What Makes Schools Effective

By Richard H. Hersh
Dean of the Graduate School
University of Oregon

Editor's note. This article first appeared in the Eugene Register-Guard as a two-part series on November 23 and 26, 1981. It is reprinted here in full with the permission of the author and the Register-Guard.

For the past two years I have been reviewing literature to determine what, if anything, makes some schools and teachers more effective than others. "Effective" here refers to student academic achievement as measured by standardized achievement tests, usually in reading and math. This is not to suggest that such schooling outcomes are the only objectives we should consider but rather that they are, for the moment, the only variables on which we can easily compare schools.

Happily, there emerges from such research a variety of clues, which when put together into a coherent whole, seems to make a great deal of intuitive sense.

What is particularly pleasing is that different researchers in a variety of studies are reaching similar conclusions about effective schooling. Further, these conclusions are reinforced by the recent pronouncements of the critical end of the experience. This conjunction of researchers' knowledge and professional educators' wisdom marks the first time in years that one might believe optimistically in the possibility of improving education in America.

During the early 1970s researchers had the public and policy makers believing that variations among schools made no difference in student learning. Although teachers' and administrators' daily lives denied such a conclusion, their protests were muted by the media and by criticism of already damned American schooling. Now research findings and educational reality are congruent.

Third powerful facts have emerged. First, people run schools. How teachers, administrators, and students behave in a school setting matters and accounts heavily toward determining a school's effectiveness. Second, quality and not just quantity of effort, materials, and time is what counts. Previously measured factors such as the total books in the school library, amount spent per child, and the average number of years of teaching experience have been shown to account for little difference between more and less effective schools. Third, the curriculum of the school, which includes both what is taught and how it is taught, is important.

The accompanying table lists two sets of attributes associated with most effective schools. Under the heading "Social Organization" are listed those items which pervade the school building. These attributes (Clear Academic and Social Behavior Goals; Order and Discipline; High Expectations; Teacher Efficacy; Pervasive Caring; Public Rewards and Incentives; Administrative Leadership; Community Support) help promote school-wide conditions for teaching and learning across all classrooms. In essence, these are necessary social conditions which help individual teachers and students to excel.

The second set, "Instruction and Curriculum," subsumes those items which are found in the most effective classrooms. These attributes (High Academic Learning Time; Frequent and Monitored Homework; Frequent Monitoring of Student Progress; Tightly Coupled Curriculum; Variety of Teaching Strategies; Opportunities for Student Responsibility) help promote the classroom conditions for maximum student engagement with purposeful learning activities.

Please note that the distinction between the two sets of conditions ("Social Organization" and "Instruction and Curriculum") is not hard and fast. In fact they are both overlapping and interactive, complementary and reciprocal to each other. Clear school-wide goals, for example, not only may help generate community understanding and support but also may allow individual teachers to better assess the fit between their expectations for students, students' expectations for themselves, and the curriculum.

Attributes of Effective Schools

<table>
<thead>
<tr>
<th>Social Organization</th>
<th>Instruction and Curriculum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear Academic and Social Behavior Goals</td>
<td>High Academic Learning Time (ALT)</td>
</tr>
<tr>
<td>Order and Discipline</td>
<td>Frequent and Monitored Homework</td>
</tr>
<tr>
<td>High Expectations</td>
<td>Frequent Monitoring of Student Progress</td>
</tr>
<tr>
<td>Teacher Efficacy</td>
<td>Tightly Coupled Curriculum</td>
</tr>
<tr>
<td>Pervasive Caring</td>
<td>Variety of Teaching Strategies</td>
</tr>
<tr>
<td>Public Rewards and Incentives</td>
<td>Opportunities for Student Responsibility</td>
</tr>
<tr>
<td>Administrative Leadership</td>
<td></td>
</tr>
<tr>
<td>Community Support</td>
<td></td>
</tr>
</tbody>
</table>

Continued on Page 14

Direct Instruction On Line

By Robert C. Dixon
Martin A. Siegel
University of Illinois

The boom in third-wave computer technology over recent years is spreading from business applications to educational applications. On the one hand, the prospect of widespread computer usage in the classroom is full of promise. In reality, however, little that has been promised has actually been realized. Francis D. Fisher recently reviewed computer coursework for the Ford and Carnegie foundations, and reached this conclusion:

"Educational coursework is beginning to appear, but most is simplistic in design and fails to exploit the teaching power of the computer."

This conclusion may surprise some educators, but not devotees of Direct Instruction, who have long held a position strikingly similar to Fisher's with respect to the traditional delivery of instruction:

"Instructional material has been around for a long time, but most is simplistic in design and fails to exploit the teaching power of human beings."

The fact is, computers are no more innately competent to teach than are people — indeed they are certainly less so. The fact that computers have many capabilities relative to effective and efficient instruction does not in any way insure that such capabilities will be exploited. Obviously, the effectiveness of computer-based education is contingent upon the principles of instructional design that guide the development of the coursework.

The Computer-based Education Research Laboratory (CERL) at the University of Illinois uses two Control Data Corporation main-frame computers to deliver instruction on approximately 1200 terminals stationed, literally, around the world. CERL's particular computer configuration is called PLATO. Many sources develop curricula for PLATO, and the range of that curricula most likely approaches that found in non-computer (off-line) cur-

Continued on Page 13
Dear Editor:

I use DI programs because they work. My students, who use Decoding C, do improve their reading ability and their scores. I like DI programs because they are organized in a logical manner — new information build[s] on old and old material is continually reviewed.

I approve of teaching to mastery and the concept that all students can learn the material.

I like the structured correction procedures.

John S. Zinelmier
Bridgewater, California

Dear Editor:

I use DI programs because they raise students’ scores in reading, math and language quickly. I can think of several students, for instance, whose reading scores gained more than a year in just one year’s time. This is really exciting for me and for the students.

I use DI programs because students have a better chance of being mainstreamed into the regular classroom. This chance also comes quicker with DI. Since I have worked with DI programs, I’ve had three students mainstreamed into regular classrooms. At the end of this school year, I will have three more students to mainstream next year because of their progress this year.

I like the way the DI programs have a system of motivation built into them. This really helps in classroom management, especially in a classroom-like mine where there are so many different types of students, some of whom have violent tempers and are highly volatile.

DI has benefits for the professionals and paraprofessionals who use these programs. We have the chance to learn these programs and become proficient at them. Training sessions and daily usage greatly help this skill development.

Leslie Anne Hart
Welton, Arizona

Research Reports

Russell Gersten, Director of Research at the Direct Instruction Model Institute at the University of Oregon has recently made several DI-related presentations at national conventions including:


Copies of these papers are available by writing Gersten at Follow Through/Education, University of Oregon, Eugene, OR 97403.

Recent Publications


Two Follow Through Directors Resign

Joan Guikin resigned recently as Director of the Direct Instruction Model Implementation Site in New York, N.Y. She had held that position for many years. Joan was presently given a distinguished service award by the DI Model Sponsor Staff for her years of commitment to the Model and to educational excellence for the students of P.S. 137 in Brooklyn, N.Y.

Marion Wilkins will retire this summer from the Director of the Model Implementation Site in Flint, Michigan. Marion has directed the Flint Project since 1964. She will be greatly missed by all the sponsoring staff who have worked with her over the years, but we all extend our best wishes for the future.

*This figure represents 460 memberships and 60 subscriptions only. If you receive the DI NEWS through subscription, please consider becoming a member of ADI. Benefits of membership are listed on the front which appears on the back page of this issue. If you have been receiving the DI NEWS under our distribution policy, you are not a member of ADI. If you wish to be included in the membership, please contact us at your earliest convenience.*

Happy Birthday ADI - and Many Happy Renewals

ADI and the DI NEWS are one year old this month. And we’re happy to report that as we march into our second year, we’re at the 500 mark in memberships and subscriptions. You have followed our DI Guilt in supporting the movement during this first year. We hope to add many of your colleagues around the U.S. and around the world to our ranks in the coming year. But the real criterion we must meet is to secure membership for additional members and subscribers — that’s you.

We sincerely hope that you feel the Association and the DI NEWS merit your continued support. You may use the form on the back page of this issue to renew — or you may renew in person if you plan to attend the Conference in Eugene this summer. If you question whether we deserve your renewed support, the fact that you give us one more chance — and that we write to let you know what we could be doing to make the organization and/or the DI NEWS more worthy of your investment. We want very much to be a consumer-oriented group and to produce a user-oriented publication. With your help, we can do that we can do better in meeting your professional needs.

To encourage new members, we are offering a special ‘extended membership’ persons joining by August 1st. Join now and receive the year you pay for plus the time you receive the newsletter, which runs until August 15th. The sooner you join, the longer your bonus period will be. Persons whose membership is received by August 1st will be considered charter members of the organization and will receive copies of the first four issues of the DI NEWS.

We hope that you will continue to support ADI and the DI NEWS during the 1983-84 school year and that you will encourage your colleagues in your area in supporting us, as well. If we all help, the membership/subscription list will continue to grow, we will all benefit from the increased services that such growth will enable us to provide. We hope to hear from you.

Stan Paine
President ADI

The DI Direct Instruction News is published Fall, Winter, Spring and Summer, and is distributed free to members of the Association for Direct Instruction. Readers are invited to submit articles for publication relating to the DI. Send contributions to: The Association for Direct Instruction, P.O. Box 10252, Eugene, Oregon 97440.

Editors: Wes Becker
Art Director: Stan Paine
Layout: Susan Johnson
Photography: Springfield News
Typesetting: Springfield News
Printing: Alton Munks

DI DIRECT INSTRUCTION NEWS, SUMMER, 1982

2

New Program Notes

DISTAR Reading, Level Five, is currently in the final stages of completion by the University of Oregon Research Associates (SRA) this fall. Work will begin this summer on DISTAR Reading, Level 6.
Taking DI to the Community with "TMR's"

By Robert H. Hornor
Heidi Rose

Direct Instruction typically brings to mind small groups of students sitting around a teacher, rapid pacing, and carefully programmed academic materials. The technology of Direct Instruction, however, appears to have much promise for teaching vocational, self-help and community living skills to severely handicapped learners as it does for teaching math, reading, and language to non-handicapped students. Consider Lisa.

ROBERT H. HORNER

Lisa is eighteen years old, severely retarded, minimally verbal, and a student in a secondary "TMR" classroom. During her IEP meeting Lisa's parents indicated that they want her to learn skills that would allow her to function more independently in community settings. They would like her to cross streets independently, purchase items from stores, go to movies, and learn a vocation. Two characteristics of these requests are worthy of note. The first is that they reflect a growing trend toward identifying age appropriate, functional, community-referenced objectives for severely handicapped students. The second characteristic is that unlike many of the skills taught to severely retarded students, the above activities require acquisition of a general case skill - one which the student can use in a wide variety of contexts. The purpose of this article is to describe recent efforts to use direct instruction procedures to teach general case skills to severely handicapped students.

"The general case has been taught when, after instruction on some tasks in a particular class, any task in that class can be performed correctly (Becker & Engelmann, 1979)." For example, a student in a classroom that has learned the general case for double digit addition when s/he can add any pair of double digit numbers. A student in the community has learned the general case for cross street crossing when s/he can cross any street in town. Community skills are usually different from classroom skills in that they: (a) take longer to perform, (b) require more complex motor responses, (c) include more distractors, and (d) are more likely to change across performances. People with severe disabilities often do not perform daily living skills related to moving about in the community, purchasing items, visiting friends, or taking advantage of leisure activities (movies, parks). With recent efforts to include severely handicapped individuals in community options there has come an interest in how to teach these basic community skills. As with early efforts to teach math and reading, early efforts to teach community skills to severely handicapped students have focused on teaching a single example of the skill, and hoping that after the student learns that example s/he will be able to do other examples. As with our experience in teaching math and reading we have learned that severely handicapped students do not "generalize" very well. While Direct Instruction with severely retarded students in the community may look different that Direct Instruction of math skills with a small group of non-handicapped children, the principles in use are the same. To teach community skills with severely handicapped students requires the same care in selecting and sequencing teaching examples as is found in a DISTAR program. A Direct Instruction teacher avoids student confusion about "b" and "d" by selecting and sequencing teaching examples. Similarly, the confusion associated with one-way and two-way streets is avoided by selecting and sequencing teaching examples.

Any community skill which requires that students perform correctly in non-trained situations (i.e., new streets, new vending machines, new electronic games, new items in the store) is a general case skill. The ability of severely handicapped students to learn these skills rests largely with the ability of teachers to adapt Direct Instruction technology to the community. A rose is a rose is a rose (Gertrude Stein, Sacred Emily, 1913)." In most cases you can also assume that the process for adding two numbers, or the rule for defining a language concept will be the same from place to place and time to time. Because math, language, and reading skills are nearly the same in all parts of the country, it is reasonable to build programmed texts for teaching these skills. Unfortunately, the same strategy does not work for community skills. The skills required for street crossing in Eugene, Oregon are different from those needed in Denver, Chicago, or New York. The vending machines in Miami are different in their shape, sounds, and methods of operation from those found in Wyoming, even though they have many similarities. As a result, there are few programmed materials which teachers can use that are programmed for their local community. Of more importance, it is unlikely that a curriculum soon will be published which meets all the requirements of all local communities. The need to teach community-referenced skills, and the diversity among communities require that teachers of severely handicapped students assume a major role as developers of community skill sequences.

For the teachers of severely handicapped students, the teaching skills of pacing, prompting, reinforcing, and correcting must be supplemented with competence in selecting and sequencing teaching materials. Because of this recent research at the University of Oregon has begun to address rules that teachers can use when programming vocational and community skills with severely handicapped students. Two examples of this research will be described next.

As older severely handicapped students prepare to leave school, access to employment becomes a major concern. A recent study conducted by Rebecca McDonald examined the use of DI to teach a general case vocational skill. The skill involved using a pinger-like tool to crimp and cut the wire leads of circuit board assembly performed by handicapped and non-handicapped workers in the electronics industry. The job requires a general case skill because the type of components that are crimp/cut will vary from day to day. All components require the same manipulation of the pliers and squeezer, but different components require slightly different ways of performing the task. Small components, for example, are more difficult to place in the piers and the big components can get twisted. Errors occur if the piers are not held next to the head of the component or if the component is held at an angle.

The twenty (20) components shown in Figure 1 sample the range of all components in terms of: (a) shape of the component head (b) length, and the distance between the wire leads. Four students from a TMR classroom were given the twenty-component task and asked to "crimp" them. This baseline measure was followed by each student being trained how to "crimp" the one component. Following training with a "single instance" component (Figure 2) they were then tested with the 20 contaminated components. The four students were finally trained (one at a time) with a set of three "general case" components (Figure 2). The general case components were selected to sample the range of component variability across the dimensions head size, head shape, and distance between leads. After a student could...
**Comparative DISTAR Results from Five South Afrikaans Schools**

By Chris von Rensburg
Rand Afrikaans University, South Africa

(Editors' note: Chris von Rensburg recently completed a visiting scholar stay at the University of Oregon while on study leave from his position as Senior Lecturer in Education at Rand Afrikaans University located near Johannesburg which specializes in teacher training. This summary is an abstract of the dissertation Chris wrote in completing his doctoral degree at Rand Afrikaans in 1981. Chris' work reflects a growing interest in Direct Instruction in his country and the increasing international support for the Direct Instruction movement.)

Chris Van Rensburg

This study was conducted in five schools for Afrikaner (Dutch) children in Lenasia, Johannesburg, South Africa. In 1978, all the first-grade pupils in each school were grouped into four or five classes, depending on the number of pupils. Their reading progress was then evaluated over a three-year period. Stratified random sampling was done on the basis of the following stratification variables: sex, beginner/repeat/over age, and the scores obtained on a reading aptitude test for school beginners. The subject attrition rate for the study was 13.8%. After the classes had been equated, they were allocated to the different methods by drawing lots. The teachers in each school decided amongst themselves who would teach the basal reader method, the Breakthrough approach, or the Distar instructional system.

The basal reader scheme (Let's Learn to Read) and the Breakthrough to Literacy method were both taught strictly according to the meaning emphasis approach, since flash word teaching was emphasized. The basal reader and Breakthrough groups followed a general school readiness program in the first three weeks, while the Distar lessons commenced directly after the classes had been constituted.

Approximately 30% of all the pupils in the five schools normally fall at least once in the first three grades. This failure rate is mainly caused by the fact that many children do not master the basal mechanical reading skills in those grades.

A structured interview with 92 percent of the parents of the children in the study revealed a generally better quality of life than that suggested by the high failure rate in the schools. Sixty-one percent of the fathers were classified in higher occupational categories (salaried, clerks, storemen, business owners, professional people). Sixty-seven percent of the fathers had progressed further than grade 8 in school. On the other hand, only 36 percent of the mothers matched this achievement. English was the adopted mother tongue of 84 percent of the families, and a second language was spoken in 75 percent of the homes. Ninety-seven percent of all the children in the study were living with their natural parents. Discipline in these families tends to be strict and the children are generally well behaved. Thus, it was believed that the children could do better in school than they had done traditionally.

The table below shows values obtained for the mean reading, spelling, and writing scores. Three reading measures were employed. The basal test is a word identification and pronunciation test, while the Reading 2 and 3 and the Gains tests are comprehension tests.

In order to establish the significance of the difference in the mean scores of the Basal Reader, Breakthrough, and Distar reading groups, t-tests for independent samples were computed. The Distar group achieved significantly higher mean scores in all the tests administered in the third grade, while none of the mean test score differences between the Breakthrough and Basal Reader groups are statistically significant.

There is presently a very strong and honest attempt on the part of all the education departments in South Africa to improve the quality of education for all population groups. The results of this experiment indicate that direct instruction programming could be very useful in attaining this goal.

**LOGO DESIGN**

The ADI Logo design contest is being kept open until August 1.

Send designs to Stan Palme

---

**Direct Instruction in Special Education**

A growing body of research is becoming available regarding the application of Direct Instruction in Special Education. This parallel and supplementary use of direct instruction programs in the field. The following is a publication summary that highlights the use of Direct Instruction programs and procedures in Special Education.

If you have any information on this topic, e.g., resource reports, program descriptions, anecdotes etc., please send them to:

Ted Fabre
Follow Through/Education University of Oregon
Eugene, Oregon 97403

**Free Workshops and Consulting**

The University of Oregon Follow Through Model in conjuction with validated projects may be able to provide trainers for mini-Direct Instruction workshops and consulting. Workshops will provide participants with program overview and specific teacher training. Participants need to be either implementing Direct Instruction programs or interested in receiving teacher training in these programs.

Consulting services to principals, supervisors, teachers, or other supervisory personnel who have responsibilities for implementing Direct Instruction programs can also be provided. Services would focus on curriculum monitoring and feedback to teachers with time also spent on setting up and interpreting criterion reference tests, scheduling, and lesson progress. Consulting services are for schools or districts implementing Direct Instruction programs.

Oregon will provide the trainers at no expense to the local schools or districts. If you are interested in setting up a workshop or consulting services in your area, please call or write Gary Davis, (513) 686-3555, Gary Davis Follow Through Project, Trailer 268, University of Oregon, Eugene 97403.
Teacher to Teacher
by Jane M. Dougall Coté, Whitaker Community School, Eugene, Oregon

Ed. Note. The article for this edition of Teacher to Teacher was written by Beverly Showers, Assistant Professor of Education at the University of Oregon, as well as the founder and director of Direct Instruction. The article focuses on methods of acquiring new teaching skills. The methods described are similar to those used in the Direct Instruction Follow Through Model throughout the country.

by Beverly Showers

Research on the ability of teachers to acquire teaching skills and strategies has provided a set of training elements that have been very successful for teacher skill development. These elements include:

- The study of the theoretical basis or the rationale of teaching methods.
- The observation of demonstrations by persons who are relatively expert in the method.
- Practice and feedback in relatively controlled conditions such as peer teaching and micro-teaching.
- Coaching (the provision of feedback, analysis, and advice to students as teachers try new skills in the classroom).

The training that focuses on "tuning" already existing or latent skills teaches mastery of teaching patterns which are consistent with existing teaching repertoire of the teacher. Skills "tuned" often involve question-asking, praising, inquiring, re-teaching student involvement, increasing time on task, and improving the clarity of lectures. Mastery of a teaching approach which is not in the "naturally developed" repertoire of the teacher requires the trainee to think differently, to organize instruction in fresh ways, and to help children adapt to and be comfortable with these new approaches.

Strategies for observing demonstrations, and practicing with feedback, taken together, are sufficient to allow the teacher to develop a skill to the point where they can, when called on to do so, use it fluidly and appropriately. However, the development of skill by itself does not ensure transfer—actual use of the skill in the classroom. Relatively few persons will transfer newly acquired skills into their active repertoire and use them regularly and sensibly unless additional instructional reception is received. When an effective "coaching" component is added, most teachers will begin to transfer the new method to the classroom.

Each of the training components is important if skill is to be developed. Unless people develop skill in a new approach, they have little or no chance of adding it to their repertoire. Coaching without studying rationale, observing demonstration, and practicing with feedback will accomplish very little.

The training components do not occur in a strict sequence or in isolation from one another. One might begin mastering a new approach to teaching by observing a few demonstrations, then examine rationale, observe more demonstrations, and begin to practice, but return frequently to rationale and further observation, and finally receive classroom coaching. Even at this point the teacher might continue to attend training sessions where rationale, demonstrations, and practice with feedback are used.

Coaching is critical to getting new skills actually used in the classroom. The first function of coaching is to provide support and encouragement to another person during a difficult process. The coaching relationship allows mutual reflection, perception checks, and sharing frustrations and successes. Companionship provides reassurance that problems are normal. The often nebulous business of teaching has sorely lacked the companionship that is possible in coaching teams.

Technical feedback should not be confused with general evaluation. Feedback implies no judgment about the overall quality of teaching. It is confined to the information about the execution of relevant skills or strategies. Coaches point out omissions, examine how materials are arranged, and check to see whether all the parts of the teaching strategy have been brought together. Technical feedback helps ensure that growth continues through practice in the classroom.

One of the most important things learned during the coaching period is when to use a new skill appropriately and what will be achieved as a consequence. Determining when to use a teaching strategy can be difficult. The coaching context provides an opportunity for examining goals, curriculum, and appropriate use of the new acquired skill.

Most of us can agree that coaching would be a wonderful addition to initial training; a person who takes courses immediately come to mind. "Who will coach me?" "When will there be training?" "Who will observe?" "Won't all this be terribly expensive?" There are no simple answers to these questions, and unfortunately there is no uniform way to implement coaching programs under existing constraints of inservice budgets and school organizing.

First, other teachers would seem to be the largest, most accessible pool of potential coaches. Teachers who have participated in the same training to learn the same skills will have developed a common knowledge about and a language for discussing the content of their training. When teaching teams or at least pairs of teachers from the same school participate in the training session, they share a motivation to learn new skills which they can implement in their classrooms; they also provide the necessary proximity for providing coaching to each other.

Second, that teaching skills be included in the inservice training (e.g., observation and feedback skills can be developed in the context of peer-to-peer training in the classroom).

Taking DI to the Community (Continued from Page 3)

perform correctly with all three general case components/she was again tested with the 20 non-trained components. An experimental design was used to ensure that any effects seen could be attributed to this training strategy.

Results from this study show the power of DI with severely handicapped students. None of the non-trained components improved; however, three components showed a trend for improvement. These were: social skills, functional skills, and learning strategies. This suggests that the components were able to help the students learn better.

Jeff's study was much like Rebecca's in that a group of 10 vending machines were selected and trained. The study showed that the vending machines could learn new tasks. In this case, the machines were taught to pick up objects. However, the study did not show that the vending machines could learn new tasks. In this case, the machines were taught to pick up objects.

DIRECT INSTRUCTION NEWS, SUMMER, 1986
Approaches to Solving Math Problems

By Craig Darch
University of Oregon

Teachers are often faced with a decision of what to do when teaching skill deficient students to solve story problems. Though some research has been done in this area, much of it is either unclear or too far removed from classroom applications. Simply, it does not provide the intervention teachers need when faced with daily decisions concerning how to improve students’ problem-solving skills.

Two approaches are used most often to teach story problem solving in the intermediate grades. The first could be called the discovery or traditional approach. This orientation views problem solving as a generic process. In this view, problem-solving skills are best taught with relatively broad procedures that motivate students and expose them to a variety of experiences. Story problems in addition, subtraction, multiplication, and division are viewed as vehicles to introduce students to the activities involved in the general activity of mathematical problem solving.

Educators in this state recognize that there is no magic formula to teach students to become good at story problem solving. Most common basal texts view solution of story problems as a complex mental process that involves visualization, imagination, generalization, and the association of related ideas. As pointed out by some authors, there is no easy answer as to what one should learn in the techniques. Most traditional basal series, consequently, emphasize that there is no one method that all students should use to solve story problems. Instead, they say, the solution must be tailored to the student’s individual interests.

The implication is that students need a range of opportunities to engage in problem solving activities. Thus, the traditional approach aims to offer the student: (a) a range of potential problem strategies, (b) highly motivating activities based on each student’s background, and (c) group discussion of issues in problem solving.

The second approach to teaching story problem solving is a more oriented approach. This oriented approach is not teaching directly a strategy for solving problems. It is teaching a more specific strategy for working several word problems. From this, they can generate correct answers to a wide variety of word problems they have never seen. This differs greatly from other instructional programs that teach students specific strategies for solving word problems which students do not succeed generally generalize to new problems.

Instruction begins with an overt problem solving strategy. Initially, the teacher makes every step in the strategy explicit. During this stage the learner is prompted to perform each step involved in solving the problem. Because an overt component is required at each step, the teacher is in an excellent position to diagnose any problems that are having in the instructional sequence. Once students are firm in their knowledge of the steps in the problem solving strategy, the strategy is made covert. This means that the students are no longer required to respond overtly at each step. Eventually, students perform all steps of the problem without prompting. However, the overt phase lays the foundation for this shift to unprompted responding. Other important components that are included in the DI procedures are cumulative review, teaching prerequisite information, and aiding instructional prompts.

In order to study the differences between the DI and traditional approaches to teaching word problem solving, fourth grade students in 6 elementary schools were screened to identify sample of students who were unable to solve multiplication and division story problems, but who possessed the necessary computational skills. Seventy-five-three percent of the sample was assigned to one of 4 experimental groups: (a) Direct Instruction with a fixed component of practice (Trad-F), which students were taught problem solving with DI procedures, and received a fixed number of practice problems (120 problems over 14 lessons); (b) Direct Instruction with extended practice (Trad-EFv), where students were taught with DI procedures, but were given extra instructional and practice sessions if they failed to meet a mastery criterion on different lessons; (c) Traditional Instruction with a fixed amount of practice (Trad-F), in which students were taught via traditional instructional procedures used in basal arithmetic series and in which they received the same number of practice problems (120 over 13 lessons); and (d) Traditional Instruction with extended practice (Trad-EFv), where students were taught with traditional procedures, but received extra instructional and practice sessions if their performance did not reach a

Craig Darch

The mastery criterion on different lessons. For the Fixed Groups, instruction lasted for eleven 30-minute sessions over 11 consecutive school days. For the Experimental groups, 12 instructional lessons (10 practice problems per lesson) were available to students in the Extended Practice groups.

The day after the final instruction session the students were given a posttest which involved the extended problem (multiplication and division story problems) and subtraction and addition story problems. Students who scored at least parallel-form maintenance test was administered to all students. In addition, a consumer satisfaction form was administered to the students to express opinions regarding the instructional procedures.

Instructional Material

Though the students in the Direct Instructional and Traditional groups received entirely different instructional methods, each contained several common threads. First, both instructional sequences were developed to teach strategies for accurately solving story problems in division and multiplication. In all groups the same multiplication and division story problems were used as problems for examples. Another similarity was the use of detailed teacher instructions (formats) that carefully guided the teacher in the instructional process. The purpose was to facilitate accurate implementation of both the traditional and Direct Instruction lessons. Finally, both instructional and Direct Instruction groups received a combination of teacher-led instruction and student activity doing story problems.

Traditional Instructional Program

The traditional instructional approach to problem solving was a composite of four mathematics programs that were adopted by the State of Oregon for use in elementary level classrooms. This composite intervention had three components that were incorporated into the instructional program: (1) guided instruction, (2) independent practice, and (3) procedures for correction of students’ errors. A major purpose of traditional mathematics programs is to ensure high interest, involvement, and motivation with each individual student. To achieve this purpose, teaching emphasized skill development in open-ended questions during the lessons.

Guided instruction within the traditional approach included two components: (1) discussion designed to increase student involvement and motivation, and (2) presentation by the teacher of a strategy to solve problems by breaking the problems into manageable parts. Generally, the teacher attempted to guide the group discussion with questions that served to help the student see the information in the problem. Typical questions were, “What numbers are given to you in this problem?” “Are there any key words that may help you decide what operation to use in solving this problem?” “Do you know what the multiplication strategy used, the teacher would attempt to include all the students in the class in giving material to help any students who appeared to be having difficulty.

The second key element in the guided instruction was to teach students to make a systematic list of information and then to break the problem into a number of possible parts. This was an important aspect of the intervention, as it appeared in each of the four tests that were used for this study. Each student was given a written guide for analyzing and solving story problems. The teacher utilized the given sequence to generate discussion for each problem. It also served as a diagnostic tool to identify and pinpoint the location of any problems the students were having.

The second component of the traditional teaching intervention was the independent work. Each classroom was given worksheets made up of story problems. As students completed the worksheets they were given minimal help and only responded to questions. Students were asked to apply the processes and skills that had been taught earlier.

The final aspect of the traditional treatment was the use of correction procedures. Corrections were developed from an analysis of the procedures used in the state-adopted curriculum. When students made errors, the teacher identified for the student the type of mistake the student was making. This allowed the student to be aware of the error (e.g., the teachers frequently told the student what the mistake was), it avoided the possibility that the student might make the same mistake. The teacher used the opportunity to guide student discussion of the facts in question.

The teacher guided discussion of other possible correct problem setups. During this time group discussion was encouraged.

Direct Instruction Approach

The DI intervention approach for this study closely paralleled the procedures that appear for teaching story problem solving in Corrective Mathematics (Englemann & Smith, 1981). The module on multiplication and division of many individual and group practice and, correction procedures were used.

The guided instruction included modeling and explaining by the teacher of how to work various problems. Also, the area was open-ended. The sequence for introducing skills was carefully controlled. When multiplication problems were first introduced, students were taught to discriminate multiplication problems from addition problems. The rule students were taught to make this discrimination was: If you use the same number again and again, you multiply.

Next, the teacher introduced multiplication and division word problems. In one type, the word each or group of was given to the student that the same number was used again and again and thus the problem called for multiplication. After the guided instruction, the students worked the problems independently, receiving corrective feedback as needed. This was an important aspect of the intervention. As described earlier, the teacher initially guided the students through this multi-

Continued on Page 7
Barriers to Educational Change

By Douglas Carnine

(Editors’ Note: From time to time, News columns are guest-authored. This edition of the Administrative Briefing, contributed by Doug Carnine, is based on his full-length paper entitled Barriers to Increasing Student Achievement: What They Are, Where They Come From, and Some Thoughts on How They Can Be Overcome. Its content here has implications for those of you attempting to implement structured programs in your schools. I hope you find this information useful, and I encourage you to submit your ideas for future columns. You may send them to me in care of the editors. I.C.C.)

The major studies of curriculum reform have shown that where training, the introduction of innovations, vertical political solidarity, and staff and administrative commitment are brought together, there is considerable movement. Gradually, however, the school returns to the normative pattern which characterizes most American schools and the innovations lose their steam. The problem is a worldwide one.

(Hendle, Carnine, Gall, Stockard, Cermack & Gaoon, 1981)

Even though teacher’s greatest rewards have to do with serving their students (Dunn, 1980), innovative practices that help teachers better serve students are under-utilized or misunderstood. The defense operating to resist change may be labeled “discriminating, deluding, distorting, and ultimately, discriminating.” We will discuss each of these areas in turn.

Discriminating

If an innovation is discriminated, pressures to adopt it are minimal. Innovations are usually discriminated through intellectual or quasi-intellectual activities as well as attributing their success to unique factors not found in other settings, questioning the value represented by the innovation, questioning, criticizing and ignoring any evaluation that judges the innovation to be effective, or even claiming that the innovative practice has already been adopted when, in fact, it has not.

According to the uniqueness argument, the effective instructional program for over 12 years with different principals, a different compensatory education director, and over 50 different teachers. If this view is true, scientific work in education is a contradiction in terms, since, to be valid, scientific knowledge must be true in more than one setting.

What would be the reaction to a doctor who said that heart surgery could be done successfully on 10th St. in Chicago, but not on 11th Street? In education, people readily accept data showing that most students can read in one urban school while most students cannot read in another school a few blocks away, without ever considering that this may be due to the specific instructional processes going on in the two buildings. Early sociological data (Jenkins, Goodman, Campbell, Hobsin, McPartland, Mood, Wentworth & York, 1966) has been used to support the idea that schooling makes little difference, although more recently, even Jenkins seems to be attracting more emphasis on the schooling process (Jenkins, 1979).

Undermining an innovation by question the values it represents is more subtle. "For the educationalists, the doctrine of the whole child is the magical balm that eases their pains. Ask a question about skills, and you get T.S. Eliot, transforming the question to one about values" (Lyons, 1980). The Direct Instruction Model, which has been relatively effective in fostering both academic growth and a positive self-concept in economically disadvantaged children was seemingly discredited on a PBS television documentary by a survey of principals who said the program does not address creativity and other aspects of the lower level than those while the programs’ effectiveness was well known, it was believed to be insufficient. The results on the student achievement and children into robots. One principal new to a building forbade two teachers to teach a lot from this unit which the Lafayette had never seen it in use and even refused to observe the teachers using it.

Similarly, criticizing the claim that any evaluation of an innovative program is invalid because it doesn’t measure what is truly important, one colleague states, “...Any program that wishes to rid itself of the vermicular nature of the list of objectives one metaphorical, obscure, or otherwise immeasurable phenomenon.” One St. Peter and Stevens, 1978, Cognition of both intended and unintended effects of Math Story Problems

(Continued from Page 6)

ple discriminations. Over time, the students were given increasingly more responsibility to complete the problems independently.

Division problems were introduced after students mastered the discrimination of multiplication problems from addition and subtraction. The teacher was determined whether a problem called for multiplication or division, students were first taught to identify division story problems from multiplication story problems. Students were taught to recognize the use and apply the rules. If the big number is given, it is an addition problem. If the small number is given, it is a multiplication problem. If the big number is given, it is a division problem.

In the final step, students learned to discriminate between addition, subtraction, multiplication, and division story problems. To make discriminations, students applied the procedure of determining whether the small number was used again and again and then determined whether the big number was given. As was the case with the traditional program, students spent time independently applying the rules they had learned to solve story problems. The Direct Instruction sequence incorporated detailed correction procedures within all lesson formats. The initial step in correcting errors was to determine the possible cause of the error. When an error occurred during the presentation of a problem-solving strategy, the teacher generally implemented a two-step correction. First, the teacher would correct the specific error by modeling the apposite response. Next, the teacher would prompt the students by asking questions from the previously taught strategy. After the student’s mistake was corrected, the teacher returned to the beginning of the problem-solving strategy and presented all steps in the process again.

Results

When the experimental groups were compared on their test performance, the two DJ groups performed highest with mean scores of 22.35 (85% correct) and 22.59 (85% correct). The two traditional groups scored significantly lower, 17.31 (65% correct) for the Traditional-Extended Practice sample and 16.46 (63% correct) for the Traditional-Practice sample. (See Table 1.)

The following are four groups compared on the 26-item maintenance test to a slightly different pattern emerges than on the immediate posttest. The Direct Instruction-Extended Practice group had the highest score with a mean of 21.73 (80% correct); the Direct Instruction Practice group was a bit lower, with a mean of 19.75 (74% correct). The two traditional groups follow with 17.55 (65% correct) for the Traditional-Practice group and 14.26 (54% correct) for Traditional-Extended Practice.

Several interesting findings emerge from this research. First, on the posttest, regardless of whether extended practice was provided, the DJ groups outperformed the traditional groups. Next, on the maintenance test, results showed that for the traditional groups, students received additional practice actually performed at a lower level than those students who had never seen it in use and even refused to observe the teachers using it.

The students were asked to indicate that the Direct Instruction-Extended students: (1) felt they had learned a lot from this unit which they did not enjoy the method of instruction; and (3) stated that they would make use of the instruction in their personal or work lives.

The students were asked to rate their experience and were not particularly enjoy the experience; and (3) did not feel they were able to apply what they had learned to actual story problems.

The teachers noted that the behavior of the traditionally taught students differed in handling the extra practice session tended to be disruptive. The DJ students were reported to be less enthusiastic and more on-task during the extra practice sessions. One explanation for this difference is that practicing a strategy which had not been mastered (as traditionally taught students were required to do) is unpleasant, whereas extra practice resulting in success (such as that engaged in by DJ students) is rewarding.

Apparently, acquisition, maintenance, and student satisfaction can all be enhanced through Direct Instruction to teach story problem solving to skill-deficient students.

Table 1

<table>
<thead>
<tr>
<th>Percent Correct on Posttests and Maintenance Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Posttest</td>
</tr>
<tr>
<td>Maintenance Test</td>
</tr>
<tr>
<td>N</td>
</tr>
</tbody>
</table>

Continued on Page 11
By Lynn Anderson-Inman, University of Oregon

For the last several years public schools around the country have been involved in a profound reorientation of services for handicapped students. Underlying this reorientation in educational service delivery is the philosophy or principle of "mainstreaming." Although models for implementing this principle vary greatly, all are unified by their focus on providing opportunities for increased participation of handicapped and non-handicapped students during the course of a normal school day. To the extent extent to which this interaction should embody more than mere physical proximity to one another. The spirit of mainstreaming is best achieved when handicapped students have the skills and preparation necessary for them to succeed from instruction with their non-handicapped classmates, and (b) develop appropriate social relationships with students of similar age. As expressed by Kaufman, Gottlieb, Agard & Kucik (1979), "mainstreaming is the temporal, instructional, and social integration of eligible exceptional children with normal peers" (p. 41).

In response to the mainstreaming movement, special educators have become increasingly concerned with preparing handicapped students, especially the more mildly handicapped students to enter and succeed in regular team teaching. In a similar manner, many regular class teachers have become more accommodating in their instructional practices and more receptive to administering teaching strategies for both the special educator and the regular teacher. However, the principles and practices of direct instruction evolved from a concern for the educational needs of low income and minority students, there is a growing awareness that handicap students also benefit from the high structure, careful programming, and systematic procedures of direct instruction methods.

Described below are six strategies for using direct instruction to promote the mainstreaming of handicapped students. Each is accompanied by a summary of some recent research supporting that particular strategy.

**Special Class Remediation of Academic Skill Deficits**

The use of direct instruction materials and procedures with handicapped students is probably most common in special education settings such as self-contained classes and resource rooms. The purpose of this instruction is to eliminate, or at least minimize, handicapped students' academic skill deficiencies. This instruction is often provided in the hope that elimination of skill deficits in the academic tool subjects (e.g., reading, math, and spelling) will eventually facilitate students' integration into regular classrooms on a more permanent basis. Although the use of direct instruction materials and procedures by special education teachers has become increasingly widespread, it is only recently that researchers have begun to examine the relative efficacy of direct instruction materials for handicapped students and the extent to which their use is beneficial in mainstreaming academic problems.

In a study by L. E. Stein and Goldman (1980) DISTAR reading materials were compared with the PAOL Reading Program on effectiveness with primary level students diagnosed as having specific learning disabilities. Improved performance by students in the study were between 0 and 8 years of age, attended private schools (by the DISTAR reading program worked on problems, and had difficulties maintaining attention and task behavior. Overall, students still average or above average intelligence, their school records were characterized by reading failure, social underachievement, and for many, accompanying emotional problems. All were taking part in a larger reading subset of the Peabody Individual Achievement Test (PIAT) and in the diagnostic reading analysis associated with respective reading materials. Based on these results, students received instruction in small groups (2 to 3 students) for 60 minutes each day over a period of approximately 11 months. A comparison of print scores on the PIAT indicated significant reading differences for the two groups before intervention. However, an analysis of their scores following instruction indicated a significant increase in performance for students using the DISTAR materials (significant at the .001 level). Improved performance was demonstrated in both word recognition and reading comprehension. Classy, the DISTAR reading materials were more effective in training deficits in these students' reading skills than the PAOL Reading Program.

More important, perhaps, than the statistical significance between the two groups was the relative performance of the students' gains. The mean gain for students in the DISTAR reading groups, after receiving instruction for a period of 10.9 months, was equal to approximately 15 months of instruction on a normative scale. In other words, the handicapped students who received reading instruction using DISTAR materials were progressing faster than their non-handicapped peers on whom the PIAT was normed. With continued instruction using the same materials, and assuming a similar rate of gain, these students might easily be candidates for retention into regular classrooms in another year or two (providing, of course, that their other academic and behavioral deficits can be remediated in a similar manner). Although reading performance for students using the PAOL materials also improved during the period in which instruction was provided, their mean gain of 7 months during the 11-month period is insufficient to expect them to eventually "catch up" to their non-handicapped agemates.

The authors attributed the success of the DISTAR reading materials to the manner in which they are constructed. Further, the impact of additional factors contributing to the superiority of the DISTAR program might be the use of (a) fast-paced teacher directed lessons, (b) union responding and (c) systematic reinforcement procedures. These factors would maximize the students' attentional problems and increase the probability of being on-task. Given the average or above average intelligence of the students participating in this study, eventual reintegration into public schools and even regular classrooms would seem to be an appropriate goal. For the students in the study, and others with similar academic problems, the above data indicate that the use of direct instruction materials by special education teachers to remediate academic deficits might well facilitate students' movement into successful regular class placements.

**Regular Class Accommodation to Low Performing Students**

As regular class teachers take on more responsibility for the academic achievement of handicapped students, there is a growing tendency to adopt curricular materials and procedures which accommodate students' needs and limitations, while at the same time teaching them effectively. Because of their suitability for teaching the handicapped, as well as other low-performing students, the principles and techniques of direct instruction have found a home in many regular classrooms.

At the elementary level this may mean using published direct instructional materials for teaching some or all of the basic skills. These materials might be adapted for use with the entire class or only with the students who have demonstrated some difficulty with academic tasks. As Buros (1981) has pointed out, it is increasingly common, for example, to find regular class teachers at the primary level using the DISTAR materials to teach their low performing students using the DISTAR materials, while retaining the basal reader in use statewide for their better performing students.

In content area classes such as science and social studies, regular class teachers familiar with direct instruction have begun employing its principles and techniques to program their lessons, build in systematic review, design effective correction procedures, and maintain student attention while teaching. Special education teachers have often played an important role in this process by introducing direct instruction to regular class teachers, assisting them in efforts to incorporate specific strategies and reinforcing their efforts to provide more accomodative instruction in their classrooms. The net result is an instructional environment in which all students can learn, including the handicapped.

Support for the ability of handicapped students to be in regular classes where direct instruction materials are used comes from a study examining the relationship between academic achievement for students participating in the Direct Instruction Follow Through Program in New York State (Hegarty & White, 1981; also see DI News, Vol. 1, No. 1). The yearly reading and math scores were analyzed for approximately 3000 disadvantaged primary level students who received three or four years of basic skills training using the DISTAR materials. To explore the relationship between IQ level and yearly achievement, achievement test scores were placed into one of six groups based on each student's measured IQ at the time of entering the program. Each group represented a range of IQ scores (e.g., 70 & below, 71 to 90, 91 to 100, etc.). Comparisons were then made between IQ level and yearly rate of learning for all students.

Students in the lowest IQ block (70 or below) would probably have been found eligible for special education assistance had they had been in a special education setting. Model, however, recommends teaching all students, regardless of entry ability, in regular classrooms, while avoiding the labeling of a student as handicapped and leaving responsibility for instructing all students with the regular classroom teacher. Although students' performance levels in a classroom may vary greatly, their individualized needs are met by the regular teacher in small groups. The students in the lowest IQ block would therefore have been more accommodating with the classmates of average and above average IQ, i.e., mainstreamed. Were they able to make academic progress in the regular classroom?

The results of the analyses indicated little or no relationship between students' entry scores on the IQ test and the rate at which they learned math and reading skills using direct instruction materials. In other words, students with low IQ were able to learn from the instruction provided to the
Handicapped Students

same extent as students with average or above average IQs. Although beginning and ending academic skill levels for low IQ students were generally lower than for other students in the program, the amount of material learned was about the same. Furthermore, the "growth pattern" was similar, characterized by a large gain during the first year (more than the average), followed by standard yearly growth in successive years. It is clear from the above study that low IQ students, who might normally be labeled as handicapped, can survive academically in regular classes if instructionally effective materials and procedures are used. Direct instruction programs facilitate the development by maximizing teacher-student interaction, minimizing distraction, improving learning, and providing students at the appropriate level of difficulty and focusing on mastery of content. This formula for the success of low IQ students was equally effective for their higher achieving peers, proving that the integration of handicapped students will negatively affect the progress of nonhandicapped classmates.

Special Class Preparation on Academic Support Skills

Success in regular classrooms seems to be dependent upon handicapped students having three types of critical skills: (a) social skills acceptable to teacher and peers, (b) content-based academic skills sufficient to cope with and benefit from the curriculum, and (c) non-content based academic skills such as working efficiently, seeking assistance, and writing notes. This last set of skills, known as "academic support skills" is the focus of the Oregon State University's Project ASSIST (Academic Support Skills for Gifted Students).

Academic support skills are defined as those skills which indicate a student's acquisition of content-based academic skills or a student's ability to demonstrate that content-based skills have been acquired. They are tremendously important for regular class survival and some have been found to be correlated with academic achievement. Since handicapped students spend much of their school time in highly structured educational settings, they are often unfamiliar with the support skill expectations of regular class teachers. In addition, many integrated handicapped students are not perceptive enough to identify their teachers' expectations correctly and be able to perform the required skills without specific training to do so. Providing direct instruction to handicapped students on the academic support skills critical for regular class success can be an effective way to promote their acceptance and adjustment in mainstream settings.

One of the preliminary investigations for Project ASSIST explored the use of direct instruction for teaching handicapped and disadvantaged students to produce written papers acceptable in neatness to regular class teachers (Anderson-Inman, Paine & Deutchman).

Figure 1 - Student's written assignment before direct instruction was provided and the self-monitoring checklist introduced

Lesson 1

1. The turtle is not going anywhere.
2. I'll could not find her glasses.
3. They will feed the monkeys.

Lesson 2

1. False
2. Maybe
3. True
4. Maybe
5. True

Note 1. After observing in intermediate level regular classrooms, nine features of note papers were identified as characteristics of students' written papers. (1) Use of marginals, (2) writing on the front side, (3) proper placement of the student's name, (4) identification of the assignment's content, (5) leaving the sheet of paper whole, (6) no unnecessary marks or scribbling, (7) writing which stays on the line, (8) use of correct punctuation, and (9) neat and appropriate use of an eraser.

scripted lessons using direct instruction formats and techniques were developed to teach all of the 9 skills found to be important for regular class acceptance of students' written papers.

Figure 2 - Student's written assignment following direct instruction and implementation of the self-monitoring checklist

Duly student papers in two transfer settings were monitored for neatness: a period focusing on reading comprehension and a period designed to improve language skills. A multiple baseline design across skills was used to evaluate the effects of direct instruction alone and direct instruction plus the checklist on the neatness of student's papers in these two settings. Direct instruction alone was sufficient to produce changes in the neatness of students' papers during practice assignments but had little effect on the frequency with which students applied their skills in other class periods. When direct instruction was combined with the use of a self-monitoring checklist, however, performance on all nine skills improved markedly. In fact, the mean level of occurrence for each skill reached or surpassed the level felt to be indicative of successful mastery and transfer (90%).

Figures 1 and 2 present written assignments for one of the students who participated in the study. The change in neatness between these two papers is characteristic of the improvement demonstrated by all participating students. The use of direct instruction plus a self-monitoring checklist was clearly an effective strategy for promoting the acquisition of skills necessary to produce a neat paper and the transfer of these skills to other classroom situations. Being able to hand in written assignments of acceptable neatness could have a significant impact on the acceptance of handicapped students by regular class teachers. Writing neatness has been found to have an effect on teachers' grading of essays (Frohlich & Good, 1974) and it is likely that neat papers elicit more specific feedback to students than messy, unreadable ones.

Regular Class Instruction on Academic Support Skills

Providing handicapped students with the academic support skills necessary to survive in regular classrooms need not be the sole responsibility of the special education teacher. Regular class instruction on critical academic support skills would, in fact, have several advantages. First, teachers of regular classes are more familiar with their own expectations and the skills required for functioning successfully in their classrooms. Second, by offering such instruction in the regular classroom, teachers would be able to assist all low performing students who are generally represented by skills, not just handicapped students. Third,
Special Class Transfer Training

The mainstreaming movement has resulted in the increased popularity of sending special education students to resource rooms for mildly handicapped students. Inherent in the use of programs which provide special education assistance outside the regular classroom is the assumption that skills learned in one educational setting will transfer automatically to other educational settings. As the ultimate goal for resource rooms is mainstreaming, it is important to determine the extent to which such transfer actually occurs and to incorporate strategies for promoting this transfer if necessary. In the following study, the degree to which a newly acquired skill in reading comprehension was transferred from special class instructional materials to regular class texts was explored (Dorothy A. Perkins & Inman, 1981).

Using Corrective Reading, Comprehending, the five learning disabled students were taught a strategy for answering comprehension questions which included marking the strategy cues from the material read. The students' ability to use this strategy when reading regular class text was then measured over the 10 weeks of instruction. The results indicated that three of the five students had no success, and the other two had only moderate success in applying the learned strategy to regular class instructional materials. Improved comprehension in these students which could answer deductive type comprehension questions when reading class instructional materials was developed.

The transfer training procedure focused on reading passages from 11 different regular class junior high textbooks and involved the use of two direct instructional formats. The training provided under both formats consisted of two parts: guided practice, completed orally as a group, and independent practice. The first instructional format provided introductory instruction and practice in applying the strategy for answering deduction questions when reading regular class text. It required students to read a passage from a specified text, find the deduction rule, and use it to answer the comprehension question correctly. When the strategy could be successfully used by students during the training sessions, more intensive training was provided in applying the strategy to expository material was provided. Using the second transfer training format, students were required to answer multiple deduction questions for each text book passage. Sometimes this would require using the same deduction rule more than once and sometimes it would require students to locate multiple deduction rules which were valid in the same passage. This format attempted to simulate regular classroom expectations where answers to the comprehension questions may be found in close proximity.

Students received transfer training involving 46 practice exercises during a period of 10 weeks for four of the students and over 4 weeks for one of the students. The effects of this training on their ability to answer deductive type comprehension questions from content area text were measured at interval 1, 2, 3, 4, and 5. All students' accuracy improved significantly, and each achieved over 80% accuracy to be successful. (i.e., the student was asked to read orally to the student to be sure that the student understood the same sentence in more than one setting the percentage of agreement in response to the two settings for all students indicates the degree to which the student responded was consistent (i.e., the student repeated exactly what was given on a given lesson. The results of the study indicate a fairly high rate of consistency and agreement in performance.

Cross Classroom Coordination of Instructional Assistance

In their attempt to remediate the academic deficiencies of mainstreamed handicapped students, regular and special class teachers have had to develop programs which are designed to benefit them make the number of daily class periods devoted to a given task. This usually accountable training and scheduling a student to receive instruction in the same content area. (For example, the regular class, the resource room, and the regular class). Although the impact of this interaction is to help the student learn the skills addressed, in the two settings concerning the instruction presentations were tightly controlled. A study focusing on the more than 70% of students with learning disabilities benefited from the use of this strategy. The students were tested on their ability to answer questions related to the instructional materials used in both settings in three classrooms. The results showed that the students who were given feedback and direction in the other settings in the classroom and then compared the results with those obtained in the other settings.

In their attempt to improve her performance in the regular class, the resource room teacher was responsible for evaluating the instructional strategies in the resource room by the regular class. The results of the study indicated that the teacher was performing considerably better in the resource room than in the regular class. In fact, the teacher was able to help the students in both settings.

The effect of these preteaching sessions on the student's regular class performance was striking. Her mean level of accuracy for both written and oral responses improved markedly and approximated that of her peers. On a few occasions the accuracy of her written or oral responses surpassed the mean level demonstrated by peers for this lesson. Clearly, the resource room preteaching sessions had helped her become more proficient in the use of language.

In their attempt to remediate the academic deficiencies of mainstreamed handicapped students, regular and special class teachers have had to develop programs which are designed to benefit them make the number of daily class periods devoted to a given task. This usually accountable training and scheduling a student to receive instruction in the same content area. (For example, the regular class, the resource room, and the regular class). Although the impact of this interaction is to help the student learn the skills addressed, in the two settings concerning the instruction presentations were tightly controlled. A study focusing on the more than 70% of students with learning disabilities benefited from the use of this strategy. The students were tested on their ability to answer questions related to the instructional materials used in both settings in three classrooms. The results showed that the students who were given feedback and direction in the other settings in the classroom and then compared the results with those obtained in the other settings.
Mainstreaming. Direct instructional materials facilitate the close coordination of instructional assistance by providing instructional support and allowing multiple teachers to use precisely the same verbal directions and physical activities to teach precisely the same skills.

Summary
Six strategies for using direct instruction to promote the successful mainstreaming of handicapped students have been described. Special class teachers have found direct instruction effective in preparing students for the demands of the regular class and regular class teachers have found it useful when selecting or modifying a curriculum to meet students' individual needs. These six strategies are not by any means exhaustive of the variety of ways direct instructional materials and procedures can be used to assist handicapped students to succeed in public school settings. If you have identified a need or data to share relating to the use of direct instruction when mainstreaming handicapped students, please feel free to contact me with your experience and suggestions, thereby expanding the possibilities of successful mainstreaming for other students, as well.

Reference Notes

References

Barriers (Continued from Page 7)

an innovation is important. It is always necessary to evaluate the program's potential as well as the impact of its input to the present evaluation of what it means to measure. However, to reject an evaluation because no data or information is available is impossible to measure (e.g., the inner feelings, aspirations, or creative potential of the generation of school children) is unreasonable. Nonetheless, an unpopular evaluation finding can be discre- dited by emphasizing what was not measured.

Another way of discriminating a suc- cessful innovation, one that may seem almost impossible to the naive reader, is to simply ignore its success. "Although pupil achievement data are obviously a useful factor in determining the outcomes of pupil programs and are used to monitor their progress and determine their opportu- nities, the data are rarely collected or incorporated so as to provide a basis for assessing the performance of individual teachers, schools, or school systems.\" (Scott & Deal, 1979). By failing to ag- gregate data and compare progress across schools and classrooms, and ministers relieve themselves of the responsibility to either provide remedies to failed school programs or explain why some schools are successful.

Delaying
Even if an innovation is not discriminated, its adoption can be delayed. While delaying is characteristic of many fields, there are some exceptions, such as educational innovations in medicine, in which technological ad- vances are often rapidly accepted. In one study, a medical drug was adopted by 90% of the physicians in four communi- ties within 17 months. Typically, the adoption of school innovations is far less rapid. In educational innovations have been tried that proved to be of little benefit. Thus, slow-paced adoptions have served to minimize useless disruptions to school systems. As valid practices become more prevalent, the evaluation of old, traditional programs will become less of a problem, but that seems unlikely.

Distorting
No innovation is implementation-proof. Innovations that are not discriminated and delayed can and often do turn out to be ineffectual as a result of additional modifications. For an untried innova- tion, the diffusion of innovation seems reasonable; in fact, all things being equal, the more an innovation is adapted, the more likely its acceptance in a school (Berman & McLaughlin, 1975). Too often, though, adaptation becomes a mechanism for distortion. For example, Centra and Potter (1980) cited several studies of "team teaching" in which the investigators could not even identify which teachers were working in teams. The innovation had been transplanted to a different setting such as a whole grade level or from the previous early childhood. Another common occurrence is selecting only one or two dimensions of what may be implemented (in the name of eclecticism) and then attributing the subse- quent success to the entire program. Finally, an innovative adoption practiced by a district may never be implemented, because of what Charters and Jones (1973) refer to as the "risk of appraising nothing." Sometimes distortion seems more like sabotage. For example, in one small ur- ban school district in which a program to train para-professionals and specific instructional materials. One of the largest mainstreaming districts was hiring para-professionals for eight weeks, even though trained people and funds were available, over $200 hours of in- structional time were lost. A few years earlier, the same district delayed an order for essential instructional material for over six months, resulting in the loss of thousands of hours of instruction. Disruptions can also be affected by transferring key personnel to different schools or bringing in personnel oppos- ed to the innovation.

Discontinuing
Innovative practices, even those that are eventually implemented and proven to be quite effective, are often discontinued. Rowan (1979) found that inno- vations that fail to lead to the do with instruction (e.g., school health and cafeteria services) had the greatest likelihood of survival. Those innovations related to instruction (such as guidance counseling, and psychological testing), had the greatest likelihood of discontinuing. However, innovations that ac- tually dealt with instruction were the least effective, and therefore tended to disappear quickly.

Abandonment of a program by ad- ministrators can even occur in the face of public support. At a school board meeting for a small rural community, several parents testified in support of a relatively new, highly structured compensatory education program. One parent, a child of the school's, who started school before the district install- ed the new program, hadn't learned to read. Later, two younger children, who had the benefit of the new program, tutored her older siblings. The parent was worried that her sixth child, only four years old, would be a school failure, too, if the program were dropped. Despite the district's acknowl- edged that the program was quite effec- tive with poor children, the board voted to drop the program for future teachers, thus abandoning the program that the program was too structured and too narrow in outlook.

A Plan of Action
Reviewing case studies and theories of change, it appears that school systems can help policy makers identify variables crucial to the success of an inno- vation and predict the conflicts that might occur during the change process. Based on that information, planners can then develop enhancement strategies to alter or work around anticipated bar- riers. These strategies are usually based on both authority and consensus (Greenwood, Mann & McLaughlin, 1975). Suppose most of the middle-school age children have prior educational attainment at the pre-elementary level and that the curriculum specialist, teacher trainers) op- pose the impending implementation of a major innovative practice. Superintendents might exercise their authority by visiting the project and meeting with its sponsors about its importance. For consensus building purposes, the middle-level managers might be paid to attend an out-of-town training session, attended by enthusiastic users of the inno-vation who have successfully used it outside the district. A combination of practical, common sense advice from resource teachers, reliance on testimonials from peers, could contribute to a willingness to give the inno-vation a chance.

Diplomatic negotiation with hostile middle-level managers is one possible way to forestall an attempt at abandoning an innovation. The general strategy is to anticipate how the innovation might be discriminated and focus on those points — have potential adopters observe the innovation in action, talk to current users, review pertinent research reports and papers by popular "innovation leaders," and establish training programs in the innovative practice.

A different strategy is necessary in responding to delay. Situational leader- ship theory suggests that if an ad- ministrator is not interested or energized about change, others must become task oriented and assume responsibility for planning and interaction (Blanchard, 1977). As interest in the inno- vation grows, responsibility for the implementation is shifted to others. This is more. The work of Tannenbaum and Schmidt (1973) on leadership styles (sell- ing, participating, and delegating) is relevant to the process of shifting responsibility to others who will carry out the work.

Sometimes distinguishing between reasonable, inevitable slowdowns and destructive delays is difficult. When delays clearly begin to undermine the inno- vation, however, pressure should be applied. The push can come from above or from peers. Either way, a significant blockage must be removed or satisfac- tory implementation may never come about.

In deciding what constitutes a signifi- cant blockage, it is important to identify the critical, non-negotiable aspects of the innovation. Those aspects must be kept clearly in mind during installation. Otherwise, a harmless adaptation can- not be distinguished from a major dilu- tion of the innovation. Since adapta- tions should be encouraged and distor- tions discouraged, the distinction is critical. Complete and unfettered dis- cortant innovations, an innovation will quite likely fail. Conversely, fighting in- consistency, all of us, are not necessarily going to create animosities among people who need to work together.

Knowing when and how to fight deviations is only part of the strategy for dealing with distortions. Another critical component is supporting attempts to implement the innovation. Gersen and Cartwright (1981) have iden- tified several support tactics, called from research on effective school and classroom practices. Some of these tasks are: (a) assessing how well the innova- tion is being implemented in each classroom, (b) providing appropriate techniques for handling problems and rewards and sanctions according to the quality of implementation. Since most primary innovations are local or inappropriate to the teachers' tasks, responsibility for them must be shared or delegated. The principal might work with district representatives or a supervisory level, possibly a lead teacher.

Continued On Page 15

DIRECT INSTRUCTION SUMMER, 1982 11
The Graves of Academe

By Richard Mitchell
Boston: Little, Brown and Company, 1981 (229 pp., $11.95)

Everyone has been exposed to considerable teaching of many different kinds, and everyone has heard what works and what doesn’t. Most of the advice from persons outside the field of education is inedible, useless, or both. An outside vantage point sometimes permits a more objective view. People like Ziggy Engelmann and David Fleisch are able to apply their knowledge from outside areas and come up with important new insights for educators.

Like Fleisch, Richard Mitchell (also known as the Underground Grammarian) is not one to mince his words. He expresses himself more clearly. And, like Fleisch (author of Why Johnny Can’t Read and Why Johnny Still Can’t Read), Mitchell writes freely about how we could be teaching better.

Mitchell’s latest effort, The Graves of Academe, is a distinct contribution to the ongoing discussion of educational improvement. I see Mitchell as an old-line academician who doesn’t like all the changes in education which have taken place since he went to school. He criticizes some of the innovations which I support. But I find his overall view of contemporary questions to be very accurate, and his views generally complement a direct instruction philosophy. Both Mitchell and the direct instruction philosophy (in which we work best in teaching academic skills, for example, using an intensive phonics approach in beginning reading) emphasize the importance of explicit instruction. Both emphasize cognitive areas, like the 3 Rs and critical thinking, over more affective areas. Both think that the teacher, not the students, should call the shots in the classroom.

What is Mitchell’s main point? That education is a bureaucratic behemoth that cares only about increasing in size at the detriment of our society. Mitchell claims “us educationalists” too much to call us educators. He coined the term educationist. And he attributes this unwritten rule to the educationist: “Whatever we do will require more money, more teachers, more administrators, and more mandated courses in education.”

One of Mitchell’s examples of this constant bureaucratic growth is the area of learning disabilities. In response to countless schoolchildren’s failure in reading, educators don’t try to teach reading better; they create a new specialty area (learning disabilities) that imper- fectly deals with problems of past facts. This new area demands more tax dollars, more teacher training, more faculty positions in the colleges of education, new regulations, and more administrators to interpret and oversee the regulations. The bureaucracy benefits from the status quo, not poor teaching.

According to Mitchell, the educational bureaucracy is worse than other bureaucracies, because how we teach in schools affects how rationally the public thinks. And a highly educated public, states Mitchell, is the essential ingredient for the American society.

Mitchell also maintains that education is an unusually successful bureaucracy. Not only are laypersons duped into believing that the extra millions of school dollars and programs actually make a difference, but the educators themselves believe in their program.

While Mitchell recognizes the importance of education, he may oversate his case. There are other bureaucracies worse than education. Take defense. An appeal to national security is good for more billions in the federal budget than an appeal to education. The Department of Defense is at least as wasteful as the Department of Education. Defense specialists are probably every bit as sincere and dedicated in what they do as are educators. And with the military-industrial complex clamoring for all the federal money it can get, can we blame educators for advocating the importance of their field?

But let’s face it, there’s a lot of fat in the education budget—at all levels. The budget can’t be trimmed indiscriminate- ly, though, The trick is deciding what’s fat and what’s not. If legislators aren’t careful, they might throw out the baby with the bath water. Mitchell makes plain his style extends me, as it does and programs that think’s it’s hard.

Usually I agree with him, but the issue is complex and Mitchell’s storylines frighten me.

Reading The Graves of Academe is an emotional experience. Mitchell’s Procrustean efforts to gain incite, his sarcasm scathing. On points that I agree with Mitchell, I’m intrigued by his wit and clarity:

“One claimed theory is that since a teacher must be a man of the people” to the student before any learning can happen, the teacher ought to be as much like the students as possible. Like the students, the case of the especially intellectual teacher.”

Here’s Mitchell on the (lack of) logic of educational humanism:

“Such abstractions must always occur when the mouth runs off in the recitation of precepts couched in vague generalizations and undefined terms. But they do not trouble the educationalist. Humanism, who never seem to notice them. The important thing is that the precept sounds good.”

Of course, when I disagree with Mitchell, his style extends me, as it does and programs that think’s it’s hard.

Richard Mitchell writes on a more general, abstract level than fellow writer Fleisch. Mitchell also relies on examples (with the exception of infamous straw men) and data that support what he says. His conclusions are so dependent on a chain of previous points that when his logic fails (as it occasionally does), his entire argument tumbles down like a house of cards. Like a school system’s spiritual curriculum, Mitchell tends to cover the same points periodically, yet indistinctly, throughout. And even when Mitchell’s presuppositions are logical- ly reasonable, he fails to simplify and explain in detail so that the layperson — the person Mitchell should be trying to reach — can understand.

The Graves of Academe shows Mitchell to be an armchair quarterback full of worthwhile notions. Despite the in- adequacies, the book fulfills its role. The Underground Grammarian is writing well on many of the same practices in the educational establishment that we’re fighting. He merely attacks them on a strategic level, leaving the tactics to us.

— reviewed by W.A.T. White

Curriculum Materials Handbook

By Meredith D. Gall
Boston: Allyn & Bacon, 1981 (227 pp., $11.00)

Gall’s Handbook for Evaluating and Selecting Curriculum Materials is a potentially useful book for those who make curriculum selections for schools. Since the benefits of good materials are recognized, the purpose is to provide a resource to those who want to become proficient in this aspect of education. The book fulfills this purpose by tying together much of what is known about the curriculum selection process.

The book is presented in six chapters and a series of practical appendices. In Chapter 1, Gall does a fine job of outlining a rationale regarding the importance of selecting good instructional materials. The essence of his logic is that effective instruction requires both good teaching and good materials. Much has been said about effective teaching in other areas, but little has been said about the importance of good material in providing an effective education.

The book is intended for use by district administrators in selecting curriculum materials. The book is divided into two major sections: the first six chapters discuss the selection of good curriculum materials. This section nicely integrates the research findings that are usually scattered throughout the curriculum literature and begins the book by structuring his/her presentations more fully. Weak materials can or may lessen the results of one’s efforts (Engelmann, 1981). A distinctive feature of the book is Gall’s experience in selecting curriculum materials. This experience gives Gall insights into the evaluation process. Gall’s experience in selecting curriculum materials makes this book a useful resource for those who want to become proficient in this aspect of education.

Chapter 2 outlines the steps in s selection process — from an identification process to the consideration of school needs to the curriculum selection. Appendix C describes accessing various materials by means of materials catalogs and other sources. While this book

Continued on Page 13
ficulties. An ambitious in-house development project, however, is described in the development of curricular materials in accordance with Direct Instruction principles of instructional design. The project is called the PLATO Curriculum Project (PCP), and is directed by Martin A. Siegel, a long-time proponent of Siegfried Engelmann.

Through our development of curricula for PCP, we have found that the application of Direct Instruction design principles to computer-based education is a natural extension of DI development efforts. This is true because arguments for a teaching format based on the principles of Direct Instruction are valid for computer-based instruction as well.

For example, we have developed a system of lessons on verb recognition. In the final, expanded practice phase of that sequence, students literally underline, on line, the verbs in randomly selected sentences that test a wide range of the concept verb. Literally hundreds of specific error possibilities exist for any given verb. The response task is to underline all the parts of a complete verb, failure to underline one part of a complete verb, failure to recognize a “be” verb or other linking verb, failure to recognize all parts of a complete verb in a question, assigning the wrong word to a verb, and so on.

In our lesson sequence, we identified over fifty different significant error types and provided a different feedback for each of those error types. The criteria for determining error types included considerations such as the type of verb involved, the sentence structure involved, the specific response made by the student to each item type, errors within corrections, and level of prompting.

Once a student makes any one of the possible errors, the lesson automatically creates a unique review sequence for that student to be gracefully extending across increasingly longer time periods. If students do not achieve mastery in a reasonable discriminative interval, then their longest-term delayed test (which rarely occurs), the lesson automatically (and specifically) assigns that student to the help from the human instructor and the lesson authors. The instructor can then try to give the student a different lesson. The authors make an immediate adjustment in the design of the lesson that is implemented for all users within a matter of steps once the lesson is opened within the house.

The elaborations of the above sequence are not due primarily to the complexity of the content, but to the fact that verb actually represents more than one concept. The expanded practice, therefore, allows the consolidation and discrimination of highly similar, but different concepts. Our evaluation indicates that this actually made during this phase of the instruction. Whenever errors are made, however, the lesson responds appropriately and effectively. We would like to indicate more generally how computers can be utilized to effectively and efficiently address the correction of errors.

The design of initial teaching presentation made fundamentally in computer-based instruction. Teachers using Direct Instruction materials, however, need not concern themselves with computer-programmed error corrections. Diagrams are in fact, how Direct Instruction materials have been worked out in advance of the instruction according to Engelmann’s instructional program. These are essentially “uninstructed.” The perfect lesson would respond perfectly to faultless instructional communication flows. The reality, however, is that the computer cannot respond in completely predictable ways even to teaching demonstrations which are analytically simple. Therefore, we can never be sure which students will make which mistakes on which tasks.

In order to respond optimally to the student mistakes, the use of the Direct Instruction teacher would consider several questions. Did the student make a discrimination mistake, a conceptual mistake, or a combination of the two? Could the mistake have been the result of testing? Did the mistake occur within an initial teaching sequence? Is this a chronic mistake? Are the mistakes being made everywhere across the sub-type? Different answers to each question and different combinations of answers imply different correction procedures — procedures which often amount to an “off-the-put” creation of instructional sequence. The teacher may attend directly to these complexities, which accounts for the seemingly disproportionate amount of time devoted to error pronouncements in Direct Instruction teacher-training workshops.

For purely pragmatic reasons, Direct Instruction corrections pose two types of problems relative to teacher-directed instruction. The first and more obvious problem is how to do a lot of appropriate correction sequences and when to do each. We are referring here not to the “off-the-shelf” guide portions of the various DI programs, but to the more elaborate, more generic and wider range of optimal sequences described by Engelmann and Carnine in Theory of Instruction.

Compounding this first type of problem is the possibility that students will make errors within a correction sequence. Consider the following correction sequence, used for chronic discrimination mistakes that occur within an initial teaching sequence on item 4.

a. Firm on the original sequence.

b. Construct a sequence containing examples of the subtype of items common to item 4.

c. Firm the learner on this sequence and parallel sequences if necessary.

d. Firm the learner on the sequence in which the mistake originally occurred.

Mistakes can occur in any of the firming steps of the above correction sequence. The appropriate “sub-corrections” are generally just quite simple, but knowing when to return in the original correction sequence is a different matter for a teacher who is trying to teach many students and to keep good pacing.

Neither is step b, constructing a sequence of items that the student is trying to keep good pacing, especially when the sequence is a “house” sequence, easily or readily accessible.

We hasten to point out that these problems are not caused by DI design principles. Rather, they are caused by the implementation of optimal design principles in less than optimal educational systems. The ultimate solution of these difficulties for teacher-directed instruction is a political/economic solution: provide for better teacher training, more in-service time, better supervision, and more favorable teacher-student ratios.

A more immediately practical alternative is to implement Direct Instruction in computer-based education. Current computer technology is such that the complete array of Direct Instruction corrections can be stored in a computer without the difficulties discussed above. First, every DI correction can be programmed for use in the computer's memory for instant retrieval under the appropriate circumstances. Second, these multiple programming can be defined precisely: sequence types, item types and subtypes, response mode, range of error messages, error message type, any other factor relative to correction sequence selection can be programmed into instructional lessons. Third, “pools” of extra items can be created and called up into a sequence if novel sequences are required. Fourth, lessons can be branched instantly to earlier instruction or other remedies if errors occur within a correction sequence, and be returned automatically to the appropriate place in the original correction.

Naturally, the prerequisite to computer-delivering such optimized instruction is that the designers of a computer-based instruction have a facility with the design principles such that they can tell the computer exactly what to do and when to do it. The disappointing performance of computer-delivered instruction is identified as not a question of computer capability, but of instructional design capability. This is found in non-computer modes of instructional delivery.

We are a phase in the development of Direct Instruction for computers is convincing us that even improved microprocessor computers are capable of delivering extremely effective and efficient instruction on a genuine instructional task. On the other hand, the general willingness of instructional designers, people used to understand and struggle with a system of instructional design as it appears, is that this approach to instructional delivery appears to be severely limited. We do not anticipate seeing the widespread use of any computer-based education or computer-assisted instruction until quality instructional design becomes widespread.

Gall's Handbook

by Dixon & Siegel

Continued From Page 1

frequently produces many programs for possible consideration, state or district adoption lists usually limit the number of simultaneous lessons.

In Chapters 4, 5, and 6, Gall presents strategies for analyzing and appraising the utility of methods which have been identified. His "Inventory of descriptive features," which includes 39 program features, was developed after more than 100 specific questions, seems potentially helpful for discriminating between programs. Fifty-four percent of the questions deal with materials and the instructional formats. This imbalance of emphasis seems to be characteristic of most commercially available instructional materials, as well (Engelmann, 1982). Ideally, content and instructional variables would account for at least three-quarters of the data, since the design of a given program. If we could construct, validate, and gain widespread use of a set of criteria which discriminated between instructionally effective and ineffective programs, and if we used these criteria in conjunction with those proposed by Gall, we would have an extremely powerful curriculum selection tool.

The appendices contain guidelines, sample policies, catalog inventories, checklists, and evaluation forms relative to direct instruction. In particular, the sample curriculum policies are potentially very valuable for those interested in establishing or revising policies for their own programs. Additionally, the book is well indexed, and its table of figures is clear and helpful.

I believe that this book is potentially useful to those involved in the curriculum adoption process particularly those interested in developing program design principles (Engelmann & Carnine, in press) and program assessment criteria (Engelmann & Carnine, 1981) described elsewhere.

Engelmann (1982) has detailed the instructional characteristics of the four most commonly used basal reading programs in the intermediate grades and found them to be greatly differing in dimensions related to effective teaching. We need materials selection procedures which reflect these differences in program characteristics and more effective ones. As long as educators continue to purchase programs which are not appropriate for high performing students, publishers will continue to market only those programs which are most effective. Educators and teachers will continue to perform at average and below average levels. When educators learn to judge programs on the basis of characteristics which actually make a difference in learning for all students, we begin to have an impact on the programs which are made commercially available. In dealing with this problem in a systematic manner, Gall's book represents an important first step toward that goal.

Reviewed by Stan Payne


Effective Schools (Continued from Page 1)

Social Organization

Schools are social entities whose purp

pose is purposeful learning. As with all

social groupings, their organizational excellence requires some minimum commo

nly held values, norms, beliefs, expectations, rules, and sanctions. The "ethos" of a school's "ethos." Others call it "com

munity."

When a certain term is selected, it is impor

tant to note that there is a need in a school for such shared agreement on rules and the like because it is the exi

istence of common understanding and assent which creates the foundation for trust and respect for others - the ful

gume of social and moral intercourse. The research suggests that schools which are most effective have a strong sense of community within the school building, a community derived from common values and norms and why educators and students treat each other, how much that precious community is developed, depends on the academic and social learning skills are integra

ted.

A clear Academic and Social Behavior Goals. Effective schools have articulated a clear school-wide set of academic and social behavior rules and have achieved an awareness of adherence to these rules through a variety of techniques. The class of 1992's 16 years of experience in the classroom, which promotes an orderly class and school climate. There is no ambiguity. Teachers, students, and parents share the same understanding of the school's goals.

Order and Discipline. Administrators, teachers, students understand and agree to basic rules of conduct. Each person may expect that such rules will be enforced. Teachers instruct. Students are not asked to do anything against gum chewing, running in the hallways, hitting another person, or showing disregard for a school building. The attitude of each teacher is that "I have the right to enforce the rules even if the student is not in my class."
The concern for an orderly and disciplined school climate is not meant to imply that the 1992's 16 years of experience in the classroom, which promotes an orderly class and school climate. There is no ambiguity. Teachers, students, and parents share the same understanding of the school's goals. The concern for an orderly and disciplined school climate is not meant to imply that the 1992's 16 years of experience in the classroom, which promotes an orderly class and school climate. There is no ambiguity. Teachers, students, and parents share the same understanding of the school's goals.

High Expectations. Teachers and ad

ministrators in effective schools hold

higher academic and social behavior expec

tations for their students than do teachers and administrators in less effective

schools. High expectations carry several messages. First they symbolize the demand for excellence and the need for the student "I think you ought to and can achieve."

High expectations are stars to reach for. Second, they communicate to the student that the teachers care. By say

ing, in effect, "The reason I have high expectations for you is that I care about you. Third, high expectations serve as clear goals for the student, goals which is translated by the student as "I am really more capable than I at least I think I can do it." Thus, I have high expectations for me even when I screw up, then maybe I really can do it."

Teacher Efficacy. Effective schools have teachers who have a strong sense of efficacy - a belief which says, "I know I can teach any and all of these kids."

Efficacy is a sense of potency, and it is what provides a teacher with the energy needed for relentless and persevering ef

fort required to get many students to work. A sense of efficacy combined with high expectations for one's students communicates powerfully to students to help learn and that they will learn, or damnit, we will both die try

ing. Intrusive Caring. Student effective

teachers tell you that their teachers and administrators care about them. One child, when asked, "How do you know your teacher cares?" responded, "Because she gets mad at me when I don't do my homework or do poorly on a test."

Caring is expressed in a variety of ways through teachers' high expectations, enforcement of rules, and homework assignments, for example, all tell the student that the teacher is interested in the student's achievement and cares about their achievement.

One goal of effective schools see the caring atmosphere in the informal pat

tern of children's heads, the rigorous demands of high schools, English teacher symbolized by blue-pencilled essays, and the staff's collective celebra

tion of a student's achievement. Parents and parents too know when a school is a caring place for students and see that goals and Incentives. Effective

schools have a system of clear public rewards and incentives for student achievement. Public display of ex

cellent student work, honor roll, assemblies to honor student excellence, groups to learn about parents, and verbal and non-verbal praise from teachers as often as possible serve to motivate and sustain students' achievement of a school's high expectations for them.

Effective schools have administrative leaders, most often principals who are active ad

vocates for and facilitators of the child's set of conditions. Such leadership does not mean that the principal, for exam

ple, must do the planning, or, in the master teacher, or conduct the teachers' evaluations; rather, it means that the principal is a person who helps to make sure these tasks are carried out appropriately. Such a person initiates programs, coordinates learning, expectations, school-wide rules, and the establishment of a good testing program. Most essen

tial in such leadership, in my point of view, is that teachers and students are supportive, caring, and trusting in each of which helps create conditions for excellence.

Community Support. Effective schools have been found to have more parent and community contact than less effective schools. Contact with parents is especially important when the student is concerned with discipline. Parents and other community members are engaged in school beautification programs, tutoring, fund

raising, etc. It is being kept that effective schools, expectations, successes, and failures. Effective schools usually have more parent initiated contacts that less effective schools.

Instruction and Curriculum

"Instruction and curriculum" refers to that part of schooling which is most familiar to the public. For example, the post-Sputnik revolution in schooling (with its increased emphasis on math and science) or the extension into the new curricula, inquiry teaching, open classrooms, and mini-courses) were all rightly visible and public alterations in the instructional and curricular patterns of the past two decades. Only recently have researchers begun to understand the mechanisms underlying the strengths and weaknesses of some of the components of these patterns. Clear

ly all of the factors previously discussed as part of the social organization of the school overlap and complement the instructional curriculum. I have labeled these two sets of attributes separately only for the sake of convenience in this discussion. High Learning Time (ALT). Not surprisingly, researchers have found that the time spent on instruction, or the time the student spends on a learning task the more one learns. Although this sounds perfectly obvious in reality, monitoring this rediscovery is actually more complex and very important.

I have found that in many classrooms teachers may allocate a great deal of instructional time (for example, reading instruction) to students who are behaviorally engaged in learning how to read (reading, reciting, doing a text, etc.) or for only a small fraction of the allotted time. Several studies show that second and third grade teachers could allocate two hours per day for reading instruction, but upon observation of their classrooms, one could see students spending an average of only 12 to 15 minutes a day in learning how to read. Thus, allocated time, or teachers' intended time for instruc

tion, has been shown not to be the best indicator of what covers effective instruc

tion.

Consequently, a more precise measure of time has been substituted for the "time allocation," which is a measure of how much time students actually are engaged in the learning process. A recent study which did not yield widely used standardized test item in the U.S., in fourth-grade math, has no more than 60 percent corresponding to any of the three most well selling fourth-grade math textbook series effective schools purposely link good instruction and curriculum, and evaluation devices in a tightly coupled way to avoid the common error of misinterpretation. A Variety of Teaching Strategies. Several studies have found that teachers who use strategies that emphasize student-centered teaching strategies than those in less effective schools. That is, teachers in effective schools better to student differences (a measured by frequent evaluation) have adopted this different student needs and teaching strategy when students do not seem to be succeeding.

Continued on Page 4
Barriers

(Continued from Page 11)

With concentrated thought and effort, practical solutions to all these barriers can be found. For instance, the walls that prevent students from becoming institutionalized can become institutionalized. Schools would then assume greater responsibility for providing effective practices while still fulfilling institutional requirements.

References


Centra, J.A., and Prince, D.A. "School and Teacher Involvement as an Effort: Will it Pay dividends in students' success?"


Effective Schools

(Continued from Page 14)

Opportunities for Student Respon- sibility. Effective schools provide students with more opportunities for engaging in responsible behavior. Such opportunities include student govern- ment, hallway monitors, discipline panels, peer and cross-age tutoring, and school fund-raising projects.

Each of the attributes above has been shown separately to exist in some effective school studies. However, it is im- portant to note that simply creating one, two, or three of such conditions at ran- dom would not necessarily result in a more effective school, measured at least in academic achievement terms. The more important conclusion that one draws from this is that it is the cumulative effects of these conditions that has payoff. Although no one has shown how much these above conditions are necessary and suffi- cient to guarantee an effective school, observers of such schools suggest that there is an element of synergy involved. That is, it seems that one has to do many things at once to do one thing well. It would be folly, for instance, to believe that simply increasing teacher expectation for students would necessarily lead to increased ALT or teacher efficacy. But in combination, many of the at- tribute above may help create a critical mass of conditions which serve to better promote student achievement. We are unsure as yet as to what variables such a critical mass comprises, but the story of Marva Collins, a Chicago elementary teacher recently portrayed on CBS 60 Minutes, perhaps illustrates the point to be made here.

A Chicago elementary teacher for 10 years, Ms. Collins by her own admission had failed in her attempt to teach black children in Chicago's public schools. So that you, if you can, can come out of Town W. might be noticed in her school in the house. The 60 Minutes pro- gram shows her as the supremely suc- cessful in physical education. Fourth, she held very high expectations. Fifth, she had a high sense of efficacy.

The best summary of this literature was summarized by T. E. Bowers and F. T. Youngson, a research associate with the Na- tional Institute of Education, in the study of the teacher's standards. He states that school resources are not the first or generic cause of learning.

The ability and effort of the child is the prime factor and the task of the schools is to enable children to use their abilities and efforts in the most efficient and effective manner. In the last analysis, that translates as undistracted work, and not schools nor research has discovered a method or resources that obviate this fact.

"We should take comfort from the enormity of the problems that we face, and the notion that we can alter. The common thread of meaning in all that research has dis- closed is that academically effective schools are 'everyday' schools organized on behalf of the consistent and undeviating pursuit of learning. The principal, teachers, parents and the rest of their degrees to the proposition that children can and shall learn in schools. Nothing is more potent and no magic, just the provision of the necessary conditions for learning."
Join the ASSOCIATION
SAVINGS for New Members!

Normal membership covers the period from September 1 through August 31. To encourage new members to join during this period of growth, all new memberships received between April 15 and August 31, 1982, will be extended through the following school year i.e., through August 31, 1983.

Options: 1. Association membership includes DI News subscription.
2. DI News subscription only.

It is still not too late to become a charter member of the Association. Categories include:

a. Student membership... $7/year (includes DI News and a 40% discount on ADI sponsored conferences and 20% discount on publications).
b. Regular membership... $15/year (includes DI News and a 20% discount on all ADI sponsored events and publications).
c. Sustaining membership... $30 or more/year (helps to insure our survival)

ADI sponsored products and events include books and other materials prepared or marketed by the Association (DI Reading, DI Mathematics, Theory of Instruction, Research on Direct Instruction), the Annual Direct Instruction Training Conference, and on-site training/consultation available from ADI staff or contractors.

The Direct Instruction News is published four times a year (Fall, Winter, Spring, Summer).

To join the association, clip out this form and mail it in.

ASSOCIATION FOR DIRECT INSTRUCTION
CHECK ONE
P.O. Box 10252, Eugene, Oregon 97440
☐ 1. I WISH TO RECEIVE THE NEWS. A CHECK FOR $5 IS ENCLOSED.
☐ 2. I WISH TO BECOME AN ASSOCIATION MEMBER, ENROLL ME AS A:
A. STUDENT MEMBER (ST. ANNUALLY)
B. MEMBER (M. ANNUALLY)
C. SUSTAINING MEMBER (S$ OR MORE INITIALLY)
NAME:
MAILING ADDRESS:

DI News, Summer, 1982
16