Direct Instruction *news*

DON CRAWFORD and RANDI SAULTER, Editors

Summertime: Relax, Learn, and Prepare for the Year Ahead

Happy summer! Summer means a lot of things to educators, parents, students, and others involved in education: sleeping late, beach holidays, and time away from planning, bells, marking papers, observing teachers, ordering textbooks, and more. It also means time for the Association for Direct Instruction's national conference in Eugene, OR! If you are reading this at the conference, lucky you. If you are at the conference for the first time, luckier you. Enjoy the opportunities to learn from great trainers, meet likeminded educators, and hang out with some of the smartest people in the country. (Perhaps we are self-serving, but they seem like the smartest people we know!) If you are reading this in the comfort of your home, enjoy and begin making plans to join us in Eugene next summer.

A brilliant way to spend some time this summer would be by reading Randy Sprick's article on page 3. It serves to remind all of us of the importance of making a plan for reducing stress (and who in the field of education isn't the victim of stress?) *before* the stress or tension occurs. Randy provides an outstanding "menu" of stress-relieving strategies that may be learned and practiced throughout the summer.

In this issue, we also have the opportunity to read about helping students understand the importance of two important life skills: doing the right thing and making the effort to learn.

Across the country, in every state, major reforms in education have failed to produce the anticipated improvement in the quality of schools or the academic achievements of students. While the readers of the *DI News* understand that much of the problem lies in the poor curriculum adopted, we also understand the importance of teacher quality and the ability for teachers to motivate students' efforts to both behave and exert effort toward learning. Few students seem naturally enthusiastic about learning. Most require instructors to inspire, challenge, and stimulate their success. It is clear that good teachers utilize positive reinforcement as a powerful tool that can be as simple as praise or a kind word, but it can also be complex. It continues to become clear that students must believe that a teacher's praise is genuine and important. As you read Dr. Crawford's article keep in mind how many times you have thought about how much more we all could accomplish if we had tools that helped us use positive reinforcement more effectively.

We have a wonderful reprint of a great story about a school Down Under that has discovered the power of DI for itself (with some help from the National Institute for Direct Instruction). After traveling to Eugene to meet Zig Engelmann, an Aboriginal leader by the name of Noel Pearson has brought DI to the remote Australian town of Aurukun. Children who had never had a chance to learn to read are suddenly learning from this "radical new program." It is satisfying to hear Direct Instruction called innovative—because in point of fact DI is the most innovative thing to happen in education in the last century or two. Unfortunately, most journalists think that the tired, old, progressive educational ideas that have been recycling since the early 1900s are "innovative" whereas DI is "traditional." When DI changes lives like it is doing for these people in Australia, it truly is a wonderful innovation. Read all about it.

Board member Leslie Zoref has written an inspiring story of her experi-

In this issue

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:

ADI Publications
P.O. Box 10252
Eugene, OR 97440

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.

ences with Direct Instruction over the years. Her story covers a long career with DI and includes the time she spent as a coach in Project Follow Through up to the present. Sadly, Leslie informs us that her school will no longer allow her to use Direct Instruction materials next year, but that is the first time this has happened in her entire career. We think you will find her story compelling.

The feature "Martin's Musings" talks about what superior teachers have in common when they teach. They work very hard to help their students make sense of what they are learning. Great teachers are concerned about whether their students learn and so make an effort to connect the ideas they are teaching in some way. Dr. Kozloff's descriptions of the ways superior teachers do that is very informative.

We also have a chapter from Zig and Doug Carnine's forthcoming book with the improbable title "Could John Stuart Mill Have Saved Our Schools?" This chapter is fascinating in its exploration of some of the underlying ideas behind Direct Instruction. The reader gets a glimpse behind the curtain and into the thought processes that guide curricular design. There is a wonderful story about field-testing the new math program and how *Zig* was able to change a difficult lesson into a raving success with a small tweak. There is a logical science to good instruction, which is informed by work with real students—and the outcome is amazing in its power and efficacy. If you're one of the people who has never finished *Theory of Instruction*, don't miss this chance to learn some of its lessons in an easier-to-read format.

We are also very excited to bring you an article about a school in Liberia using the Direct Instruction curriculum to educate students. Liberia lies on the Atlantic Ocean, in the southern part of West Africa. Bordered by Sierra Leone, Guinea, and Côte d'Ivoire, Liberia is approximately the size of Tennessee. Most of the country is covered by tropical rainforests that receive an annual rainfall of about 160 inches per year. Not an easy place to live, let alone start a school and successfully educate students who have been "left behind" in the past. Illiteracy rates in West Africa are the highest in the world. Forty percent of the adult population cannot read or write. An illiteracy rate this high severely stunts the citizens' power to effect socioeconomic and political change. The article in this issue, written by a group of hard-working DI proponents, makes it clear that hard work and smart instruction with a *very* smart curriculum can have an impact in even the toughest "neighborhoods."

As always, we hope you find this edition of the *DI News* to be edifying, entertaining, or both. *ADI*

Help us out!

Contribute your story of success with DI! We want to hear from you!

You all have stories and it is time to share them. This is *your* journal—let it reflect your stories!

You'll be glad you did.

RANDY SPRICK, Safe & Civil Schools

Summertime Stress Management

Just about everywhere, school is out for the summer. Teachers around the country are enjoying sunny, carefree days—no more tests, no papers to correct, no more misbehaving students. Life is stress-free!

So, why talk about relieving stress now?

While it is true that stress management is especially appropriate when a student's behavior is upsetting and distracting, it is also appropriate to think about dealing with stress, and setting up a plan to rein it in, *before* you find yourself in the throes of tension. Summer is the ideal time to relax and think about strategies to reduce your stress levels and to rehearse relaxation techniques so that, during the school year when you need them, you will have a practiced set of strategies to call upon.

The following menu of stress reduction techniques provides a series of procedures to consider when you're dealing with the daily pressures of teaching.

1. Practice deep muscle relaxation.

2. Keep a confidential journal.

3. Work on a balanced lifestyle.

4. Promote positive self-talk and attribution.

5. Practice visualization.

6. Identify student strengths.

In this article, I'd like to focus on the first in the list. Learning this physical skill is a useful way to deal with the pressures of teaching. If you practice deep muscle relaxation every day now,

---

Excerpted from *Interventions: Evidence-Based Behavioral Strategies for Individual Students.*

ences with Direct Instruction over the years. Her story covers a long career with DI and includes the time she spent as a coach in Project Follow Through up to the present. Sadly, Leslie informs us that her school will no longer allow her to use Direct Instruction materials next year, but that is the first time this has happened in her entire career. We think you will find her story compelling.

The feature "Martin's Musings" talks about what superior teachers have in common when they teach. They work very hard to help their students make sense of what they are learning. Great teachers are concerned about whether their students learn and so make an effort to connect the ideas they are teaching in some way. Dr. Kozloff's descriptions of the ways superior teachers do that is very informative.

We also have a chapter from Zig and Doug Carnine's forthcoming book with the improbable title "Could John Stuart Mill Have Saved Our Schools?" This chapter is fascinating in its exploration of some of the underlying ideas behind Direct Instruction. The reader gets a glimpse behind the curtain and into the thought processes that guide curricular design. There is a wonderful story about field-testing the new math program and how Zig was able to change a difficult lesson into a raving success with a small tweak. There is a logical science to good instruction, which is informed by work with real students—and the outcome is amazing in its power and efficacy. If you're one of the people who has never finished *Theory of Instruction*, don't miss this chance to learn some of its lessons in an easier-to-read format.

We are also very excited to bring you an article about a school in Liberia using the Direct Instruction curriculum to educate students. Liberia lies on the Atlantic Ocean, in the southern part of West Africa. Bordered by Sierra Leone, Guinea, and Côte d'Ivoire, Liberia is approximately the size of Tennessee. Most of the country is covered by tropical rainforests that receive an annual rainfall of about 160 inches per year. Not an easy place to live, let alone start a school and successfully educate students who have been "left behind" in the past. Illiteracy rates in West Africa are the highest in the world. Forty percent of the adult population cannot read or write. An illiteracy rate this high severely stunts the citizens' power to effect socioeconomic and political change. The article in this issue, written by a group of hard-working DI proponents, makes it clear that hard work and smart instruction with a *very* smart curriculum can have an impact in even the toughest "neighborhoods."

As always, we hope you find this edition of the *DI News* to be edifying, entertaining, or both. *ADI*

RANDY SPRICK, Safe & Civil Schools

Summertime Stress Management

Just about everywhere, school is out for the summer. Teachers around the country are enjoying sunny, carefree days—no more tests, no papers to correct, no more misbehaving students. Life is stress-free!

So, why talk about relieving stress now?

While it is true that stress management is especially appropriate when a student's behavior is upsetting and distracting, it is also appropriate to think about dealing with stress, and setting up a plan to rein it in, *before* you find yourself in the throes of tension. Summer is the ideal time to relax and think about strategies to reduce your stress levels and to rehearse relaxation techniques so that, during the school year when you need them, you will have a practiced set of strategies to call upon.

The following menu of stress reduction techniques provides a series of procedures to consider when you're dealing with the daily pressures of teaching.

1. Practice deep muscle relaxation.

2. Keep a confidential journal.

3. Work on a balanced lifestyle.

4. Promote positive self-talk and attribution.

5. Practice visualization.

6. Identify student strengths.

In this article, I'd like to focus on the first in the list. Learning this physical skill is a useful way to deal with the pressures of teaching. If you practice deep muscle relaxation every day now,

Excerpted from *Interventions: Evidence-Based Behavioral Strategies for Individual Students.*

by the time school starts in September you will be able to put your body into a relaxed state quickly and easily.

Tension and relaxation are at opposite ends of a continuum used to describe the physical state of muscles in your body. Learning to keep your muscles in a relaxed state can help you improve your performance no matter what you are doing—hobbies, teaching, or learning. Consciously focusing on staying relaxed gives you the added benefit of using less energy to accomplish the same tasks, meaning you will be less tired at the end of the day.

Though people tend to associate tension with a state of mind, it is also related to the physical state of the body. As teachers respond to the pressures of the day, muscles can become more and more tense. Physical tension can drain your energy until patience wears thin and little is accomplished. As stress builds, it becomes more diffi-cult to keep classroom problems in perspective. This carries over into the rest of life and has a major impact on general health and well-being.

Relaxation is not a mystical phenomenon. It simply involves knowing how to relax your muscles. However, learning this physical skill is like learning any new skill. It requires daily practice. Like learning to ride a bike, it is initially awkward and may be difficult to use during stressful interactions. However, once learned, deep muscle relaxation can be a valuable lifelong skill. Learning to relax can increase your effectiveness with students, your enjoyment of teaching, and your appreciation of each day.

To begin, you must first learn how to tense and relax your muscles:

1. Put one hand in your lap or on a table.

2. Concentrate on how your hand feels.

3. Make a fist. Squeeze for five seconds.

4. Concentrate on how the muscles feel when they are tense.

5. Slowly unclench your fist.

6. Relax the muscles so there is no tension in your hand.

7. Concentrate on how your muscles feel.

Note that the tension level goes up when you make a fist and then drops to a lower level of tension as you release the fist. By consciously tensing and relaxing your muscles, you can learn to reduce tension throughout your body.

Next, schedule daily practice sessions. Plan to practice deep muscle relaxation at specific times of day so that you can begin to make the process more natural and beneficial. Conduct these sessions in a quiet place, as free from interruptions as possible. Try to fit in one to three sessions daily for three to five minutes each.

And finally, you may find it easier (especially at the beginning) to practice relaxation exercises by following a script like the one below.

Think about the muscles in your feet. Slowly tense those muscles. Hold for five seconds. Now slowly let those muscles relax. Let the muscles release until they are more relaxed than when you started. Focus your attention on how those muscles now feel.

Now do the same thing with your calves. Slowly tense those muscles. Hold for five seconds. Now slowly let those muscles relax. Feel how relaxed your calves and feet are in this relaxed state.

Focus on your thighs. Slowly tense those muscles. Hold for five seconds. Gradually let go of the tension. Take 10 seconds. Feel how relaxed your legs and feet are.

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 subscribers, like this:

To: di@lists.uoregon.edu

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.

Now concentrate on your lower torso—stomach, lower back, and seat. Slowly tense those muscles. Hold for five seconds. Gradually let go of the tension until there's no more tension in your lower torso. Feel how relaxed your lower body is. Pay special attention to your lower back. Let those muscles release.

Now concentrate on your hands and arms. Make fists. Tighten your biceps and triceps. Hold for five seconds. Gradually release. Let the tension go. Let the muscles go until they are more relaxed than when you started.

Focus on your neck, shoulders, and chest. Gradually tense up. Hold for five seconds. Release.

Concentrate on the muscles in your face. Close your eyes as tightly as possible. Scrunch up your face. Hold for five seconds. Now let go. Relax those muscles. Don't frown. Don't smile. Simply relax the muscles in your face.

Now take a few moments to concentrate on your breathing. Breathe easy and evenly. Each time you exhale, think about letting the tension in your muscles dissolve away. Take 10 seconds. Think about how relaxed your body feels. Take a moment to enjoy the sensation and be aware that you can recreate this relaxed state at any time.

Now begin the rest of your day.

You may wish to make an audiotape of your script and play it during your daily practice sessions, or you may prefer to read through the script, following each instruction as you read it.

In the script above, the relaxation process begins with the feet and progresses up to the head, but you may wish to experiment by reversing the order, going from head to feet. There is no right or correct way to practice this skill. Your objective is to learn to relax the muscles of your body and thus reduce tension

With practice and experience, you will be able to use this skill without depending on scripts or tapes. You can then use deep muscle relaxation while sitting in meetings, while standing in a checkout line at a store, or while waiting for your students to return from lunch. Once the skill is mastered, you will be able to achieve a relaxed state within 10 to 30 seconds.

So, find yourself a comfortable chair, sit back, and begin the relaxation exercise. **ADI**

The schools and organizations listed below are institutional members of the Association for Direct Instruction. We appreciate their continued support of quality education for students.

American Preparatory Academy
Draper, UT

Baltimore Curriculum Project Inc.
Baltimore, MD

Bancroft - Rosalie School
Bancroft, NE

Barren County Board of Education
Glasgow, KY

Beacon Services
Milford, MA

Cache Valley Learning Center
Logan, UT

City Springs School
Baltimore, MD

Community Unit SD #60110
Carpentersville, IL

Coyne and Associates Education Corp.
Encinitas, CA

Criterion Child Enrichment
Milford, MA

Educational Resources, Inc.
Missoula, MT

Evergreen Center
Milford, MA

Exceptional Learning Centre
Ajax, ON

Foundations for the Future Charter Academy
Calgary, AB

Hinckley - Finlayson School District
Hinckley, MN

Institute for Effective Education
San Diego, CA

JP Associates
Valley Stream, NY

Keystone AEA Instr. Services
Elkader, IA

Knik Elementary School
Wasilla, AK

Law Offices of Maureen Graves
Irvine, CA

Mescalero Apache School
Mescalero, NM

Morningside Academy
Seattle, WA

Mountain View Academy
Greeley, CO

Mount Pleasant Cottage School UFSD
Pleasantville, NY

Mystic Valley Regional Charter
Everett, MA

National Institute for Direct Instruction
Eugene, OR

Oconomowoc Developmental Training Center
Oconomowoc, WI

Park Elementary School USD 428
Great Bend, KS

The Gregory School for Exceptional Learning
Ancaster, ON

Tiospa Zina Tribal School
Agency Village, SD

USD #428
Great Bend, KS

Direct Instruction in Africa

Educating young children is one of the most pressing problems facing less-developed countries around the world. A well-educated populace is crucial in helping nations escape from grinding poverty. However, developing a well-functioning education system in the face of very limited financial and human resources can be extremely difficult. American teachers, working with colleagues in Liberia, have shown how Direct Instruction can help meet these educational challenges and how educators from the developing world can help.

Liberia, a country in West Africa, is one of the poorest nations in the developing world. The average annual income per capita is only $300 (US), and 95 percent of the population survives on less than $2 a day. Of its population of 3.4 million, 44 percent are younger than 15 years of age—more than twice as many as in the United States. Few children persist in school to the higher levels. Because this pattern has existed for decades, only slightly more than half of all adults are literate. Few Liberians have completed teacher training programs. Thus, the small potential pool of teachers, for very large numbers of children, has a relatively low level of education, especially in comparison to more developed countries.

Eugene Christian Fellowship, a church in Eugene, OR, supports a mission church in Monrovia, Liberia's capital city. In the summer of 2003, John and Lee Gallinger, a husband-and-wife missionary team to Liberia, traveled back to the United States with a dream to start a school to serve the children of church members and of the surrounding community. Having no formal background or training in education, they approached Rob and Tamara Bressi, educational consultants and former teachers in the Bethel (OR) School District, for help. Lee Gallinger had heard about DI's scripted curricula and thought it held potential for Liberian parishioners who would someday be teachers in the school. Many conversations and a breakfast later, the Bressis were invited to come to Monrovia and lend hands-on help to the project.

Extensive civil unrest in Liberia delayed the start of the school for a year. Nonetheless, early in the summer of 2004, local instructors for the newly formed Liberty Elementary School were chosen. Most of the potential instructors had no more than a high school diploma, but all expressed a strong desire to teach. In June of that year, the Bressis and their 18-year-old daughter traveled to Monrovia. Tamara and Rob trained the instructors in the proper administration of placement tests in *Reading Mastery*, *Language for Learning*, *Reasoning and Writing*, and *Connecting Math Concepts*. The instructors administered the tests to 153 students, ages 4-15, all dressed in their finest clothes. Many hours later, tests were scored, instructional groups were created, and, thanks to financial support from Eugene Christian Fellowship, Zig Engelmann, and SRA, curriculum for the next year was ordered.

Two months later Rob and Tamara, along with their colleagues Mary Gleason and her husband Scott Ricker, returned to Monrovia to conduct pre-service training in the reading, math, and language programs. Lee Gallinger was trained as the school's first principal and is credited by the Bressis for encouraging tenacious attention to implementation details. She administered all of the program mastery tests and reading checkouts herself and closely adhered to the passing criteria. For instance, if students did not pronounce the ending of words, as they were prone to do in their oral language, the word was marked as incorrect. Lee conducted classroom observations and held mini-inservices using training videos when applicable.

The implementation schedule began with two blocks of time for reading and an hour each for math and language. Sometime into the first year, amid parent and teacher pressure, the second block of reading was suspended. The

A student works through her lesson at Liberty Elementary School in Monrovia, Liberia.

Two couples from Eugene, OR, helped found an elementary school in Liberia where students learn through Direct Instruction and now rival their US peers in reading skills.

second reading block was, however, reinstated sometime in 2008.

In addition to implementing DI curricula, Tamara and Rob have provided training in Positive Behavior Support (PBS), and the combination has altered the school climate. Other schools in Liberia routinely use switches to punish and "motivate" students, swatting them throughout the day. Adults recount stories of being struck by teachers and other students for answering a question incorrectly or for other minor "infractions." Training in PBS management strategies along with students being placed at the correct instructional levels have led to few behavior problems at Liberty. Instructors teach their classes behavior expectations, and students receive positive reinforcement for following school and classroom rules. Most importantly, students are corrected without the use of switches.

Learning conditions at Liberty Elementary School are better than most in the area but rival some of the poorest conditions in the United States. Liberty students sit behind desks that were cast-offs from a district in Oregon and were purchased for $0.25 each. In contrast, students in neighboring Liberian schools often sit on wooden benches and have makeshift wooden planks for tables. Student–teacher ratios in those schools are sometimes as high as 50:1. Liberty classes average 20-25 students per grade level, with instructional

groups for the lower levels of the programs being much smaller.

The school has been very well received in the community and has a long enrollment waiting list. A missionary with extensive ties and experience in Liberia told the Bressis that the students at Liberty Elementary School were "the best readers in the country." A Liberian principal of another school in the area told Rob and Tamara that the only way to a better future was to "educate our children." The students at Liberty are on their way to doing just that— contributing to the betterment of their nation.

Quantitative data on skills and accomplishments reinforce this conclusion. In fall 2009, a random sample of 43 Liberty second- to sixth-graders took DIBELS Oral Reading Fluency (ORF) probes using the standard administration protocols. As a comparison group, 19 students in two schools with similar populations were also tested. The results, portrayed in Figure 1, show how well the Liberty students are doing in comparison to students in a similar Liberian school that does not use the DI curriculum. Based on these scores, and using mid-year US norms for their grade, about one-third of the Liberty students would be termed at risk of having future academic difficulties, while all but one of the students in the comparison school fell in that category. None of the comparison students were deemed low risk, while

one-third of the Liberty students were in this group.

Liberty students' achievement improves as they proceed with mastery through Direct Instruction programs and move into the upper grades. Figure 2 compares the average ORF scores for students in grades 2-6 at Liberty with the average ORF scores obtained by students in these grades in three schools in the rural US Midwest, one of which has been lauded as one of the most successful in the state. The Liberty students' scores in the early grades are markedly lower than the American students and the established benchmarks, but the differences become much smaller by the later grades. By fifth grade, the average student at Liberty School in Monrovia has oral reading fluency scores similar to those of students in the rural United States. Most importantly, only one of the fifth graders and none of the sixth graders has DIBELS scores

that indicate they are at high risk of future difficulties.

Similar results occurred with mathematics. In a recent e-mail, the Liberty School principal reported, "The sixth-graders are almost through with Level 6 (in *Connecting Math Concepts*). They are all passing smoothly. … Performance on the CMC F test 4 was really impressive. Except for one student who scored 77 percent, all the rest were at 90 percent and above."

The Bressis make yearly visits to Liberia to train new staff, refresh experienced teachers, and encourage the administration. The visits last two weeks and consist of daily classroom observations, after-school and weekend trainings, and ongoing emphasis on increasing the skills of the new principal, Benetta Gibson. Benetta started as a teacher in the school when it first opened and assumed the administrative reins in September 2008 when the US missionaries returned to the United States. She is currently enrolled at the University of Liberia to get her degree in education, and plans are being made for her to attend the "Becoming an Effective DI Trainer" session at the 36th National Direct Instruction Conference and Institutes in Eugene in July 2010.

The news of the success of the project has led to expansion of DI in Liberia. Liberian Orphan Aid Fund, Inc. has begun construction of a new school in Johnsonville, a community just outside of Monrovia. Three acres have been purchased, the corner posts have been set, the land has been cleared, and a school district in Oregon has donated enough *Reading Mastery* material to supply the entire school. Further fundraising is needed to acquire language and math curricula. The principal projected for that school, Larville Peda, is a former teacher from Liberty Elementary. He is slated to attend the DI conference in the summer of 2011 to prepare for the opening of the school in the fall of the same year.

When asked if Liberty School could be a model for Africa, Tamara and Rob immediately respond, "Absolutely! There are many English-speaking countries throughout Africa. With relatively small amounts of money, teachers can be trained and provided with implementation support. Our dream is to build more schools and one day have a DI conference in Africa." ~~ADI~~

Figure 1

Percentage of Students At Risk of Future Academic Difficulties at Liberty Elementary and a Comparison School
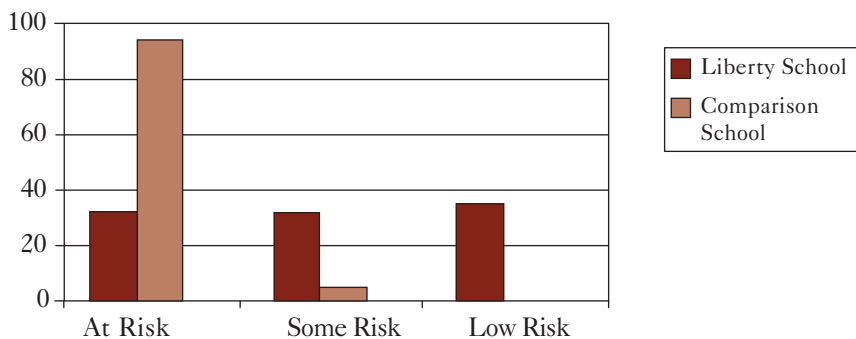
Note. Students were selected randomly from Liberty School and from a nearby school with similar financial support and student body composition. Data indicate the percentage of students at risk, at some risk, or at low risk of future academic difficulties using the established mid-year benchmarks for DIBELS Oral Reading Fluency scores as used in the United States.

Figure 2

Average ORF Scores by Grade at Liberty Elementary and Rural Midwest Schools
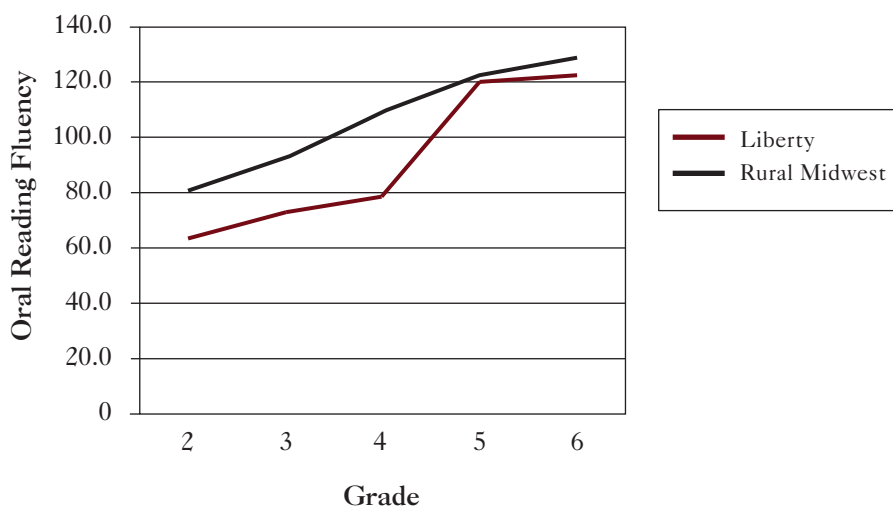
Note. Data are the average Oral Reading Fluency (ORF) scores for each grade. Those for the rural Midwest represent average scores across three schools.

MIRANDA DEVINE, The Sidney (Australia) Morning Herald

Scripted Lessons Start a Classroom Revival

If you want to see a real Education Revolution then you should go to the remote Cape York town of Aurukun, where Aboriginal leader Noel Pearson has imported a radical teaching program into a school in which more than half of the students were barely reading at kindergarten level, if they could read at all. In terms of indigenous disadvantage, Aurukun was at rock bottom, with NAPLAN (National Assessment Program—Literacy and Numeracy) test results 70 percent below the national benchmark, and every year the achievement gap widening.

The social dysfunction of the Cape's most violent town, driven by gambling, drugs, and alcohol, was being played out in the schoolyard. But Pearson says the children's backgrounds have always

been used by principals, teachers, and education department bureaucrats as an "alibi for schooling failure." His philosophy is that if a student is at school and ready to learn, "a learning failure is a teaching failure." Already, after just one-and-a-half terms, the American-designed Direct Instruction program in which teachers deliver scripted lessons, according to a strictly prescribed, methodical program in literacy and mathematics, has surpassed even Pearson's extraordinarily high hopes. It is a program on which he has staked his reputation, forced into being against the will of much of the educational establishment, and on which his legacy will be judged.

This week, the 17th week of the DI program, a year 4 girl named Imani Tamwoy became the first in the school to have caught up to her grade level in reading. The grade 5 to 7 students managed to master 76 percent of the kindergarten program in the first 11 weeks, and the prep—or pre-kindy class of four-year olds—is already 40 percent through the kindergarten language program.

"I'm surprised," Pearson said on Thursday, during a visit with his 5-year-old son Ngulunhdhul, aka Charlie, to Aurukun school, two hours by charter flight from his Cairns home. "I thought in Aurukun we'd have a hell of a time with behavior. … I thought Aurukun would be a special case, with the notoriety of the school and the community. But it hasn't been, and the great thing is we're doing it with your stock standard Education Queensland teacher. This is the biggest surprise and they're doing a bloody great job."

Pearson traveled to Oregon last year to meet the architect of DI, Professor Siegfried Engelmann, and after a series of bruising negotiations, and entrenched opposition from some teachers and bureaucrats, installed a $7 million, three-year trial in Aurukun and Coen schools at the beginning of the year, with the cautious support of the Queensland Education Department.

The new principal, Geoff Higham, 59, drafted early this year to replace his less-than-enthusiastic predecessor, remembers how students in years 8 and 9 used to bring iron bars to school. "The senior boys were out of control. They were reading at kindy level and they hated everything about school," he says. "It's hard to believe the transformation in just 15 or 16 weeks.

"This is a wonderful system. All the children are put into ability groups so no one is failing. The teachers aren't failing. The children aren't failing. … It's a magnificent successful educational experiment."

Having taught in hardscrabble schools from Kenya to Thursday Island, the former Victorian describes himself as an old-fashioned "chalk and talk" teacher. His previous schools have been described as places where "even the grass sits up straight." He says DI accords with his educational philosophy that every child can learn, given a disciplined routine and effective instruction. But even in his wildest dreams he hadn't known how effective DI could be.

"I have no doubt the pupils will be at the national level in maths and English

in three years' time, and many children will be one, two, or three years above that level."

Walking through the collection of modest white buildings nestled among stringybark and palm trees at the school of 250 pupils, you see everywhere, on teachers' shirts, on banners, and in classrooms, the motto Pearson has coined for his education revolution: "Get ready. Work hard. Be good."

In Sarah Travers's kindy class, she wears a microphone around her neck to amplify her voice for children with chronic ear infections. It seems to work, because her ten 5-year-old students sit attentively on the floor, calling out sounds as she points to phonetic symbols in a book. At 1:45 p.m. at the tail end of a busy school week, their concentration and focus is remarkable.

In another classroom, children are sounding out words as the teacher clicks her fingers rhythmically to speed up their voices so that the sounds soon join up to become a fluent word.

Colleen Page, a 24-year-old teacher from the Sunshine Coast, in her third

year at Aurukun, says the change DI has had on her pupils is marked. "They thrive on it. It's really good to compare the last two years with this year. … Previously the kids would be running around your classroom … not listening. Now they're confident about participation in class."

She tells the story of the 8-year-old boy who came to her one morning proudly telling her how he had applied his previous day's lesson. "Miss, I saw a frog, and I said, 'You are an amphibian. You are born in water and raised on land.'"

An essential part of the DI program is weekly testing and data crunching. Every Thursday, 120 pages of detailed test scores and information about each student and class is faxed to a DI center in North America to be analyzed. The following Tuesday, the school leaders have a conference call with DI experts in Oregon about any problems identified.

For example, the data may pinpoint a deficit in a particular child's understanding that came from a particular work sheet in a particular lesson that may have been taught six weeks ear-

lier. The solution is prescribed and the process repeats itself.

The children seem to thrive on the organized routine. Even those difficult older children in years 9 and 10, who have not gone away to boarding school like most of their peers, and who were expected to be too far behind to reap many rewards from DI, have responded in a way that is heartening and heartbreaking, as you consider countless lost opportunities.

The next stage in Pearson's plan is to extend the school day to run from 8:30 a.m. to 4:45 p.m., with direct instruction of basic skills until 2:15 p.m. Afternoons will be devoted to two crucial areas of learning: Club, which is physical activities such as Auskick, and Culture, which is devoted to learning their traditional Aboriginal culture and becoming literate in the first language of most Aurukun children, Wik-Mungkan.

With growing community delight in the new DI system at school, and the charismatic leadership of Pearson, there is a feeling of renewal in the air. Or, what Principal Higham calls a corner of light. *ADI*

LESLIE ZOREF, ADI Board of Directors

DI: A Personal Perspective

Many years ago, after I had been introduced as a presenter at a Direct Instruction (DI) conference in Utah, longtime DI consultant Gary Johnson turned to me and teasingly asked if I had trouble holding down a job. At that point, I'd worked as a school psychologist, Project Follow Through consultant, co-author on *Reading Mastery V* and *VI*, assistant director of a private DI school, curriculum developer for federal health promotion research projects in the areas of tobacco and steroid prevention, consultant on federal

research projects in the area of school improvement and change, and classroom teacher. It's true, my resume is long, but my jobs all come back to DI.

This past school year, at the middle school where I now teach reading, I found out that soon I will no longer be allowed to use DI. Next year the school district—in San Diego County near the US–Mexico border—is switching from *Corrective Reading* to *READ 180*. This type of decision-making by school district administrators is not new to me, but it continues to baf-

fle, anger, demoralize, and sadden me, as DI has played a powerful, constant role in my career. What follows is my DI story.

Intro to DI

In 1974, I began my graduate studies in school psychology at Western Michigan University. A new, young professor named Galen Alessi had just been hired into the department. Galen's practical knowledge, academic prowess, foresight, and immense wisdom quickly impressed and guided me, and they still do to this day. He taught our rebellious, somewhat revolutionary cadre of future school psy-

in three years' time, and many children will be one, two, or three years above that level."

Walking through the collection of modest white buildings nestled among stringybark and palm trees at the school of 250 pupils, you see everywhere, on teachers' shirts, on banners, and in classrooms, the motto Pearson has coined for his education revolution: "Get ready. Work hard. Be good."

In Sarah Travers's kindy class, she wears a microphone around her neck to amplify her voice for children with chronic ear infections. It seems to work, because her ten 5-year-old students sit attentively on the floor, calling out sounds as she points to phonetic symbols in a book. At 1:45 p.m. at the tail end of a busy school week, their concentration and focus is remarkable.

In another classroom, children are sounding out words as the teacher clicks her fingers rhythmically to speed up their voices so that the sounds soon join up to become a fluent word.

Colleen Page, a 24-year-old teacher from the Sunshine Coast, in her third

year at Aurukun, says the change DI has had on her pupils is marked. "They thrive on it. It's really good to compare the last two years with this year. … Previously the kids would be running around your classroom … not listening. Now they're confident about participation in class."

She tells the story of the 8-year-old boy who came to her one morning proudly telling her how he had applied his previous day's lesson. "Miss, I saw a frog, and I said, 'You are an amphibian. You are born in water and raised on land.'"

An essential part of the DI program is weekly testing and data crunching. Every Thursday, 120 pages of detailed test scores and information about each student and class is faxed to a DI center in North America to be analyzed. The following Tuesday, the school leaders have a conference call with DI experts in Oregon about any problems identified.

For example, the data may pinpoint a deficit in a particular child's understanding that came from a particular work sheet in a particular lesson that may have been taught six weeks ear-

lier. The solution is prescribed and the process repeats itself.

The children seem to thrive on the organized routine. Even those difficult older children in years 9 and 10, who have not gone away to boarding school like most of their peers, and who were expected to be too far behind to reap many rewards from DI, have responded in a way that is heartening and heartbreaking, as you consider countless lost opportunities.

The next stage in Pearson's plan is to extend the school day to run from 8:30 a.m. to 4:45 p.m., with direct instruction of basic skills until 2:15 p.m. Afternoons will be devoted to two crucial areas of learning: Club, which is physical activities such as Auskick, and Culture, which is devoted to learning their traditional Aboriginal culture and becoming literate in the first language of most Aurukun children, Wik-Mungkan.

With growing community delight in the new DI system at school, and the charismatic leadership of Pearson, there is a feeling of renewal in the air. Or, what Principal Higham calls a corner of light. ADI

LESLIE ZOREF, ADI Board of Directors

DI: A Personal Perspective

Many years ago, after I had been introduced as a presenter at a Direct Instruction (DI) conference in Utah, longtime DI consultant Gary Johnson turned to me and teasingly asked if I had trouble holding down a job. At that point, I'd worked as a school psychologist, Project Follow Through consultant, co-author on *Reading Mastery V* and *VI*, assistant director of a private DI school, curriculum developer for federal health promotion research projects in the areas of tobacco and steroid prevention, consultant on federal

research projects in the area of school improvement and change, and classroom teacher. It's true, my resume is long, but my jobs all come back to DI.

This past school year, at the middle school where I now teach reading, I found out that soon I will no longer be allowed to use DI. Next year the school district—in San Diego County near the US–Mexico border—is switching from *Corrective Reading* to *READ 180*. This type of decision-making by school district administrators is not new to me, but it continues to baf-

fle, anger, demoralize, and sadden me, as DI has played a powerful, constant role in my career. What follows is my DI story.

Intro to DI

In 1974, I began my graduate studies in school psychology at Western Michigan University. A new, young professor named Galen Alessi had just been hired into the department. Galen's practical knowledge, academic prowess, foresight, and immense wisdom quickly impressed and guided me, and they still do to this day. He taught our rebellious, somewhat revolutionary cadre of future school psy-

chologists about the amazing results of a program called DISTAR and even organized a dinner party to introduce us to the program's author, Siegfried Engelmann, who came all the way from Oregon for the occasion. Our graduate program was a division of the psychology department, not the education department, and moreover this was a *behavioral* psychology department. Had the circumstances been different, it's not clear if, or when, I'd have learned about Direct Instruction.

To satisfy my curiosity about the nuts and bolts of DI, and to get a chance to once again see Ziggy in action, I took the train from Kalamazoo, MI, to Eugene, OR, to attend the third annual DI conference, held at Sheldon High School. I was hooked. I was absolutely enthralled by Engelmann's instructional design genius and analytical logic. It was mesmerizing to watch him (on reel-to-reel tape) teach disadvantaged kids all kinds of concepts that traditional educational and child development theorists had pronounced as "impossible" to learn at that age level.

My behavioral training had taught me about motivating school children and effective classroom management. For me, the missing piece was curriculum. *What* were these kids supposed to be motivated to learn? *What* were they being reinforced to pay attention to? I had to learn more about Engelmann's powerful educational programs.

After completing my graduate studies and getting my feet wet as a school psychologist, I gleefully donated my winter clothes to the Michiganders I was leaving behind, packed up my Ford Pinto, and headed to Eugene in 1977. I was the envy of my school psych friends—I was off to Mecca to learn from the creators of DI. Project Follow Through was in its heyday and I was unexpectedly about to become a part of this major educational field study.

Taking Part in Follow Through

I happily enrolled in the University of Oregon's courses in the education department to learn everything I could about DI firsthand. My instructors were Doug Carnine, Wes Becker, Barbara Bateman, and none other than Engelmann himself. The DI classes were a rigorous combination of understanding the instructional design for a particular content area, creating new instructional sequences using Zig's theories, and demonstrating that you could present certain teaching scripts from memory.

> *It was mesmerizing to watch Zig (on reel-to-reel tape) teach disadvantaged kids all kinds of concepts that traditional educational and child development theorists had pronounced as "impossible" to learn at that age level.*

To fulfill my stipend requirements, I worked as Becker's teaching assistant. I was housed in one of the Follow Through trailers, where there was no running water (i.e., no bathroom). It's worth noting that although Engelmann and Becker were bringing in substantial amounts of money to the university, they were not always given the respect they deserved.

During this time, many of the current DI programs were under development across town at the "Corp"—the Engelmann-Becker Corporation. I became part of the pool of "item writers"—folks who wrote workbook items to specifications delineated by the authors, who also happened to be some of my university professors. This is when I met my mentor, DI reading author Susie Hanner, who had come

from Illinois during the great DI westward migration.

As I try to remember the order of past events from the late '70s and early '80s, I am struck with a new appreciation for people who write their own memoirs. Here's the most accurate reconstruction I can muster. In part, my mental fuzziness is due to the fact that I was involved in such a variety of interrelated activities (as were many others) that I can no longer separate them in a linear fashion. However, I am very clear about this: These were intoxicating times in the world of Direction Instruction!

After I had completed the core DI classes that were offered, I began traveling as a Follow Through consultant, initially with Marcy Stein and Milly Schrader to Flint, MI, and East Las Vegas, NM, respectively. Visiting these two sites (later I would also go to Rosebud, SD, and Kingstree, SC) was a lesson in reality, to put it mildly. To witness a full-blown DI implementation was thrilling, humbling, and exasperating all at the same time. Thrilling because the students were enthusiastic about being academically engaged and proud to be smart, and because the majority of the teachers, instructional aides, administrators, and parents worked incredibly hard. Humbling because these same children (and some of the adults) came from such poverty that the term "disadvantaged" was an inadequate descriptor. Exasperating because of the reasons you'd expect, such as local and school politics, resistance to DI, and weak teachers. My takeaway lessons from the field were: DI definitely works, it works even under the worst circumstances, it works with all kinds of kids, and high expectations do matter.

(A side note: A fortuitous perk happened on Fridays of travel weeks. Many of the DI consultants had to fly through San Francisco en route back

to Eugene, so we would have impromptu gatherings at the airport gate while we waited for the flight back home.)

Field-testing: A 'Madcap' Comedy

Concurrent with attending classes, item writing, and traveling, I also started to help with field-testing *Reading Mastery III* and then *IV*. I and the other curriculum writers worked in the basement of the Corp, an underground space with five offices and no windows, buried beneath the street-level brick building. The scents of hairspray and permanent wave solution wafting from the beauty salon next door further enhanced this work environment. There were no computers. Zig typed on a Remington so fast that the keys were constantly getting stuck—not a good thing for a man whose impatience and incredible productivity could not tolerate the loss of a single second. Engelmann's genius, coupled with his amazing work ethic, were something to behold. Day in and out, he would work on five or more different programs! Co-authors would "book time with Zig" and go in and out of his office nonstop.

Field-testing had the feel of an old-fashioned "madcap" comedy, except that the work was quite serious and deliberate. I had the same routine every day. In the basement, I waited for Zig and Susie Hanner to complete the lesson. As soon as the last page was pulled through the typewriter's roller, I ran upstairs to make two copies—one for me and one for the teacher. I then jumped in my car (yes, still the Pinto) and drove to Coburg Elementary, north of Eugene, where an experienced DI teacher would whisk the lesson out of my hand, preview it, and then present it to the class. I would observe and note the following: questions that were confusing to the students, acceptable student answers that weren't included in the answer key, formats that didn't flow and were cumbersome, and sug-

gestions/questions from the teacher. As soon as class ended, I headed back to the basement to share my information with Susie. Depending on the severity and amount of changes that were made based on this feedback, the next day's lesson would either be the newly improved version or the subsequent lesson.

Talk about having your finger on the pulse. I observed firsthand the amount of attention given to details and the respect accorded to data from students and teachers. By the way, it was rare that an entire lesson was botched and completely rewritten. But if it needed to be done, it was.

Susie began to groom me for moving into her role of developing the Word Attack and Vocabulary tracks for *Reading Mastery*. She had developed a highly organized system for tracking which words had been taught and on which lessons they had been introduced and reviewed. This sacred listing was kept in a black binder and was regularly updated. Our main tasks were to carefully read each lesson's story and do the following: identify which words would be difficult to decode, either because they included sound combinations that hadn't yet been taught or because they were phonetically irregular; check the black binder to make sure these words hadn't been previ-

ously taught; meet during our scheduled time with Zig to decide which words would be taught as Vocabulary and to hammer out (literally and figuratively) the definitions; and lastly, return to our office to write the workbook items for the newly identified vocabulary words. Susie was beyond patient with me and was an extraordinary mentor. Because of her excellent tutelage, I was poised to continue her work when she left.

(Another side note: Whenever a format was changed, we had to use liquid correction fluid to go back and update all the previous lessons in which this format appeared. As you might imagine, this could be both time consuming and frustrating.)

Next, I had the delightful privilege of working on *Reading Mastery V* and *VI* with the mother–son team of Jean and Steve Osborn, also Illinois imports. They were literary dynamos in addition to being experienced DI curriculum developers. These assets proved invaluable as the programs we were working on were to be the first *not* to use stories written mainly by Zig. Instead, we would be teaching from published works. We would also be one of the few reading programs, if not the only reading program, in

which students would read complete novels rather than excerpts. Our instructional goal had shifted from "learning to read" to "reading to learn." (I also learned a great deal by listening and watching.) Every seven years, we again work together to revise these programs.

Along with working at the Corp, I was also enrolled in the University of Oregon as a doctoral student. In 1980, I spent three weeks in San Diego (a Follow Through site) collecting data from seven inner-city schools for my doctoral dissertation. (My eternal thanks to Russell Gersten for serving on my dissertation committee, for being brilliant with data analysis, and for employing me on his school-improvement grants.) My thesis was simple and straightforward, and I was frankly amazed that it was such a novel idea in the world of education. By this time, a major report had been released about the results of Follow Through, and DI had knocked the proverbial ball out of the park. Among the different Follow Through models was an implicit assumption that their interventions had been used as intended. Of course, this could be difficult to evaluate because most of the interventions weren't particularly specific as far as the teacher's role was concerned. For

example, how exactly were they to respond when students made errors? Obviously, the scripted DI programs lent themselves to this type of scrutiny. My hypothesis was that there would be a direct correlation with the degree to which teachers faithfully taught the DI programs and the amount of growth their students made. There was—yet another validation of the power of DI.

Moving to the Classroom

By 1981, *Reading Mastery V* and *VI* were completed, as was my doctoral program, and it was time for me to find a new job. Since I couldn't imagine working outside the DI world, I was thrilled to land a position as assistant director at Morningside Learning Center, a private school started by Kent Johnson with sites in Seattle and Bellevue, WA, that coupled DI with Precision Teaching. After working on the development side for several years, it was quite wonderful to be surrounded by children of all ages who were being taught the full gamut of DI programs. Of course, it was particularly thrilling to watch those kids who were in *Reading Mastery V* and *VI*. During this time I met Tim Slocum and Anne Desjardins, who continue to
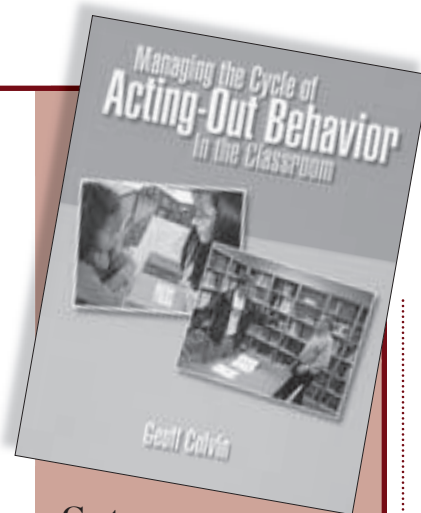
successfully dedicate themselves to the promotion of DI (as well as to each other).

But I missed Eugene, an incredibly beautiful and easy place to live where traffic was minimal and if you decided to go to a movie at the last minute it wouldn't be sold out. So when I received a call from Oregon Research Institute about developing curriculum for a smoking-prevention program, I decided to head back down Interstate 5. For the next 15 years, I remained in Oregon, developing and implementing curricula for health-promotion interventions by using Engelmann's design principles and instructional strategies. Whether I was training teachers, pediatricians, teen peer leaders, or football coaches to use these programs, I always heard Zig's voice reminding me that if the student didn't learn, look to the teacher or the curriculum for the reasons you weren't successful.

As much as I loved many aspects about Eugene, the seemingly never-ending rain wasn't one of them. So after 19 years in the Northwest, I headed to sunny San Diego to teach DI at another private school, this one run by The Institute of Effective Education, headed by Ken Traupmann and Suzy Fitch. Four years later, I took the plunge into public schools.

With the exception of one year, I've been teaching some DI in regular education ever since. And though my luck and joy in carving out a job as a DI teacher ran out at the end of this past school year, I continue to believe now, more than ever, in this powerful instructional approach. *ADI*

DON CRAWFORD, Baltimore Curriculum Project

Rationale for a School-wide Positive Behavior Management System

The main point of a school-wide positive behavior management system is to teach students the importance of doing the right thing—especially in terms of making the effort to learn in school. Positive behavior management not only can motivate good behavior but also can help prepare students to be successful in life by teaching them the value of striving toward learning and achievement. Many schools think of discipline or behavior management as a means toward the end of eliminating disruptive or unruly behavior. However, it is a dead end to aim toward ensuring that students are simply quiet and do not cause trouble. (We know it is a dead end, because dead people could do it!) Instead a school should aim toward students who are motivated to achieve and learn.

To motivate students, we must maximize the value or power of the positive recognition efforts of all teachers, so that positive recognition from the teacher becomes very important to the students. The school's whole system should be pointing students toward success, telling them "This is what you should do to succeed." Teachers' praise should build habits of studying and focused behavior that will help students the rest of their lives. Minute by minute teachers have the capacity to shape student behavior in the direction of success, *but only if their praise matters to the students*. School administrators have a moral obligation to arrange the environment in schools so that many good things come about as a result of teachers noticing students doing the right thing. When students learn that recognition, rewards, and status come to those who follow the rules and do their best, they are being taught important life lessons. Teaching those lessons is, or ought to be, as primary a mission of schools as academic achievement.

The best teachers are truly enthusiastic actors. Their acting skills can make their positive praise and recognition exciting enough to be important to children. It is also true that students care more about the comments of teachers who have strong and meaningful relationships with them. But what happens in the classrooms of new teachers who lack those skills or relationships? Should those classes be allowed to run amok until the teachers develop the skills to make their positive statements matter to the students? That's what happens when there is no school-wide support for positive recognition from the teacher. Or what about teachers of elective courses who see classes only once a week and frequently have difficulty managing students because they have so many students who they see too infrequently? Should those classes be constant sources of problems with student behavior because the teachers are unable to make their once-a-week positive recognition matter to the children? What about substitute teachers? Don't they need to be able to affect student behavior from day one? They often don't have either the relationship or the acting ability to make their positives count. What about cafeteria and playground staff? Don't they need a tool to effectively manage student behavior?

We should want students to behave and learn throughout the school. Frankly, without intensive coaching help, many teachers and staff are not initially able to make their positive recognition important to students. Here is the tragedy: Students of such

successfully dedicate themselves to the promotion of DI (as well as to each other).

But I missed Eugene, an incredibly beautiful and easy place to live where traffic was minimal and if you decided to go to a movie at the last minute it wouldn't be sold out. So when I received a call from Oregon Research Institute about developing curriculum for a smoking-prevention program, I decided to head back down Interstate 5. For the next 15 years, I remained in Oregon, developing and implementing

curricula for health-promotion interventions by using Engelmann's design principles and instructional strategies. Whether I was training teachers, pediatricians, teen peer leaders, or football coaches to use these programs, I always heard Zig's voice reminding me that if the student didn't learn, look to the teacher or the curriculum for the reasons you weren't successful.

As much as I loved many aspects about Eugene, the seemingly never-ending rain wasn't one of them. So after 19 years in the Northwest, I headed to

sunny San Diego to teach DI at another private school, this one run by The Institute of Effective Education, headed by Ken Traupmann and Suzy Fitch. Four years later, I took the plunge into public schools.

With the exception of one year, I've been teaching some DI in regular education ever since. And though my luck and joy in carving out a job as a DI teacher ran out at the end of this past school year, I continue to believe now, more than ever, in this powerful instructional approach. *ADI.*

DON CRAWFORD, Baltimore Curriculum Project

Rationale for a School-wide Positive Behavior Management System

The main point of a school-wide positive behavior management system is to teach students the importance of doing the right thing—especially in terms of making the effort to learn in school. Positive behavior management not only can motivate good behavior but also can help prepare students to be successful in life by teaching them the value of striving toward learning and achievement. Many schools think of discipline or behavior management as a means toward the end of eliminating disruptive or unruly behavior. However, it is a dead end to aim toward ensuring that students are simply quiet and do not cause trouble. (We know it is a dead end, because dead people could do it!) Instead a school should aim toward students who are motivated to achieve and learn.

To motivate students, we must maximize the value or power of the positive recognition efforts of all teachers, so that positive recognition from the teacher becomes very important to the students. The school's whole system should be pointing students toward success, telling them "This is

what you should do to succeed." Teachers' praise should build habits of studying and focused behavior that will help students the rest of their lives. Minute by minute teachers have the capacity to shape student behavior in the direction of success, *but only if their praise matters to the students*. School administrators have a moral obligation to arrange the environment in schools so that many good things come about as a result of teachers noticing students doing the right thing. When students learn that recognition, rewards, and status come to those who follow the rules and do their best, they are being taught important life lessons. Teaching those lessons is, or ought to be, as primary a mission of schools as academic achievement.

The best teachers are truly enthusiastic actors. Their acting skills can make their positive praise and recognition exciting enough to be important to children. It is also true that students care more about the comments of teachers who have strong and meaningful relationships with them. But what happens in the classrooms of

new teachers who lack those skills or relationships? Should those classes be allowed to run amok until the teachers develop the skills to make their positive statements matter to the students? That's what happens when there is no school-wide support for positive recognition from the teacher. Or what about teachers of elective courses who see classes only once a week and frequently have difficulty managing students because they have so many students who they see too infrequently? Should those classes be constant sources of problems with student behavior because the teachers are unable to make their once-a-week positive recognition matter to the children? What about substitute teachers? Don't they need to be able to affect student behavior from day one? They often don't have either the relationship or the acting ability to make their positives count. What about cafeteria and playground staff? Don't they need a tool to effectively manage student behavior?

We should want students to behave and learn throughout the school. Frankly, without intensive coaching help, many teachers and staff are not initially able to make their positive recognition important to students. Here is the tragedy: Students of such

teachers will learn to ignore their teachers' positive comments—such as, "I like the way Johnny got right to work on today's drill without being reminded"—if nothing really valuable happens as a consequence of such statements. Learning to ignore positive praise is not a helpful life lesson. When administrators see their students ignoring the positive recognition of the teachers or staff, they owe it to the students to change things so that students learn that positive recognition is important.

If the administration does nothing to support the value of every teacher's positive recognition, such positive teacher comments will neither motivate nor control the students in those classrooms. This has the unfortunate effect of making teachers think that "positive recognition" doesn't work. They then begin to follow the lead of their colleagues (both teachers and administrators) who manage students through threats and intimidation. Teachers come to view punishment as the most effective way to control student behavior. Such punishing tactics may help the school gain classroom control, but the school will lose out on the vastly more important motivational benefits of using positive reinforcement. In other words, children may learn not to cause trouble for those who punish them, but they will not be positively motivated to strive hard to do their best in academic tasks. Developing the habits of working hard and doing one's best are the habits of success in life—critical for life after school. Without proper positive motivation, students at the school will neither achieve all that they could nor learn the most important life lessons about the value of hard work and effort.

By carefully designing a positive reward system, a school administration can ensure that the entire reward system can support and reinforce the teachers and staff in their efforts to recognize students for good behavior.

With an effective system everyone's positives will "count" and lead to important and valuable rewards and status—and these good things should happen consistently and frequently. All share in the extra work required for such a system, and all benefit from an improved and more positive school climate. Not only does the system bring student behavior under control, but the same system can go on to promote positive academic engagement, motivation, and success. This is the real payoff for a positive behavior management system—it can be used to motivate and strengthen the academic (and life) success of all the students in the school.

With an effective system everyone's positives will "count" and lead to important and valuable rewards and status—and these good things should happen consistently and frequently.

The teacher gives positives to students for any good behaviors that we want students to do more often. Remember: If you want to see something happen again, *say something nice about it!* The key to success is for the teacher to name the behavior that earned the positive as well as the person or group that earned it. You should soon be awarding positives for good academic participation more often than for proper behavior. All teachers, substitutes, and administrators should be able to award positives—not just the homeroom teacher. The function of the whole system is to ensure that each time someone awards positives, *the students will care* or be motivated by the positive recognition because of the many rewards associated with how many positives are earned.

There cannot be a limit or a set number of positives that a teacher can give over the course of the time the students are with that teacher because the teacher will need to award positives three times as often as the students need corrections. Positive behavior management systems that set a predetermined number of points for each activity or day nearly always end up turning negative. Either a student gets all the points—or something is wrong. Teachers must then defend not giving full points by explaining to the student what the student did wrong. What's positive about that? Students must suffer a loss of points—and cannot be equally excited by an excess. Instead we want the teacher to focus energy on giving points to students who are behaving like scholars and to spend most of his or her time discussing good behaviors.

A number of decisions need to be made before starting a school-wide positive behavior management system:

- How are positives awarded—points on the white board, points on a clipboard, tickets, token dollars, or a combination?

- What is the challenge for students, what are they competing against—themselves, other individuals or teams, the teacher, or time?

- How are the points displayed so students can keep track of their progress?

- What mild consequences are available for students who are ignoring the positives?

- How will points be equalized between teachers and classes?

- In what ways will the points count?

To make a school-wide positive behavior management system powerful, the positives could count in up to four different ways. The more of the following ways a school selects, the more strongly positives will affect behavior:

1. Students could get to spend points through a store, an auction, or a catalog ordering process.

2. A weekly behavior grade could be based on points earned, accumulating on a report card.

3. The school could initiate daily contact with parents of high and low earners each day.

4. Students could achieve status or levels relating to privileges in the school based on points earned, which is a very powerful system.

The levels would be changed weekly based on points earned as well as homework completion, good grades, and attendance. Interestingly, nearly all schools have an implicit level system—some students are allowed on field trips and special outings while other students are not.

It is important to plan a positive behavior management system carefully. Everyone would like this job to be easier than it is and will try to find shortcuts. There are many pitfalls in the details of a school-wide positive behavior management system. Choose the wrong details and the system will no longer be effective. And of course, if the system demands more effort to keep it running than the staff is willing to put forth, it will simply fade away during the year. A good place to begin is to review the Fall 2009 edition of the *DI News* where we discussed 13 principles for designing a positive behavior management system.

Despite the work involved, designing and maintaining a well-thought-out positive behavior management system can provide significant benefits to the schools that do it. A successful system will support staff at various skill levels. It will bring student behavior under control. Most importantly, the system can be used to motivate student efforts toward academic achievement. Isn't that one of the most important functions of a school? ADI

MARTIN KOZLOFF, University of North Carolina

MARTiN'S MuSiNgS

Teach as if You Had Something to Say

"Eyes on me, everyone. Today we'll blah blah blah. In addition, blah blah yadda yadda. Moreover, blahhhhhhhhhhhh. Your turn."

That was high school for me. Maybe for you, too. The only teacher I paid attention to was Mr. Maxwell. He wove his Korean War experiences into our course on physics.

"Now, if the Chinese commies fired a machine gun round from 1,000 yards away, it would have so little force that you could let it hit you. All you'd get was a bruise and then you'd be awarded a Purple Heart. Physics tells us how that works!"

But most of the time, it was one big snore. Since high school days, I've observed lessons in scores of middle and high schools. I'd ask the principal, "May I see your best teachers?" Sure enough, they held my attention. They were so good, I almost wanted to raise my hand and ask questions. I took notes on how they taught, compared the teachers and identified sameness, and organized what I learned as follows. Great teachers—at least I thought they were great—do four things:

1. Deliver coherent lessons or presentations.

2. Make lessons or presentations striking.

3. Ensure that there is a lesson, a moral, and implications for action.

4. Show students that it is important to be critical but not relentlessly negative about their society's core values and institutions.

Following are examples of these traits.

Coherent Lessons

The presentations or lessons of great teachers are coherent. Information (such as facts, lists, concepts, rules/propositions, routines [methods of analysis, theories]) was connected.

How did these teachers connect information?

1. **The information told a story.** Here are three examples:

   a. The story of a poem. The teacher read a poem—for example, Ulysses, by Tennyson. Then the teacher asked students for their reactions.

   "It made me feel strong."

   "It made me think of doing something heroic."

   Then the teacher presented events in the poet's life and times that led the poet to write such a poem, and to write it in a way—wording, symbolism, rhyme, and meter—that had its effects.

   Finally, students reread the poem with this background in mind.

   The students had learned the story of the poem.

1. Students could get to spend points through a store, an auction, or a catalog ordering process.

2. A weekly behavior grade could be based on points earned, accumulating on a report card.

3. The school could initiate daily contact with parents of high and low earners each day.

4. Students could achieve status or levels relating to privileges in the school based on points earned, which is a very powerful system.

The levels would be changed weekly based on points earned as well as homework completion, good grades, and attendance. Interestingly, nearly all schools have an implicit level system—some students are allowed on field trips and special outings while other students are not.

It is important to plan a positive behavior management system carefully. Everyone would like this job to be easier than it is and will try to find short-cuts. There are many pitfalls in the details of a school-wide positive behavior management system. Choose the wrong details and the system will no longer be effective. And of course, if the system demands more effort to keep it running than the staff is willing to put forth, it will simply fade away during the year. A good place to begin is to review the Fall 2009 edition of the *DI News* where we discussed 13 principles for designing a positive behavior management system.

Despite the work involved, designing and maintaining a well-thought-out positive behavior management system can provide significant benefits to the schools that do it. A successful system will support staff at various skill levels. It will bring student behavior under control. Most importantly, the system can be used to motivate student efforts toward academic achievement. Isn't that one of the most important functions of a school? *ADI*

MARTIN KOZLOFF, University of North Carolina

MARTIN'S MUSINGS

Teach as if You Had Something to Say

"Eyes on me, everyone. Today we'll blah blah blah. In addition, blah blah yadda yadda. Moreover, blahhhhhhhh-hhhh. Your turn."

That was high school for me. Maybe for you, too. The only teacher I paid attention to was Mr. Maxwell. He wove his Korean War experiences into our course on physics.

"Now, if the Chinese commies fired a machine gun round from 1,000 yards away, it would have so little force that you could let it hit you. All you'd get was a bruise and then you'd be awarded a Purple Heart. Physics tells us how that works!"

But most of the time, it was one big snore. Since high school days, I've observed lessons in scores of middle and high schools. I'd ask the principal, "May I see your best teachers?" Sure enough, they held my attention. They were so good, I almost wanted to raise my hand and ask questions. I took notes on how they taught, compared the teachers and identified sameness, and organized what I learned as follows. Great teachers—at least I thought they were great—do four things:

1. Deliver coherent lessons or presentations.

2. Make lessons or presentations striking.

3. Ensure that there is a lesson, a moral, and implications for action.

4. Show students that it is important to be critical but not relentlessly negative about their society's core values and institutions.

Following are examples of these traits.

Coherent Lessons

The presentations or lessons of great teachers are coherent. Information (such as facts, lists, concepts, rules/propositions, routines [methods of analysis, theories]) was connected.

How did these teachers connect information?

1. **The information told a story.** Here are three examples:

   a. The story of a poem. The teacher read a poem—for example, Ulysses, by Tennyson. Then the teacher asked students for their reactions.

   "It made me feel strong."

   "It made me think of doing something heroic."

   Then the teacher presented events in the poet's life and times that led the poet to write such a poem, and to write it in a way—wording, symbolism, rhyme, and meter—that had its effects.

   Finally, students reread the poem with this background in mind.

   The students had learned the story of the poem.

b. Historical events. For example:

- The story of the decline and fall of the Roman Empire. "Listen, the Romans had it all—for a little while. And then they started to lose it. Here's the nutshell version. Then we'll look more closely. They got rid of corrupt monarchs and established a republic. Then there was civil war between rich and poor. Then the senate and tribunes (representatives of the people) became corrupt. Then there was more civil strife. Then they had an emperor—perhaps to bring order. Then there was expansion into the lands of the barbarians. From this, Rome acquired great wealth, but then came luxury, idleness, boredom, and loss of patriotic feeling, and then…bye-bye."

- The story of the war between Greece and Persia. "How did separate city-states, vastly outnumbered, defeat hundreds of thousands of Persians again and again? Was it their weapons and armor? Was it that the Greeks were fighting to defend their land? Was it that despite their city-state differences, they saw themselves as one civilization? Was it their fighting tactics? Was it some kind of special courage and toughness? Maybe all of these. Let's hear their story."

- The story of the birth of the United States.

2. **The information was guided by and was mapped onto big ideas.**

Great teachers began instruction with big ideas, then they showed how the rest of the content mapped onto the big ideas—much like using the picture on the cover of a jigsaw puzzle to figure out which piece goes where. With the picture as reference, each piece has a place and makes sense.

Great teachers used at least four kinds of big ideas: diagrams or models, theories, rules or propositions, and concepts.

a. They organized instruction around a *diagram* of how things are connected. A model. See the diagrams in Figure 1.

The rest of the presentation would give information that fits the diagrams.

b. They organized instruction around a *theory*—a sequence of propositional statements (rules) that describe, explain, or make a case for something. For example, a great teacher began a unit on the American Revolution with a general theory of how political systems change:

From Peter Blau, *Exchange and Power in Social Life* (1964).

Proposition 1: The relationship between the government and The People involves **exchange**. The government makes **demands** (in the form of taxes, service in time of war, obedience to law) and the government provides **rewards** (for example, protection from invasion; protection against violation of rights; certain services such as postal, highways, emergencies).

Figure 1
Diagrams of Big Ideas

Plato's cycle of governments
Timocracy → Oligarchy → Democracy → Tyranny → Aristocracy

Timocracy is a government of the military and of honor. Oligarchy is a government of money and of the rich. Democracy is a government of the people [Plato considered it to be a mob swayed by passions and self-interest rather than reason and concern for the good of the whole.] Tyranny is a government of absolute power and dictatorship. Aristocracy is a government of philosopher kings, from "aristos" meaning "the best."

Life cycles
Birth → Growth and Development → Reproduction → Decline → Death

Cycles in civilizations
Emergence → Growth and Differentiation (e.g., division of labor, social classes) → Exhaustion → Transformation

Proposition 2: When The People judge the exchange to be fair (not too much is demanded by the government; not too little is given in return by the government), The People see the government and its demands as **legitimate**, reasonable, right.

Proposition 3: The People develop norms of fairness, which become part of their common-sense knowledge. "That's not asking too much" vs. "Now they've gone too far!"

Proposition 4: When The People judge that the government is acting according to the norms of fairness, The People socialize their children and encourage other persons to support the government.

Proposition 5: When The People judge that the government is *not* acting according to norms of fairness, The People begin to oppose the government through opposition **organizations** (Sons of Liberty, the Tea Party Movement). The People also develop opposition **ideologies** that justify rebellion. "The government's actions are unconstitutional. These guys are nothing but fascists! We must not obey. Resistance is our *duty*!"

Proposition 6: The government responds to opposition with threats, coercion, bribery, and force.

Proposition 7: The People judge the government's response to be further evidence of the government's **illegitimacy**, and The People **escalate** their opposition (they tar and feather government officials, dump tea into the harbor, form militias, attend huge rallies, refuse to pay taxes, don't send their children to government schools).

Proposition 8: The cycle of increasing conflict continues until the government either reduces it coercive force, increases its rewards (which suckers The People back into a coercive relationship), is changed by legal means (e.g., election, impeachment), is overthrown by force (e.g., armed rebellion, military coup), or eliminates its opposition and installs dictatorship.

This theory was a framework for studying the American Revolution. It could then general-

Superior teachers make lessons or presentations striking. Superior teachers shake students out of their complacency, challenge their system of beliefs with counterexamples and with logic. They force students to wake up.

ized to the Civil War, the fall of the Soviet Union, and current events.

c. They organized instruction around *rules or propositions.* Great teachers either started with the rule, then showed examples that were explained by the rule, or started with examples and helped students figure out (induce) the rule. For example:

- Starting with a *general proposition*, or rule. Deductive style: from general to specific.

   Teach students the rule. "Democracies eventually fracture into factions whose con-

flict for power and/or money from the treasury destroys the moral order of democracy (the good of the whole) leading to political decisions that weaken the society (e.g., bankrupt the treasury)."

Now examine examples that are explained by this rule. "Here's what happened in the Roman republic."

Include nonexamples for contrast. "But it didn't happen in this example—yet."

Have students use the rule to predict what will happen in new examples. "Do you notice factions in *this* country? What are they? What are their different self-interests?..."

- Starting with *examples of a rule*, or proposition.

   Examine each example. Identify the ways that they are the same (e.g., factions) and the outcomes (corruption and destruction of the political system). Inductive style. From specifics to general rule.

   Help students to state a rule that summarizes what happened across the examples.

   Have students use the rule to predict what will happen in new examples. Generalization. "Do you notice factions in *this* country? What are they? What are their different self-interests?..."

d. They organized instruction around a *concept*. The concept shows how materials hang together.

For example, the *Orestia* plays, by Aeschylus. Without a relevant big idea, students may infer that the Greeks were merely homicidal. But the big idea is justice.

In the first play, *Agamemnon*, Agamemnon the king sacrifices his daughter, Iphigenia, so that the winds will blow the Greek ships to Troy. When he comes back, his wife, Clytemnestra, kills Agamemnon for killing her daughter. However, the Chorus warns:

Among the wicked of mankind
An old crime breeds a younger crime.
Sooner or later, when the appointed day
Comes for the new crime to be born—
A Wrath, a Demon for the house,
Unfightable, unwarrable on, unholy,
A bold, black Ruin for the house-hold—
Truebred to its ancestral type.

The next play—*The Libation Bearers*—continues the concept of justice. Orestes, the son of Agamemnon, is old enough to avenge his father's murder. He kills his mother, Clytemnestra. The Chorus says:

The anvil of Justice stands firm-based;
Swordsmith Destiny whets the blade;
And the glorious Avenger, profound in mind, the Fury,
Brings in for retribution a child,
To expiate the old pollution
Of the house at long last.

When Orestes avenged his father's murder, he murdered his own mother. This matricide must be avenged. The big idea— the concept of justice—is continued in the final play, *The Eumenides*. Now Orestes faces justice. The Chorus says to Orestes:

It is your turn for giving—let me gulp up
The scarlet broth from your living limbs. Let me get

Nourishment out of you, drinking an ill drink.
I will suck your life's blood dry, then hale you below
To pay the painful penalty for mother murder…
For mighty Hades is strict
In calling men to account under the earth.
His mind keeps records, Nothing escapes his control.

And that pretty much takes care of the House of Agamemnon!
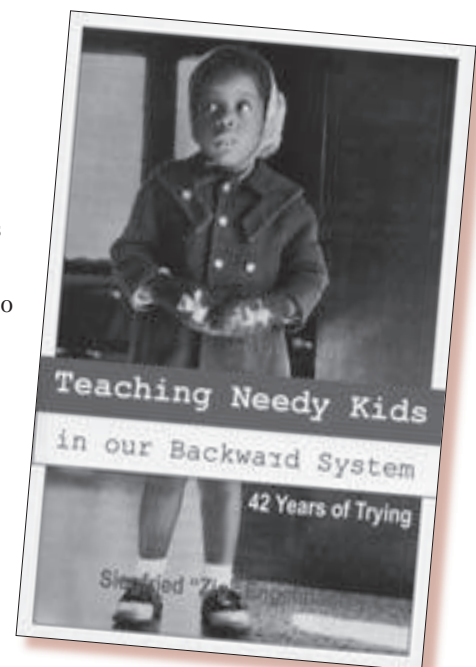
Striking Lessons

Superior teachers make lessons or presentations striking. Superior teachers shake students out of their complacency, challenge their system of beliefs with counterexamples and with logic. They force students to wake up. "Listen. Things are not the way you think." See Figure 2 for a few examples.

Figure 2

Examples of Striking Presentations

Students believe:	The teacher challenges:
It's not fair. I deserve better. Whine whine whine.	All beings suffer. All being die. All beings are imperfect. All beings are responsible for the meaning of their lives—including suffering and death. In the end, you have only family and yourself. And maybe not family. So, face the facts of life. Suck it up. Stand up on your hind legs. Strap on your gear. Lock and load. Move out! Or lay down and die. Nobody's going to carry you. We've got our own weight.
The government is good. I support what my government does. My president is so cool.	Hitler was cool, too. The government may be your enemy. Governments have no money—only what you give or what they take. Smarten up! You think a government that is going to *use* you will be honest? They know what to say to make you salivate. Be skeptical! Ask, "Who benefits?" Ask, "What's the price of these so-called benefits?" Is it your liberty?
America had slavery. The Founders had slaves. America is racist, sexist, classist, and genderist. Capitalism is based on exploitation of the workers. We need a social revolution.	Did you expect imperfect beings to create a perfect society? Utopia is in your mind only. All efforts to create utopia have produced mega death. And who will run this revolution of yours? Mere mortals? Mortals who are vain, greedy, prone to delusion, and driven by passion? Do you trust any person or any group that makes grand promises? How gullible *are* you? Is it logical to label a whole society as racist or sexist or whatever because *some* persons are racist, sexist, etc.? Name *one* society that has survived relentless and destructive criticism of its own values and institutions. Make things better. Don't throw out what you've got—or you'll end up in a very bad place.
War is bad. And unnecessary. It's better to negotiate with your enemy.	Sadly, our enemies don't want to negotiate—except to buy time while they arm themselves. What they want is you *dead*. You must learn the difference between an idea (peace through negotiation) and what's real. Read history! Besides, who said there are good and bad choices? Sometimes, the best choice is the just least bad.

Lessons, Morals, and Implications

Superior teachers ensure that there is a lesson, a moral, and implications for action.

"I'd better do some reading on revolutionary groups that claim they are working for The People, social justice, and peace. Maybe they use those words to lull The People to sleep so that they can take over without anyone noticing."

"If I'm so concerned about disadvantaged persons, maybe I should turn off the TV and volunteer somewhere." "If some of my beliefs don't fit with the facts, maybe I should examine other beliefs of mine, too."

"Time to quit making excuses and get to work."

Criticism, Not Negativity

Superior teachers show students that it is important to be critical but not relentlessly negative about their society's core values and institutions.

"How arrogant are we to judge a whole society, as if we could have done better. As if we know so much."

"If a house has *some* red paint on it, can you call it a red house?"

"If a society *used* to have slavery, how long should it be chastised for an evil that happened a long time ago? All of us were once crybabies. Should we consider ourselves to be crybabies the rest of our lives?"

"It is unwise to sacrifice the good on the altar of 'it could be better.' Are you going to starve because you can't have the perfect cheeseburger? You know what they call persons who refuse to settle for anyone but the best partner? They call them *alone*."

If I had had teachers who taught like this, maybe I would have learned something besides how to stick pencils in the ceiling. ~~ADI~~

Application of the Logico-Empirical Analysis

Editors' note: This article is a reprint of Chapter 6 from *Could John Stuart Mill Have Saved Our Schools?* by Zig Engelmann and Doug Carnine. The book, which has not yet been published, explores John Stuart Mill's system of logic and how it possibly would have changed today's educational practices and knowledge base if it had been applied to instruction. A video on Zig's website, www.zigsite.com, called "Theory of Direct Instruction (2009)" outlines the close relationship between Mill's *System of Logic* with that of *Theory of Instruction*, also written by Doug and Zig.

The preceding chapters develop the notion that designing effective programs involves two analyses: one is consistent with Mill's methods and addresses the logic of communicating through examples; the other addresses empirical issues, such as how much repetition should be provided for a particular step in the program. Issues of this type are not answered through a logical analysis of teaching presentations but through empirical information.

In this chapter, we will provide more detail about the relationship between these two analyses. The picture that we provide will necessarily be sketchy, but hopefully it will be adequate to illustrate the basic approach and the typical problems that are encountered.

In broad terms, the first and primary analysis is logical. Questions of clarity are approached first from a logical perspective, then an empirical perspective. Is the presentation clear in terms of what we show and the discriminations we teach? In practice, the answer is never definitively yes, but rather, apparently, yes. The empirical analysis renders the final decision on clarity.

The same relationship holds for questions of adequacy. Is the amount of practice provided adequate? Until empirical verification is obtained, the most positive answer is, apparently yes. The modifier "apparently" means simply that the design has gone as far as it can by applying both logic and empirical formulas. The goal is to design the program so that the program sequences are both apparently clear and provide adequate amounts of practice on the components taught in the sequence.

The logical analysis is often influenced by knowledge of empirical relationships. For instance, we have learned from extensive applications that nothing may be assumed to be taught to at-risk children unless it appears on at least three consecutive lessons. For programs that teach English to non-English speakers, at least four consecutive lessons are needed before something may be assumed to be taught. When we apply this formula to the first draft of the material, we presume that when the program is field-tested, our estimates will be confirmed. However, we remain perfectly aware that in some cases the practice estimates are wrong. They may vary in either direction—providing too much practice, or providing too little. More frequently the error is in the direction of too little practice.

Sequence-Related Inferences

An important issue that we must address in creating a sequence of activities is how large the inferential gaps are between one exercise type and the next type in the sequence. These inferences have nothing to do with the effectiveness, clarity, or adequacy of the component exercise types in the sequence. They involve only the magnitude of gaps between the exercise types.

The formula for creating a successful sequence of activities is relatively simple in broad terms: start with the most basic skills and information students need, and then progressively move to more sophisticated examples. The question facing the instructional designer involves translating the general progressive movement to more sophisticated examples into a series of exercise types that are different from each other but that are related. If we were to unintentionally design a program with enormous gaps for teaching reading, we might first teach letter names, teach the short sounds for the vowels, and then require learners to sound out regularly spelled words like *run* and *hat*. Obviously, the gap between the exercise types is large because students haven't been taught the sounds for the consonants, or how to blend the sounds together to identify words.

Although some bright students may be able to formulate workable inferences about how to derive the sounds from the names of some consonants, most students will fail the instruction because of the large gap between what they know and what they are expected to do. Discovery learning assumes that students are able to fill large inferen-

Help us out!

Contribute your story of success with DI! We want to hear from you!

You all have stories and it is time to share them. This is *your* journal—let it reflect your stories!

See the directions on page 2 on how to make a contribution. You'll be glad you did.

tial gaps between what they know and what they are expected to learn. Proponents of structured instruction believe that only small sequence-related inferences are appropriate.

Note that there will always be inferential gaps between exercise types. The only issue is how large they are. This is an empirical issue. If we believe that students should be successful, we would design instruction so the inferential gaps are small enough for students to succeed. If students do not succeed, their failure suggests that the inferential gaps are too large, which means that the sequence should be redesigned to make the gaps smaller.

Direct observation of how students respond to a sequence is necessary because that is often the only way these gaps are identified. Typically students are progressing through a sequence well and then encounter an exercise type that is too difficult for them. If the exercise seems clear and apparently provides adequate practice, the problem is not with this exercise type but with the sequence of activities. In other words, student performance implies that there is a gap in the sequence that is too large for the students.

As suggested above, the size of reasonable gaps is not the same for all students. The children we have worked with have ranged from those who could not take even the smallest imaginable steps without considerable practice, to children who drew correct inferences that were far in advance of what they had been taught.

At the extreme low end was a pair of twins who had spent the first four years of their lives with virtually no human contact and who could identify some real objects, like a shoe, a ball, and a cup, but could not identify any two-dimensional representations. Even when the teacher prompted the relationship by holding a red ball next to a picture of a red ball, the children

could not identify the object in the picture. After many trials, they could identify pictures of balls, shoes, and cups without the corresponding three-dimensional object next to it; however, these children had to practice identifying more than 10 illustrated objects before they could generalize and identify an illustrated object that had not been taught.

At the other extreme are the highly talented students who make a mockery out of the three-lesson rule. They learn names of new things in only a couple of trials and are able to take

The logical analysis is often influenced by knowledge of empirical relationships. For instance, we have learned from extensive applications that nothing may be assumed to be taught to at-risk children unless it appears on at least three consecutive lessons.

great leaps from what they know to remotely related inferences they are scheduled to learn much later.

If the designer assumes that every minor variation in what is to be taught requires explicit instruction, the instructional sequence may be many times more laborious than it needs to be for the average learner who goes through the program. On the other hand, if the designer makes elitist assumptions that characterize analyses of Dewey and Bruner, the inferential leaps required by the program are so large that they may be made by fewer than one fourth of the students. For example, a math program that presents a single example

of each problem type assumes that students will formulate an algorithm for solving the problem presented that will generalize to the full set of related problems that are not taught. In fact, possibly only one-fourth of the average students will solve the problems or benefit from the experience of struggling with them. The percentage of low performers making this leap is virtually zero percent.

The only way to determine whether the program is highly effective with the intended student population is to provide an empirical test of the sequence. This test will not only identify the missing inferences but will reveal both their character and size. In other words, they provide the designer with precise information about how to address the missing inference.

Rounding Numbers

The designer must carefully attend to the sequence-related inferences because the students' performance may give the impression that there is a huge inferential gap in the sequence, when only a small inference is missing from a sequence. In early 2010 we experienced a good example of how elusive a missing inference may be, even for an astute observer. The second-grade math program we were field-testing had a sequence designed to teach estimation. We based the sequence on what the children had already mastered. They could identify numerals through 1,000. They could count by ones and tens and could work oral problems that required them to add 10 to two-digit values (What's 37 + 10? What's 52 + 10?). They could reliably identify numerical values that were more or less than comparison values. They could add and subtract column problems that had two-digit and three-digit numbers and that involved either carrying or borrowing.

An analysis of what they would have to learn to estimate the answers to addition or subtraction problems disclosed that the key skill was to round num-

bers to the closest tens number. Once students became well practiced in rounding, the next step would show them how to convert any addition or subtraction problem to a rounded counterpart. For example:

57 + 24 is converted into 60 + 20

The answer to the problem with rounded numbers provides an answer close to that of the original problem.

The first skill we taught showed children how to divide intervals like 50 to 60 into numbers that were closer to 50 (51, 52, 53, 54) and numbers closer to 60 (56, 57, 58, 59). The routine was simple. The teacher would first show a pair of tens numbers on a number line and teach children the numbers that were closer to each tens number.

30_ _ _ _35_ _ _ _40

"The numbers closer to 30 are 31, 32, 33, 34. Say the numbers that are closer to 30."

"The numbers closer to 40 are 36, 37, 38, 39. Say the numbers that are closer to 40."

"Say the number that is in the middle." (35.)

After working with different tens numbers for several days, students would respond to verbal tasks.

"Everybody, start with 50 and count to 60."

"Say the numbers that are closer to 50." (*51, 52, 53, 54.*)

"Say the numbers that are closer to 60." (*56, 57, 58, 59, 60.*)

After practicing variations of this routine with different pairs of tens numbers for several days, students were able to identify the *tens number* that was closer to a specified number.

"Listen: 56. Is 56 closer to 50 or 60?"

"52. Is 52 closer to 50 or 60?"

"57. Is 57 closer to 50 or 60?"

After several days of identifying the closer tens number, students would be introduced to the final step of constructing a problem with tens numbers and estimating the answer to the original problem. For example:

57 + 24

"Is 57 closer to 50 or 60?"

> *The first skill we taught showed children how to divide intervals like 50 to 60 into numbers that were closer to 50 (51, 52, 53, 54) and numbers closer to 60 (56, 57, 58, 59).*

"Is 24 closer to 20 or 30?"

"The estimation problem is 60 + 20."

None of the steps seemed to require a large sequence-related inference. It seemed that if students were able to say the numbers that were closer to 50 and 60, closer to 70 and 80, and closer to other pairs, they would certainly be able to identify the *tens number* that is closer to 73 or 28. And if they could identify these numbers they would be able to construct a problem of rounded numbers and quickly arrive at the estimated answer.

The sequence passed our test of clarity and adequacy without being too laborious. So it was ready for field try-out. We tested the program in several sites. The results reported from a classroom in Baltimore implied that the step of going from saying the numbers that are closer to each tens number did not guarantee that students would be able to correctly identify the

tens number that was closer to a specified number.

Here's part of an email from Don Crawford who works for the Baltimore Curriculum Project and who had worked with and coauthored a program with Engelmann.

> I watched part of this lesson with Ms. Kramer. The kids slammed through the perimeter like a hot knife through butter. They also did well on the adding and subtracting tens numbers. They were having difficulty with Exercise 4, the exercise on estimation. She walked the class through every example, asking, "Is it closer to 70 or to 80, or is it in the middle? Think carefully. Which one is it closer to or is it in the middle?" They weren't getting it. I'll bet the kids were getting it wrong randomly from the start and she couldn't firm them. When she asked which number is it closer to, she did not get a unison response, even with lots of think time. My guess would be that the idea of spatial distribution implied in "which number is it closer to" isn't being comprehended.

> Alternatively, you didn't ask me, but I would start it like this in workbook exercises…

Don described a fairly elaborate sequence of activities involving visual displays. Engelmann responded the same day.

> Don:

> Thanks a lot for the feedback. Without it we might not have found out about the rounding problem. Obviously, there is something wrong with the sequence, but the fixing may be pretty straightforward if students know the things they're supposed to know. The idea of fix-

ing it is like finding a hole in the roof. Possibly the whole building has to be rebuilt. Possibly the rest of the building is okay or needs only minor tweaking, not rebuilding. Just as the rule would be that you provide the least invasive remedy here, you do the same with instruction. You postulate alternative models only as a last resort because they are time consuming, space consuming, and may generate problems as severe as or more severe than the one you have observed.

With respect to rounding, if the kids can reliably respond to the directions "Say the numbers that are closer to 50" and "Say the numbers that are closer to 60," the correction or adjustment is in the can.

For example: 54.

Say the numbers that are closer to 50…

Did you say 54?

So is 54 closer to 50 or 60?

Example: 57.

Say the numbers that are closer to 50…

Did you say 57?

Say the numbers that are closer to 60.

Did you say 57?

So is 57 closer to 50 or 60?

Of course this assumes that the kids are firm on saying the numbers that are closer to 50 and 60. If they are, the sequence above could teach the relationship between what they know and how they need to apply it in a matter of less than 5 minutes. All done.

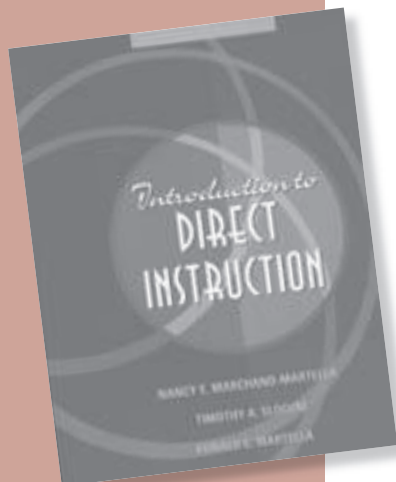We'll be sending out a remedy for the teacher today.

Again, I don't intend to put down your suggestions, simply to show that there's a simpler route.

The next day, Don sent another email.

Zig,

I'm sending video clips that I hope will come through from today's lesson. Ms. Kramer did the remedy on estimation. The remedy worked beautifully. And then about 20 minutes later I had the teacher redo the exercise from the previous day on estimation from Lesson 69. They did the first half of the problems and 100 percent of the students were getting answers correct, so we moved on. No other issues surfaced. All the students seemed to have the material down cold, so that is good.

The apparently brash prediction that Engelmann made about the students being able to learn the relationship in a few minutes was based on what the students could do before the remedy and the size of the missing inference. The only possible thing the students could not have known is how saying the numbers closer to 50 and closer to 60 was related to the task of identify-

ing the closer tens number for 54 or 58. Mentally, all they would have to do is say the numbers closer to 50 to themselves and check whether they say the targeted number.

The remedy simply articulated the relationship by directing children to say the numbers that are closer to a tens number and then asking the question, "Did you say _____?"

This step appears to be so small that if the remedy had not been observed, someone might not believe that putting the step in the sequence would create such dramatic results.

This example reveals some of the more obscure but important facts about empirical validation:

1. Simply providing students with additional practice on the difficult tasks and giving them additional thinking time before responding did not forge the missing link between what they knew and what they needed to know. During the thinking time, the students obviously were not testing numbers by comparing them to numbers that are closer to a tens number.

2. The authors most probably would not have discovered the problem if there hadn't been a field test and a set of very compulsive rules about using data obtained by the field test to identify weaknesses in the program sequences. The empirical analysis is not simply ritual, but a potent component that guides the logical analysis.

3. As Don's response documented, the entire sequence appeared to be ill conceived when only one relatively tiny discrimination was missing. Don is a very sophisticated observer, so if he did not identify the missing small inference that could account for the students' performance, it is not likely that even very competent teachers would. In Don's defense, he did not observe

the students' progress from the beginning of the rounding sequence, so he may have lacked information needed to identify the link. In teachers' defense, they are not trained in the skills needed to identify problems of this type. Their typical response to the students' failure is to repeat the material, which works in some cases but often isn't effective when the sequence is flawed.

The procedure for precisely formulating a remedy in a sequence that seems to be flawed is logical. We compare the relevant skills students have with what they are expected to do. The difference between the two describes the missing inference or inferences.

Remedies for Missing Inferences

The procedure for precisely formulating a remedy in a sequence that seems to be flawed is logical. We compare the relevant skills students have with what they are expected to do. The difference between the two describes the missing inference or inferences. If the difference is fairly large, the remedy would necessarily be fairly elaborate. If the difference is as small as it was in the rounding example, the remedy may be effected in a few minutes.

The rounding sequence would have a larger inference gap if we omitted any of the exercise types we presented in the Baltimore sequence. If we omitted all of the steps, we would simply give students a brief statement about how

to round and then require students to identify the tens number closest to 36, 58, 72, and so forth.

What is interesting is that the students who go through this sequence *could respond exactly the same way the Baltimore students performed in the flawed sequence we presented.* Therefore, if we simply view the student responses, we cannot identify an efficient solution. Only if we compare the knowledge base the students originally had with what the exercise expected the students to do can we identify that the inference gap is much broader than it was with the Baltimore students.

Consider the possible reasons students could have failed in the instructional sequence that left out all the steps. Possibly they didn't know which numbers were closer to a specified tens number. Possibly they didn't know an operation for testing different numbers. Possibly, they were confused about what constitutes a tens number. The only way to ensure that students had the missing skills and information they lacked would be to test them, then provide the remedies for what they don't know. If the students were like those in Baltimore, we would discover that we had to teach all the details that were in the fixed-up program used in Baltimore.

The same basic procedure applies to anything students are taught: compare what they know with what they are expected to do. The difference describes the missing skills or knowledge. In 1965, Engelmann and his colleagues applied this logic to beginning reading. They discovered that the preschool children they worked with could sound out written words but could not identify the words they sounded out. What was the lacking skill? A very short investigation revealed that they couldn't say words that were presented *verbally* by the teacher a sound at a time. This was a simpler example than reading words, so the assumption was that it would be

a small step for children to sound out and identify written words if they could first identify words that were orally "sounded out." Although the field of reading had later come to recognize the importance of this missing inference, the field missed the point by labeling it *phonemic awareness* and treating it as a vague intervention that prepares students to read. It is not vague. It is a missing sequence-related inference that is clearly implied by identifying the difference between what children know and what they are expected to do.

As the illustrations show, there are various ways to design instruction, and there are many ways that the sequence can fail. The only certain way to determine which parts of sequences fail, and the only certain way to determine how to remedy problems of failure, is to observe student performance, with great attention to the difference between what they are able to do and what they are expected to do. When their performance reveals that they are unable to do something they were expected to do, the remedy becomes a question of logic.

The formula will be greatly compromised, however, unless the designer of instruction recognizes that the students' responses are the ultimate determinant of whether or not sequences work. Certainly, the designers can ignore the data if the teacher is not following program specifications or if the children are not appropriately placed in the program. If the students are appropriately placed, however, and if the teacher follows program specifications or gives evidence of trying, the designers can't exercise the options of either ignoring the data or blaming the teacher for not "teaching." The program sequence must be recognized as the cause of the students' problem. And the only acceptable solution is to use the evidence of the students' performance to determine how to modify failed sequences.

Bruner's Theory of Instruction Revisited

In microcosm, the rounding sequence illustrates the key processes that are involved in instructional design. Therefore, any worthy theory of instruction would recognize the processes, the need for observation, and the manner in which a logico-empirical approach employs two complementary domains to shape instructional sequences.

The only certain way to determine which parts of sequences fail, and the only certain way to determine how to remedy problems of failure, is to observe student performance, with great attention to the difference between what they are able to do and what they are expected to do.

Compare the requirements that Bruner (1966) ascribed to instructional theory with the processes illustrated above:

1. **A theory of instruction should specify the experiences which most effectively implant in the individual a predisposition toward learning.** (p. 41)

The rounding illustration describes a process for finding out which experiences predispose the learners to learn something. The assumption is that the students' predispositions are revealed by their learning performance. Learners who learn are obviously predisposed to learn. From an instructional standpoint, the formula for implanting or causing this predisposition is to provide success. If the learner receives evidence of being successful, the

learner has a basis for being predisposed to further learning. This learner assumes that she will learn whatever the teacher presents next. Let's say that students had gone through the fixed-up sequence for rounding and could reliably identify the closest tens number but hadn't yet learned to construct estimation problems. We could ask them to estimate how successful they think they would be on the next thing the teacher presents. We would find that they rate their "predisposition" as being very high. In contrast, if learners had struggled through a flawed sequence and had never mastered some of the discriminations, their judgment of their predisposition to learn the next thing the teacher taught would understandably be lower.

The results of Project Follow Through revealed that the students in the Direct Instruction model scored higher in positive predisposition to learn than students in any of the other models (Stebbins et al., 1977). The Direct Instruction students estimated that they had a high predisposition to learn because they knew they had been able to learn what their teachers taught.

In summary, the formula for *causing* a predisposition for learning is simply to engineer success.

2. **A theory of instruction must specify the ways in which a body of knowledge should be structured so that it can be most readily grasped by the learner.** (Bruner, p. 41)

The rounding example does not address this issue, because rounding is not a body of knowledge, but it does show how whatever is taught should be structured so that it can be readily grasped by the learner (not "most readily" grasped but clearly grasped). Just as there are different ways to teach rounding, there are many options about how to teach a body of knowledge. However the body of knowledge is originally conceived, it

must provide instruction for all aspects of what the students are expected to learn. The program development is achieved through the logico-empirical procedure of teaching material in small steps and revising the sequence if student responses indicate that the sequence is flawed.

The guidelines for sequencing the body of knowledge are as follows:

a. First teach processes and information that are most generalizable.

b. Don't introduce any vocabulary that is not necessary.

c. Present nuances and subtypes of what is to be taught only after the formidable structures and processes are in place.

In other words, students don't need to learn the words *numerator* or *denominator* when basic fraction operations are taught, because these words are unnecessary for inducing understanding of basic operations. Later, however, students should learn these terms so they will have "proper" understanding, with the knowledge that these terms have only a nominal relation to basic fraction properties and operations.

3. A theory of instruction should specify the most effective sequences in which to present materials to be learned. (Bruner, p. 41)

This requirement misses the point of designing instruction. The rounding example didn't necessarily present the most effective sequences, but the most effective *process* for creating effective sequences. The process outlined is the only one that guarantees that sequences will be shaped so they become effective.

4. A theory of instruction should specify the nature and pacing of rewards and punishments in the process of learning and teaching. (Bruner, p. 41)

This is clearly an empirical issue that rests firmly on what contingencies have evidence of being reinforcing or punishing. This issue should not be clouded by what we may believe are reinforcers or punishers. Their status can be identified only by observing behavior. However, many of the current trends present things the designers misinterpret as being reinforcing, when in fact they are punishing. One reason is that designers sometimes look at the wrong behavior.

Missing sequence-related inferences may be identified by a careful analysis of the material used to teach the students. However, the analysis probably won't identify all of them. An empirical test of the sequence will.

For example, the designer attempts to seduce students by initially presenting activities that are reinforcing for them with the rationale that once students are lured into the lesson, they will find the instruction that follows the luring activity more reinforcing. Clearly there are two empirical issues—whether the activity is actually reinforcing and whether it has a reinforcing effect on the activities that follow in the sequence. The empirical fact is that lessons are best designed so that the rewarding activities are presented at the end of the lesson, not the beginning. At the end, they function as payoffs for students working hard. At the beginning, however, they serve as false lures that hook the learners, but the real lesson work that follows is punishing because students prefer to continue with the luring activity. In contrast, if students learn that their only access to something they like a lot is to do the real lesson work, the

reinforcing activity serves to reinforce the hard work. In other words the hard work becomes more reinforcing for the students because this work leads to the reinforcing activity.

If the luring technique is observed and student performance on the following activities is noted, the problems with the luring activity are easily identified. The fact that seductions continue to be used strongly suggests that the observers are not using the student performance as the ultimate determinant of whether the lures influence behavior positively or negatively.

The Logico-Empirical Analysis and the Scientific Method

Although Bruner's conception of instructional theory alludes to some important theoretical issues, it is weak because it is based on absolutes—the most effective sequences—rather than processes that lead to the development of highly effective sequences. As noted above, the strategy involves two parts. The first involves applying logical principles for creating sequences that generate only one inference and for sequencing these so the steps between them are small enough that the learner should be able to take them.

The second part involves empirical tests that show whether the sequences were designed with adequate practice and were sufficiently clear. The empirical tests also reveal whether students were able to draw the inferences necessary for them to proceed smoothly through the sequence of activities.

This empirical process is best conceived of as an application of the scientific method. There are different descriptions of this method, but the one that best captures the instructional applications begins with observations. These are not observations expressed as numbers, or observations that are tainted by interpretation. These are raw observations of how

teachers and learners actually perform in response to specific material.

Traditionally, process incorporates a cycle that is designed to lead to a theory: **observation, problem identification, hypothesis, prediction, test**. For instructional applications, the cycle is repeated until it seems that the program will work well with the intended population of students.

The interchange between Crawford and Engelmann illustrates this cycle.

It started with Don's **observation** that revealed a **problem** with the material being taught.

The next step involved **hypotheses** about how to correct the observed problem.

The next step involved **predictions** about what would work and why.

The next step was construction of an empirical **test** that took the form of a remedy to the problem.

The final step was an **observation** of the students' responses to the test, which confirmed the more efficient hypothesis.

Until this process is recognized as the only scientific or efficient way to create highly effective instructional material and procedures, there will be no recognized theory of instruction that has substance because alternative theories won't be grounded in the facts of teacher-student performance or effective ways to use these facts.

In summary, this chapter addressed the issue of whether an instructional sequence provides teaching for all the inferences that students need to do well on the sequence. Missing sequence-related inferences may be identified by a careful analysis of the material used to teach the students. However, the analysis probably won't identify all of them. An empirical test of the sequence will.

The designer assumes that the program is at fault if observations reveal that students fail. The designer further assumes that if students are unable to perform an exercise, the sequence is flawed, either because an exercise is clumsy or the students have not been taught everything they need to perform well on the exercise.

The magnitude of these sequence-related inferences may be accurately assessed simply by comparing the current knowledge base of the learner with what the difficult exercise requires them to do. The difference describes the inference or inferences that must be inserted to make the sequence effective.

The designer uses logic to create instruction for any missing inferences. Then the designer must return to the empirical arena to determine whether the remedy for the sequence is effective. This possibility is not revealed by logic but by field-testing the material.

Student problems don't always imply the extent to which the sequence needs to be revised. In some cases, the students' failure may suggest that the entire sequence is flawed when in fact only a small discrimination is missing.

In other cases, the same student responses are the result of a seriously flawed sequence. The only certain procedure for determining the magnitude of the missing inference is to compare the students' knowledge base with what they are expected to do.

A well-designed field test of programs being developed is an application of the scientific method for discovering what causes what. The steps in the method are observation, problem identification, hypothesis, prediction, test, and observation. Applying the method identifies specific difficulties students and teachers encounter and clearly implies missing inferences as possible causes. The method also determines whether the remedy solves the problem initially observed. **ADI**

References

Bruner, J. S. (1966). *Toward a theory of instruction.* Cambridge, MA: Harvard University Press.

Stebbins, L., St. Pierre, R. G., Proper, E. L., Anderson, R. B., & Cerva, T. R. (1977). *Education as experimentation: A planned variation model (Vols. IVA-D).* Cambridge, MA: Abt Associates.

Dear friends in the DI community,

What do you remember most about your first experience seeing or using DI?

You no doubt have plenty of stories to share about your first time with Direct Instruction, whether it was 30 years ago or last month. We hope to hear these stories—and learn from them—in upcoming issues of the DI News.

Send us your responses—short answers are fine—to Don Crawford, **dc0843@aol.com**, or Randi Saulter, **itsrandi@aol.com**. Let us know your name and your affiliation (school, organization, synagogue, rifle club, political party, etc.). Have a good idea for a future question? Let us know that, too!

—*Don & Randi, editors*