We want to make sure all schools are using the same curriculum. Why not something based on the standards that are going to be taught?” So in the end, the state not only identifies mutts as Dalmatians, but rejects true Dalmatians because they don’t meet the state-created definition of “Dalmatians.”

The solution is to excise this medieval logic and to be more straightforward about identifying specific programs that work, without pretending that the analysts are able to identify the full set of variables that make the program effective. This is not to say that the criteria for effective instruction are unspecifiable, only that the current standards are far from specifying them, and the effort of trying may be misplaced. If the goal is to identify programs that are effective, why not take the most direct route and simply identify them without the questionable analyses?

Another problem with “research based” recommendations is that the

investigators apparently do not research the skill and capacities of the consumer of instructional practices (aside from possible verbal reports). The result is that even if their analysis disclosed all the vital characteristics of effective programs, their recommendations for using the evidence on effective instruction would completely lack research support.

For example, the April 2000 “Report of the National Reading Panel: Teaching Children to Read” discusses phonemic awareness, and the panel makes this recommendation: “There

*This is not to say that the criteria for effective instruction are unspecifiable, only that the current standards are far from specifying them, and the effort of trying may be misplaced.*

are many ways to teach [phonemic awareness] effectively. In implementing [phonemic-awareness] instruction, teachers need to evaluate the methods they use against measured success in their own students.”

The assumptions are that a mix-and-match creation by the typical teacher will be effective, and that the teacher knows how to evaluate the methods he or she uses against measured success. There is no data showing that typical teachers are able to successfully combine components to make superior instruction, and none to suggest that a significant number of them have the knowledge or the resources needed to operate on the implications of “measured success,” particularly if they are unaware of what a truly effective program is able to achieve. Before issuing this recommendation, a research-based

panel would first have gathered data to address some practical issues:

How many years would it take for an average teacher to “discover” or “create” an excellent combination (given that it would be hard to try out more than one or two combinations a year in a classroom)? What kinds of records would be needed to make this enterprise systematic? How does this pursuit fit in with the district-adopted program and practices? Where does the teacher get the funds and the time that may be necessary to evaluate the results?

Two issues are even more serious: What concern do we have for the children who are being subjected to the teachers’ experimentations, particularly if it takes the assiduous teacher years to come up with a program that has sufficient “measured success”? What in the history and demography of teachers in failed schools suggests that more than a very small percentage of them would be able to develop highly effective packages without extensive training?

The ultimate products of the National Reading Panel’s spots-first logic are implications that true Dalmatians are not really Dalmatians. “[I]t is more common for phonics programs to present a fixed sequence of lessons scheduled from the beginning to the end of the school year,” its report says. “In light of this, teachers need to be flexible in their phonics instruction in order to adapt it to individual student needs.”

The central problem with this appraisal is that to accept it, one would have to deny that Dalmatians are Dalmatians. Highly effective programs have a fixed sequence. When the panel calls for adapting instruction to individual student needs, it is implying that the successful sequences are not successful, and that the teacher will be able to improve on the program by deviating the program’s “fixed sequence.”

In fact, the highly successful program has evidence of being successful with the full range of beginning readers. This range comprises great variation in “individual student needs.” The panel doesn’t have to know how the program does it, but the panel must accept the evidence that the program must have successful procedures for accommodating “the needs of individual students.”

Certainly, teachers would have to be trained to use the effective program to achieve individualization, but training would present specific practices that

have been demonstrated to be effective and efficient. Teachers would not be encouraged to make changes in the sequence before they were very familiar with the details of the program. The training would show how to group children homogeneously, how to place them appropriately in the sequence. Groups may be started in different parts of the sequence and may be moved through the sequence at different rates, with lower performers repeating some lessons, and higher performers skimming parts of the sequence.

If the program is a Dalmatian, however, it has provisions for placing children, teaching them to mastery, and accelerating their performance. Researchers would learn a great deal about both program design and training if they studied effective programs carefully before drawing conclusions about what it takes to be a Dalmatian.

Siegfried Engelmann is a professor of education at the University of Oregon, in Eugene, OR, and the director of the National Institute for Direct Instruction, located there. *ADI*

BOB DIXON



## *We've Come a Long Way, Baby (Sort of)*

I was chatting with someone the other day about the massive paperwork which, by necessity (or, more certainly, by law), accompanies special education. I can't think about the current state of special education without remembering what was going on prior to 1975, when Public Law 94-142 (PL 94-142) was enacted. A disadvantage of getting old is losing one's short-term memory, but an advantage, sometimes, is retaining memories from long ago. I'm capitalizing upon the latter in order to offer a bit of perspective on the bureaucracy that special education so often seems to be.

Before I go any further with this, I'd like to warn readers that I'm on the verge of using terminology that not only is no longer used in special education, but that is generally offensive. It is impossible for me, however, to accurately describe conditions prior to PL 94-142 without using some of the language of the time.

I entered junior high school in 1962, a fairly large school with about 1,200 students. Among those students were a handful of special education students with severe cognitive and physical disabilities. These students were known collectively as “the retards.” At the time, there weren't any students with learning disabilities or with emotional or behavioral problems, or any with “mild” anything, or even “moderate.”

Perhaps only the general student body referred to these students as retards, although I suspect many adults associated with the school did so as well. We regular education students hadn't seen these very strange people before because they had their own elementary school. It was practical to house special education in one small elementary school, but not to create junior and senior high schools for what amounted to a relatively small number of students—probably somewhere in

the neighborhood of 25 or 30 when I was in junior and senior high school.

The policy at the time was to isolate the special education students from the rest of the students to the extent possible. Every effort was made to do so, but occasionally, the rest of us were exposed to “the retards” as they walked down the hall in a group—often arm in arm—to get from one hidden location to another. They sometimes bought school lunches, but always took their lunches back to their classroom—wherever that was—and ate there.

I would say that in equal proportions, the general population was afraid of both the special education students and their teacher, Mr. Henry. The fear of the students was the classical fear of the unknown. The fear of Mr. Henry, however, was based upon the reality of his stern enforcement of rules upon general education students. As it happened, Mr. Henry followed his group of students from the junior high to the high school. Eventually, I got to know Mr. Henry, and found that he wasn't purely mean by disposition, but was easily annoyed by students who had no idea on earth how fortunate they were to be free of disabilities.

Fighting behind the backstop after school was a hugely popular activity when I was in junior high, but the most ferocious bullies in the school would step aside when the special education students came down the hall. Generally speaking, those students looked a bit strange, walked a bit strange, and *really* talked strange. Some drooled routinely. The toughest “hood” in the school would take on just about any two guys, bare fisted, but would avoid the special education students like the plague. The simile wasn’t that bad: severely disabled special education students as a plague. My recollection is that most of us literally thought we might contract some awful disease if one of those weirdos touched us.

I should note that one of the special education students I went to school with for 6 years was spastic—“the spaz” was the usual way of referring to that particular boy. Just imagine this: That boy had an IQ substantially above normal, but spent 6 entire years in classes where everyone else had exceptionally low IQs. If I think about that situation much, I fall into a deep depression. I imagine that high IQ or not, by the end of high school, that kid didn’t know much, and wasn’t close to being in a position of self-sufficiency.

I managed to make it through 3 years of junior high school without getting within 20 feet of any single special education student. That changed pretty dramatically when I became a sophomore at the high school. We had 3,100 students in my high school, in three grades. (The same district now has four high schools but fewer than 3,100 students in Grades 10–12.) We were crowded. French 3 met in the hall—not a classroom. Spanish 3 met in a band practice room. Several of the smaller classes, in fact, met in the halls or broom closets.

This crowding all led to what might have been—inadvertently—one of the earliest experiments in “inclusion” or “mainstreaming.” It was the

1963–1964 school year, the same year the Beatles hit our shores. I ended up as one of five regular education students in a physical education class otherwise made up of “retarded boys.” There were about 15 of “them” and 5 of “us,” which was exactly the way everyone felt. The school sent letters to the parents *of us regular education students*, seeking permission for the arrangement. I have very strong doubts that it occurred to anyone to consult with the parents of the special education students. I confess to agreeing to the arrangement because I had

*I learned something very quickly from DaGasto: Although he was awkward physically, and although he was very slow on the draw, and although his social skills were terrible, he had feelings.*

become curious about those students. Also, if I opted out, my alternative was a second study hall, and after just 1 day of school, I was already in trouble for sleeping in my regular study hall.

The P.E. teacher was an exceptionally good P.E. teacher—for regular education boys. He was—through no fault of his own—clueless about “them.” He would put the 5 of “us” on one basketball team and make three more teams from the 15 of “them.” We’d end up with game scores like 42 to 0, in spite of the fact that after a while, four of us on our team stopped trying to steal balls, block shots, and even to score, unless we were just standing there with no one near us—which happened often.

Imagine: If *WE* were afraid of “them,” how must they have felt about “us”? (To this day, I wonder what they called us.) One of the five regular education guys should not have been in the class

at all. He was a very small boy who got some sort of perverse pleasure out of snapping the jock strap of one of the *huge* special education kids. We all called the small kid “The Worm,” and I’ll refer to the big guy as DaGasto. (No one had a first name in P.E. classes.) One time, The Worm stole one of DaGasto’s tennis shoes and hid it.

I learned something very quickly from DaGasto: Although he was awkward physically, and although he was very slow on the draw, and although his social skills were terrible, he had *feelings*. (It was much later that I learned from Siegfried Engelmann that DaGasto had tremendous learning potential, as well.)

To avoid a barrage of letters, let’s just say that *someone* among the five regular education guys started encouraging DaGasto to beat the tar out of The Worm. DaGasto resisted the idea, mostly because he thought he’d get into trouble. The P.E. teacher was aware that The Worm often taunted DaGasto, but couldn’t seem to catch him in the act. The Worm was fairly clever about that. Anyway, the regular education guy worked on DaGasto nearly every day, trying to convince him to stand up for himself. Finally, DaGasto—probably with great reluctance, initially—turned on The Worm after a jock snapping incident and started to pummel him quite effectively. Guys started to break up the fight, but the P.E. teacher ordered everyone to back up and allow the “fight” (such as it was) to proceed. When the P.E. teacher was pretty sure that The Worm had gotten the point, he broke up the fight himself, *and then sent The Worm to go see the Dean of Men about fighting*. Everyone congratulated DaGasto—special education and regular education guys alike. The P.E. teacher didn’t say a word to him.

When The Worm returned to school a few days later (after a suspension for fighting), he did so with an improved attitude. Ironically, he got to be *friendly* with DaGasto—even a bit protective.



While I certainly don't condone violence in the school or anywhere else (with the possible exception of professional basketball), I got an early example of how punishment, if used very sparingly, can effectively change behavior.

P.E. that year turned out to be rewarding. After that, there were 15 additional kids I wasn't afraid of, and the special education students had four or five kids (out of 3,100) who they weren't afraid of. Some of the special education kids learned some social skills they probably never would have learned otherwise. Not all of them, but some. I always thought that there was an unspoken bond among us regular education guys through our junior and senior years. We didn't articulate it, but we'd been through *something* together.

One day in my junior year, I was standing near the radiator before school started, when DaGasto and a few other special education students, including girls I didn't know, were walking down the hall. Usually, they all kept their arms locked together and stared at the floor as they passed on their way to...who knows where? But on that particular morning, DaGasto broke from the pack and came over to me, leaving about an inch and a half space between him and me. As usual, he was drooling, and had gunk on his teeth, and his breath wasn't very sweet. Kids around me moved back a bit. The other special education students, in their confusion, moved toward DaGasto, thereby moving the regular education kids even farther away.

Finally, DaGasto, while looking straight at me and while pointing to me, awkwardly, because there was almost no space between us, said to his friends, "I know him." I suspect he was showing off to the girls. As I said before, he had *feelings*.

"Hi, Mike," I said.

"Do you know my name?" he responded incongruously, but in a fashion I had become accustomed to.

"Sure," I said. "You're Mike DaGasto."

He didn't say anything for a moment, but then turned to his friends and said, "See? I told you." And then they all left.

One of the regular education guys then asked me, somewhat accusingly, "Why do you talk to the retards?"

"He's more interesting than you are," I said, or something similar.

In the spring of my junior year, I ran for Student Body President, and won by a slim margin. One of my well-meaning

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friends quipped, "Well, you swept the nerd vote, and the retard vote probably pushed you over the top."

I pointed out that I probably could have picked up all 30 special education votes, *had they been allowed to vote*. They didn't vote. Their pictures weren't in the annual. Their accomplishments weren't duly reported in the school paper. They didn't go to pep rallies or school assemblies. They weren't at football games and basketball games. None have shown up for a class reunion.

For all practical purposes, they weren't there. Consciously or not, that seemed to be a goal. I was never quite sure of who was supposed to be isolated from whom: them from us, or vice versa? Who would have been hurt the most through commingling? Them, I suppose. At least at first.

Anyone currently associated with special education is likely to be frustrated much of the time. There are regulations and procedures and bureaucrats

and paperwork and endless tasks tangential to the education of students. Some special educators have become the problem, rather than the solution. A state level special education official in California once told me that a sixth-grade special education student *had* to work out of a sixth-grade math book—period. It was an *access* issue. The special education students were guaranteed access to exactly the same curriculum as everyone else. If this kid was at, say, a second-grade level in mathematics, then apparently, the potential frustrations of working out of a sixth-grade math book were offset by the realization of his lawful rights.

Nonetheless, I do think it is important to remember that PL 94-142 didn't pop into someone's head because they didn't have anything better to do. Rather, it was a response to the gross inhumanity of special education prior to the enactment of the law. Has the pendulum swung too far in response to that inhumanity? Probably. Isn't that what always happens? We get genuine kill and drill in arithmetic for a while, then the pendulum swings to a "new" approach where instead of making computation more manageable and meaningful through word families and through other means, we just get rid of computation altogether. It's the classical "if not A, then B" fallacy.

In the case of special education, a pendulum swinging too far is much preferable to a pendulum that hasn't swung. I don't know what's coming next in special education. We can hope for more common sense, more focus on contact time with students, more flexibility with respect to determining the best learning environment for children, and even possibly more focus on financing well designed experimental studies, toward the goal of taking us further out of the alchemy of special education.

I don't know where we're going, but I got a glimpse of where we were before, which was a place on just the outskirts of civilization. The main thing is that we never go back there. *ADI*

## *Education for Language Minority Students: Recent Events*

How is an education system that teaches its curriculum in the English language able to manage with students who have little or no experience with the language of instruction? If numbers are low, or if there is little assessment of later educational outcomes, then the issue may not arouse a great deal of attention. However, the number of immigrants without English is very high and increasing in many developed countries. For example, the number of students who have limited English proficiency (LEP) has doubled in the last 10 years, whilst the general school population has grown by only 12% (Kindler, 2002). Within 50 years in the United States, the proportion of children beginning school whose language is not English could be as high as 40% (Lindholm-Leary, 2000).

The recent emphasis on accountability for educational outcomes (U.S. Department of Education, 2002) at national and state levels has focused attention on how best to assist LEP students to manage the adjustment to a new culture, language, and education system. It has long been recognized that most LEP students were born into economically disadvantaged families, and their arrival in a new country often creates even more profound disadvantage. Many newly arrived parents have little or no English and may have experienced little or no formal education. Thus, many LEP students will come to school with little of the background knowledge that is prerequisite for academic progress, nor with a family culture of learning.

LEP students represent an educationally at-risk group—most perform below grade level in educational attainment and are in educational settings with fewer than average resources. There has been strong concern about the pre-

dictable trajectory of such disadvantaged students and an awareness of the need to interrupt the pattern for the sake of the new arrivals—and also because it creates a cycle of further disadvantage that entrenches a subclass in society.

Endeavors to maximise opportunities for the LEP children have been complicated by a contentious, politically enmeshed issue—the language in which most or all early education should take place (Porter, 2000).

### *History*

Schools employing the native language of new arrivals were established by enterprising European immigrant groups as far back as the 1800s, and of course, many children of that period received their education at home in their parents' language rather than in the school system.

Nationalistic fervor following the First World War led to the belief that rapid assimilation to the culture and language was the ideal outcome for new arrivals. In education, the non-English speaking student was largely left to his own devices—to dive, survive, or thrive—a model that became known as submersion. No particular assistance was provided to the students, who were placed immediately in regular classes with their English-speaking peers.

This approach was later tempered when regular instruction in English as a Second Language (ESL) was introduced. ESL is a model in which children attend regular classes in English, but are provided with an additional period of English instruction either daily or several times per week (Rossell, 1998).

The rise of multiculturalism after the 1960s introduced a different atmosphere—one in which diversity was to be cultivated rather than submerged. From this perspective, the dominant culture is enhanced by encouraging different languages, customs, and lifestyles to coexist, thrive, and merge. Indeed, the students' native culture (including language) should be celebrated and respected as the equal of that of the dominant culture (Mora, 2002).

Partly deriving from this broad socio-cultural belief system is the expectation that schools should provide early teaching in the child's first language in a discrete, largely single-language class. The instructional rationale is that at least some degree of first language competence is necessary for students' cognitive development (Rossell, 2003), and that literacy skills developed in this first language will readily transfer to learning to read and write in English (Mora, 2002; Rossell, 2003).

This bilingual approach is intuitively attractive, as it provides a sense of the familiar in a potentially threatening environment, and it also begins with instruction that makes use of the child's strengths. Thus, it is argued, students should make progress consonant with that of their peers because they do not have to master both English and the school curriculum simultaneously. It became known as a bilingual education system, because education is provided by the school in more than one language. Students would learn to read, write, and experience the school curriculum (math, science, etc.) in their native language, with an increasing amount of English instruction as their progress dictated (Guzman, 2002). The expectation was that it might entail a couple of years or even as many as 7 before their English proficiency would enable full inclusion in all regular classes, but certainly within their elementary school career. Another advantage was the capacity of

parents to be involved in their child's education at the beginning stages, when they might otherwise have been excluded by the language barrier.

An extension of bilingualism is known as two-way immersion (Christian, Howard, & Loeb, 2000) and involves all kindergarten students participating in learning a second language from the beginning of the school year. In this model, all instruction occurs in two languages (for example, English and Spanish), and all students remain in the same classroom. The assertion is that each group benefits to a greater degree than they would were they segregated. The language minority students rapidly develop English through authentic discourse and interlanguage transfer of skills, whilst the language majority students reap the bonus of proficiency in a second language. Despite the apparent loss of instructional time available for the language majority students to attend to curriculum issues, it is argued that the process occurs without jeopardising their academic progress (Christian et al., 2000).

A later approach, structured immersion, was based on the premise that progress may be more rapid if the language minority student receives his or her education in English alongside the locally born peers and also participates in English language instruction in a special class for a year. The underlying beliefs are that learning a new language is easier when a child is young and that immersion in the language promotes optimal development (Morlan, 2000). Philosophically, immersion is attractive because of its presumed advantages in producing fluency in the English language, an essential step on the path to an equal education, and thereby to full participation in society (Porter, 2000). This scenario of inclusion in the same class as one's peers is potentially less stigmatising, and also provides opportunities for English language learning to be accelerated through increased peer contact and the sheer volume of English experi-

enced (Glenn, 2003). English instruction is provided intensively for a year, and then children are assigned to a grade with students of similar levels of English development. A specialist teacher provides instruction for every subject in English, with allowance for some excursions into the native language as the need arises, such as for difficult concepts. This is unlikely to exceed about 10%–30% of the instructional time, and the language sophisti-

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cation employed by the teacher is expected to match the capabilities of the particular group of students (Baker, 1998).

Which general approach is most effective may appear to be an empirical question; however, much more heat than light has been shed on this question. The goal of the protagonists in this debate is surely identical—to enable students to make optimal use of educational and social opportunities so as to enjoy productive and satisfying lives in their new land. However, there are other ideals competing with efficacy. For example, the United Nations asserts that children have a right to be educated in the language of their home should parents seek it, a position also adopted by the International Reading Association (2001). When a Public Agenda poll (Farkas, Duffett, & Johnson, 2003) asked immigrants for their views, 63% responded that all classes should be conducted in Eng-

lish; whereas 32% considered that at least some subjects would be better taught in native languages. Most parents, it appears, consider immersion a better option for their children's participation in society.

Some interested parties have argued that multiculturalism is a vitally important social goal that is best promoted by the bilingual approach of teaching in and about other languages and cultures (Mora, 2002). Others have suggested that one reason why bilingualism became so entrenched was as an element in the broader social goal of reducing prejudice in society (Aboud & Levy, 1999). Thus, efficacy is not the only criterion employed in discussion about the competing approaches.

The bilingual approach has been the dominant approach for many years but has received increasing criticism over the past 10 years. For example, the time spent in maintaining development of the native language has an opportunity cost. It is time that could have been spent in practising English, and critics argue that the costs outweigh the benefits (Gersten & Baker, 2000; Guzman, 2002). Numerous studies and reviews have been performed, yet methodological quality has frequently been questioned (Rennie & Marcos, 2003; Slavin, 2004), making consensus difficult to obtain. This has led to an entrenching of positions as protagonists laud studies supporting their perspective and strongly criticize others. Their opponents condemn those lauded studies and defend the criticised studies (Rossell, 2003). In particular, the choice of studies deemed acceptable to various meta-analysts has been an area of disagreement. Slavin's (2004) recent "best evidence synthesis" (Slavin, 1986) regarding reading instruction is an attempt to overcome some of the apparent variability in determining which studies are of sufficiently high quality to be included in a meta-analysis.

Ad hominem attacks on opponents are not unknown. For example, Mora (2002) asserts that arguing for structured immersion implies a belief that other languages and cultures are inferior to English-based cultures. She further claims, "In order to curtail rights of access to education for language minority students and their parents, the anti-bilingual education forces have constructed a lie" (para 8).

Further clouding the issue are problems of definition. There can be considerable difficulty in determining precisely what instructional components are employed in programs that carry the label bilingual. There is a great deal of variation across programs, a scenario similar to that which plagued the whole language evaluation question for so long. Some consider almost all intervention programs bilingual if some native language is used at some part of the day. Others consider bilingual programs to include a narrow band of specified features (de Cos, 1999). It is conceivable that different reviews may include the same study but under any of the categories: structured immersion, bilingual, or ESL (Clark, 1999; Rossell, 2003).

### *Recent Public Concern*

However, some statistics have troubled parents and policy makers. Under bilingualism, non-English proficient students have higher grade-repetition rates and four times the dropout rate of their English-fluent peers (Marnie, 2001). They present with lower school achievement, whether assessed by their teachers or on standardized tests of reading and math (Moss & Puma, 1995). Teachers often express concern about poor attitude and lack of motivation among many LEP students, although it is now being recognised that these secondary obstacles to progress are more often a result of difficulties with language acquisition, rather than a cause of their learning problems (Ganschow, Sparks, & Javorsky, 1998).

The length of time students spend outside the mainstream has also elicited criticism. Those children who begin bilingual intervention early (ages 4–7 years) could be segregated for between 3 and 10 years, while later starters (ages 8–11 years) average 2 to 7 years. When students arrive later into programs (ages 12–15 years), they may never leave—remaining segregated for 6 to 8 years (Kellis, Brezovsky, & Silvernail, 2001). The current state of education for LEP students is creating great concern, yet clear unambiguous solutions are not easy to find.

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An influential report commissioned by the National Research Council (August & Hakuta, 1997) noted that there was insufficient evidence that teaching programs in one's native language was more effective than English immersion or English as a Second Language programs. The report further noted a paucity of well designed studies of the dominant model's effectiveness, calling for more fine-grained research that would allow for decisions to be based upon measurable student outcomes. Rossell and Baker (1996), in reviewing 300 studies, reported that only 72 were of adequate design. From this data, they concluded that there was little evidence to recommend bilingual education over other approaches or, indeed, over submersion. Several authors have challenged the criteria employed in this meta-analysis and

criticised aspects of the selection (de Cos, 1999). To complicate matters further, a relatively low proportion of students in bilingual classes participate in statewide testing (Rossell, 2003), as such tests are printed in English. Thus, the system-wide attainment levels of students in bilingual education programs have been less well scrutinised than is desirable.

A further exploratory meta-analysis by Baker and Gersten (1997) was prompted by a desire to tease out instructionally important variables. But, as was noted in the National Research Council report, the research to that time had been insufficiently well controlled to enable any firm conclusions about such variables. Indeed, Gersten and Baker (2000) describe the pace of instructional research focused upon LEP students as "glacial" (p. 454).

### *Mandated Change*

The criticisms developed enough momentum among Californians that, in 1998's Proposition 227, they replaced bilingual education in the state's public schools with English-immersion programs that allow education in a transitional sheltered immersion program only for the 1st year. After that year, they are expected to manage in an all-English language classroom. Although parents have the right to request bilingual education, fewer than half the former number of students are currently in bilingual programs (Rossell, 2002). Several other states have taken, or are considering, similar action. Of course, not all states make special provision for LEP students—there are 16 that do not, and there is considerable variation in the models of assistance that other states provide (Kellis et al., 2001).

The long term impact in the states adopting immersion programs is not yet clear. Rossell's (2002) analysis notes improved outcomes in California, partly because, according to her

data, bilingual programs had produced generally negative effects on achievement. Some other reported improvements include a statewide 20% elevation of standardized test scores for minority language speakers on the California state test (Prop. 227's promise, 2000). In one school district employing structured immersion, LEP students' scores increased by 47% in a school year, whilst another largely bilingual district's scores increased by only 4% (Baker, 2000). *The New York Times* (Soifer, 2001) reported that, since the introduction of immersion, there had been an increase of 11 percentile points in reading and 19 percentile points in math on Stanford 9 test scores for limited English proficient students in the Oceanside Unified School District.

Although gains have been noted across all levels, the most significant improvements have been with younger children (Amselle & Allison, 2000). This finding is consistent with the generally accepted view that learning a new language is easier when a child is young (Johnson & Newport, 1989). In a different interpretation, these young LEP students are not strictly learning a second language, rather they are simply continuing the process of learning a language, though in a new language, English (Bialystok & Hakuta, 1994).

Of course, many students arriving in a new country have difficulties beyond that of a lack of English. A high proportion will have lived in poverty with the attendant problems that entails. Their parents may be uneducated, and the children's early language development even in their native language may have been severely limited. Thus, LEP students may have additional vocabulary problems (McLaughlin et al., 2000)—sharing one similar obstruction to progress with locally raised disadvantaged students (Hart & Risley, 2003). An early vocabulary deficit has been shown to be remarkably predictive of language growth and reading comprehension to at least

third grade (Hart & Risley, 2003). Almost certainly this additional hurdle contributes to the continued concerns for many LEP students, even those in structured immersion programs.

Soifer (2001) points out that the elevated achievements of some structured immersion programs derive from important structural and curriculum components, rather than simply because of the change of philosophy. In successful programs, care is taken to ensure that appropriate levels of resources are available for instructional materials. The successful schools adopted a code emphasis reading pro-

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gram, and a carefully structured English language development program, and ensured that instructional time was sacrosanct, regardless of competing day-to-day priorities. Thus, influences on progress that are now well accepted for general education students (such as academic learning time) are intentionally controlled to promote similarly improved progress for LEP students.

Phoenix Advantage Charter School in Arizona has also reported very strong outcomes for its high proportion (30%) of LEP students. It is a school in a disadvantaged area (80% free meals), yet it has managed to dramatically alter the trajectory of its students over a relatively short period of time. The Measure of Academic Progress (MAP) results compare each student's Stanford 9 scores from one year with the same students' scores in the following year to determine how many students

make 1 year's progress from one year to the next. It offers a more transparent view of individual student progress than is obtained by only summing results and examining averages (Barker & Torgesen, 1995).

Over one year, Stanford 9 test scores for first-graders increased from the 24th percentile to the 49th percentile in reading, from the 38th to the 48th percentile in math, and from the 22nd to the 46th percentile in language. School officials announced last year that the percentage of student scores in the top 25 percent nationally had increased from 4 percent to 18 percent in just one year. (Soifer, 2001, para 9)

More recent data (2003) from the Arizona Department of Education reveals that 74% of Advantage students in math and 72% of students in reading made a year's growth between 2002 and 2003, a result above the state average. These outcomes are surprising given the high support needs of the students at intake (GreatSchools.net, 2003).

This school pays careful attention to instructional details for LEP students. It includes Direct Instruction programs in reading, writing, and math among its curriculum. Rather than categorising students according to age, instructional groupings are determined by initial assessment of attainment in each of these areas. Teaching occurs intensively in small homogeneous groups. It is highly structured, with extended opportunities for practice, continuous assessment, and regular feedback of progress. Acceleration occurs regularly, as movement to and from groups is based on day-to-day performance, rather than on assumptions about a student's ability. Any students whose progress begins to decline are thus readily detected and able to obtain additional targeted instruction.

As noted above, there is considerable variation across bilingual programs, and similar variation is also likely across structured immersion programs. It is important, then, to define what instructional qualities are present in programs when they are evaluated.

In 2002, the U.S. Department of Education's research office formed a 14 member National Literacy Panel on Language Minority Children and Youth (U.S. Department of Education, 2002). The National Reading Panel (2000) did not include literacy development among language minority students in its report; in fact, much of the experimental research on literacy specifically excludes such students (Stuart, 1999). Apart from the focus on LEP students, the National Literacy Panel is established along similar lines to the National Reading Panel, although it accepts a broader range of studies, including quantitative experimental studies, quantitative nonexperimental studies, and qualitative studies. Perhaps the additional inclusiveness was a reaction to the dearth of methodologically sound research noted by other analysts (Baker & Gersten, 1997; Rossell & Baker, 1996), or it may be in anticipation that a larger net will enable the raising of interesting research questions, even if at the cost of providing clear answers. Gersten and Baker (2000) also responded to the paucity of sound studies with a qualitative analysis technique—multivocal synthesis. It is a method for discerning patterns and trends from disparate data sources.

The National Literacy Panel's stated intention is to produce the definitive analysis of the research literature to date that will eventually lead to instructional guidelines to aid optimal development of literacy in LEP students. The report will examine such issues as the relationship between oral proficiency and literacy, the transfer of literacy skills from a student's first language to the second language, how literacy develops among LEP students,

in what contexts is it best encouraged, how is professional development for promoting literacy best provided, and how should literacy be assessed among LEP students. The panel is expected to release its report in January 2004.

One of the enduring issues in early elementary education involves the degree to which direct instruction is considered to be important in language devel-

*One of the enduring issues in early elementary education involves the degree to which direct instruction is considered to be important in language development.*

opment. Some teachers consider language development to be a natural process that occurs when students have adequate communication opportunities in everyday activities, such as listening to story reading and engaging in conversation with peers and teachers. Thus, a child-centered teacher endeavors to create a pleasant, supportive environment to motivate students to engage in a discovery process of acquiring language. This perspective is popular, and relatively few teachers deem it necessary or desirable to provide explicit instruction (Snow, Burns, & Griffin, 1998). A different perspective holds that too many students do not induce language conventions merely by exposure to them, and that careful attention to the language of the classroom can make a large difference in the trajectory of these students. The two approaches are not mutually exclusive if an empirical rather than an ideological perspective is adopted. Thus, there is no valid reason why a structured approach cannot coexist alongside the provision of ample opportunities for the activities favored by the child-centered protagonists.

Gersten, Baker, Unok Marks, and Smith (1999) and Gersten and Baker (2000) provide quite specific recommendations that include the necessity for formal explicit programming that emphasizes the structure of the English language. Indeed, they recommend that content learning and language learning should be separated into discrete educational objectives if both are to be achieved.

### *Explicit Systematic Programs and LEP Students*

In a British study (Stuart, 1999), 224 school beginners, 96 of whom were LEP students, were assigned to one of two intervention groups for 12 weeks. One group participated in the *Jolly Phonics* programme, a structured code-emphasis approach. The other group received a whole language introduction to literacy through Holdaway's (1979) *Big Books*. The *Jolly Phonics* programme produced stronger effects on the students' phonemic awareness and phonics knowledge and their usage of these skills in reading and writing. In a 1-year follow up, the students in the *Jolly Phonics* group were still significantly more advanced in all the phonological and literacy measures.

Another explicit, structured program is *Language for Learning* (Engelmann & Osborn, 1999), an update of the *Distar Language I* program (Engelmann & Osborn, 1976). It is designed to teach oral language skills to young school children whose language underdevelopment is threatening to impede their literacy and general academic progress. It emphasizes the language usage conventions—the information and concepts that will assist those at risk, including LEP students, to manage the demands of the classroom. The emphases include syntactic, semantic, and pragmatic skills—general information, descriptions of objects, background knowledge, words used in

instructional settings, problem-solving, concepts, classification, and problem-solving strategies. The curriculum focus is sometimes described as the language of instruction—a level of communication skill often assumed, in the everyday discourse of infant grade teachers, to have been mastered by all their students.

Not only are the relevant curriculum skills carefully delineated, but the nothing-left-to-chance attitude of the designers extends to the mode of instruction. It is an explicit approach that employs scripted lessons, choral responses on cue, immediate error correction, massed and spaced practice, cumulative review, and the principles of mastery learning (Robinson, 2002).

The earlier (*Distar Language I*) program has been shown to be effective for at-risk students of various types, including those from disadvantaged backgrounds, and those with physical, sensory, or intellectual disabilities (Cole & Dale, 1986; Cole, Dale, & Mills, 1991; Cole, Dale, Mills, & Jenkins, 1993; Darch, Gersten, & Taylor, 1987; Gersten & Maggs, 1982; Gregory, Richards, & Hadley, 1982; Lloyd, Epstein, & Cullinan, 1981; Maggs & Morath, 1976; Mitchell, Evans, & Bernard, 1978).

The *Distar* interventions have occasionally been evaluated with LEP students. For example, Kenny (1980) employed the *Distar Language I* program (Engelmann & Osborn, 1976) with a group of infant grade LEP students. She compared it with the *Tate Oral English* course (Tate, 1971), a program designed to teach the structure of English as opposed to the language of the classroom. It operates always at the level of the whole sentence, and differs from the *Distar* approach—and is broadly described as holistic and discovery oriented. Results favored the *Distar* program on measures of morphology, syntax, concept development, and expressive language. The techniques apparent in *Distar Language 1*

and *Language for Learning*, in particular the highly structured, fast paced and intensive administration are thought to contribute significantly to its effectiveness in improving the language skills of children (Sparzo, Bruning, Vargas, & Gilman, 1998; Wanzek, Dickson, Bursuck, & White, 2000).

*One advantage of the scripted Direct Instruction programs is their use of the same standard instructions to introduce similar tasks. This consistency reduces the language load for students who are better able to concentrate on the concepts, reducing the risk that they may fail to comprehend the instructions for the task.*

Gersten, Brockway, and Henares (1983), after some early success with the response of young LEP students to *Distar Language* and *Distar Reading* (Engelmann & Bruner, 1974), developed the DILE (Direct Instruction for those with Limited English) for LEP students throughout the elementary years—but particularly to assist those students first arriving at school in the intermediate years. It involved teaching reading, oral language, and mathematics in small, ungraded groups. Sessions were 30 min with a great deal of oral student–teacher interaction. The ungraded feature enabled intermediate grade students to receive instruction appropriate to their actual attainment levels. Gersten et al. make the point that although in structured immersion instruction occurs in English, it is important that it be at a language level understandable by the student. One advantage of the scripted Direct Instruction programs is

their use of the same standard instructions to introduce similar tasks. This consistency reduces the language load for students who are better able to concentrate on the concepts, reducing the risk that they may fail to comprehend the instructions for the task.

Assessment occurred across reading, language, math, and spelling at 6-week intervals to enable monitoring for the purposes of acceleration or additional support. Results were outstanding, with both the LEP students and their English-speaking peers performing above national median levels after 1 to 2 years in the program. After leaving the program, the students' 1- and 2-year follow-up data indicated that these high levels of performance were maintained.

Further studies by Gersten and colleagues (Becker & Gersten, 1982; Gersten, 1985; Gersten & Woodward, 1985, 1995) reported increased high school graduation rates and reduced grade retention when the Direct Instruction curricula were employed. In fact, Gersten (1996) noted that even monolingual teachers could be effective in teaching literacy when using these curricula.

In recent times two studies have evaluated the *Language for Learning* program (Benner et al., 2002; Waldron-Soler et al., 2002), although not with LEP students. The first (Benner et al., 2002) employed the program over a school year to a general sample of 21 kindergarten students. They noted educationally significant improvements in receptive language compared to the results for students maintained in the regular school language program.

The Waldron-Soler et al. (2002) evaluation was a brief study (30 lessons over a 15-week period) with 36 preschool participants, of whom 8 had developmental delays. Though the study design allows only a cautious interpretation, the results offered support for the program's value for both disabled

and nondisabled students across receptive and expressive language domains, and in their social interactions.

An interesting addition to the *Language for Learning* program is an integrated complement entitled *Español to English* (SRA/McGraw-Hill, 2003). It is designed to be used in conjunction with *Language for Learning* for Spanish-speaking students in English language classrooms. It provides Spanish scaffolds strategically, for example, to assist with the introduction of new information. Spanish is gradually faded as students gain competence in English.

## *Instructional Design and Effective Teaching Principles*

In considering curriculum issues for LEP students, it is helpful to appreciate that the principles underlying all Direct Instruction programs have been successfully employed across a range of curriculum areas and learner types (Adams & Engelmann, 1996). Studies demonstrating effective student outcomes include populations of disadvantaged students (Gregory, 1983), special education students (Scruggs & Mastropieri, 1993; White, 1988), and students with learning disabilities (Hendrickson & Frank, 1993; Kavale, 1990) and traumatic brain injury (Glang, Singer, Cooley, & Tish, 1992). In fact, Gersten (1985), in his review of studies involving students with a range of disabilities, concluded that Direct Instruction usually produced higher academic gains than traditional approaches, a finding supported by the meta-analysis of Adams and Engelmann. In education, it has become apparent that the intuitive proposition that differential diagnosis of disability should lead to differential treatment regimens has not been empirically supported. O'Neill and Dunlap (1984) argued that "...the principles underlying effective instruction may be more

influential in the process of learning than the special characteristics of any particular student population" (p. 6). Further support for the view that well designed instruction transcends learner characteristics is the finding that Direct Instruction has also been found to accelerate the progress of average and gifted students (Noon & Maggs, 1980).

The breadth of effect extends to many curriculum areas. Direct Instruction no longer has a sole emphasis on basic skills such as reading, spelling, math, language, and writing—but has broad-

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ened its area of application to include higher order skills, for example, literary analysis, logic, chemistry, critical reading, geometry, and social studies (Carnine, 1991; Casazza, 1993; Darch, 1993; Grossen & Carnine, 1990; Kinder & Carnine, 1991). Use has been made of technology through computer-assisted instruction, low-cost networking, and videodisc courseware (Kinder & Carnine, 1991), and researchers have begun to test the model in non-English speaking countries, for example, third world countries (Grossen & Kelly, 1992) and Japan (Nakano, Kageyama, & Kinoshita, 1993).

There are a number of important characteristics of Direct Instruction programs (Becker, 1977). It is assumed that all children can learn and be taught, thus failure to learn is viewed as failure to teach effectively (Engelmann, 1980). Children who are

behind must be taught to learn faster—this implies a focus on features of teaching designed to improve efficiency. These features derive from the design of instruction and from process variables such as how the curriculum is implemented. Curriculum is designed with the goal of "faultless instruction" (Engelmann, 1980), that is, sequences or routines for which only one interpretation is logical. The designer's brief is to avoid ambiguity in instruction—the focus is on logical-analysis principles. These principles allow the organisation of concepts according to their structure and the communication of them to the learner through the presentation of positive and negative examples.

Engelmann (1980) highlighted four design principles: First, where possible, teach a general case, that is, those skills which when mastered can be applied across a range of problems for which specific solutions have not been taught (e.g., decoding regular words). These generalizations may be taught inductively by examples only, or deductively, by providing a rule and a range of examples to define the rule's boundaries.

Second, teach the essentials. The essentials are determined by an analysis of the skills necessary to achieve the desired objective. There is an underlying assertion that, for reading, it is possible to achieve skilled reading by analysis and teaching of subskills in a cumulative framework. Advocates of a "whole language" perspective would disagree with the possibility, or desirability, of teaching in this manner.

Third, keep errors to a minimum. Direct Instruction designers consider errors counterproductive and time wasting. For remedial learners a high success rate is useful in building and maintaining motivation lost through a history of failure. This low error rate is achieved by the use of the instructional design principles explained in *Theory of Instruction* (Engelmann &



Carnine, 1982), and by ensuring that students have the preskills needed to commence any program (via a placement test).

Fourth, provide adequate practice. Direct Instruction programs include the requirement for mastery learning (usually above 90% mastery). Students continue to focus on a given task until that criterion is reached. The objective of this strategy is the achievement of retention without the requirement that all students complete the identical regimen. The practice schedule commences with massed practice, shifting to a spaced schedule. The amount of practice decreases as the relevant skill is incorporated into more complex skills. Advocates of Direct Instruction argue that this feature of instruction is particularly important for low achieving students and is too often paid scant regard (Engelmann, 1980). Although this emphasis on practice may be unfashionable, there is ample supporting research, and a number of effective schools are increasingly endorsing its importance (Rist, 1992). “The strategies that have fallen out of style, such as memorizing, reciting, and drilling, are what we need to do. They’re simple—but fundamental—things that make complex thinking possible” (p. 19).

These principles of instructional design set Direct Instruction apart from traditional and modern behavioral approaches to teaching. However, the model does share a number of features with other behavioral approaches (e.g., reinforcement, stimulus control, prompting, shaping, extinction, fading) and with the effective teaching movement (mastery learning, teacher presentation skills, academic engaged time, and correction procedures).

These latter features have been researched thoroughly over the past 30 years and have generally been accepted as comprising “direct instruction” (note lower case letters) (Gersten, Woodward, & Darch, 1986).

Rosenshine (1980) used the expression direct instruction to describe a set of instructional variables relating teacher behavior and classroom organization to high levels of academic performance for primary school students. High levels of achievement were related to the amount of content covered and mastered. Hence the pacing of a lesson can be controlled to enhance learning. Academic engaged time refers to the percentage of the allotted time for a subject during which students are actively engaged. A range of studies (Rosenshine & Berliner, 1978) has highlighted the reduction in engagement that occurs when students work alone as opposed

*A strong focus on the academic was found to be characteristic of effective teachers.*

to working with a teacher in a small group, or as a whole class. The choral responding typical of Direct Instruction programs is one way of ensuring high student engagement. As an example, the author counted 300 responses in the 10 min of teacher-directed decoding activity in a Year 7 reading group (Hempenstall, 1996).

A strong focus on the academic was found to be characteristic of effective teachers. Nonacademic activities, while perhaps enjoyable or directed at other educational goals, were consistently negatively correlated with achievement. Yet in Rosenshine’s (1980) review of studies it was clear that an academic focus rather than an affective emphasis also produced classrooms with high student self-esteem and a warm atmosphere. Less structured programs and teachers with an affective focus had students with lower self-esteem. Teacher-centred rather than student-centred classrooms had higher achievement levels. Analo-

gously, teachers who were strong leaders and did not base their teaching around student choice of activities were more successful. Solomon and Kendall (as cited in Rosenshine, 1980) indicated that permissiveness, spontaneity, and lack of classroom control were “negatively related, not only to achievement gain, but also to positive growth in creativity, inquiry, writing ability, and self-esteem for the students in those classrooms” (p. 18).

The instructional procedure called demonstration-practice-feedback (sometimes, model-lead-test) has strong research support. This deceptively simple strategy combines in one general model three elements of teaching strongly related to achievement. It comprises an invariant sequence in which a short demonstration of the skill or material is followed by guided practice, during which feedback is provided to the student (and further demonstration if necessary). The second phase usually involves response to teacher questions about the material previously presented. It would appear that the over learning this phase induces is particularly valuable. The third phase, that of independent practice, is later evaluated by the teacher. Medley’s (1982) review indicated the efficacy for low SES students of a controlled practice strategy involving low cognitive level questions, a high success rate (above 80%), and infrequent criticism. The popularity among many teachers of high cognitive level questions implicit in discovery-learning models is difficult to justify empirically. These high level questions require students to manipulate concepts without having been shown how to do so. Research on discovery approaches has indicated a negative relationship with student achievement. Winnie’s (1979) review of 19 experimental studies on higher order questions made this point very strongly, as did Yates (1988).

To summarize the findings of research into teacher variables with a positive

impact on student learning, Rosen- shine and Berliner (1978) provide a definition for direct instruction, a concept related to but distinct from Direct Instruction.

Direct instruction pertains to a set of teaching behaviors focussed on academic matters where goals are clear to students; time allocated for instruction is sufficient and continuous; content coverage is extensive; student performance is monitored; questions are at a low cognitive level and produce many correct responses; and feedback to students is immediate and academically oriented. In direct instruction, the teacher controls the instructional goals, chooses material appropriate for the student's ability level, and paces the instructional episode. (p. 7)

## *Effective Teaching and LEP Students*

Of course the principles of effective teaching can be equally applied in a bilingual program, in a structured immersion program, or in any of their variants, and the presence of these principles may be more potent than the language of instruction (Slavin, 2004). Interestingly, *Open Court* (Adams et al., 2002), a literacy program that has been recommended as effective (American Federation of Teachers, 1998; Foorman, Francis, Fletcher, Schatschneider, & Mehta, 1998), has now been released in a K-6 Spanish-translated version, *Foro Abierto Para la Lectura*. Its publication is based upon the belief that LEP students have the best chance of achieving English literacy when they first learn to read in their native language. Its sole intention is to teach children how to read, write, and communicate in Spanish, employing an explicit, structured, scripted, code-emphasis approach.

In their review of research, Gersten et al. (1999) revealed that those

approaches that adapt the effective teaching findings produce stronger outcomes for LEP students, especially in basic skills, than do the approaches that favor innovation over rigor. Further, they argue that the research emphasis is best directed away from head to head, apples versus oranges comparisons, and rather focused on manipulating a few variables whilst controlling other potentially confounding variables. One of the problems in making pronouncements about the relative effectiveness of bilingualism and structured English

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immersion has involved the amount of noise introduced by marked variations in instructional features within the approaches. Given that the structured nature of the bilingually-based approach *Foro Abierto Para la Lectura* is similar to that of the structured English immersion model described earlier, opportunities for a comparison of outcomes would be feasible and may provide useful outcome comparison research opportunities.

## *Observation Tools*

A device that may assist in this fine-grained analysis is the *Ecobehavioral System for the Contextual Recording of Interactional Bilingual Environments* (ESCRIBE) (Arreaga-Mayer, 1992; Arreaga-Mayer, Carta, & Tapia, 1994).

It enables the recording of ecobehavioral variables (i.e., instructional environment, teacher and student variables), and is based on a 15-s momentary-time sampling system enabling reliable record keeping.

The ESCRIBE code allows for the recording of:

1. the variety of regular and special education service delivery settings in which instruction is delivered,
2. the type of instructional model used,
3. the range of teacher-to-student ratios that occur,
4. the actual activity engaged in by the target student,
5. the materials the student is using during instruction and the language of the material,
6. the size of the instructional grouping in which the target student receives instruction,
7. the variety of teaching persons who deliver instruction to the target student,
8. the behavior of teaching persons as well as the persons to whom that behavior is directed,
9. the languages used for and during instruction,
10. the corrective/affirmative characteristics of the discourse,
11. the concurrent recording of academic and verbal interaction behaviors of the target student,
12. the languages used by the target student, and
13. the initiating and responding characteristics of the student's language (para 10).

This instrument may provide a level of objectivity often missing in more subjective, holistic observation schedules. While directing attention to well-defined behavioral and contextual variables, it also ensures that student passivity is noted. It is through careful attention to detail that researchers

have noticed such surprising findings as only 21% of the time did observed students in English-language development classes use written or oral language (Arreaga-Mayer & Perdomo-Rivera, 1996). Just because time is scheduled for a particular activity doesn't mean that the intended activity actually occurs. Just as a microscope provides a different perspective to that of the naked eye, so too can an ecobehavioral observation system like ESCRIBE offer a different perspective on a classroom lesson.

## *Current Research Themes*

Gersten and Baker (2000) argue for the emergence of several important themes from the research that when addressed are likely to be beneficial to LEP students. One of the themes relates to the passivity of students described in the paragraph above—a characteristic of many classrooms for LEP students, whether conducted in English or in students' native tongue. The importance of high rates of student response was raised earlier, and deserves greater emphasis in curriculum planning.

There is also a concern that insufficient time is being devoted to promoting English language acquisition. Gersten and Baker (2000) suggest that studies are needed to explore a better balancing of the provision of instructional time, resources, and strategies in order to produce *both* curriculum mastery and language development. Related to this is the need to discern the optimal ratio of conversational and academic oral language activities—an objective that classwide peer tutoring (Klingner & Vaughn, 1996) and cooperative learning groups (when highly structured) may be useful in addressing (Slavin, 2004).

Another theme highlights the importance of investigating explicit programs that have been demonstrably

effective with other learners, a number of which have been described above. Gersten and Baker (2000) also point to the need to be alert to the need for any modifications that may enhance such programs' effectiveness with LEP students. This capacity to tailor interventions to meet the idiosyncratic needs of a particular group has been called situational empathy (Hempenstall, 1996) in recognition of the process involved in ensuring an intervention is effective. The teacher asks the question—what may interfere with the effectiveness of the intervention

*A teacher's acceptance of responsibility for ensuring that interventions are successful does provide an added burden, but it has benefits in increased effectiveness and in a clearer understanding of the complexities of the profession.*

in this situation? Put more positively—what steps should I take to give this intervention strategy the best possible opportunity to be successful in this situation? In order to list the potential obstacles to success, the teacher figuratively enters the environment of the LEP students through observation, questioning, past experience, or through consultation with other experienced teachers. The process is analogous to that involved in program field trials in which the responses of students to a program produce the data from which appropriate program modifications are enabled.

This skill is a high order one, and should continue to develop across a teacher's career. The proviso is that the teacher maintains this mental set and remains committed to evaluation;

otherwise, similar errors may continue to be made without the teacher ever becoming aware of them. One outcome of this latter scenario is a tendency to blame the intervention content rather than the intervention delivery. Thus, one may lose faith in an effective approach when the problem lies in a different domain. An example of this phenomenon is sometimes seen when home-based parent-reading programs are introduced without examining the household situation. Despite the fact that an excellent program may be adopted, some factors that may preclude satisfactory implementation are previous daily time commitments, work schedules, parent literacy skills, parent-child relationship, parent assertiveness, student levels of resistance, marital relationship, between-parent support, and/or parent mental health.

There are many such potential problems capable of scuttling an otherwise well-researched and developed program. For example, teachers, without an understanding of its principles, may be tempted to reduce the structure, fail to correct errors, omit sections, ignore firming procedures, and provide less practice. When a lack of success becomes evident, they may discard a program instead of recognizing the true source of the problem. Even worse is the possibility that blame may be shifted to the student or family to account for the intervention failure. A teacher's acceptance of responsibility for ensuring that interventions are successful does provide an added burden, but it has benefits in increased effectiveness and in a clearer understanding of the complexities of the profession. Despite this emphasis on tailoring programs to meet particular circumstances when necessary, Fitzgerald (1995) found no evidence that LEP students require unique forms of instruction in basic skills.

Other areas for investigation include the optimum means of ensuring vocabulary growth, and the importance of

the introduction of strategically significant words. Most beginning English readers have an oral vocabulary of about 10,000 words (Labov, 2003). Having commenced, school students learn the meanings of words at the rate of 3,000 to 4,000 per year, yet only about 300 to 500 new words are taught directly in a year (Osborn & Armbruster, 2001). This occurs because most vocabulary development throughout elementary school is largely a consequence of reading (Johnson, 2001). LEP students are thus doubly disadvantaged in their vocabulary development. Those who know only a few words in English can comprehend little of that which they read, and because they are able to recognise few words, their volume of reading is minimal. Thus, their vocabulary does not keep pace with their English proficient peers—unless they make accelerated progress.

To avoid this LEP-specific Matthew Effect (Stanovich, 1986), teachers must take care in selecting and teaching only the most productive vocabulary. According to the teachers involved in the Gersten and Baker (2000) focus groups, introducing more than seven novel words per lesson produces diminishing returns. Additionally, for each new word, spaced practice should be scheduled to enhance retention and increase the likelihood of its continued use.

Some other fine-grained recommendations include using visuals (such as concept maps) for reinforcement of language concepts when possible, with the caveat that teachers be trained in how to employ them effectively.

There was a concern expressed about the retrograde effects of teachers' routinely teaching concepts in both languages. It obviously takes longer than monolingual explanations, and appears not to advance comprehension significantly (Ramirez, as cited in Gersten & Baker, 2000). Yet, there was agreement that, at times when curriculum complexity far exceeded students' comprehension, translation into the

native language could be an effective strategy. Similarly, reducing the language complexity of the teachers' English explanations can make a considerable difference to student comprehension. There can also be advantages (only when complex questions are involved) in teaching LEP students to employ their first language when constructing answers that they will then provide in English.

Finally, Gersten and Baker (2000) warn against spending inordinate time developing conversational language to the detriment of the formal English language principles necessary to enable academic progress. They argue that language development and academic growth should be considered as separate goals. Whether by English immersion or bilingual instruction, the LEP student needs to complete more learning in the same time as students born into the dominant culture. The LEP students are also likely to have difficulties additional to that of language. Thus, the expectation of learning more than the average home grown student may be unrealistic in normal circumstances. Educationists attempting to produce such accelerated learning have control over curriculum and time. The logical responses are, first, to increase the effective available time through an extended school day and/or year. The second response is to increase the opportunities for learning, employing only programs and strategies with evidence for their effectiveness, presented in small groups to enable extensive dialogue between teacher and student (Baker, 1998). Since the Direct Instruction programs are also demonstrably effective with other learner groups, then principles of integration and parsimony make the curricula an obvious choice. **ADI**

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## Results With Reading Mastery

### Portland Elementary School, Portland, Arkansas

If you plan to visit Portland Elementary School, it would be best to get directions before you go. First drive south from Little Rock for 2 hours, go through Lake Village, turn at the town's lone stoplight, then drive for another 10 miles or so through the region's cotton fields. After a few more turns, you'll pass the John Deere store. The school is just past that on the left.

Portland, Arkansas, population 560, is the last place you would expect to find a model elementary school. But this tiny town is home to an elementary school with a success so extraordinary that it attracts national attention.

#### The Challenge

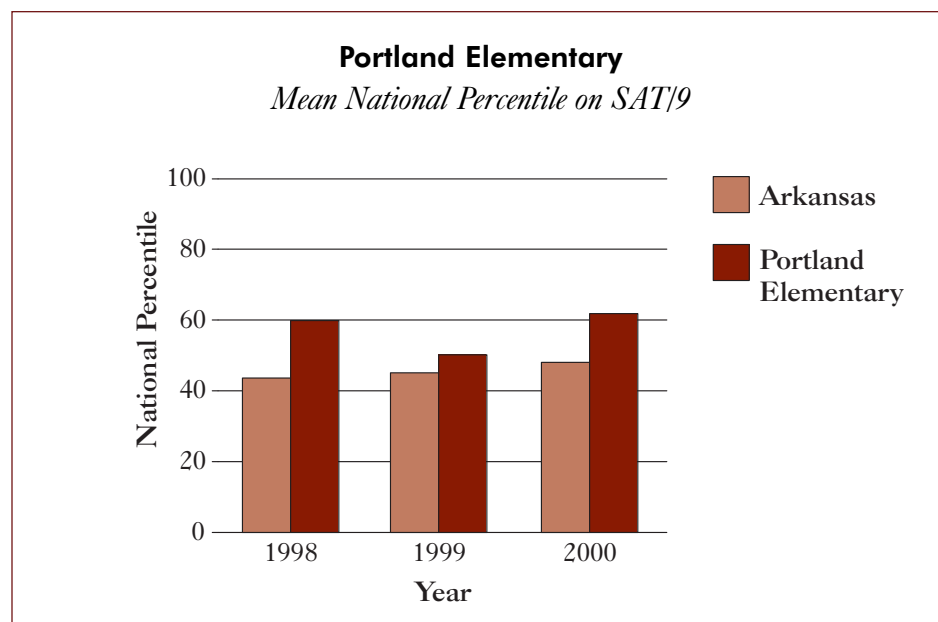
That wasn't the case 9 years ago when Ernest Smith took over as principal of Portland Elementary School. With 155 students in Grades Pre-K through 6, the majority of whom live in low-

income homes, the school had been rated at the bottom of the district for years. Test scores hovered at the 38th percentile, 12 percentage points below the district average. Half of the students in Grades 4 through 6 scored 2 or more years below grade level on national tests. "Still, we thought we were doing well," says Smith. "Noth-

ing exceptional was ever expected to happen at Portland."

The change began when district and state officials urged Smith to visit a

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nearby school using *Reading Mastery*. Seeing the students' intense involvement in the program made Smith a convert. In 1995 he implemented *Reading Mastery* into Portland Elementary and hired consultants to train his staff and follow up with periodic visits.

### Reading Mastery

*Reading Mastery* was instrumental in bringing about the school's turnaround. Student average test scores improved from the 38th mean national percentile to just below the 60th mean national percentile. The school gained 5 percentile points each year and led the district average within 4 years. By 1998, Portland Elementary was consistently outscoring the rest of the state on the SAT/9 test. That year, fifth graders scored a mean national percentile of 60 on the SAT/9, compared to only 43 statewide. The success has continued ever since, with fifth graders scoring a mean national percentile of 61 in 2000, 13 points higher than the rest of the state. Almost the entire diverse student body, which is 44% African American and 4% Hispanic, now reads at grade level or higher. Today, scores significantly exceed the performance of students not only in Arkansas, but also in the Southeastern U.S. and the nation.

### Personal Achievement

"There's a lot of positive reinforcement," says Sheila Greene, a guidance counselor. "Students are not singled out to be ridiculed, and the students don't realize they are in a lower group ability-wise. They aren't stigmatized as underachievers." Before *Reading Mastery*, 18% of students were assigned to special education classes. After the implementation of *Reading Mastery*, that number was trimmed to 5%.

Perhaps the school's biggest accomplishment was doing what other schools in the district found difficult: helping underprivileged children succeed. Principal Smith attributes much of the school's success to *Reading Mastery*. The program "has taught us that all children, when placed at their appropriate instructional level, can learn," he said.

### National Recognition

The dramatic rise in scores did not go unnoticed. In May 1998, The U.S. Department of Education recognized Portland Elementary School as a Distinguished Title I school. Only 109 schools of 54,000 received this award. In January 1999, Portland Elementary was selected to take part in a national study of high-performing, high-poverty schools.

Soon after, *Reader's Digest* picked up the story. Principal Smith was featured in an article entitled "Principals of Success." *Reading Mastery* has helped transform this small public school in a tiny Mississippi River Delta community into a winner.

"This," Principal Smith adds, "is the most exciting period of my life. I have no intention of retiring anytime soon."

## Fort Worth Independent School District, Fort Worth, Texas

By the end of the 1996–1997 school year, it was apparent that students in the Fort Worth Independent School District were not learning to read at required levels.

The Texas Assessment of Academic Skills (TAAS) reading scores showed minimal gains in third-grade scores from 1994 to 1997. Average scores of the Gates-MacGinitie Reading Test were falling below the 50th percentile. That same year, the district also failed to meet Imperative I of the District Educational Improvement Plan that stated "all students will be able to read by the end of Grade 2." The district called in a team of reading instruction experts to analyze the problem.

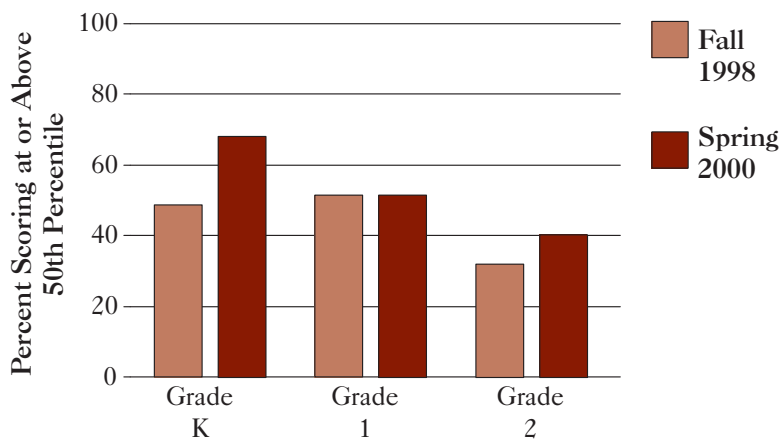
Their solution: The Fort Worth Independent School District must restructure its reading program.

### Participating Schools

In the fall of 1997, 18 high-minority, low-income and low-performing schools were chosen to participate in the implementation of *Reading Mastery* for Grades Pre-K through 2 scheduled to begin in the 1998–1999 school year. Over 300 teachers trained in the program.

*Reading Mastery* consultants were brought into the schools to help with the implementation. They provided teachers and administrators with feed-

**Fort Worth Independent School District**  
*Percent of Students at or Above 50th Percentile on SAT/9 Reading*





back regarding classroom instruction. They also assisted teachers at regular intervals and provided feedback, including classroom coaching and formal observations of classroom instruction.

In spring 1999, teachers and administrators were asked to assess the value of the *Reading Mastery* coaching staff. Overall, the staff of the Fort Worth Independent School District (FWISD) expressed an overwhelming satisfaction with the training and coaching sessions.

### Reading Mastery in the Schools

Using the SAT/9 reading test, students in *Reading Mastery* schools were compared to peers in Fort Worth schools using traditional reading programs. After 2 years of *Reading Mastery*, the students in the at-risk schools showed greater gains than students in more affluent schools. All grade levels showed gains that were higher in *Reading Mastery* schools than in the others. Notable improvements also included the Texas Primary Reading Inventory (TPRI), which identifies students who need help with reading development. Between 1998 and 2000, the percentage of students meeting TPRI criteria jumped nearly 20 points!

According to Dan O'Brien, a Dallas-based researcher who has been evaluating the Fort Worth reading program for the past 3 years, first graders taught by Direct Instruction showed a far greater increase in reading comprehension than students taught through more traditional methods. "Students in the lower grades are being given an early boost to their school careers," he adds.

### A Happy Ending

Recently, 32 schools in the Fort Worth Independent School District received an Exemplary or a Recognized rating from the Texas Education Agency. This rating is based on test scores from the spring 2000 Texas Assessment of Academic Skills (TAAS). To receive a coveted Exemplary rating, 90% of the

school's students are required to pass the reading, mathematics, and writing portions of the TAAS.

The success of *Reading Mastery* can be felt in ways that go beyond the numbers. According to Fort Worth teachers, students are experiencing improvement in self-esteem. The ability to read has opened new doors to learning and to its rewards. Since *Reading Mastery* was introduced into the Fort Worth Independent School District, administrators have noted fewer disciplinary problems and fewer referrals to special education programs.

*Reading Mastery* works. According to Dr. Thomas Tocco, Superintendent of the Fort Worth Independent School District, "The message is clear. Our students are reading. The gap is closing, and not at the expense of any Fort Worth student."

### Wilson Primary School, Phoenix, Arizona

According to the latest U.S. census, Wilson Primary School in central Phoenix is located in the most indigent public school district in the state of Arizona. The school serves a population that is 97% minority, 92% His-

panic, and 75% Limited English Proficient (LEP). "That means the majority of our population spoke another language before they came to school," says Debbi Burdick, principal of Wilson Primary School.

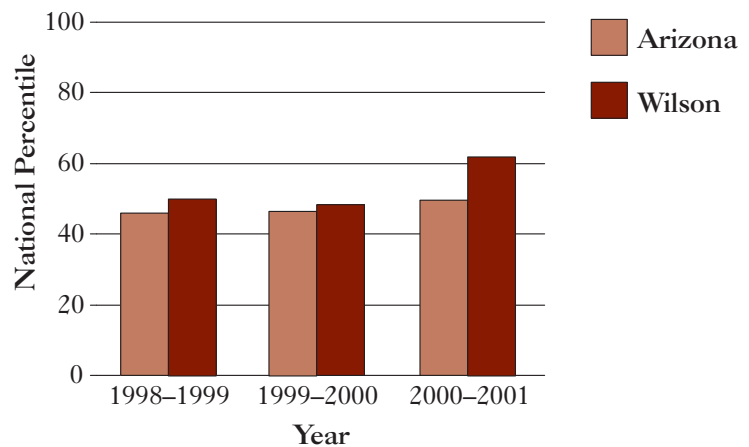
For years, the standardized test scores (SAT/9) in the district were consistently in the teens and twenties. In 1998, the reading score for Grade 3 was at the 17th percentile, up only 1 percentile point from 1997. It was obvious that something had to change.

### A Fresh Start

Starting with the 1998 school year, Wilson Primary School implemented a structured reading program using *Reading Mastery*. All Wilson Primary School teachers went through extensive training in the program. Consultants conducted training in *Reading Mastery* at the beginning of the school year and twice during the year. Teachers then taught the *Reading Mastery* lessons by following the scripted plans written in the Teacher Presentation Books.

"We've seen that the teachers who are consistent and do follow the program carefully are the ones that have the highest achievement," noted Burdick. "Our job in kindergarten—besides

Wilson Primary School  
Mean National Percentile on SAT/9



everything else—is teaching these kids to speak, read, and write English.”

The strategy worked. After the 1st year of implementation, the Grade 3 SAT/9 reading scores leaped from the 17th percentile to the 50th percentile. The language arts scores rocketed from the 21st percentile in 1998 to the 59th percentile in 1999, then to the 71st percentile in the spring of 2000. The mean national percentile on the SAT/9 has grown exponentially as well, from 50 in 1999 to 61 in 2001. In 2001, the score for the rest of Arizona was just 50.

Currently, the reading instruction is consistent across all levels. Teachers use *Reading Mastery* to teach decoding and comprehension in a 120-minute daily block. The first 45 minutes are devoted to *Reading Mastery*, and the students are given time to read whatever they want. According to Burdick, students learned not only how to read but also to enjoy reading.

All Wilson teachers were required to attend meetings with reading consultants. “Reading is the key. We teach reading in everything we do,” adds Burdick. With *Reading Mastery*, “it’s all down in writing. There is no guesswork.”

### A Personal Testimonial

In the first-grade classroom, the teacher stands before the class and reads from the script. “When I hold up my finger, say rrr. Get ready.” The teacher holds up a finger, “rrr.” “Next sound,” says the teacher. “Say fff. Get ready. fff.” The students again respond in unison, “fff.” The teacher does not move to another sound until each student has answered correctly.

Debbi Burdick has embraced the philosophy of Direct Instruction programs. In her experience, other reading or comprehension programs did not work for students with risk factors or language barriers. Sometimes the teachers did not feel they were equipped to teach the content correctly. With *Reading Mastery*, however, and with the staff development provided, teachers now feel confident in their ability to teach all their students, and the test scores verify their feelings. *Reading Mastery*, Burdick believes, is an extraordinary way for second-language learners to learn how to read.

According to Burdick, *Reading Mastery* is “the most phenomenal thing I’ve ever seen, and I’m kicking myself for not considering it sooner.”

## Lebanon School District, Lebanon, Pennsylvania

The Lebanon School District has always been committed to ensuring a successful start for all its students.

Located in the rolling hills of south central Pennsylvania, the Lebanon School District is home to five urban elementary schools serving more than 2,300 students in Grades K through 5. As in many urban school districts, its student body is diverse: 22% of students are Hispanic, while 5% are African American, Asian, or other minority.

In the mid-1990s, the Lebanon School District saw its reading test scores drop. Concerned that its scores would continue to fall, the district’s reading committee decided it was time to look at some other programs.

### Reading Mastery

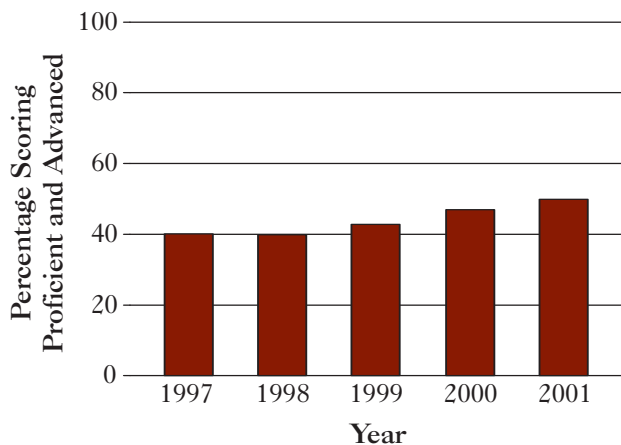
SRA’s *Reading Mastery* was chosen first among all programs because it gets results. Since the program was first developed in the late 1960s, schools around the country have seen dramatic gains in their reading and comprehension scores. In most cases, *Reading Mastery* is used to teach special education children or children from less affluent communities. And because of the program’s structure, teachers can move children to higher or lower levels based on their accomplishments. As the Lebanon District learned, the *Reading Mastery* program offered the structure and discipline the students needed.

Dr. Frederick Richter, Assistant to the Superintendent, implemented *Reading Mastery* for Grades 1 through 5. The school also provided instruction in before- and after-school programs and in summer school.

Students are first grouped based on reading ability as identified by a carefully developed and researched

### Lebanon School District

#### Grade 5 Students Scoring Proficient and Advanced on PSSA Reading



placement test. Then teachers, using a script, instruct students in decoding. Following this practice, the students learn to associate each sound with its written symbol, responding to the teacher aloud as the lesson proceeds. The lesson continues until each student is ready to move up to the next level.

### Success

The results were immediate. Within a year, students progressed at least one grade level in their reading ability. In the 4 years since the Lebanon School District began using the program, Grade 5 scores on the Pennsylvania System of School Assessment (PSSA) rose by 50 points. The percentage of fifth-grade students scoring proficient and advanced on the PSSA has climbed from 40% in 1997 to nearly 50% in 2001. In that same time frame, students in Grade 5 also increased their reading fluency from 117 words per minute to 166 words per minute. In Grade 2, students increased their reading fluency from 54 words per minute to 118 words per minute.

*Reading Mastery* proved to be a huge success. The Lebanon School District has since expanded the program to include its 900-student middle school. According to Richter, *Reading Mastery* “is a scripted program where teachers have a script to read. The success of the program speaks for itself.”

To keep the teachers on track, a *Reading Mastery* consultant visits the school on an ongoing basis. “The professional support has been incredible,” says Richter. “And the training goes further than just what is on the written page. During these sessions, our teachers gain a deeper appreciation of what it takes for a student to learn how to read. That’s what makes this program so unique and successful.”

### Accolades

An Educator’s Guide to Schoolwide Reform, a report that examines and rates the effectiveness of schoolwide learning programs, found strong evi-

dence that *Reading Mastery* has positive effects on student achievement. The report, prepared by the American Institutes of Research (AIR), gave this top ranking to only 3 of 24 approaches.

“When you look at the research, you can’t ignore *Reading Mastery*,” adds Richter. “We made the right decision.”

## Roland Park Elementary/Middle School, Baltimore, Maryland

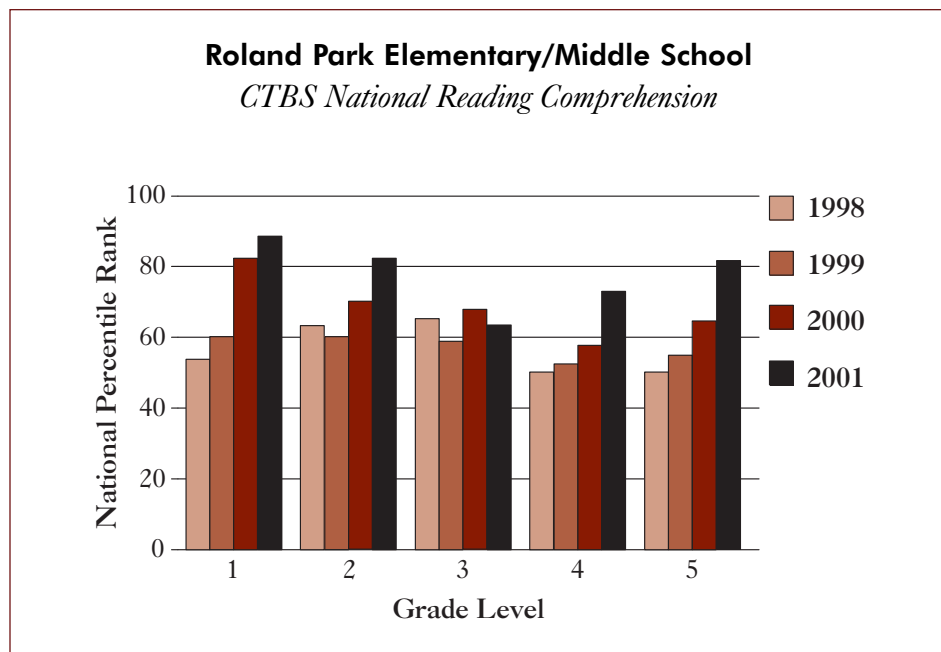
The best always strive for improvement. That’s certainly true of Roland Park Elementary/Middle School, located in the Baltimore City School District. As one of the top performing schools in the Baltimore metropolitan area, Roland Park exemplifies the best that education has to offer. The school was recognized in a *U.S. News and World Report* article and in 1998 was named a “Blue Ribbon School of Excellence,” which signifies high academic standards, high student achievement, and innovative schoolwide programs, among other qualities.

Roland Park School’s population represents the diversity of Baltimore’s population. The school is home to almost 1,400 students attending Grades K through 8, with 35% economically disadvantaged and a 69% minority population. To make sure that not one student falls through the cracks, the school has striven to provide varied programs to meet the needs of its diverse student body.

Even so, Principal Mariale Hardiman wanted to improve the school’s reading program. “We had no citywide program in place,” she said. “So there was no consistency across schools or even across classrooms. It was apparent that our school needed a K–5 program that would give our teachers and staff more training and ongoing support. When it came time to make a decision to choose a reading program, the choice wasn’t difficult at all. *Reading Mastery* was by far the best.”

### Polishing the Gem

Principal Hardiman implemented *Reading Mastery* for all of Roland Park’s K–5 students in reading and language. The program was blended in as a component of a teacher-driven curriculum that included core knowledge, literature, and performance-based instruction. J/P Associates, a consulting group



that provides professional development and hands-on assistance to schools utilizing the Direct Instruction methodology, worked with the district on its implementation.

“The *Reading Mastery* consultants made sure we didn’t stray off course,” said Principal Hardiman. “They provided the training our teachers needed to ensure the program was implemented properly and was a success.”

Within 1 year, students progressed at least one reading grade level. In addition, two-thirds of the students in Grade 5 had finished *Reading Mastery* Level 6 by the end of the year. Comprehensive Tests of Basic Skills (CTBS) scores for Grade 5 moved from a mean national ranking of 50 in 1998 to a ranking of 64 in 2000. The largest and most significant growth occurred in Grade 1. In 1998, the students in Grade 1 had a mean national percentile of 54.5. In 2000, the mean national ranking skyrocketed to 82, a growth of almost 28 points! Between 1998 and 2000, Roland Park saw an increase in reading scores across all grade levels.

Teachers at Roland Park also noted how the better reading skills improved scores in other subjects as well. “The ability to read is the foundation of learning,” said Principal Hardiman. “Ever since the implementation of

*Reading Mastery*, we have seen the students’ scores rise in nearly every subject, from science to social studies.”

*Reading Mastery* “has really contributed to the strong reading ability of our kids,” she added. “And the parents agree. Whatever your philosophy is on reading, our scores clearly indicate that the *Reading Mastery* program is successful.”

Roland Park Elementary/Middle School’s philosophy of education is best reflected in its motto: “All students are gifted and all students get smart.”

### *City Springs Elementary School, Baltimore, Maryland*

In 1995, City Springs Elementary School was in dire straits. Located in southeast Baltimore in one of the poorest sections of the city, the school had to improve its test scores or face closure.

“We were in a very difficult position,” said Bernice Whelchel, principal of the K–5 elementary school. “Our school serves a poor and largely minority community pulled primarily from nearby public housing projects. All of our students receive Title I services, while 95% of our students are in the free/reduced lunch pro-

gram. In 1994, we didn’t have a single student in Grade 5 who had scored ‘satisfactory or above’ in the Reading, Writing, and Language Usage sections of the Maryland Schools Proficiency Assessment Program (MSPAP). But our difficulties went beyond the classroom. Attendance had been low for years, and many students were unruly and disruptive.”

With City Springs Elementary School on the verge of closure by the state of Maryland, Principal Whelchel believed that radical changes in curriculum and expectations were necessary to save the school and its students.

### **Help Arrives**

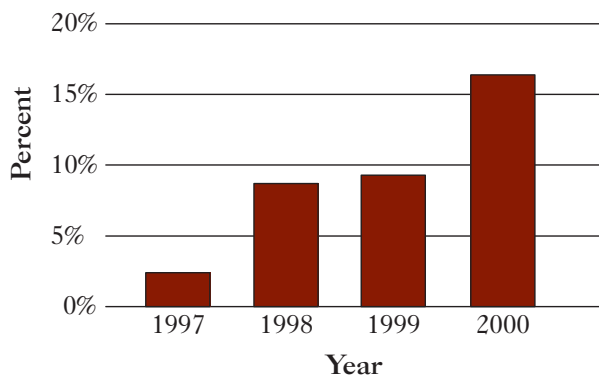
In 1996, Principal Whelchel and the City Springs teachers adopted *Reading Mastery* in the hope of turning the school around. The staff at City Springs Elementary had great confidence in the program. In testimony before the U.S. House of Representatives, Whelchel stated that *Reading Mastery* “has been the subject of numerous studies that have compared the effectiveness of various programs on the achievement of groups of diverse students.” She went on to state that *Reading Mastery* “does produce the desired result.”

Students were grouped by ability, based on carefully designed placement tests. Teachers then used the *Reading Mastery* scripted lessons to teach essential reading skills presented in a specific sequence that is based on years of research and field-testing. Program support materials showed teachers how to measure student progress and how to assure that students retain the newly acquired learning. Using *Reading Mastery*, mistakes were corrected immediately, before bad learning habits were formed. Students demonstrated mastery of each reading lesson before moving to the next level.

### **The Impact**

In many cases, 5 years may be needed before schools see significant improve-

**City Springs Elementary**  
*Percent of Students Receiving Score of Excellent on MSPAP*



ments in test scores, but the improvements in City Springs Elementary were almost immediate. The percentage of City Springs students in Grade 5 who passed the MSPAP Language Usage section increased from 1.8% in 1997 to 8.2% in 1998. In 2000, 16.4% of City Springs Grade 5 students earned the “excellent” mark in Language Usage, an amazing success considering that in 1994 not one student had hit the mark. The school was removed from the Maryland Department of Education’s “failing” schools list in January 2002, because of improved test scores.

Scores improved throughout the grades because the school made a commitment to *Reading Mastery*. “It’s a step-by-step procedure,” says Whelchel, “so that we can reach every child. We absolutely love this program because not only can our students read, but they’re also learning problem-solving strategies.”

*Reading Mastery* had a profound influence on student behavior as well as on academics. According to Whelchel, the program has “created a rewarding learning environment. Our school climate has improved. Students do not become frustrated and act out because their work is based on their levels of learning. Students are on task almost all the time, hallways are free from disruption, disciplinary referrals are down, and attendance is about 97%.”

### Tomorrow

Principal Whelchel feels an immense satisfaction in the student’s progress. Every so often she will look in on classrooms to see *Reading Mastery* in action, and she is never disappointed with the results. Not only are students learning, but their satisfaction and confidence are immediately apparent.

“You would have never seen that 10 years ago,” says one teacher at City Springs Elementary. “The *Reading Mastery* program is proof that students

of a low socioeconomic status can and will succeed.”

The future of City Springs is promising. Its struggle and ultimate success have already been documented in the PBS documentary *The Battle of City Springs*. Reading scores continue to rise year after year. Whelchel sees only a brighter tomorrow.

“Next year,” she says, “we’re going to knock the socks off the tests again.”

## Eshelman Avenue Elementary, Lomita, California

The students at Eshelman Avenue Elementary face many hurdles even before entering the classroom. The K–5 elementary school is located in a poverty-stricken area. Seventy-three percent of the students are minority and an equal percent receive a reduced-cost or free lunch. Many of the students speak little or no English at home.

Until 1997, test scores showed that few students were overcoming these hurdles. During the 1997–1998 school year, students were reading well below the national average. In the fol-

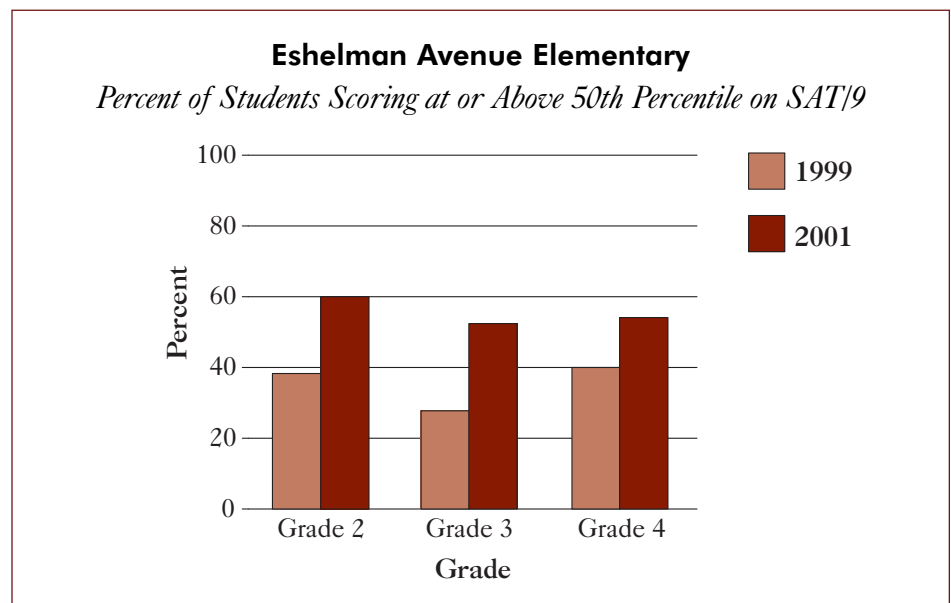
lowing year, only 18% of Eshelman’s fourth graders were at or above the national average. This was compared to 40% of fourth graders statewide and 21% in the entire Los Angeles Unified School District.

In 2000, students in second, third, and fourth grade did better than their peers statewide in the reading portion of the SAT/9 basic skills exam. Fifty-four percent of fourth graders scored at or above the 50th percentile in reading, a full 25% higher than the Los Angeles Unified fourth-grade average. Between 1998–2001, reading scores on the SAT/9 for Grades 2 through 4 skyrocketed more than 20 points. The largest jump occurred in Grade 2, from only 39% of students at or above the 50th percentile in 1998 to 60% in 2001. Math scores were even higher, which district officials attributed to the students’ ability to read and comprehend the test questions.

What was the reason for this dramatic change? *Reading Mastery!*

### A Fresh Start

The success of *Reading Mastery* was significant. Already used by hundreds of schools nationwide, this program is ideal for special education students and students from disadvantaged com-



munities. Teachers “signal” to keep students in step with the instruction and then wait as students pronounce sounds and words. Any student who falls behind is immediately corrected so that bad learning habits are not formed. Also, teachers, aides, and the principal are trained in the program and attend regular review sessions taught by consultants.

When Joanne Vegher, a kindergarten teacher at Eshelman, began using *Reading Mastery*, she soon discovered the creativity the scripted program allowed her. The structured program also gave her the opportunity to work individually with each student. This was very important to her. “It has a structure but within the structure is a great deal of flexibility,” she said. “You are able to reinforce daily what

you’ve taught before. If children need to move to another group, either up or down, it’s easy to move them gracefully.”

Principal Winnie Washington cites other advantages of the program. “You see kids on task,” she says. “There are no more disciplinary problems. The kids feel better about themselves because they are successful.”

### Success

Test scores show that *Reading Mastery* works. In the 2000–2001 school year, Eshelman’s Academic Performance Index (API) score was 644, a 63-point improvement from just 1 year before. The API score for the 2000–2002 school year was even better. Eshelman’s API score soared to 707,

another 63-point gain. More notably, 33% of Limited English Proficient students scored in the 50th percentile or higher on the SAT/9 compared to only 17% statewide.

*Reading Mastery* goes beyond the classroom as well. Eshelman Avenue Elementary has family nights that expose parents to the reading program. During these family nights, Reading Coordinator Gary Kolumbic, who was a key contributor to the success of *Reading Mastery* at Eshelman, trains parents to teach their children to read. The school also takes part in the “Reading by Nine” program.

In just 3 years, Eshelman Avenue Elementary has seen a dramatic climb in reading scores. It’s obvious that *Reading Mastery* works. **ADP**

ALAN J. BORSUK, *Milwaukee Journal Sentinel*

## *Bush Honors Principal’s Work*

### Barton School’s success under initiative lauded

Marking the second anniversary of the signing of the “No Child Left Behind” education law on Thursday, President Bush singled out Milwaukee’s Barton School and its principal, Norman Mishelow, for their success in educating low-income children.

Bush was joined on stage at an elementary school in Knoxville, Tenn., by five educators, including Mishelow, who described the success they have had using educational practices in line with the law.

Mishelow told Bush about the reading and math programs at the high-scoring kindergarten-through-sixth-grade school at 5700 W. Green Tree Road and about the school’s success with using about 50 volunteer tutors to help students. Mishelow praised the school’s staff as “the best, most dedicated staff in the country.”

The school teaches reading using Direct Instruction, a program that provides a detailed script for teacher-student interaction. The program also focuses on small group learning and emphasizes phonics. The school also uses a math curriculum that focuses generally on building basic arithmetic skills.

According to a White House transcript of the session, after Mishelow spent several minutes describing the school’s success, Bush said, “We’re learning what works when it comes to reading. It’s not guesswork anymore. For a while it was a guesswork. You might remember the great debates, capsulized—whole language versus phonics. There was a lot of political capital expended over that.

“And all of a sudden the accountability system starts to clarify reality. And as

Norm (Mishelow) mentioned, they’ve chosen a program and a curriculum that is now working. Why do we know? Because they measure. They’re able to tell because there is a measurement standard. The other thing that happens when Norm’s school does well, other schools say, wait a minute, old Norm doesn’t seem to be all that good, how is he able to do what he’s doing?”

To laughter, Mishelow cut in, asking, “Who’ve you been talking to?”

“Well,” Bush said. “Just guessing, Norm.”

The president went on to say, “As Norm mentioned to you, he’s taken a school of children who—as we say—used to say, tough to educate, and showing what can happen. I appreciate, Norm, your leadership....I know

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the people of Milwaukee are thrilled that you are where you are.”

Barton School was the only school in Wisconsin to receive recognition from the U.S. Department of Education this year as a “Blue Ribbon” school, a long-standing federal program that has been retooled by the Bush administration to emphasize provisions of the “No Child Left Behind” law.

After the event, Mishelow called it “one of the highlights of my 32-year

career, just to be on the stage with these people and to be with the president and the secretary of education....The whole thing was amazing.”

Mishelow said a White House aide called Tuesday, asking if he would be part of the program. The White House paid the expenses of the trip.

Mishelow said he had seen some of the school’s scores from standardized testing done in November, and more than 90% of the school’s fifth- and

sixth-grade students were rated proficient or better in reading and none was in the “minimal proficiency” category. The school’s fourth-grade scores a year ago were well above state averages and among the highest in Milwaukee. A large majority of the school’s students are African American and have family income levels that qualify them for free or reduced-price lunch. *ADI*

MAUREEN KENNEDY BERG, Principal, Louisa May Alcott Elementary School

## *How One Urban Elementary School Achieved Success With Direct Instruction*

Seven years ago, as a 1st-year principal, I was given the joyful yet arduous task of opening a small urban elementary school in the city of Cleveland, Ohio. Crowded conditions in other buildings required additional classroom space, so Louisa May Alcott Elementary School was actually reopened after being closed for 16 years under desegregation. We began with 250 students in Grades K–5 in a building with the capacity for approximately 210 students, our enrollment today.

The staff was not selected by me, but was assigned by the district under union guidelines, and everyone came with varying levels of experience. None of us knew each other and three were 1st-year teachers. The students were assigned from at least 10 surrounding schools. They brought an abundance of behavior and academic problems with them. We were not given a curriculum, had few textbooks at all until November of our 1st year, and had no library or science materials. The energies of the staff went to assessing student needs (which were great) and achievement (which was low) and scrounging for materials. As

the principal, most of my time was spent on discipline and handling the crisis of the day.

Despite these challenges, much was accomplished during the 1st year. From the beginning the staff and I tried to work together to figure things out and set in place a plan for improvement. Most of our 1st-year reading test scores (1997–1998 prior to DI implementation) were in the single digits and teens, so we knew drastic change

was needed (see Table 1). Through a cooperative endeavor, the staff became interested in Direct Instruction. In our research we found this to be a sound methodology for teaching children to read, a skill very few of our students possessed. I had never been a proponent of the theory that one method of teaching reading is as good as another—as was the resounding cry in educational circles at the time. My own experience as an urban teacher for 13 years had taught me that the process was much more of an exact science. Now the teachers were hearing this for the first time and the idea relieved and excited them. I know many of them felt at a loss with all we were up against as we started the

**Table 1**  
*Mean Percentile Ranks\**

	Grade 1	Grade 2	Grade 3	Grade 4*	Grade 5
1998	2	10	34	31	15
1999	33	28	15	37	13
2000	76	48	50	29	36
2001	69	70	53	41	52
2002		71	69	73	57
2003			65	86	79

*Note.* 1998 scores were prior to DI implementation.

\*4th Grade—Ohio State Proficiency Test. All other grades—Riverside Off-Grade Proficiency Test.

school, and we were all very anxious for some solutions.

Many factors had to be considered when trying to determine the path our school would take. The majority of our children were impoverished with a poverty rate fluctuating from 84% to 100%. Most of our children entered school poorly prepared to succeed, with poor language development, and with inadequate vocabulary the norm. Many of our children had special needs. The special education population ranged from 20% to 25%, as it still does today. We began and continue to service OH, OHI, CD, LD, and ED students in inclusion classrooms. Like other urban schools, mobility was another obstacle. Today our mobility rate is still about 25%. How could we put all this into the mix and come up with a plan that would work? Most lay people and many educators, although few would admit it, think it is impossible to turn a school around. They blame the parents and society for creating conditions that cannot be overcome. The common belief is that these children cannot be educated to any high degree. My staff and I thought otherwise.

In this large district with strong unions, a quagmire of red tape, and conflicting political agendas it was not easy to find ways of sharing our ideas and our excitement about Direct Instruction. The opportunity came when trying to plan one of our 1st-year professional days. Our needs were so great—we were at a loss as to where to begin. This was when I mentioned to the staff an urban school in another city that was achieving high academic success using a program called Direct Instruction. There was much discussion among the teachers, and our entire staff decided to visit this school and see for ourselves if this was possible. What we observed were urban children reading at high rates and happy and confident teachers. We had time to talk to the teachers, the principal,

and to a consultant from the University of Oregon who was visiting the school and who was able to answer the many questions our teachers had. Everything I saw and heard about DI reinforced my beliefs. I could not wait to get started, but I knew I would have to allow time for the collaborative process to work. After much discussion, the staff voted unanimously to adopt DI schoolwide. We wrote and received a CSR grant from the state of Ohio that provided us with funds for 3 years for teacher training and all materials. And then the real work began.

*What we observed were urban children reading at high rates and happy and confident teachers.*

What was so appealing to all of us about DI was that it aligned with our core beliefs about teaching and learning and contained the necessary components for a comprehensive reading program. We believed that beginning with phoneme awareness and systematic phonics instruction would go far in leveling the playing field, as all of our children learned the new “language” for learning to read. We would not have to rely on our children having attended preschool (most had not) or being read to by parents (many had not) or looking at pictures for clues (an activity counterproductive to learning to read). The staff and I were determined to use a program that emphasized mastery learning. We were also looking for lessons that would engage the students’ full attention, provide necessary practice, and minimize time off task and behavior problems. DI has gone far and above meeting these expectations.

The implementation began in K–3 the 1st year (1998–1999) and moved to the fourth and fifth grades Year 2 (1999–2000). Having full day kinder-

garten has afforded us the time to complete *Language for Learning A, B, and C* and *Reading Mastery I* so that the children exit kindergarten reading. While our children may come to school with readiness deficits, we have found that presenting a challenging DI curriculum can get children on a fast track to making up for their weaknesses. In kindergarten children are grouped into thirds and one group does *Reading Mastery I* with the classroom teacher, one group does language with a trained instructional assistant, while the third group does independent work or centers which are often monitored by parent volunteers. Each lesson takes a half-hour, so in 1 and a half-hours, all children have rotated through the three stations and have had reading and language for the day. There is still plenty of time to do other subjects, literature, and creative projects.

In Grades 1–5 a different structure was needed for optimum benefit of students. We designed three separate, 1-hr DI reading blocks (Grade 1, Grades 2–3, Grades 4–5). This allows all special education and other resource teachers to teach during each block. This also keeps the student/teacher ratio low for DI instruction and makes it possible to offer a wide range of reading levels at each grade. This structure is especially helpful to students with mobility and other special education needs, since we are able to find an appropriate developmental reading level for every student. During the 2nd hr of our district prescribed reading block, all children work at grade level with other literature, writing, and creative projects aligned with state standards.

As shown in Table 1 (1999–2003) and Table 2, the results of this work have been most rewarding. We had dramatic improvement with the lower grades in the first two years of the DI implementation. Although it took more time to show dramatic changes for the upper grades, gradual improvement was evident across the 4-year period.



**Table 2**  
*Ohio Fourth-Grade Reading Proficiency Test*

**Percentages of Students Scoring at Basic, Proficient, and Advanced Levels by Subgroups**

	2002–2003	2001–2002	2000–2001	1999–2000
<b>SCHOOL SCORES—Reading</b>				
Total				
At or Above Basic	97.3	Not Defined	Not Defined	Not Defined
At or Above Proficient	86.2	66.6	38.3	29.6
At Advanced	14	4	3	0
Number of students tested	36	24	35	24
Percent of total students tested	100	73	97	66.7
Number of students excluded	0	9	1	12
<b>SUBGROUPS</b>				
<b>1. White</b>				
At or Above Basic	95	Not Defined	Not Defined	Not Defined
At or Above Proficient	70	83.3	52.4	25
At Advanced	10	8.5	0	0
Number of students tested	20	12	20	16
<b>2. African American</b>				
At or Above Basic	100	Not Defined	Not Defined	Not Defined
At or Above Proficient	88.9	57.1	20	50
At Advanced	0	0	0	0
Number of students tested	9	7	10	4
<b>3. Economically Disadvantaged</b>				
At or Above Basic	97.3	Not Defined	Not Defined	Not Defined
At or Above Proficient	86.2	66.6	38.3	29.6
At Advanced	14	4	3	0
Number of students tested	36	24	35	24
<b>4. Special Education</b>				
At or Above Basic	87.5	N/A	N/A	N/A
At or Above Proficient	62.5	N/A	N/A	N/A
At Advanced	12.5	N/A	N/A	N/A
Number of students tested	8	N/A	N/A	N/A
<b>STATE SCORES—Reading</b>				
At or Above Basic	90.6	N/A	N/A	N/A
State Mean Score				
At or Above Proficient	66.6	67.7	56.0	58.2
State or Mean Score				
At Advanced	9.3	7.0	7.0	6.0
State Mean Score				

As shown in Table 2, the percentage of students scoring at or above the proficient level on the Ohio Fourth-Grade Proficiency Test increased from 29.6 in 1999–2000 to 86.2 in 2002–2003. As shown in Table 1, mean percentile ranks for Grade 5 increased from 13 in 1999 to 79 in 2003.

What was encouraging along the way, however, was that we were seeing remarkable improvement in science, citizenship, writing, and math scores, which we attributed to our children being able to read the test questions so much better. The emphasis of expository reading and writing in *RM III* really impacted our students' ability to analyze and understand factual material. On our yearly standardized tests, Stanford 9, we were scoring near or well above the 50th percentile in every grade, but the design and format of the Ohio Proficiency Test required refinement of our literacy practices along with DI.

We have now evolved into a school culture that is calm, orderly, and happy. Parents love the school and are very proud of their children's achievement. Our teachers are confident and are considered some of the very best in the district, and we have not had any turnover except for one retirement in 5 years. In a district with 123 schools and

77,000 students, our scores are some of the highest. Often, we outscore schools in the suburbs. We have been able to demonstrate academic achievement with all children, eliminating a racial gap or poverty gap (see Table 2). We have been recognized with a School of Promise Award from the State of Ohio for children scoring above the state standard (75%) on the Ohio Fourth Grade Proficiency Test in math (2002 and 2003) and reading (2003).

Recently we were nominated by the State Superintendent of Schools, Susan Tave-Zellman, for a National Blue Ribbon Award and will hear the results in September 2004.

Many other initiatives, programs, and financial support have come our way during the last 7 years, including us having a nationally renowned CEO, Barbara Byrd-Bennett, who has made many strides in the district. For our school, however, the teachers and I all agree that the implementation of Direct Instruction has been the foundation of our success.

The future for DI in a large district is tenuous at best, but our success is hard to ignore. I do see hope on the horizon, however. Although DI is not emphasized, we are designated a model school in our district, and many teachers and administrators come to

observe our practices. We have also been given autonomy to do DI in a district with different initiatives in place, and I have been given responsibilities as an executive administrator to mentor and train new principals. The AFT, which is the union of the Cleveland teachers, has come out with several articles in favor of Direct Instruction. With DI being so strongly aligned with No Child Left Behind legislation and having sound research to support its practice, it would seem the interest in it would have grown. But in many circles, to even whisper the words Direct Instruction is paramount to burning the flag. So we have all learned to say little at conferences, and when we hear ideas that we believe contrary to what we have proven works, we ignore them. My favorite encounter recently involved a statement made by a director of early childhood for a large urban district who said that how children learn to read was a "mystery" and that you try many different things and you "hope" something works. Is it any wonder that many urban systems are still floundering? This equates to flinging mud on the walls and hoping some of it sticks. I never intended to become a rebel, but I must admit, I now relish the fact that by doing what's right for children, I have become one. ~~ADI~~

CHRISTOPHER D. JONES and PEGGY TARPLEY, Longwood University; TODD FORGETTE, Cumberland County DI Coordinator

## *Demystifying Instruction: How the Collaborative Process Can Help Facilitate Literacy*

"Few professionals are more steeped in mythology and less open to empirical finding than are teachers" (Maggs & White, 1982, p. 131). It's a powerful statement—one that at first

offended me, then upon further reflection I reluctantly agreed. Many teachers work tirelessly to provide instruction that attempts to meet the unique needs of their students, but at

the end of the day many, I fear, wonder whether they are being as effective as they should or could be. I often visit public schools that are struggling to provide exceptional instruction, and I hear the teachers' frustration and mistrust of the education system. They feel as if they have been betrayed and misled. Mandate upon mandate, intervention upon intervention have been placed in bold letters on their green chalkboards. While the intentions of these mandates and

interventions have been optimistic and hopeful, too many of them never produced the desired results. Every new reform failure works to validate teachers' mistrust in the education process. Most teachers are working hard to produce students who can compete with their peers, but in the decade of high stakes assessment, it is becoming blatantly obvious that good intentions and enthusiasm are not enough to produce substantial educational gains. Understandably, teachers who work hard but fail to make the desired or needed gains feel defeated. They are doing what the powers that be suggest, so why aren't their children succeeding? It is this dangerous situation that reinforces teachers' belief that it is somehow the child's fault. Public education as the great equalizer slips through our fingers when teachers succumb to the belief that students' failure must be a by-product of societal problems or student and parent apathy.

The Reading Excellence act and now the Read First grant have given schools an opportunity to fully realize success. These lucrative grants provide us with an opportunity to prevent and replace the defeated attitude of many public school teachers by producing students who are reading on or above grade level. If teachers, in collaboration with administrators, institutions of higher education, program developers, state department personnel, and implementation specialists, form a team whose fundamental belief is that every child can and will perform at their instructional level, we can eradicate teachers' frustrations with student failure and demystify the educational process. The following article describes a positive collaborative relationship between various educational agencies whose primary goal is to systematically address the educational issues of school divisions in Central Virginia.

## *It Started With A Pilot Study*

During the fall of 2000, we were asked to set up a pilot study at a local elementary school that evaluated the phonological gains of at-risk kindergarten students. We created a graduate-level class in Direct Instruction reading. The textbook for this class was *Direct Instruction Reading, 3rd ed.* (Carnine, Silbert, & Kameenui, 1997). The graduate students were trained in the theory behind Direct Instruction and program delivery of *Reading Mastery (Rainbow)* and *Teach Your Child to Read in 100 Easy Lessons* (Engelmann, Haddox, & Bruner, 1986). The kindergarten students were randomly assigned to four different cohorts: (a) traditional classroom instruction, (b) one-on-one tutoring using a phonological awareness curriculum, (c) *Reading Mastery* group instruction, and (d) *Teach Your Child to Read in 100 Easy Lessons*—one-on-one instruction. The Longwood University masters students were the primary reading instructors for 1 month for the DI groups. Every weekday for 1 hr students received

reading instruction in their randomly assigned cohorts. The results are presented in Table 1.

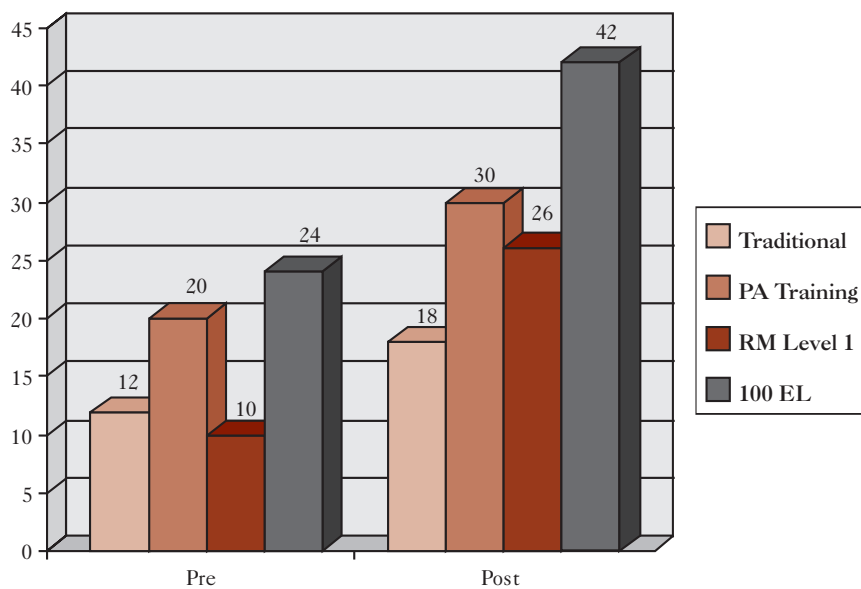
It was interesting to note that while the gains of the DI cohorts (*Reading Mastery* and *100 Easy Lessons*) were significantly higher ( $p < .05$ ) than the non-DI cohorts, there were no statistically significant differences between the DI groups. While the results were intriguing, there was not a lot of motivation to switch reading programs at the time in the elementary school.

## *Cumberland Middle School*

The atmosphere at the middle school was different. The staff was trying, with limited success, to adapt their sixth-, seventh-, and eighth-grade curriculum to meet the literacy deficits of the middle-school population. It was very challenging to teach content courses when the average sixth grader was reading at a fourth-grade level, the average seventh grader was reading at a fifth-grade level, and a cohort of eighth graders was reading at a 3.5-

**Table 1**

*Pre- and Postpercentile Scores, Comprehensive Test of Phonological Processing (Wagner, Torgesen, & Rashotte, 1999)*



grade level. The administration and faculty looked closely at the results from the elementary school pilot study and wondered if they could replicate the gains with middle-school students. The state of Virginia offered a Comprehensive Schoolwide Reform (CSR) grant for Title I schools that were willing to adopt an approved model. The grant, \$50,000 a year for 3 years, would enable Cumberland Middle school to secure the funds needed to implement *Corrective Reading* schoolwide. Cumberland's middle-school Principal, Dan Grounard, was the visionary and leader who saw what *Corrective Reading* could do for his students in Cumberland. He actively pursued a truly collaborative effort between his school division and Longwood University. The resulting partnership set the precedent for future collaborations within Central Virginia. Thus, with the support from the Virginia Department of Education, Longwood University, and the external coaches (Educational Resources Inc.; ERI), Cumberland began its journey toward full accreditation.

In the first few months of the school-wide implementation of *Corrective Reading*, content teachers' anecdotal reports indicated that dramatic changes were happening. They

informed us that for the first time their students were attempting to decode unfamiliar words. There was a great deal of excitement in the air, but it was tempered with the realization that anecdotal reports alone could not provide the clear cut data that was needed to affirm the teachers' hard work and validate the students' achievement. The answer to their questions came when the results of the Virginia's Standards of Learning (SOL) assessment confirmed for the collaborative team the success of their efforts. They were further reinforced when Cumberland Middle School was fully accredited after using *Corrective Reading* for only 2 years. While *Corrective Reading* assisted the language arts teachers in building the reading skills of their students, it was a truly collaborative effort between the content, writing, math, and reading teachers that made their goals a reality (see Table 2).

### *After Cumberland Middle School*

Based on the successful data of Cumberland Middle School, the elementary school decided to pilot *Corrective Reading* and *Reading Mastery Plus* with the at-risk students in fourth and fifth

grades. The pilot-study students began replicating the success of the middle-school implementation, and by midyear all of the third, fourth, and fifth graders were receiving either *Corrective Reading* or *Reading Mastery Plus*.

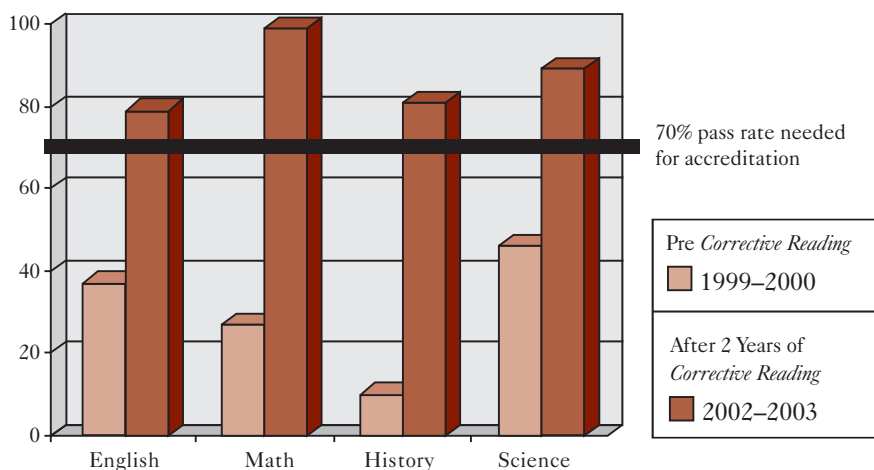
In the summer of 2002, the Virginia Department of Education (VDOE) made available the Reading First grant. We saw this as an opportunity to form a collaborative relationship between and within school divisions in Central Virginia. As a result, seven Reading First Grants were submitted, and subsequently accepted by VDOE, that used *Reading Mastery Plus* as the core reading programs for Grades K-3. Greenville\*, Buckingham, Cumberland, and Brunswick counties all adopted the collaboration model that utilized the Reading First Initiative Team (RFIT).

The goal of the RFIT teams is to facilitate student literacy development. The RFIT team consists of reading specialists, administrators, Virginia Department of Education Reading First Specialists, Longwood University Professors, and professional external coaches (ERI). These teams place a top priority on closely monitoring the progress of every student within the school system, thus ensuring that every student receives effective reading instruction at his/her instructional level. We are currently half way through the 1st-year implementation of *Reading Mastery Plus* under the Reading First Grant, and indications point to substantial reading gains.

This collaborative effort is a testament to the possibilities of what schoolwide reform can be. While at times the collaboration is stressful, the goals of producing students who are reading at or above grade level are within reach. It goes to show that with the support of

\* Greenville Elementary School is using a dual curriculum model that incorporates *Open Court* and *Reading Mastery Plus*.

**Table 2**  
*Cumberland Middle School Standards of Learning:  
Percent Pass Rate*



the various educational agencies, the hard work of classroom teachers, the use of research based programs, and the dedication and vision of administrators, the spirit of leaving “no child left behind” is alive and blossoming in central Virginia. **ADI**

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## Remarks of Jerry Silbert on Direct Instruction to the Duvall County School Board Work Session, June 13, 2000

Thank you for inviting me to speak with you about Direct Instruction. For over 32 years I've been a Direct Instruction teacher, a trainer of other teachers, an author of Direct Instruction curriculum programs, an author of college texts on Direct Instruction, and an advisor to school and district leaders using Direct Instruction.

It's an honor being here because to me the partnership between the school board, the district leaders, and ICARE offers one of the best opportunities in the nation to create an academic program that can truly decrease the academic gap between rich and poor that is all too prevalent in our schools.

The Direct Instruction Model originated in 1964 when Siegfried Engelmann wrote a book for parents entitled *Give Your Child a Superior Mind*. The book discussed the importance of providing clear, logically sequenced teaching demonstrations to accelerate children's learning and provided parents with specific suggestions on how to teach a number of concepts. The book, which was translated into several languages, sold very well.

Several years later, a professor at the University of Illinois, Carl Bereiter, on receiving funding to establish a

demonstration preschool program for low-income children, contacted Engelmann to lead the project. During the next 4 years Engelmann gathered and trained a team of teachers and worked daily with the children, translating the general ideas from *Give Your Child a Superior Mind* into sets of daily lessons for teaching reading, language, and math to the children. The results were outstanding. IQ gains of 24 points were obtained. Children entered first grade reading at a beginning second-grade level and performing at mid-second-grade level in math.

The achievement gains achieved in the preschool project led to the publication of the materials developed by Engelmann by Science Research Associates which at the time was owned by IBM. The programs, which were called *Distar* (Direct Instruction System to Teach Arithmetic and Reading), were heavily promoted and produced a good deal of success in many cities. Here is an excerpt from a newspaper article published in 1974 in the *Chicago Sun Times*.

The downward slide of Chicago public education is being reversed in one West Side school district by an experimental program which can teach

some kindergarten children to read at third grade level. The program is called *Distar*. It is credited with achieving remarkable gains in reading and math skills since its formal introduction in 1970 as a standard procedure for the primary grades in Public School District 10 in the Lawndale Community.

The data generated by Engelmann's Direct Instruction programs resulted in an invitation from the Federal Office of Education to Bereiter and Engelmann to participate in what was to be the largest experimental education research program ever conducted by the Federal Government. It was called Project Follow Through, and its purpose was to evaluate different approaches to educating economically disadvantaged students in kindergarten through Grade 3. Dr. Leon Lessinger, who at that time was an assistant commissioner in the Office of Education, has prepared several reports on the Follow-Through project. The research phase of the project lasted for almost 6 years. Over 10,000 low-income students in 180 communities were involved in the 500 million-dollar project. An analysis of the data showed Direct Instruction to be the most effective model in raising student achievement as indicated by scores on all academic and cognitive measures. Furthermore, Direct Instruction students' scores were quite high in measures of self-esteem. This result especially surprised the researchers who wrote

The performance of the Follow Through children in Direct Instruction sites on the affective measures is an unexpected result. The Direct Instruction Model does not explicitly emphasize affective outcomes of instruction....Critics of the model have predicted that the emphasis on tightly controlled instruction might discourage children from freely expressing themselves, and thus inhibit the development of self-esteem and other affective skills. In fact, this is not the case.

A number of other studies on the effects of DI have been conducted. I'll mention two. In 1985, Dr. Paul Weisberg of the University of Alabama reported on a preschool/kindergarten project for low-income children. The project included the use of the Direct Instruction language and reading components beginning in pre-kindergarten and continuing into kindergarten. At the conclusion of Year 2, the students were given the end of the first-grade component of the Metropolitan Achievement test to evaluate their performance. The data showed that the children who had been through the Direct Instruction programs for 2 years on entering first grade tested at the 80th percentile compared to their peers who tested at the 20th percentile.

A report completed several months ago by researchers from the University of Houston summarized data collected on the implementation of Direct Instruction in 10 low-income schools in the Houston School District. The implementation, which is being led by Dr. Thaddeus Lott, former principal of Wesley Elementary School in Houston, is referred to as the RITE program, Rodeo Institute for Teacher Excellence. The Direct Instruction reading and language programs are being used along with high levels of professional development for teachers

and careful monitoring of students' progress. Here is an excerpt from the research summary:

Overall, the results of the 1998–1999 external evaluation of the RITE program indicate that the children involved in the RITE program are performing at levels comparable to or far exceeding those of children within the district who are involved in other active reading programs.

*Analysis showed that the Direct Instruction group had statistically significantly higher rates of high school graduation, application, and acceptance to college and lower rates of retention.*

The most dramatic development is seen for children who begin the program in kindergarten. By the end of first grade, these children are performing at levels that were not only well above their district peers, but well above national averages.

Most of the data I have reported has dealt with the lower grades. A logical question is, will the gains made with Direct Instruction in the lower grades be maintained during the upper grades? A group of researchers studied this question in 1987. With cooperation from the New York City Board of Education they obtained data on students who had been in a Direct Instruction Follow Through Project school in New York and on students who had been in the control group. Analysis showed that the Direct Instruction group had statistically significantly higher rates of high school graduation, application, and

acceptance to college and lower rates of retention.

Other studies also found that students who had been in the Direct Instruction programs were ahead of their peers in control groups. Still, it was clear that there was a decreased level of performance for all students. In response to this data, in the 1980s Engelmann and his team began developing curriculum for Grades 4 to 6 and for middle school. While much work remains to be done, there are a number of encouraging signs.

In Moss Point Mississippi a school with a poverty level over 85% implemented the DI Model and obtained the second highest reading scores and the sixth highest language scores on the fourth-grade state test administered in 1994.

At Wesley school, data on the administration of the Texas State Test showed Wesley students in the upper grades scoring at a level which qualified Wesley to be recognized as an exemplary school.

In Sacramento, California, a middle school that had extremely low scores showed the greatest level of gains among all the middle schools in the district.

An interesting development in the history of Direct Instruction is the recent adoption of Direct Instruction by a growing number of schools serving children from wealthier backgrounds. There have been several data reports that show that the academic performance of these more privileged children can be accelerated with Direct Instruction. While a child who enters school with low literacy levels may need 2 years to progress through a curriculum, the placement and skipping procedures incorporated in the DI programs allows the child who enters school more prepared to move at a faster rate.

I've spoken about some of the research and history on Direct Instruction. Now I would like to talk about why Direct Instruction is such a powerful tool for teachers, especially those working with children who enter school with limited literacy related knowledge.

When Engelmann began working in the preschool project, he noted that a high proportion of the children did not understand many of the words that teachers typically use to explain things. The children did not understand words such as *next*, *between*, *in front of*, *who*, *what*, *when*, and *where*. He also noted that the children had trouble following directions and lacked much of the general information typically assumed of children their age. Additionally, they had trouble with various types of reasoning such as if-then logic and with comparative concepts such as categories and same and different. They also had difficulty repeating or constructing statements. It was this lack of language knowledge that was the main obstacle for the children.

Engelmann's observations about the language gap were supported by a study at the University of Kansas in which researchers counted and categorized parent interactions with children from the age of 12 months to 48 months. Their data showed that by the age of 36 months children in the homes of well educated parents knew almost twice as many words as children in the homes of less educated parents and that the difference in the rate of learning new words was increasing at a significantly faster rate for the children of the more educated parents. In other words, the gap was growing.

Engelmann and his colleagues worked at the preschool for 4 years to see if they could close this gap and prepare the children to be on an equal playing field with their more advantaged peers upon entering first grade. Engelmann

translated the logical and analytical techniques that he had presented in *Give Your Child a Superior Mind* into daily lesson plans for the teachers in the project. Separate programs were prepared for reading, language, and math. The preschoolers would have three 30-min group sessions, one in each subject area. The data I presented earlier attests to the success of these programs.

What is it in the Direct Instruction programs that contributes to their

*The words used in teaching new concepts are carefully controlled to ensure that all words in teacher explanations are words that the children understand.*

effectiveness? The answer to this question could fill a textbook. I have tried to briefly communicate some major points:

- The Direct Instruction programs teach core foundational language skills typically assumed by other programs. The teaching of this critical content is systematic. Few other programs include an equal degree of teaching on these core concepts.
- The words used in teaching new concepts are carefully controlled to ensure that all words in teacher explanations are words that the children understand. Nothing is taken for granted. Lessons are tried out with children, and the errors the children make are analyzed to ensure that all explanations are clear.
- The examples used in teaching demonstrations are carefully planned so that the presentations have only one possible logical interpretation. For example, let's say

that a teacher wants to teach the color red and to teach red, she shows the children a red wool shirt, a pair of red wool socks, and a red wool jacket, each time saying, "This is red." The naive learners could logically conclude that red refers to either a piece of clothing, something made of wool, something held up high, or something with the color red. The instruction in the Direct Instruction programs was designed to minimize problems of ambiguity.

- New concepts or strategies are introduced at a carefully controlled rate so that children can practice and become comfortable in applying one concept before new concepts are introduced.
- Previously taught concepts are systematically reviewed to foster retention.
- The program is made very interactive with teacher talk followed by student responses to determine if students did in fact understand what the teacher had just presented.
- Frequent assessments are provided to determine if children are mastering the content.
- The reading program developed by Engelmann and his associates utilizes a systematic phonics approach. A recent report of the National Reading Panel, a congressionally-mandated independent panel commissioned to conduct a review on reading research, found that the greatest gains for at-risk children were obtained with systematic phonics instruction in which students are explicitly taught to convert letters into sounds and then blend the sounds to form words. This is exactly the approach that the Direct Instruction programs utilize.

There are a number of other principles utilized in the construction of the programs; however, given the limited time, I would like to close with some

major thoughts based on my experiences over the past 30 years.

1. The early years of school, from pre-kindergarten through first grade provide the greatest opportunity to equal the playing field for at-risk children. The longer we wait to begin systematic instruction, the greater the size of the gap and the more difficult it will be to level the playing field.
2. To close the academic gap, it is necessary that at-risk children be fluent, competent readers by the end of first grade with a solid language understanding so that they can read in and outside of school and use this reading to increase their vocabulary and background knowledge.
3. Direct Instruction has shown its power in numerous implementations to bring at-risk children to grade level by the end of first grade. These children read accurately, fluently, and with comprehension on grade-level materials.
4. In order to bring at-risk children to grade-level status with Direct Instruction in first grade, children must master the content of the first two levels of the Direct Instruction reading and language programs by the end of first grade. This goal has been reached in many schools over the past 20 years and is thus a realistic goal.
5. In order to maintain at-risk children at grade level after first grade, an

intensive program of reading and writing instruction is required. The DI curricula for reading, language, and writing, when combined with a program of supplementary reading and writing, offer great hope in achieving this goal.

6. Finally, the extent to which Direct Instruction is successful in improving student reading performance is directly related to the quantity and quality of training support provided to teachers and to the determination and leadership of the school leader and project leader in ensuring that all the elements of the model are being implemented well in every classroom in every school every day for every child. [ADD](#)

## *Drilling for OIL (Outstanding Individual Learning)*

**Abstract: Although unpopular with education faculty, repetitive practice problems (drill work) are a necessary component in a comprehensive program to prepare future scientists and mathematicians. Everyone accepts the important role that drill work plays in strengthening and preparing athletes, but many seem unwilling to accept it in education. Practice, even when boring and tedious, allows students to see patterns and develop a real feel for mathematics. Rigorous academic disciplines require rigorous training and those who complete it are better prepared to apply their knowledge to the world around them.**

How do you get to Carnegie Hall? The answer used to be “practice,” but unfortunately practice has fallen out of favor in the education community. The term “drill,” often used by educators as a synonym for “practice,” has

numerous connotations, most of which seem to be negative for education faculty and positive for mathematicians. How can these two groups be in such disagreement about preparing students for careers in the mathematical sciences? I will argue that drill work is a necessary component in a comprehensive program to prepare future scientists and mathematicians.

Every mathematician I know agrees that one key to success in our field is repetition. In a recent roundtable discussion sponsored by the National Science Foundation and *Discover* magazine, a panel of experts discussed current trends in mathematics education, including drill. Keith Devlin, a mathematician and executive director of the Center for the Study of Language and Information at Stanford University, said, “The only way I know

to make the brain understand numbers is to do boring, repetitive practice with numbers, just as the only way I know to become a good tennis player is to get out on that court and practice, practice, practice” (Haseltine, 2002, p. 58). John Conway, the John von Neumann Professor of Mathematics at Princeton University added, “...I also think it’s important to be able to do elementary arithmetic reasonably well. If that goes away, it will be really terrible because it’s the introduction to mathematics” (Haseltine, 2002, p. 59). George Andrews, a mathematician from Penn State concluded, “...arithmetic is a fundamental element that is not ‘just’ designed to get answers. Arithmetic lays the foundation for what you will do in algebra, which then gets you ready for calculus” (Haseltine, 2002, p. 59). Doing many mathematics problems seems to be crucial in molding minds for mathematical careers. While such work may seem tedious, it is a critical element that cannot be overlooked. Certainly, other activities and subjects require



tedious and repetitious work. Writers are expected to write lots of papers, athletes to do physical exercises that seem unrelated to their actual sport, martial artists to execute basic moves thousands of times even though they are learning advanced moves, and ballerinas to practice fundamental movements at the barre, even though they were learned years earlier. One could question the value of an activity, sport, or college major that doesn't require any practice!

## $2 \times 5 = \dots$ Wait

Some education faculty are convinced that mathematicians are stone-age relics who just don't understand how people learn. They view drill work as a sort of academic hazing ritual that we inflict on students solely because *we* had to do it. They believe that solving one or two problems of each kind is sufficient to convey the necessary concepts. Most mathematicians would agree that this might work for a handful of unbelievably gifted students regarding a few concepts, but certainly not for all students or all concepts. After all, the education folks are always quick to point out that students learn differently, and what works for some students might not work for all. Sometimes we make assignments to improve computational skills as well as reinforce the concept. Contrary to the views of the education experts, sometimes speed does count. A student might understand the concept of multiplication, but no one would want it to take 20 min for him/her to compute the product of two single digit numbers. Too, consider that mathematics is often called the science of patterns. Is a student more likely to notice an interesting pattern after doing 2 similar problems, or 20 similar problems? The answer is obvious to all mathematicians. Repetition allows students as well as professional mathematicians the chance to look for patterns, develop intuition, and get a "seat of their pants" feel for how mathematics works.

## *If You Talk the Talk...*

The same educators who criticize drill during the day are also the soccer moms and dads who routinely drive their kids to soccer practice for the 200th time, to practice a sport played for fun and not as a career. Why deny a student the same type of preparation? Why have lower standards for a college major than for a club sport? Would these same parents drive their children to after school compulsory math practice two or three times per week? Practice isn't always fun, but it need

*Repetition allows students as well as professional mathematicians the chance to look for patterns, develop intuition, and get a "seat of their pants" feel for how mathematics works.*

not be. If a student (or athlete) is committed to a subject (or sport), they should be willing to complete the necessary practice sessions even if they are not fun. I know of no athlete who likes running laps, doing push-ups, sit-ups, and jumping jacks, or running stairs. They do them because their coach believes that fundamentals create better all-around athletes. This is general conditioning. In mathematics, the math professor is the coach and he/she decides which activities are important for their students' mental conditioning. Some of the exercises might be difficult or seem boring, but that doesn't make them wrong.

## *I Can't Stop Thinking About Math*

According to Hebb's Postulate, the more often we think of a certain topic, the easier it is for us to think

about it the next time (Hebb, 1949). Synaptic paths are formed and strengthened with such repetitive thoughts in a theory called Long Term Potentiation (Bliss & Lomo, 1973). These repetitive thoughts make actual physical changes to the brain! In his outstanding book, *The Math Gene*, author Keith Devlin referred to the physical changes that can occur in the brain due to drill when he wrote, "Repeated exposure to the same kinds of stimuli causes various neural connections to adjust so that the brain can better recognize those kinds of stimuli—which means that the resulting activation pattern is stronger and more easily distinguished from other activation patterns" (Devlin, 2000, p. 243). This is the brain's version of "muscle memory" in athletes. If you do a physical move thousands of times, it is easy for your body to do it again. This is why black belts in karate continue to practice the lowly front kick and professional ballerinas still do a plie' as part of their daily warm-up. Like a good mechanic, the more experience a budding mathematician has, the more likely they will be to apply their knowledge and skills to solve new, unfamiliar problems. There is no substitute for experience. In driving, it is called "seat time," in flying "air time," in the equestrian world it is "time in the saddle." Every discipline recognizes the value of experience and repetition to become more knowledgeable and proficient. Drivers need a lot of experience before they develop a real sense of closing speeds, traction, roll, under-steer, over-steer, and braking pressure even though they are aware of these various physical forces. Pilots are not granted a license until they have completed a certain number of flight hours. If pilots understand the concepts right away, why not grant the license immediately, without all of that "air time"? Certainly, experiencing an engine stall while actually flying is

more memorable than being taught about stalls in a classroom. Lack of experience produces overconfidence. Education faculty are subconsciously working to breed an entire generation of under-prepared, overconfident mathematics students. It is ironic that even education majors are required to do student teaching for a prescribed length of time: one semester. Why not train for only 1 or 2 weeks? If a preservice teacher understands the concept of teaching, why should it take an entire semester?

### *Those Boring Boys From Seal Team Six*

Training can be tiresome and unexciting, but does that make it wrong? The education faculty would have us believe that every aspect of math must be made “fun” so it is more palatable to students who have been raised with the MTV model of education: 10% content, 90% entertainment. Training for important activities can be grueling and tough and not every participant may complete the training. In fact, if the training is so easy that everyone finishes, one wonders how high the standards are. Richard Marcinko, one of the original Navy Seal team leaders, often told his complaining trainees, “You don’t have to like it, you just have to do it.” These men were some of the fittest, strongest, toughest soldiers that the Navy had to offer. Yet only a small percentage had what it took to survive Marcinko’s training and become a Navy Seal. The requirements were extensive. Those who did survive the training became part of a team that had no equal. Seal Team Six was arguably the finest counter-terrorism unit that has ever existed. High standards require lots of hard practice... drill. Marcinko’s men shot twice the number of rounds of ammunition in practice than a normal Seal trainee shot. Which team would you want guarding you?

### *Math = English?*

Consider the consequences of not practicing in another major. If nobody memorized the alphabet, practiced grammar, syntax, tenses, and spelling, how would anyone progress to the point of writing great novels, plays, or poetry? In any field, the basics must be memorized and practiced until they become natural, so the student can move on to higher levels. The

*In any field, the basics must be memorized and practiced until they become natural, so the student can move on to higher levels.*

comparison between English and mathematics is interesting: Learning the digits is like learning the letters. Numbers, made up of many digits, correspond to words. The elementary operations (rules for combining those numbers) are like the basic grammar rules of subject–verb agreement. More complicated grammar, tenses, and the like are similar to more advanced operations in mathematics—integration, differentiation, solving equations, etc. After all, equations are mathematical sentences. Devlin (2000) argued “the features of the brain that allow us to do mathematics are the very same features that enable us to use language—to speak to others and understand what they say” (p. 2). Thus, everyone has the math gene; it is just a matter of developing it.

We would never allow someone to drive a car without substantial practice or to operate as a doctor without extensive training. Understanding a concept and practicing it until it becomes natural are two different things. I understand the following concepts in theory: surgery, carpentry,

photography, welding, and painting, and although I’ve dabbled in each, I have mastered none. Understanding what should happen and actually doing it are two very different things.

### *You Can’t Do Construction Without A Drill*

Finally, it is curious that education faculty have such a problem with the drill strategy, since there is nothing incompatible about using drill techniques with the constructivist teaching philosophy. Their objections seem to be twofold: First, drill work is individual and not a group effort, and second, drill work points out weaknesses and deficiencies. No mathematician I know is advocating a drill-only instruction method for mathematics courses. Drill is just one technique in a comprehensive set of strategies to teach this type of material. Drill can be combined with hands-on activities, discovery learning, experimentation, and other constructivist techniques. Together, these methods can produce outstanding mathematics students. Drill alone won’t work—neither will conceptual learning without practice. And the correct answer to the question: “How do you get to Carnegie Hall?”... “practice.” **ADL**

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## *How Can All Students Successfully Learn Math Facts?*

Often teachers ask, “Really, can all students learn math facts? Aren’t there some students who just have short term memory problems and can’t learn the facts?” The short answer is “Yes, absolutely all kids can learn math facts.” If students have the mental capacity to learn their own phone number and spell their own name, then they can learn math facts to automaticity. Why do many children fail to do so, despite tons of practice?

Essentially, students are asked to practice too many facts at one time. When students are asked to practice facts in sets of 5 or 10 or more, they are unable to remember them all. In order to do the assigned practice task, the children must use some kind of strategy for remembering each of the facts, or they have to figure each one out as they are working. Children learn exactly what they practice—so they become faster at counting on their fingers or skip counting or rehearsing their strategy for remembering the answers. In order to learn to rely only on their memory, students must practice and master facts in very small chunks or sets of facts—like two facts and their reverses or a set of three facts in a row. This chunk of three or four problems is all that they need to be learning at one time and they should get no more facts until these are mastered absolutely. Practice sessions will also include interspersed practice on facts previously mastered, but more on that later.

Even if a student learns a few of a set of 10 facts (by doing the chunking themselves) they are often required to move on to the next set of facts too soon. If students haven’t mastered the

previous set(s) they experience proactive and retroactive inhibition (confusion) trying to learn more facts. The answers to previously not-quite-mastered facts interfere with the new yet-to-be learned facts and vice versa. It is much like trying to learn the rumba immediately after a session in which you failed to learn the cha-cha. The two dances are so similar that you’ll forever have them confused. This creates a “chronic confusion” where the two are intermixed and confused. The best way to fix a “chronic confusion” is to carefully avoid one until the other is learned to mastery.

There’s a myth, for example, that subtraction facts are harder to memorize than addition facts. This is clearly not true since both types of facts have exactly the same number of elements, three, to be learned at one time. But often teachers of second graders begin making children memorize subtraction facts, which are based on the addition facts they have not yet learned. So there is more proactive and retroactive inhibition making the children confused.

Worse yet, children’s only practice opportunity in school is often a timed test over all 100 facts in an operation, many of which are not in long term memory (child is still counting). Because children’s efforts are not focused on a small set to memorize, students often just become increasingly anxious and frustrated by their lack of progress. Timed tests are not a teaching tool; they are an assessment. They do not teach students anything other than to remind them that they are unsuccessful at math facts.

Given the common reliance on timed tests as a teaching tool, it is not surprising that some authors would complain that “Timed tests do not help children learn” (Burns, 1995, pp. 408–409). In contrast, when children are successfully learning the facts through the use of a properly designed program, they are happy to take tests daily to see if they’ve improved.

The purpose of practice on math facts is to learn them to the level of automaticity. Automaticity is the third stage of learning. First, students learn facts to the level of accuracy—they can do them correctly if they take their time and concentrate. Next, if they continue practicing, they can develop fluency. Then they can go quickly without making mistakes. Finally, after fluency, if students keep practicing they can develop automaticity. Automaticity is when students can go quickly without errors and without much conscious attention, when they can perform other tasks at the same time and still perform quickly and accurately. Automaticity with math facts means students can answer any math fact instantly and without having to stop and think about it. In fact, one good description of automaticity is that it is “obligatory”—one can’t help but do it. Students who are automatic in decoding can’t help but read a word if you hold it up in front of them. Similarly, students who are automatic with their math facts can’t help but think of the answer to a math fact when they say the problem to themselves. This automaticity allows them to focus their mental energies on the problem solving steps rather than the facts. Students who are automatic with math facts find learning new computation algorithms much easier and are able to use mental math to solve problems as well.

Stein, Silbert, and Carnine (1997) explained how teachers could implement an effective facts practice pro-

gram to develop math fact automaticity consistent with the research. They noted some organizational requirements for such a program to be effective and efficient:

A program to facilitate basic fact memorization should have the following components:

1. a specific performance criterion for introducing new facts
2. intensive practice on newly introduced facts
3. systematic practice on previously introduced facts
4. adequate allotted time
5. a record-keeping system
6. a motivation system. (p. 87)

While teachers often feel that flashcards are the best option for practicing math facts, worksheets are far easier to create, manage, and use during practice than flashcards. Children can practice much faster from worksheets than from flashcards. And what's more, teachers can keep worksheets in order without having to incidentally "arm" their students with rubber bands. Each worksheet can introduce the new set of facts as well as be used as a mastery test to determine when the student is ready to begin memorizing more facts. *Mastering Math Facts* (Crawford, 1998) is an inexpensive, black line master worksheet facts practice program that implements all the suggestions of Stein et al. (1997).

Stein et al. (1997) describe the worksheets that students would master one at a time.

Each worksheet would be divided into two parts. The top half of the worksheets should provide practice on new facts including facts from the currently introduced set and from the two preceding sets. More specifically, each of the facts

from the new set would appear four times. Each of the facts from the set introduced just earlier would appear three times, and each of the facts from the set that preceded that one would appear twice....[In] the bottom half of the worksheet...the facts from the currently introduced set would appear twice. The remaining facts would be taken from previously introduced sets. (p. 88)

*While teachers often feel that flashcards are the best option for practicing math facts, worksheets are far easier to create, manage, and use during practice than flashcards.*

The daily routine consists of student pairs—one that does the practicing while the other follows along with an answer key. Here is an excerpt from the teacher directions to *Mastering Math Facts*.

- One student has a copy of the answer key and functions as the checker while the practicing student has the problems without answers. The practicing student reads the problems aloud and says the answers aloud. It is critical for students to say the problems aloud before saying the answer so the whole thing, problem and answer, is memorized together. We want students to have said the whole problem and answer together so often that when they say the problem to themselves the answer pops into mind, unbidden.
- A master answer key is provided—be sure to copy it in a distinctive color to assist in classroom monitor-

ing. Also copy all the sheets needed for a given operation and staple into a booklet format. Then answer keys will be the same regardless of the set of facts on which a student is working. This allows students from different levels to work together without having to hunt up different answer keys.

- The checker watches the answer key and listens for hesitations or mistakes. If the practicing student hesitates, even slightly, before saying the answer the checker should immediately do the correction procedure, explained below. Of course, if the practicing student makes a mistake, the checker should do the correction procedure.
- *The correction procedure has three steps.* One, the checker interrupts and immediately gives the correct answer. Two, the checker asks the practicing student to repeat the fact and the correct answer at least once and maybe twice or three times. Three, the checker has the practicing student back up three problems and begin again from there. If there is still any hesitation the correction procedure is repeated.
- This correction procedure is the key to two important aspects of practice. One, it ensures that students are reminded of the correct answers, so they can retrieve them from memory—rather than having to figure them out. (We know they can do that, but they will never develop fluency if they continue to have to "figure out" facts.) Two, this correction procedure focuses extra practice on any facts that are still weak.
- *Note: If a hesitation or error is made on one of the first three problems on the sheet, the checker should have the practicing student do the next three problems and then go back to the one that was corrected, and if answered without hesita-*

tion, begin again from there and work forward again.

- Each student practices a minimum of 90 s. After a couple of weeks of good “on-task” behavior you can “reluctantly” allow more time, say 2 min. Later you can allow them 2 and one half min, and then later if students stay on task, up to about 3 min each.
- After the first student practices, then students switch roles and the second student practices for the same amount of time. It is more important to keep to a set amount of time than for students to all finish the top half. It is not necessary for students to be on the same set or even on the same operation, as long as answer keys are provided for all checkers. (Crawford, 2003, pp. 13–14)

After each student practices, the teacher conducts a timed 1-min test of the problems on the bottom half. A specific performance criterion for fact mastery is critical to ensure mastery before moving on to additional material. That is to say that children keep practicing a worksheet daily until they “pass” a timing on the bottom half of the worksheet at the expected rate and without errors. Howell and Nolet (2000) and *Mastering Math Facts* (1998) recommend a rate of at least 40 correct problems per minute—if the students can write that quickly. *Mastering Math Facts* uses a test of copying numerals such as in Figure 1 to determine the rate at which children could be expected to answer math facts, if less than 40 per minute.

Such a program of gradual mastery of small sets of facts at a time is fundamentally different than the typical kind of facts practice. Because children are learning only a small set of new facts it does not take many repetitions to commit them to memory. The learning is occurring during the “practice” time. Similarly, because the

timed tests are only over the facts already brought to mastery, children are quite successful. Because they see success in small increments after only a few practice sessions, students remain motivated and encouraged. Once students become used to the practice procedures they should be encouraged to practice at other times during the day with family members, peers, or other adults at school. Even one or two extra 3-min practice sessions per day will pay off handsomely in faster mastery of facts.

The worksheets and the practice procedures ensure the first three of Stein et al.’s (1997) six points. Adequate allotted time would be on the order of 10 min per day for each student of the practicing pair to get their 3 min of practice, the 1-min test for everyone, and transition times. The authors caution that “memorizing basic facts may require months and months of practice” (Stein et al., 1997, p. 92). *Mastering Math Facts* users report an average of between a semester and a year of practice to achieve mastery of an operation. A record-keeping system could simply record the number of tries at each worksheet and which worksheets had been passed. *Mastering Math Facts* uses a rocket ship for this record-keeping, resulting in it commonly being called “Rocket Math.” A motivation system that gives certificates and various forms of recognition along the way will help students main-

tain the effort needed to master all the facts in an operation.

In summary, the proper kind of practice can enable all students to develop automaticity with math facts, provided they gradually develop mastery at their own pace. What is required for students to develop automaticity is a particular kind of practice focused on small sets of facts, practiced under limited response times, where the focus is on remembering the answer quickly rather than figuring it out. The introduction of additional new facts should be withheld until students can demonstrate automaticity with all previously introduced facts. Under these circumstances all students can be successful learning math facts. And children really enjoy graphing their progress on regular timed tests. **ADD**

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**Figure 1**

The number of boxes copied in a minute minus 2 equals the number of problems children should be expected to answer in a minute.

7	56	8	45	3	24	9	32
10	6	27	5	63	4	81	2

## *Math Tutoring: Substantial Gains in Minimal Time*

Many children requiring special education do not receive the services they need. Oftentimes, they remain below grade level and make minimal progress from year to year. U.S. Department of Education statistics reveal that just 33.1% of students identified with learning disabilities earn standard high school diplomas (U.S. Department of Education, Office of Special Education, 2000). When schools fail to provide needed instruction, parents oftentimes look to after-school tutoring as an option for acquiring educational support for their children.

Few studies document the effectiveness of such programs. Those described in the literature typically take the form of homework supervision clubs, study skills groups, or computer clubs combined with recreational activities. In some cases, positive outcomes are reported for children who participate (Fashola, 1999; Fashola & Slavin, 1998; Pierce, Hamm, & Vandell, 1997; Posner & Vandell, 1994; Rosenthal & Vandell, 1996); however, few of these studies have adequate evaluation measures.

A significant body of literature documents Direct Instruction's effectiveness in teaching reading, written expression, and math to students in both general and special education settings. Based on this, one would assume it would be effective in tutoring situations; however, tutoring environments differ from classroom environments.

### *Participants*

The present study sought to evaluate direct instruction's effectiveness in an after-school home-tutoring environment. In this setting, direct instruc-

tion was implemented for 10 weeks twice weekly in 1-hr sessions one-on-one to teach math to two middle school Latino brothers, ages 11 years 9 months and 13 years 1 month. Each was identified by their school district as having a learning disability, and English was currently the dominant language for each of them. Both boys were taught addition, subtraction, multiplication, and division facts and two- through four-digit addition, subtraction, multiplication, and division operations for Grades 2–5 using strategies and formats delineated in the text *Designing Effective Mathematics Instruction: A Direct Instruction Approach* (Stein, Silbert, & Carnine, 1997). Participant 1, age 11 years 9 months, was in sixth grade and Participant 2, age 13 years 1 month, was in seventh. Both attended the same middle school and received math instruction in separate resource settings. Participant 1's IEP targeted addition, subtraction, multiplication, division computations, and word problems, fractions, decimals, and graphing. Participant 2's IEP addressed this content plus linear equations and pre-algebra. No overlap existed between the content addressed in the tutoring situation as compared to the classroom situation. In fact, even prior classroom instructional content differed from the home-tutoring content.

### *Measures*

The KeyMath-Revised/NU (Connolly, 1998, 1997) was administered as a pre- and postmeasure. Preintervention scores on the KeyMath-Revised/NU showed that Participant 1 achieved a Total Test score of 85 and Participant 2, a Total Test score of 79, both scoring in the below average range. Additionally, on 11 of the 13

KeyMath-Revised subtests, Participant 1 scored in the lower average to markedly below average range, with 8 of those subtest scores below average to markedly below average. Participant 2 presented an even weaker preintervention profile. On 11 of the 13 subtests he scored in the below to markedly below average range.

The KeyMath-Revised/NU is an individually administered standardized test of mathematics. It includes 13 subtests organized into three component scales (Basic Concepts, Operations, and Applications) and a Total Test scale. I used the Normative Update (Connolly, 1997) for deriving norm-based scores. KeyMath-R results for component scales and the Total Test scale are reported as standard scores. These standard scores are norm-referenced with an average of 100 and a standard deviation of 15. They are referenced to grade placement, so if a student's math skills develop at the same rate as those of the norm group, his/her score remains constant. Increases in standard scores indicate that the student is progressing faster than the norm group. The KeyMath-R manual recommends interpreting standard scores in terms of the following achievement levels (a) 125 and above, markedly above average; (b) 111–125, above average; (c) 90–110, average; (d) 76–89, below average; (e) 75 and below, markedly below average. Scores on the 13 subtests are given in scaled scores. These are similar to standard scores, except that they have an average of 10 and a standard deviation of 3. The KeyMath-R/NU manual recommends interpreting scaled scores in terms of the following achievement levels (a) 15 and above, markedly above average; (b) 13–14, above average; (c) 12, upper average; (d) 9–11, average; (e) 8, lower average; (f) 6–7, below average; and (g) 5 and below, markedly below average.

## Procedure

Examination of each boy's KeyMath-R results revealed areas needing math remediation. For both participants, those areas were (a) basic addition, subtraction, multiplication, and division facts; (b) count by series saying; (c) reading and writing multidigit numbers, (d) multidigit addition and subtraction with and without renaming from ones through thousands place; (e) multiplication of one, two, three, and four digit numbers by one, two, and three digit numbers, with and without renaming from tens to thousands places; (f) division of two and three digit numbers by one, two, and three digit numbers with and without a remainder; (g) reading, writing, adding, subtracting, multiplying, and dividing fractions and mixed numbers. Participant 1 received direct instruction tutoring in areas (a) through (f), as noted above, and Participant 2 received it in areas (a) through (e). Each received after-school in-home tutoring twice weekly for 10 weeks in 1-hr sessions one-on-one from me, an experienced direct instruction teacher. The approach involved using formats and procedures found in the text *Designing Effective Mathematics Instruction: A Direct Instruction Approach* (Stein et al., 1997). The students were taught math via a three-stage approach in which I (a) modeled the target skill, (b) provided guided practice on it until the student attained three consecutive sessions of 90% accuracy, and then, (c) introduced independent practice on that skill. Both guided and independent practice consisted of 15 problems. All guided practice targeted the skill being taught while independent practice consisted of 10 target-skill problems and 5 prior-learned types of problems, allowing for cumulative review of previously taught content. Once students attained 90% accuracy on guided practice and 80% on independent practice, I introduced a new target skill.

Other key direct instruction components were addressed. Prerequisite and component skills were taught systematically prior to introducing a target skill. Students were introduced to one target skill at a time. Mastery of each skill was required before the student could progress to the next. When students erred, I provided immediate corrective feedback consisting of modeling and guided practice on the particular problem until the student met mastery. To facilitate prompt and accurate acquisition of skills, I applied example selection rules, for example, selecting only

*Mastery of each skill was required before the student could progress to the next.*

problems for which the students knew the basic facts, or when teaching operations, including minimally different examples, such as  $1,030 - 387 = \underline{\quad}$  and  $1,003 - 387 = \underline{\quad}$ , which required students to discriminate before selecting a strategy.

## Results

Table 1 shows both boys' KeyMath-R results. It gives pretests, posttests, changes from pre to post, and change expressed in standard deviations. The change score expressed in standard deviations can be called the standardized change score and is intended to help explain the size of changes participants experienced. Since the standard deviation of standard scores is 15, the standardized change score is the change score divided by 15. As a guide, we could consider a change of less than one quarter of a standard deviation to be "near zero," a change of one quarter to one half standard deviation to be "moderately large," and a change

of more than one half standard deviation to be "large."

In the Basic Concepts area, Participant 1 showed a change of 0, and Participant 2 showed a change of +1. These near zero changes are contrasted with each participant's performance in the Operations area. Participant 1 had a change of +7, and Participant 2 had a change of +8. Participant 1's standardized change score reflects a moderately large change, and Participant 2's standardized change score reflects a large change. In the Applications area Participant 1's change was 5 and Participant 2's was 9, reflecting for Participant 1 a moderately large change and for Participant 2 a large change. The Total Test score combines the three previously described scales. On this overall measure, Participant 1 showed a moderate improvement of 5, and Participant 2 showed a large improvement of 9. For each student, there are three independent scores from the KeyMath-R, one from each of the three component area scales. This results in a total of six independent scores. Of these six scores, four represent moderate to large gains, which are well in excess of the rate of learning in the test's norm group. These changes occurred over a period of merely 10 weeks with just 20 hr of after-school tutoring for each participant.

In addition to gains measured by KeyMath-R total test and area scores, both participants made substantial progress from pre- to postintervention as measured by KeyMath-R subtest performance. They each increased their scores on 8 out of 13 subtests. Participant 1 had upward level changes on all 8 of those subtests while Participant 2 had upward-level changes on 6 subtests. Fifty percent of Participant 1's upward-level changes were two- and three-level changes. Seventy-five percent of Participant 2's upward level changes were two- and three-level changes. Most remarkable are the two- and three-level changes for each par-

ticipant. Participant 1 improved his Addition subtest score from 7 (below average) to 10 (average); his Estimation subtest score from 4 (markedly below average) to 9 (average); and his Division, Measurement, and Interpreting Data subtest scores from 7 (below average) to 9 (average). Participant 2 improved his Time and Money subtest score from 4 (markedly below average) to 9 (average) and his Subtraction subtest score from 3 (markedly below average) to 8 (lower average).

## Discussion and Conclusions

Learning each operation's basic facts was crucial to the boys' success in acquiring addition, subtraction, multiplication, and division skills. Their quick acquisition and retention of the basic facts indicated they were very capable of learning them. Additionally, they enjoyed demonstrating their basic fact knowledge to their parents and earning points during challenge games where they competed with their instructor or beat prior individual timed records.

Learning to skip count by 2s, 3s, 4s, and on through 12s was crucial to the boys learning multiplication facts. As soon as each mastered a skip counting series, immediately I had them recite that particular set of facts. For example, once the student could count by 6 through 72 three consecutive times, I introduced the facts  $1 \times 6 = 6$ ,  $2 \times 6 = 12$ ,  $3 \times 6 = 18$ , onward through  $12 \times 6 = 72$ . Once each could recite those facts without error on three consecutive occasions, I had each state the fact and its answer when it was presented on individual flash cards. Once they could do this, the 12 cards were mixed with flash cards of previously mastered multiplication facts.

It is important to note that the students did not receive resource room instruction in the areas targeted for tutoring. At the start of each tutoring session, each of the boys was asked to identify the content they had covered during that day's math class. I examined math homework assignments (if they had any) and the day's work samples to verify what they had covered that day and on prior days during math. From this I noted that classroom instruction focused on correct calculator use, applying operations to solve word problems, geometric concepts, creating and reading graphs, as well as

on some pre-algebra content (for Participant 2).

Tutoring at home was invaluable. It allowed immediate communication of progress and provided for teaching technique demonstrations to parents. It also allowed the boys to share their progress immediately. Additionally, the parents were cooperative in helping the students review basic facts during nontutoring sessions, for example, requiring each to respond to 12 basic fact flash cards before leaving the dinner table or rehearsing sets of cards for homework.

Documenting accomplishments, attaining criteria, and recording progress on charts contributed to improved attitude and motivation. Before each session, each boy wanted to view his progress chart and note whether he was at guided or independent practice on the target skill. After completion of each problem set, the students were interested in knowing whether they had met criteria on that skill, which allowed them to proceed from guided to independent practice.

It appears that this after-school tutoring increased these boys' classroom math performance as well. They were more confident about being able to succeed, having experienced success in the after-school program. Typically before each tutoring session, they shared how they had performed during math class that day or discussed what they were learning. Moreover, by the school year's end, both boys' IEPs were amended to reflect general education placement for mathematics for the next school year. Participant 1 achieved a grade of C+, and Participant 2 achieved a grade of B in math. Their previous end-of-year math grades were D and F, respectively. In contrast to the improved math grades, each earned Ds and Fs in science, literature, and social studies that year,

**Table 1**

*Participants 1 and 2 Pre and Postinstruction Area and Total Test Standard Scores on KeyMath-Revised*

	Participant 1	Participant 2
Basic Concepts		
Pre	95	86
Post	95	87
Change	0	+1
Std. Change	0.00	.07
Operations		
Pre	85	73
Post	92	81
Change	+7	+8
Std. Change	.47	.53
Applications		
Pre	83	79
Post	88	88
Change	+5	+9
Std. Change	.33	.60
Total Test		
Pre	85	79
Post	89	86
Change	+4	+7
Std. Change	.27	.47

*Note.* Scores of 125 and above are considered markedly above average.

Scores of 111–125 are considered above average.

Scores of 90–110 are considered average.

Scores of 76–89 are considered below average.

Scores of 75 and below are considered markedly below average.



requiring them to retake these classes during summer school.

Given the rapid learning rates and skill retention from these one-on-one tutoring sessions, it is questionable whether these boys had learning disabilities. Given their Latino background and that English is not the primary language of the home, it may have been that they were English language learners (ELLs) during their early school years when they were classified as learning disabled.

This in-home tutoring benefited both the students and the parents. Students increased math skills, and parental understanding of their children's deficits and potential for improvement increased. The in-home tutoring can also serve as a vehicle to train parents in direct instruction methods.

Additionally, using direct instruction in tutoring may provide opportunities for communicating with classroom teachers about direct instruction's effectiveness and inspire them to learn and implement the approach.

It is important to note that the only materials used in this intervention were the text *Designing Effective Mathematics Instruction: A Direct Instruction Approach* (Stein et al., 1997) and paper,

pencils, and teacher-created flash cards. In the absence of commercial Direct Instruction materials, a knowledgeable and well-trained instructor can provide instruction that effectively teaches students math. This is an important point for those of us who prepare teachers. If we teach DI principles well and equip our students with effective teaching tools (e.g., use of consistent instructional wording and correction procedures, proper selection and sequencing of content, careful monitoring of progress with set criteria for mastery, provision of proper modeling, and guided and independent practice with cumulative review), teachers and students will succeed.

All involved in this brief math intervention were pleased with the results. Most gratifying was a phone call from Puerto Rico from the boys' mother the following school year. In it she expressed her and her husband's gratitude for the instruction their sons received which they believed was now contributing to their current success in general education math class. Not only had the boys learned math content, but they had learned how to learn—the phone call was most gratifying to receive. **ADI**

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## Martin's Musings

### *Direct Instruction Is Applied Philosophy*

I wrote about technical proficiency in the Fall 2003 issue of *Direct Instruction News*. I focused on (a) curriculum reform (e.g., how a district might rationally vs. irrationally plan its reading program), and (b) the model-

lead-test format as a general communication strategy during initial instruction. In this issue I try to explain how DI curricula are organized and the principles of design that guide that organization.

### *Philosophy?*

DI is more than a set of programs. More than a way of organizing instruction. More than one perspective in education. More than mere subject matter. In contrast to almost everything else in the field of education (whole language, constructivism, Reading Recovery, learning styles, multiple intelligences), DI programs rest on and are guided from the first to the last word by a set of verified design principles. These principles are not

fanciful, faddish, unsupported inventions by DI curriculum developers. They are derived from the branch of philosophy called *epistemology*—theory of knowledge. These principles can be found in the work of Plato (*Dialogues*), Aristotle (*Prior and Posterior Analytics*), John Stuart Mill (*A System of Logic*), and Charles Saunders Peirce (“How to make our ideas clear”). *DI is applied epistemology*; it uses principles that describe how persons *induce* (acquire, figure out, construct, “get”) general ideas *from* examples (e.g., the strategy for sounding out a set of words during initial instruction) and then how persons *apply* this knowledge *to* new examples (e.g., unfamiliar words). (Bob Dixon wrote elegantly on this issue in *Theory of Instruction*.)

## Logically Technically Proficient Communication

Again, in marked contrast to most everything else in the field of education, the aim of Direct Instruction is logically technically proficient communication—so that all students get essential knowledge and get it quickly, and both students and teachers feel continually successful. This section presents what I think are the main principles that guide and are revealed in DI programs—principles that help to account for DI’s reliable effectiveness at teaching almost any student regardless of social class, ethnicity, and family involvement.

### Systems of Knowledge

Knowledge systems (such as mathematics, history, physics, literature, how to read) are “out there”—in bodies, books, computers, and other storage and communication devices. These knowledge systems are our species’ effort to make sense of and to represent our world. The classical role of teacher is to educate students—from the Latin word *educare*, to lead forth—out of the cave of ignorance and false

belief and into the open air where students, using **observation** and **reason** (inductive and deductive logic) can come to know how things are. (See Plato, *Republic*, 29, 514a–521b.)

Knowledge systems consist of and organize five forms of knowledge: one physical routine and four cognitive. These are **all** and the **only** sorts of things we can know and communicate. Everything known boils down to these five forms. Every specific thing and event is an example of these five more general forms. (See Kame’enui & Sim-

*Again, in marked contrast to most everything else in the field of education, the aim of Direct Instruction is logically technically proficient communication—so that all students get essential knowledge and get it quickly, and both students and teachers feel continually successful.*

mons, 1990, *Designing Instructional Strategies*; and Engelmann & Carnine, 1991, *Theory of Instruction*.)

1. Physical routines include saying sounds, scanning words with your eyes, and writing.
2. Verbal associations are of three kinds:
  - a. Simple facts. Capital of Massachusetts goes with Boston.
  - b. Verbal chains. Names of the 13 original states.
  - c. Verbal discriminations. Students identify documents or statements as representing federalist versus antifederalist political positions.

3. Concepts. Examples include red, color, democracy, political system, metaphor, simile, /a/ says ah.
4. Rule relationships, or propositions. For example,
 

All letters (squiggles) say sounds.

Terrorism never succeeds in its aim.

When rulers violate subordinates’ definition of justice, it fosters resistance. Sounding out is the primary word recognition strategy (not guessing or using context cues).

The more the enemy’s infrastructure is destroyed, the less the enemy resists after defeat.
5. Cognitive strategies. A sequence of steps for analyzing poems, sounding out words, calculating the slope of a line, conducting an experiment, representing a complex process with a theory or diagram/concept map.

Note that each higher form contains all of the lower ones. For example, the strategy for analyzing a poem uses rule relationships (“All Romantic poets believed industrial society is in conflict with nature.”), concepts (nature, society, ode, melancholy), and verbal associations (Keats was a Romantic poet.).

### Cognitive Knowledge Is Acquired Through Inductive Reasoning

Except for verbal associations (“New fact. Jefferson wrote the first draft of the *Declaration of Independence*.”), you cannot directly communicate (teach) a concept, rule relationship, or cognitive strategy. You cannot teach students to sound out words **in the abstract**. You have to use **examples**. You cannot teach students to analyze poems in the abstract. You have to analyze poems in the here and now. When examples (words to sound out, poems to analyze, math problems to solve) are presented with proper attention to the features in the examples (the sequence in which they are presented, and how the teacher treats them), students induce (figure out, grasp, get) the general concept, rule, or strategy

that applies to, incorporates, and is revealed by the examples.

In summary, DI programs aim to move students' minds from superficial or incomplete knowledge of transient and unconnected examples (words, events, and problems that come and go) to knowledge of what is general and enduring—concepts (kinds of things), rule relationships (how kinds of things are connected), and cognitive strategies ([a] big pictures—e.g., theories and models—and [b] problem-solving routines). To do this—to *lead students from superficial to general—DI curriculum designers know that one must teach in a way that facilitates students performing certain logical (inductive) operations.*

## What Logical Operations?

Getting a concept, grasping a relationship, and coming to see the big picture (not just the parts) is a process—a process of reasoning—a sequence of logical steps in which something cognitive is **done** with the examples. The five logical operations, below, are part of inductive reasoning during initial instruction—how a person induces something general (concept, rule relationship, cognitive strategy) from examples.

Imagine that students read examples and nonexamples of democracies. Or imagine that students are shown examples and nonexamples of granite. By what logical operations do they go from examples to the concept?

1. **Examine examples.** Look at them. Distinguish features from the whole. DI programs are based on the assumption that students may not know how to do this. Therefore, they must be taught.

Boys and girls. I'll show you how to examine this rock...First, I see that it looks grey. Then I look at it through the magnifying glass. Now I see that the grey is really made of

different colors—and each one is a small chip of rock...

2. **Note features.** Next, the person focuses on the observed features. In rocks, it might be the shape, color, surface, and hardness of the small chips. In examining societies, it might be language, economic system, time in history, religion, and the degree of control citizens have over their governance.

Again, DI does not assume that students will know how to perform this operation, and so they are taught.

*Getting a concept, grasping a relationship, and coming to see the big picture (not just the parts) is a process—a process of reasoning—a sequence of logical steps in which something cognitive is done with the examples.*

Boys and girls. You see flat chips of mica, pointed crystals of quartz, and flat-surfaced crystals of feldspar. Touch two examples of each mineral...Are there any other kinds of minerals in the four samples I called granite? *No.* Then these are the three minerals that make granite. Make a numbered list in your notebook and write mica, quartz, and feldspar under the heading Granite...Now look at your samples that I called **not** granite. Do you see all three minerals—mica, quartz, and feldspar—in each one?

3. **Compare and contrast features across examples.** Next, students compare and contrast examples (democracy and granite) and nonexamples (not democracy and not granite). They look from one sample to the other, or better, they compare and contrast the two lists that they made. The teacher might

model and then lead students through this step by having students read the lists for each example and nonexample.

Sample 1. Granite. Black mica, yellow feldspar, white quartz.

Sample 1. Not Granite. Pink feldspar, white quartz.

Sample 2. Granite. Grey mica, white feldspar, pink quartz.

Sample 2. Nongranite. Pink quartz, white quartz.

4. **Note samenesses and differences.** Next students use their comparison and contrast of examples and nonexamples to identify the features that always go with the examples but never go with the nonexamples (mica, feldspar, quartz; high control of governance by citizens). These are the essential samenesses that define the concept. And students identify the features that may or may not go with the examples and nonexamples (language, religion, color, shape). These are the irrelevant features.

All of the societies called democratic have extensive governance by the people. Language, time period, etc. differ. So, these can't be essential. None of the societies called not democracy have extensive governance by the people. This confirms our hypothesis that governance is the defining feature. But language, time period, and economics in non-democracies are sometimes the same as in democracies. Therefore, not essential.

All of these (a, a, a, a) say *ah*, even though size and color are different. Shape is the same in each example of *ah*, but not in any case of non-*ah*.

5. **Draw (construct, discover, state, induce) generalizations that summarize the examination.**

The only thing common to all examples called democracy is rule by citizens, and the only thing NOT found in any examples of

nondemocracies is rule by citizens. Therefore, rule by citizens **MUST** be what defines democracy.

This shape, *a*, says *ah*. All non-*a* shapes are **not** *ah*. General rules: Shape tells you what sound to say. Recognize the shape.

Of course human beings make inductive inferences from very early on in life (“The thing that smells good delivers the milk.”). But that doesn’t mean they will easily do so when examples are complex, or that they will get the right generalization. Therefore, DI programs explicitly and systematically teach students induction.

Boys and girls. I’ll show you how to induce a general rule. Look at all these triangles. Look at the one on the left. Now, look at the one next to it on the right. How did it change? *It got smaller*. Yes, it got smaller. Now look at the next one on the right. How did it change? *It got smaller*. Yes, it got smaller. Let’s induce a general rule about how the triangles change from left to right. *The triangles get smaller from left to right*. Yes, smaller from left to right. Oh, you are so smart. (Gradually use examples that have more features and that are based on verbal descriptions.)

Inductive reasoning, above, is a set of logical operations for inducing general knowledge (concepts, rule relationships, big pictures, or cognitive strategies) from examples. However, **deductive reasoning** is a set of logical operations for using or **applying** (generalizing) concepts, rule relationships, and big pictures, or cognitive strategies, to **new examples**. For example, once students (during initial instruction) have induced, firmly, that all squiggles shaped like *a* say *ah*, they may deduce that new examples with that *a* shape also say *ah*. Here are some of the steps, or logical operations, in moving from knowledge of the general to predictions about and applications to new specifics.

1. Examine new examples (letters, chunks of rock, descriptions of societies), guided by the general concepts, rules, or theories/schemes (cognitive strategies for making a big picture).
2. Does a new example have the same defining features as are embedded in the general concept, rule, or strategy?
  - a. Yes? Then treat the new example the same as the old ones.

*Unlike so-called progressive and constructivist pedagogies, DI does not assume that students can make sound deductive inferences without focused instruction.*

“This says *ah*.”  
“It’s a democracy.”  
“Granite.”

- b. No? Treat the new example differently than the old ones—not as an example of the general case. “Not granite.”
3. Does a new example fit a different general case (monarchy, not democracy; an *er* verb not an *re* verb in French; a parentheses with an exponent)? If so, then use knowledge of **that** other general case to work on it. “That sound is eee.”

Unlike so-called progressive and constructivist pedagogies, DI does not assume that students can make sound deductive inferences without focused instruction. Therefore, DI programs provide that instruction.

Boys and girls. I’ll show you how to make a **deductive** inference. Remember our rule about how tri-

angles change. What is the rule? *Triangles get smaller from left to right*. Yes, triangles get smaller from left to right. Well, there is a triangle under this piece of paper and it is on the right. So, what do we know about it? *It will be smaller*. How do you know? *Because it is farther right*. Okay, let’s **test** our deduction...Yes, it is smaller. It fits the rule. What is the rule? Then have students do it.

(Gradually use examples with difficulty levels matching the ones you will be working on, e.g., making deductions from the theory of revolution in the *Declaration of Independence*.)

## *How Do You Communicate in a Logically Technically Proficient Fashion So That Students Easily Perform the Inductive and Deductive Operations?*

The guiding ideas, or design principles, and the instructional methods in DI programs are derived from and are perfectly consistent with its theory of knowledge—the set of inductive and deductive logical operations by which persons acquire and apply knowledge. Following are some of the main design principles and instructional features.

1. Assume that students are not likely to figure things out (make inductive and deductive generalizations on their own). Therefore, you must pay attention to every bit of knowledge they must learn, how clearly you communicate, and what they are getting.
2. Teach virtually every verbal association, concept, proposition, and cognitive strategy *directly* (not round about), *systematically* (step by step with attention to details), and

*explicitly* (“The definition of democracy is...”).

3. Each form of cognitive knowledge (verbal association, concept, rule relationship or proposition, and cognitive strategy) can be taught effectively with its own communication format. Use the same format when teaching all examples of the same knowledge form. For example...

New concept. Democracy. Democracy is a political system in which citizens rule. Say that definition... This is an example of democracy... And this is an example of democracy... This is NOT an example of democracy. This IS an example of democracy... Now look at this example... Is this democracy? How do you know?

4. Preteach whatever students need in order to get what you are trying to teach.
  - a. Teach letter–sound correspondence before sounding out words (because the latter involves the former).
  - b. Teach counting before addition and subtraction.
  - c. Teach definitions of terms before analyzing documents that use those terms.
5. Teach the subskills used in logical operations. And teach these as part of a cognitive strategy called “reasoning.” That is, teach students how to examine examples and nonexamples, how to note features, how to write what they note, how to compare and contrast and discover samenesses and differences, how to draw inferences (concept, rule, big picture—theory, model), how to apply the general case (concept, rule, big picture) to new examples.
6. Introduce a big idea—concept, rule, model/diagram—to organize thinking from example to example and from day to day.

Remember the rule. When governments no longer secure what citi-

zens consider their unalienable rights, this delegitimizes the government, and this fosters opposition movements.

7. State what you are going to teach and what students will be able to do—the do-objective.

**Do-objectives.** Statements such as “Students will appreciate rhyme,” or “demonstrate rhyme,” or “make rhyme” are not do-objectives. A do-objective would be:

Teacher models how to rhyme with at. r/at, m/at, s/at. Teacher says, “Your turn to rhyme with at. rrr..., mmm..., sss....” Students correctly

*Preteach whatever students need in order to get what you are trying to teach.*

rhyme (r/at, m/at, s/at) within 3 seconds.

The do-objective tells you EXACTLY what to **teach**—to rhyme *at* with rrrr, mmm, and sss in response to the teacher saying, “Your turn to rhyme with at.”

The do-objective also tells you exactly what to **test** to determine *acquisition* (rhyme at with rrr, mmm, sss), *fluency* (students rhyme quickly), and *generalization* (students also rhyme at with fff, hhh, and vvv).

8. Teach in a logically progressive sequence.
  - a. Teach general examples before unique ones. Letter–sound correspondence for a, m, s, f, r, e before v, ing, x.
  - b. Teach elements before compounds, parts before wholes.  
Vocabulary before reading texts that contain the words.

Counting forward before addition.

- c. Teach what is useful now before what is useful later.

9. Teach so that inductive inferences are easy to make. Specifically,

- a. Use examples that **reveal/contain** the features relevant to a concept, rule, or strategy.
- b. Use a **range** of examples that have features in the population of examples OUTSIDE of instruction (to avoid stipulation errors).

—|\_\_\_\_\_||\_\_\_\_\_||\_\_\_\_\_||  
Examples of Blue

- c. Juxtapose examples to make sameness and difference obvious.

Germ —|

Germ |

Not germ —

Not germ 0

Germ 0|

What’s germ?

10. Direct students’ attention to relevant events.  
“Put your finger under the...”  
“Look at the...” Watch me...”
11. Use prompts to highlight important features. Change the circle on /d/ to an oval to distinguish it from the similar shape of /b/.
12. Test immediately, and after students have worked on many examples, test again (delayed acquisition test).
13. Strategically integrate into a larger whole what is learned earlier in a lesson or in a series of lessons. For example, teach students to use knowledge of rhyme schemes, meter, figures of speech, and symbolism in the strategy for analyzing poems.

In the earliest examples we have (e.g., Plato’s portrayals of Socratic dialogue, Aristotle’s analyses of arguments), technical precision in communication is seen as necessary to move learners from shal-

low and erroneous belief to enduring knowledge. This precision is attained by organizing communication so that it fosters the logical operations (reasoning)

learners must perform in order to get (induce) and apply (deduce) knowledge. In this sense, DI is one of the few forms of instruction remaining that not

only maintains classical aims (mastery of traditional systems of knowledge) but as well provides classical means (logically proficient communication). *ADI*

DOUGLAS W. CARNINE, JERRY SILBERT, EDWARD J. KAME'ENUI, and SARA G. TARVER

## *Preface to Direct Instruction Reading, Fourth Edition*

In April of 2000, the National Reading Panel, a panel of scientists charged by the U.S. Congress with the responsibility of reviewing research in reading instruction and identifying methods that consistently relate to reading success, issued its long-awaited report.

The findings of the National Reading Panel confirmed the validity of the content and procedures that have been included in *Direct Instruction Reading* since the first edition. The panel pointed out the importance of teaching phonemic awareness (Chapter 6), letter-sound correspondences (Chapter 7), systematic and explicit phonics (Chapters 9, 10, 11, and 15), fluency (Chapter 18), vocabulary and language skills (Chapters 11 and 20), and strategies for comprehending narrative and content-area text (Chapters 21 to 24). Furthermore, the panel pointed out the importance of systematic and explicit teaching in all areas.

*Direct Instruction Reading*, unlike most textbooks, has not described multiple approaches to teaching beginning reading but instead has provided and continues to provide the reader with detailed information on how to systematically and explicitly teach essential reading skills. The direct instruction approach is highly congruent with the findings of the National Reading Panel. The approaches described in this text have been shown to benefit all students, but are especially powerful with the most vulnerable learners, children who are at risk

because of poverty, disability, or limited knowledge of English.

This textbook is designed to provide teachers and soon-to-be teachers specific information that can help them to be effective with all their students. The text not only provides information on what to do but explains why particular procedures are recommended. Even though publishers have begun to incorporate more research findings into their reading programs, teachers will find great differences among programs regarding their effectiveness with at-risk students and must be prepared to make needed modifications and adjustments to ensure a successful learning experience for all students.

*Direct Instruction Reading* presents information on how to provide success to students through structuring initial teaching procedures so that the teacher presentation is clear; using language and demonstrations that can be understood by all children; sequencing the content to be sure that all essential skills and knowledge are taught in an aligned and coherent manner; using teacher presentation techniques that foster a high degree of interaction between teacher and student; and providing adequate practice and review to develop high levels of fluency and accuracy.

*Direct Instruction Reading* attempts to help teachers create a learning and instructional environment for teaching students in a humane and efficient manner. A learning environment is humane when the environment

enhances the student's self-concept. Our experience, and our reading of the research, suggests that competence comes first, leading to increased self-concept. A learning environment is efficient when the maximum amount of learning occurs in the shortest possible time with the fewest resources.

The organization of *Direct Instruction Reading* had changed somewhat from the third edition. We have organized the chapters to be congruent with the five major areas of reading instruction identified by the National Reading Panel. We continue to devote a disproportionate amount of the book to beginning reading, because the first months of reading instruction are immensely important to later reading success.

The major change in this edition of *Direct Instruction Reading* is not in the instructional details for how to teach reading, but in the chapters that connect Direct Instruction with the findings of the National Reading Panel, the chapters on how to establish a classroom reading program, and the chapters that present the research base that supports the importance of direct, explicit instruction in reading. We have incorporated the research findings of the National Reading Panel in chapters throughout the text as well as in the research summaries. We have also updated the instructor's guide that accompanies this text.

As with previous editions, this edition is not intended to be a definitive handbook. As we work with students,

DIRECT INSTRUCTION READING, 4/E by Carnine/Silbert/Kameenui/Tarver, ©2004. Reprinted by permission of Pearson Education, Inc., Upper Saddle River, NJ.

we continue to learn, and this learning enables us to improve our procedures. Procedures can always be improved. The main purpose of the text is to empower teachers by providing them with specific suggestions for problems they will encounter in the classroom.

It is our hope, however, that the systematic procedures recommended here will stimulate the development of even better procedures. Furthermore, we encourage teachers to view learning as an outcome of instruction, rather than a function of inalterable attrib-

utes of the learner. We also encourage commercial publishers to design better programs for students. Overall, we hope that this book contributes to better teaching methods for all students, particularly the hard-to-teach and at-risk students. ~~ADI~~

Edited by NANCY E. MARCHAND-MARTELLA, TIMOTHY A. SLOCUM, and RONALD C. MARTELLA

## Preface to Introduction to Direct Instruction

Part One provides an overview and discusses the importance of Direct Instruction. In Chapter 1, Hempenstall sets the stage for the text by describing why we need quality education and how so many of our children fail to experience success and, instead, participate in a cycle of failure. Hempenstall describes the importance of using research to guide our practices and the obstacles to using research to drive education. Finally, Hempenstall defines effective instruction (direct instruction) and Direct Instruction and chronicles the history of the Direct Instruction model and its founder, Siegfried Engelmann. In Chapter 2, Watkins and Slocum describe the three main components of Direct Instruction: program design, organization of instruction, and teacher–student interactions. Watkins and Slocum note the results of Project Follow-Through, independent reviews of Direct Instruction research, and long-term follow-up investigations.

Part Two provides an overview and analysis of Direct Instruction academic programs. In particular, these chapters describe the importance of each academic area and instruction in the area, critical elements of focus, an overview of programs with corresponding content analyses and format features, teaching techniques specific to the programs, assessment and troubleshooting aspects, extensions and adaptations, and a summary of the research

supporting these programs. In Chapter 3, Waldron-Soler and Osborn describe the language programs. Stein and Kinder discuss the various reading programs in Chapter 4. In Chapter 5, Fredrick and Steventon provide a discussion of writing programs. Simonsen and Dixon discuss spelling programs in Chapter 6. Snider and Crawford discuss various math programs in Chapter 7. Finally, in Chapter 8, Harniss, Hollenbeck, and Dickson describe content area programs in history/social studies and science.

Part Three focuses on additional issues in Direct Instruction implementation. In Chapter 9, Lignugaris/Kraft describes how Direct Instruction principles can be applied to new content. A lesson plan format is provided to guide teachers in providing effective instruction to students when Direct Instruction programs are not available. Marchand-Martella, Blakely, and Schaefer discuss aspects of schoolwide implementations in Chapter 10. These aspects include critical issues and guidelines for implementing Direct Instruction programs, coaching as a means of staff development, tutoring to increase support for students, and effective supervision of preservice teachers.

### *Additional Chapters*

Two additional chapters on Direct Instruction published in the Summer

Issue, Volume 3(2), of the *Journal of Direct Instruction (JODI)* can be obtained by calling the Association for Direct Instruction (ADI) at (800) 995-2464, by faxing ADI at (541) 683-7543, or by accessing ADI's website at [www.adihome.org](http://www.adihome.org). These chapters include what was to be Chapter 11: Evaluation of Direct Instruction Implementations by Timothy Slocum, Utah State University and Chapter 12: Managing Classroom Behavior by Ronald C. Martella, Eastern Washington University, and J. Ron Nelson, University of Nebraska-Lincoln. Due to space limitations, both chapters were cut and subsequently published in *JODI*. In the chapter on evaluating Direct Instruction implementations, Slocum notes how Direct Instruction implementations should be evaluated. Slocum describes issues of assessment, evaluation, and validity, as well as formative and summative evaluation. Evaluation designs are also illustrated. In the chapter on managing classroom behavior, Martella and Nelson overview how to manage classroom behavior using primary prevention, secondary, and tertiary techniques. Martella and Nelson focus on the connection of Direct Instruction programs and their elements to classroom management. We encourage readers to purchase this issue of *JODI* for further information on aspects of Direct Instruction implementations. ~~ADI~~

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From Nancy Marchand-Martella, Timothy Slocum, Ronald Martella, *Introduction to Direct Instruction*. Published by Allyn and Bacon, Boston, MA. Copyright ©2004 by Pearson Education. Reprinted by permission of the publisher.

## *Summer 2004 Direct Instruction Training Opportunities*

The Association for Direct Instruction is pleased to announce the following intensive DI training conferences. These events will provide comprehensive training presented by some of the most skilled trainers in education. Plan now to attend one of these professional development conferences.

### **Save these dates:**

#### **7th Southeast DI Conference and Institutes**

June 22–25, 2004  
Radisson Hotel Orlando  
at Universal Studios  
Orlando, Florida

#### **30th National Direct Instruction Conference and Institutes**

July 18–22, 2004  
Eugene Hilton and  
Conference Center  
Eugene, Oregon

#### **9th Midwest DI Conference and Institutes**

August 2–4, 2004  
Holiday Inn Mart Plaza  
Chicago, Illinois

#### **19th Atlantic Coast DI Conference and Institutes**

August 9–11, 2004  
Holiday Inn Inner Harbor  
Baltimore, Maryland

## *Everyone likes getting mail...*

ADI maintains a listserv discussion group called DI. This free service allows you to send a message out to all subscribers to the list just by sending one message. By subscribing to the DI list, you will be able to participate in discussions of topics of interest to DI users around the world. There are currently 500+ subscribers. You will automatically receive in your email box all messages that are sent to the list. This is a great place to ask for technical assistance, opinions on curricula, and hear about successes and pitfalls related to DI.

### **To subscribe to the list, send the following message from your email account:**

To: majordomo@lists.uoregon.edu

In the message portion of the email simply type:

subscribe di

(Don't add *Please* or any other words to your message. It will only cause errors. majordomo is a computer, not a person. No one reads your subscription request.)

### **You send your news and views out to the list sub- scribers, like this:**

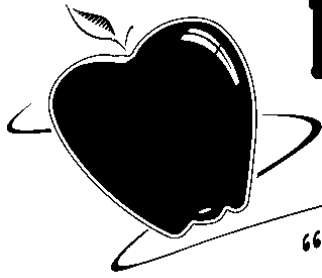
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Subject: *Whatever describes your topic.*

Message: *Whatever you want to say.*

The list is retro-moderated, which means that some messages may not be posted if they are inappropriate. For the most part inappropriate messages are ones that contain offensive language or are off-topic solicitations.





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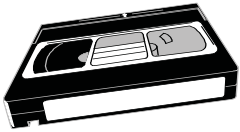
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# Videotapes on the Direct Instruction Model

ADI has an extensive collection of videos on Direct Instruction. These videos are categorized as informational, training, or motivational in nature. The informational tapes are either of historical interest or were produced to describe Direct Instruction. The training tapes have been designed to be either stand-alone training or used to supplement and reinforce live training. The motivational tapes are keynote presentations from past years of the National Direct Instruction Conference.

## Informational Tapes

**Where It All Started**—45 minutes. Zig teaching kindergarten children for the Engelmann-Bereiter pre-school in the 60s. These minority children demonstrate mathematical understanding far beyond normal developmental expectations. This acceleration came through expert teaching from the man who is now regarded as the “Father of Direct Instruction,” Zig Engelmann. Price: \$10.00 (includes copying costs only).

**Challenge of the 90s: Higher-Order thinking**—45 minutes, 1990. Overview and rationale for Direct Instruction strategies. Includes home-video footage and Follow Through. Price: \$10.00 (includes copying costs only).

**Follow Through: A Bridge to the Future**—22 minutes, 1992. Direct Instruction Dissemination Center, Wesley Elementary School in Houston, Texas, demonstrates approach. Principal, Thaddeus Lott, and teachers are interviewed and classroom footage is shown. Created by Houston Independent School District in collaborative partnership with Project Follow Through. Price: \$10.00 (includes copying costs only).

**Direct Instruction**—black and white, 1 hour, 1978. Overview and rationale for Direct Instruction compiled by Haddox for University of Oregon College of Education from footage of Project Follow Through and Eugene Classrooms. Price: \$10.00 (includes copying costs only).

## Training Tapes

**The Elements of Effective Coaching**—3 hours, 1998. Content in *The Elements of Effective Coaching* was developed by Ed Schaefer and Molly Blakely. The video includes scenarios showing 27 common teaching problems, with demonstrations of coaching interventions for each problem. A common intervention format is utilized in all scenarios. Print material that details each teaching problem and the rationale for correcting the problem is provided. This product should be used to supplement live DI coaching training and is ideal for Coaches, Teachers, Trainers. Price...\$395.00 Member Price...\$316.00

**DITV—Reading Mastery 1, 2, 3 and Fast-Cycle Preservice and Inservice Training**—The first tapes of the Level I and Level II series present intensive preservice training on basic Direct Instruction teaching techniques and classroom management strategies used in *Reading Mastery* and the equivalent lesson in *Fast-Cycle*. Rationale is explained. Critical techniques are presented and demonstrated. Participants are led through practical exercises. Classroom teaching demonstrations with students are shown. The remaining tapes are designed to be used during the school year as inservice training. The tapes are divided into segments, which present teaching techniques for a set of upcoming lessons. Level III training is presented on one videotape with the same features as described above. Each level of video training includes a print manual.

- Reading Mastery I* (10 Videotapes) .....\$150.00
- Reading Mastery II* (5 Videotapes) .....\$75.00
- Reading Mastery III* (1 Videotape) .....\$25.00
- Combined package (*Reading Mastery I–III*) .....\$229.00

**Corrective Reading: Decoding B1, B2, C**—(2-tape set) 4 hours, 38 minutes + practice time. Pilot video training tape that includes an overview of the *Corrective* series, placement procedures, training and practice on each part of a decoding lesson, information on classroom management/reinforcement, and demonstration of lessons (off-camera responses). Price \$25.00.

## Conference Keynotes

These videos are keynotes from the National Direct Instruction Conference in Eugene. These videos are professional quality, two-camera productions suitable for use in meetings and trainings.

### **Keynotes From the 2003 National DI Conference, July 2003, Eugene, Oregon**

**To the Top of the Mountain—Giving Kids the Education They Deserve**—75 minutes. Milt Thompson, Principal of 21st Century Preparatory School in Racine, Wisconsin gives a very motivational presentation of his quest to dramatically change the lives of all children and give them the education they deserve. Starting with a clear vision of his goal, Thompson describes his journey that turned the lowest performing school in Kenosha, Wisconsin into a model of excellence.

In his keynote, Senior Direct Instruction developer Zig Engelmann focuses on the four things you have to do to have an effective Direct Instruction implementation. These are: work hard, pay attention to detail, treat problems as information, and recognize that it takes time. He provides concrete examples of the ingredients that go into Direct Instruction implementations as well as an interesting historical perspective. Price: \$30.00

**No Excuses in Portland Elementary, The Right Choice Isn't Always the Easiest, and Where Does the Buck Stop?** 2 tapes, 1 hour, 30 minutes total. Ernest Smith is Principal of Portland Elementary in Portland, Arkansas. The February 2002 issue of *Reader's Digest* featured Portland Elementary in an article about schools that outperformed expectations. Smith gives huge credit to the implementation of DI as the key to his student's and teacher's success. In his opening remarks, Zig Engelmann gives a summary of the Project Follow Through results and how these results translate into current educational practices. Also included are Zig's closing remarks. Price: \$30.00

**Lesson Learned...The Story of City Springs, Reaching for Effective Teaching, and Which Path to Success?** 2 tapes, 2 hours total. In the fall of 2000 a documentary was aired on PBS showing the journey of City Springs Elementary in Baltimore from a place of hopelessness to a place of hope. The principal of City Springs, Bernice Whelchel, addressed the 2001 National DI Conference with an update on her school and delivered a truly inspiring keynote. She describes the determination of her staff and students to reach the excellence she knew they were capable of. Through this hard work City Springs went from being one of the 20 lowest schools in the Baltimore City Schools system to one of the top 20 schools. This keynote also includes a 10-minute video updating viewers on the progress at City Springs in the 2000–2001 school year. In the second keynote Zig Engelmann elaborates on the features of successful implementations such as City Springs. Also included are Zig's closing remarks. Price: \$30.00

**Successful Schools...How We Do It**—35 minutes. Eric Mahmoud, Co-founder and CEO of Seed Academy/Harvest Preparatory School in Minneapolis, Minnesota presented the lead keynote for the 1998 National Direct Instruction Conference. His talk was rated as one of the best features of the conference. Eric focused on the challenges of educating our inner city youth and the high expectations we must communicate to our children and teachers if we are to succeed in raising student performance in our schools. Also included on this video is a welcome by Siegfried Engelmann, Senior Author and Developer of Direct Instruction Programs. Price: \$15.00

**Commitment to Children—Commitment to Excellence and How Did We Get Here...Where are We Going?**—95 minutes. These keynotes bring two of the biggest names in Direct Instruction together. The first presentation is by Thaddeus Lott, Senior. Dr. Lott was principal at Wesley Elementary in Houston, Texas from 1974 until 1995. During that time he turned the school into one of the best in the nation, despite demographics that would predict failure. He is an inspiration to thousands across the country. The second presentation by Siegfried Engelmann continues on the theme that we know all we need to know about how to teach—we just need to get out there and do it. This tape also includes Engelmann's closing remarks. Price: \$30.00.

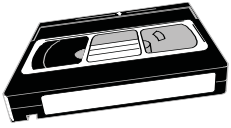
**State of the Art & Science of Teaching and Higher Profile, Greater Risks**—50 minutes. This tape is the opening addresses from the 1999 National Direct Instruction Conference at Eugene. In the first talk Steve Kukic, former Director of Special Education for the state of Utah, reflects on the trend towards using research based educational methods and research validated materials. In the second presentation, **Higher Profile, Greater Risks**, Siegfried Engelmann reflects on the past of Direct Instruction and what has to be done to ensure successful implementation of DI. Price: \$30.00

**Fads, Fashions, & Follies—Linking Research to Practice**—25 minutes. Dr. Kevin Feldman, Director of Reading and Early Intervention for the Sonoma County Office of Education in Santa Rosa, California presents on the need to apply research findings to educational practices. He supplies a definition of what research is and is not, with examples of each. His style is very entertaining and holds interest quite well. Price: \$15.00

**Aren't You Special**—25 minutes. Motivational talk by Linda Gibson, Principal at a school in Columbus, Ohio, successful with DI, in spite of minimal support. Keynote from 1997 National DI Conference. Price: \$15.00

**Effective Teaching: It's in the Nature of the Task**—25 minutes. Bob Stevens, expert in cooperative learning from Penn State University, describes how the type of task to be taught impacts the instructional delivery method. Keynote from 1997 National DI Conference. Price: \$15.00

*continued on next page*



## Videotapes on the Direct Instruction Model...continued

**Moving from Better to the Best**—20 minutes. Closing keynote from the National DI Conference. Classic Zig Engelmann doing one of the many things he does well...motivating teaching professionals to go out into the field and work with kids in a sensible and sensitive manner, paying attention to the details of instruction, making sure that excellence instead of “pretty good” is the standard we strive for and other topics that have been the constant theme of his work over the years. Price \$15.00

**One More Time**—20 minutes. Closing from 1997 National DI Conference. One of Engelmann’s best motivational talks. Good for those already using DI, this is sure to make them know what they are doing is the right choice for teachers, students, and our future. Price: \$15.00

**An Evening of Tribute to Siegfried Engelmann**—2.5 hours. On July 26, 1995, 400 of Zig Engelmann’s friends, admirers, colleagues, and protégés assembled to pay tribute to the “Father of Direct Instruction.” The Tribute tape features Carl Bereiter, Wes Becker, Barbara Bateman, Cookie Bruner, Doug Carnine, and Jean Osborn—the pioneers of Direct Instruction—and many other program authors, paying tribute to Zig. Price: \$25.00

**Keynotes from 22nd National DI Conference**—2 hours. Ed Schaefer speaks on “DI—What It Is and Why It Works,” an excellent introductory talk on the efficiency of DI and

the sensibility of research based programs. Doug Carnine’s talk “Get it Straight, Do it Right, and Keep it Straight” is a call for people to do what they already know works, and not to abandon sensible approaches in favor of “innovations” that are recycled fads. Siegfried Engelmann delivers the closing “Words vs. Deeds” in his usual inspirational manner, with a plea to teachers not to get worn down by the weight of a system that at times does not reward excellence as it should. Price: \$25.00

**Keynotes from the 1995 Conference**—2 hours. Titles and speakers include: Anita Archer, Professor Emeritus, San Diego State University, speaking on “The Time Is Now” (An overview of key features of DI); Rob Horner, Professor, University of Oregon, speaking on “Effective Instruction for All Learners”; Zig Engelmann, Professor, University of Oregon, speaking on “Truth or Consequences.” Price: \$25.00

**Keynote Presentations from the 1994 20th Anniversary Conference**—2 hours. Titles and speakers include: Jean Osborn, Associate Director for the Center for the Study of Reading, University of Illinois, speaking on “Direct Instruction: Past, Present & Future”; Sara Tarver, Professor, University of Wisconsin, Madison, speaking on “I Have a Dream That Someday We Will Teach All Children”; Zig Engelmann, Professor, University of Oregon, speaking on “So Who Needs Standards?” Price: \$25.00

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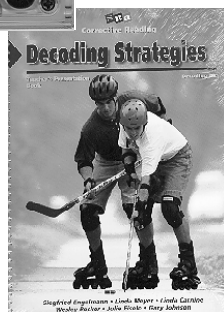
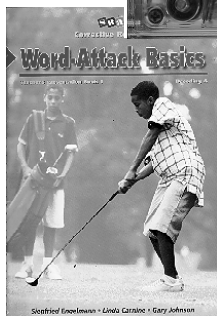
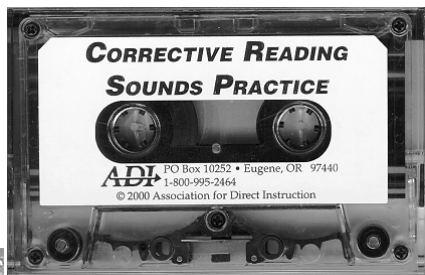
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**New from the Association for Direct Instruction**  
**A tool for you...**

# Corrective Reading Sounds Practice Tape



Dear *Corrective Reading* User,

A critical element in presenting *Corrective Reading* lessons is how accurately and consistently you say the sounds. Of course, when teachers are trained on the programs they spend time practicing the sounds, but once they get back into the classrooms they sometimes have difficulty with some of the sounds, especially some of the stop sounds.

I have assisted ADI in developing an audio tape that helps you practice the sounds. This tape is short (12 minutes). The narrator says each sound the program introduces, gives an example, then gives you time to say the sound. The tape also provides rationale and relevant tips on how to pronounce the sounds effectively.

Thanks for your interest in continuing to improve your presentation skills.

Siegfried Engelmann  
 Direct Instruction Program Senior Author

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Qty.	Item	Each	Total
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# Books Price List

The Association for Direct Instruction distributes the following Direct Instruction materials. Members of ADI receive a 20% discount on these materials. To join ADI and take advantage of this discount, simply fill out the form and include your annual dues with your order.

Title & Author	Member Price	List Price	Quantity	Total																		
<b>Preventing Failure in the Primary Grades</b> (1969 & 1997) Siegfried Engelmann	\$19.95	\$24.95																				
<b>Theory of Instruction</b> (1991) Siegfried Engelmann & Douglas Carnine	\$32.00	\$40.00																				
<b>Teach Your Child to Read in 100 Easy Lessons</b> (1983) Siegfried Engelmann, Phyllis Haddox, & Elaine Bruner	\$16.00	\$20.00																				
<b>Structuring Classrooms for Academic Success</b> (1983) S. Paine, J. Radicchi, L. Rosellini, L. Deutchman, & C. Darch	\$11.00	\$14.00																				
<b>War Against the Schools' Academic Child Abuse</b> (1992) Siegfried Engelmann	\$14.95	\$17.95																				
<b>Research on Direct Instruction</b> (1996) Gary Adams & Siegfried Engelmann	\$24.95	\$29.95																				
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# Association for Direct Instruction

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## What is ADI, the Association for Direct Instruction?

ADI is a nonprofit organization dedicated primarily to providing support for teachers and other educators who use Direct Instruction programs. That support includes conferences on how to use Direct Instruction programs, publication of *The Journal of Direct Instruction (JODI)*, *Direct Instruction News (DI News)*, and the sale of various products of interest to our members.

## Who Should Belong to ADI?

Most of our members use Direct Instruction programs, or have a strong interest in using those programs. Many people who do not use Direct Instruction programs have joined ADI due to their interest in receiving our semiannual publications, *The Journal of Direct Instruction* and *Direct Instruction News*. *JODI* is a peer-reviewed professional publication containing new and reprinted research related to effective instruction. *Direct Instruction News* focuses on success stories, news and reviews of new programs and materials and information on using DI more effectively.

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