Using DI to Teach Computer Programming to Retarded Institutionalized Adolescents

by Diane Berryman & Alex Maggs
Massey University, New Zealand, Australia

The application of Direct Instruction technology to the development of basic intellectualbehaviours and cognitive processes with developmentally disabled children has been well documented in the literature over the past decade. These field studies (Booth et al., 1979; Green, et al., 1979; 1979b; Clinen-Koss, 1979; Gersten & Maggs, in press; Maggs, 1979; Maggs et al., 1980; Maggs & Moreth, 1976a; 1976b) have demonstrated that, given the direct instruction according to the Theory of Direct Instruction (Becker et al., 1975; Engelmann & Carnine, 1980) in the academic task of the language of instruction, basic reading skills and/or basic mathematical skills, such learners are able to exhibit the acquisition of an increasingly refined set of cognitive processes with which to control their own learning as well as a repertoire of intellectualbehaviours in order to deal with their environment.

The Development of Basic Intellectualbehaviours and Cognitive Processes through Direct Instruction in Basic Numeracy and Literacy.

The "intellectualbehaviours" or "intellectualskills" required for dealing with one's environment consist of discriminative, conceptual, and procedural acquisition of which is demonstrated through operations and rules. As the acquisition of these behavioral elements involves the learning of concepts, is the most fundamental capability learned by human beings (Gagne, 1977), the initial research (Maggs, 1974) involving developmentally disabled children investigated the applicability of the Direct Instruction model to the teaching of concepts.

The subjects of this two-year "true" experimental study were twenty-eight moderately to severely intellectually handicapped children (age range 6-14 years) in two longitudinal school programs.

The children in the experimental groups were instructed in the language of instruction using the DISTAR Language I programme (Engelmann et al., 1969) and taught through the systematic application of behavioral principles, whilst the control groups received language instruction using traditional teaching practices and the Peabody Language Programme. Results indicated that the learners in the experimental groups were able to exhibit the acquisition of a significantly higher number of concepts than those children in the control groups after the two-year instructional period (Maggs, 1974; Maggs and Moreth, 1976b).

Further analysis suggested that these children would be able to exhibit the acquisition of an increasingly refined set of cognitive processes. These processes, which are also referred to in the literature as "the development of the "ability to learn" as a whole", "cognitive strategies", "executive control processes" or "cognitive processes" are largely independent of specific external content, such as language and numbers, but can be only learned, applied and progressively refined through the acquisition of intellectualbehaviours (discriminations, concepts and rules). Once acquired, they are exhibited as the generalization of the intellectualbehaviours learned to a variety of novel, but related situations. (Gagne, 1977; Olton et al., 1967; Witteck 1967). Hence, in order to examine whether, in the course of instruction, cognitive processes rather than only intellectualbehaviours had been acquired, the subjects were tested on more general tests of cognitive functioning.

Results showed that the subjects instructed using the DISTAR materials thought out and based on valid evidence. The inquiry teacher does not provide the answers or tell the students they are right or wrong. The attempt is to simulate real life problem solving where students are on their own (Busnet, 1968).

There have been some field studies (Stallings, 1973; Siebolds et al., 1977) and experimental studies (e.g., Darch, Carnine & Gersten, 1983) that have suggested that DI is more effective in promoting gains on tests of reading and arithmetic than inquiry-based methods. However, these have not been tests of a well-developed inquiry method under controlled conditions. It has been suggested that when the focus of instruction is on complex skills rather than basic skills, that inquiry methods are likely to be more effective (Grous, 1980). In inquiry methods, the student is given more opportunity to test possible solutions and to analyze their mistakes.

A study by Oliver and Shaver (1966) is closely related to the present study. They compared "revelation" and Socratic methods for teaching legal and ethical concepts to junior high school students. They did not find any significant differences. However, the revelation method did not provide systematic guidance of learning provided by Direct Instruction.

The present study seeks to compare DI and Inquiry methods by teaching concepts and concept applications in the field of law. The field of law was selected because the Socratic method is widely practiced in American law schools, and it represents a well-developed inquiry model (Mayer, 1966, p.81). In addition, legal subject areas are being incorporated more and more into secondary education, and hence their teaching merits systematic evaluation.

Method

Thirty juniors in a suburban high school participated in this study. They were selected randomly from two social studies classes and randomly assigned to the two experimental conditions. There were 18 boys and 12 girls. Ten single sex groups of three each were formed for instruction.

Continued on Page 12

9th Eugene Direct Instruction CONFERENCE
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Continued on Page 14
A “Modest Proposal” for Educational Excellence

By Galen Aleshi
Western Michigan University, The John Hopkins University, and The John F. Kennedy Institute

The major obstacle to improving quality of instruction in our school probably is deciding where to begin. Should we start with the publishers who market untested and non-validated curricula? Or with the university teacher training programs that studiously avoid telling student teachers how children learn, or how to teach them? Or should we organize local communities to pressure their schools to adopt effective and drop ineffective practices? Should we directly approach school boards and superintendents and explore why the education of children has taken a back seat to almost every other faddish issue and genuine crisis facing today’s schools? Should there be a consumer movement and consumer reports for educational curricula and products? It’s not easy to answer all these questions.

The education of children is a complex social institution. All of us, at some point in our lives, have benefited from our schools. We have learned to read and write, and have gained knowledge of the world in general. We have learned to live with others and to contribute to society. We have learned to think critically and to solve problems. We have learned to communicate effectively. We have learned to be responsible citizens.

GALEN ALESHI

educators also may have too many other agendas preventing their objective participation. One established, every political and social interest group in the community will apply pressure to get a seat on the commission. The ability of the board to act independently in the best interests of the community depends on the strength of the board and the board’s willingness to stand up for what is best for the community. To this end, it is important that the board be composed of individuals who are willing to stand up for what is right, even if it means taking a unpopular position.

What will happen if public schools fail to recover the quality in instruction? Public schools may face the same difficulties now ravaging the auto and steel industries in this country. By failing to improve quality, reliability, and efficiency, these industries now cannot compete with more efficient and less expensive competitors. Union workers with ten years of seniority are laid off with little hope of returning to their jobs. Unions are accepting significant cutbacks in fringe benefits and even wages (steel). As the industries face the dilemma of not being able to compete well enough to stay in business, they are forced to mass lay-offs. The result is that the country is enrolling their children in private schools, even though they are paying public school taxes. As a large percentage of the population takes this option, there will be less support for the public schools: less support for private schools for lower income families, less support for existing PTA members, and less support in terms of a higher percentage of high school graduates in the population. As an overwhelmingly large percentage of parents place their children in private schools, the school millages may be cut back to a subsistence level (i.e., baby-sitting) level.
DI for Severely Handicapped Learners

By George Singer

Dan Close

Stefried Engelmann

Oregon Research Institute

This research was funded by contract 330-00-0733 between the U.S. Department of Education and the Oregon Research Institute. The opinions expressed in this statement do not necessarily reflect the opinions of the U.S. Department of Education.

If you teach students with severely handicapping conditions, you probably have taught individuals who were either recently released from an institution or who were in danger of being sent to an institution. You probably wondered what to do with these problematic students. They often exhibit severe behavior problems and limited skill repertoires. They are also likely to have a variety of handicaps. For example, Ron, a ten-year-old, was admitted to a large state hospital in California. Along with a very limited skill repertoire, Ron exhibited severe behavior problems including hitting, kicking, aggressive and self-injurious behavior.

Another student, a nineteen-year-old, exhibited severe behavior problems but also had multiply handicapping conditions including autism, attention deficit disorder, and seizures. Stef, a seven-year-old, required a wheelchair to move around because of her cerebal palsy. The head, very limited range of skills and several maladaptive behaviors, including biting and scratching her mother and教师, and refusing to eat any solid foods. Also, she rarely initiated any activity. Teaching children with such limited skills presents many instructional and programmatic problems.

While there has been great progress in the behavioral treatment of the severely handicapped in the past 15 years, there is still a need for new technology to reach those who do not respond to current approaches. Because of our failures, extremely low performing students are still placed in large state hospitals where they are subjected to neglect, isolation, and inappropriate custodial care.

The principles of direct instruction offer an innovative approach for teaching extremely low performing students. It is based upon the method of teaching the component principles and procedures of direct instruction to severely handicapped students. We can help teach these new skills to these students and prevent their social failure.

The purpose of this paper is to describe some of the problems we have encountered in teaching extremely low performing students and to relate how we have used the principles of direct instruction to solve them.

Project S.A.I.L.: Normalization through Direct Instruction

For over 5 years, we have been working with children and young people similar to the three students described below. The students are currently a demonstration group home in Mount Shasta, California. The home is the main product of Project S.A.I.L. (Systematic Adaptation to Life), a federally funded demonstration project conducted by the Oregon Research Institute with young people, ages 8 to 21, who were residents of a California State Hospital or who were awaiting admission to a state hospital.

All of the clients have severely handicapping conditions, including mental retardation.

Take Henry as an example. He was born with Downs Syndrome. Henry lived in northern California, under age six years old. No school services were available for him in his home town. When he contracted juvenile arthritis, there was no community service to help with his many needs. His mother placed him in a state hospital where he was the only verbal and ambulatory person on a large ward. He soon lost his speech and became severely autistic.

Thirteen years later, when Henry moved to Mount Shasta to live in the S.A.I.L. training home, he simply sat all day in a chair. He occasionally moaned. He had very few self-care skills. When his mother asked the question, "Where do we begin?" at Project S.A.I.L. the beginning staff, "That is a big job in preparation.

The ideas of normalization and personification suggest the ultimate goal is to provide a detailed instruction on the demands of a normal household and community. They provide a set of values. We must keep these values constantly in mind when designing the environment. We perform the training tasks, they begin to teach. We must examine what a person must know in order to enter a simple human community. What are the basic elements of human communication and interaction? What must a person know to begin instruction? We have identified the following concepts as essential to the learning process.

The first principle is that can be demonstrated to these young people is the contingent relationships inherent in the social environment. They do not function as individuals. They work with others do not conform to basic standards of human interaction. Their behavior appears to be very uninterpretable. Tantrums seem to develop without external provocation. These have been defined as behavior that is inappropriate to the situation. It is important to the learner to comprehend the relationship between their action and social or environmental consequences. These students need an understanding of the rules and standards for acceptable and unacceptable behavior. They need to learn that acceptable behavior leads to reward and unacceptable behavior leads to punishment.

Another principle is that is meaningful language of nature. Many of our students possess little receptive or expressive language. They are unable to know the rudiments of communication. A basic concept which must be taught is the language of self-care. Their attention is directed to a simplified and purposeful manner. If we point to a bar of soap, we are teaching the student to use the soap. When we give an instruction, we are indicating to the learner what is expected.

These two principles, that the social community is orderly and that language is meaningful, directly relate to the issue of compliance. Compliance with instructions is a major component of any instruction. We must carefully and deliberately teach our students to comply with instructions, in order to benefit from training. The following section will present examples of instructional strategies that are used to teach our students new skills, thus increasing their participation in society.

Compliance Training

Since compliance management procedures are a powerful tool in changing behavior. However, these procedures are often not effective with persons who have firmly established inappropriate behavior of a serious nature (self-abuse, aggression, tantrums, tantrums).

When contingency management procedures did not produce adequate behavior changes, we began to use inappropriate A.I., a second procedure, generalized compliance training (Engelmann & Colvin in preparation). This procedure attempts to teach compliance behaviors that generalize to a variety of settings. For example, we are teaching new behaviors in isolation and generalizes behavior to the teachers. We use both a set of guidelines or a prescription for programming. This is a guide to the teacher in the classroom. A detailed description of the procedure. It does not provide a set of guidelines or a prescription for programming. The individual is taught to follow the instruction until the appropriate behavior appears during the compliance training session, the student is corrected with a loud command, e.g., "No tantrums" and required to follow a simple instruction, e.g., stand up. After the tantrums, the inappropriate behavior persists, the student is required to perform the simple instruction until the behavior stops. Social reinforcement is provided only after correct performance of simple instruction. Further, the procedures are carefully programmed to achieve generalized compliance across all relevant people, materials, and settings.

An important lesson learned in compliance training is that appropriate behavior or following directions of research inappropriate behavior, distracting directions, leads to simple repetitive tasks without reinforcement.

Generalized Skill Training

Generalized skill training refers to a method of teaching that incorporates many direct instruction principles (Engelmann, Colvin, & Singer in preparation). Of interest in the present paper are the notions of teaching core skills and generalized instructional tasks, and removed-component instruction to focus on training essential features of tasks. These tasks have been used to teach self-care and domestic-living skills to students in Project S.A.I.L.

Core skills. A detailed analysis of the skills required to perform self-care and domestic-living tasks indicates that 10 basic core skills account for over 99% of all the motor movements (Close, Halpern, Slezin, & Taylor, 1983). Of these 10 core skills, the vast majority are variations of a simple manual grasp. Other core skills include push, pull, pull, and push, and use of the hands, and two hands, and two hands and objects, together, place hands under the faucet, etc. These core skills appear in a variety of hygiene tasks such as showering, bathing and shampooing. Once the core skills are mastered, they are applied to other tasks. Tasks are selected for instruction because they include core skills common to other skills, not because they are easy to learn.

Removed-Component Training

Several students at Project S.A.I.L. could not perform basic core skills. As a result, we used the component response or core skill but not when it was needed. Both of these groups of skills is removed-component training. The essential part of the task is practiced in isolation and then generalized to the task. Several rules guide this technique:

1. Select skills or components that can be performed in less than 10 seconds.

2. Once the learner reaches the point, present it in a sequence juxtaposed to a variety of other skills.

3. Finally, reintegrate the task as an entire sequence.

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5. Finally, reintegrate the task as an entire sequence.

Results

On a norm referenced measure of adaptive and maladaptive behavior, the results of this instruction showed statistically significant gains in adaptive behavior (domestic, leisure, self-help, and communication skills) and statistically significant reductions in maladaptive behaviors (tantrums, running away, public masturbation, destruction of property, aggression, and self-abuse). To date, three of our students have been able to return to their natural homes or to foster homes in the vicinity of their home communities. Three other clients are scheduled to leave for foster homes. One home has a waiting list of referrals for other children with severely handicapping conditions and another home has been opened soon in Chico, California. Global data for the efficacy of our demonstration is presented in detail elsewhere (Singer & Close, in preparation).

Continued on Page 4
The present study was designed to extend the research on rapid pacing and feedback to learning disabled students. Also, both the isolated and interactive effects of rapid pacing and praise were evaluated.

Method

Subjects and Setting
The subjects for this study were four students, three boys and one girl, who were identified as learning disabled by school psychologists. Each had a history of difficulty in basic word decoding. At the beginning of this study, each subject had just been placed into learning disabilities classroom. Students' individualized educational programs (IEPs) included learning basic sound/symbol relationships and blending sounds into words.

The reading class met daily for a 45 minute period. The first 20 minutes were used for the experimental intervention. The remainder of the class period was spent having the students work on individually designed worksheets. The four students were taught as a group. The teacher for this study was a 23-year old woman who was completing a graduate practicum in learning disabilities.

Reading Program
The DISTAR Reading I Program was used for this study. In this program, the rate of teacher presentation (pacing) is expected to be rapid (approximtely ten tasks per minute).

Before the study began, the teacher and experimenter practiced providing signals for student responding, contingent praise, and increasing the rate of instruction. Training consisted demonstration, practice, and feedback.

Experimental Design
A modified reversal design, with replication across subjects, was used. The advantage of this particular design is that it allows demonstration of the isolated and interactive effects of individual intervention components. Because most instructional systems are multi-component, the ability to identify those aspects of a treatment that contribute most to increased student performance is very important. Data were collected daily during this study and presentation lasted a total of 22 school days.

The following are some results:

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Average Daily Number of Tantrums</th>
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<tr>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
</tr>
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<td>15</td>
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<tr>
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Figure 1. Average daily number of tantrums per week before and after generalized compliance training.

Compliance training improved the students' performance. The strategy that has proved to be promising with Jack and other clients involves teaching a re- component of the task.

Figure 2 represents the steps completed with the assistance of a verbal prompt on the task of facewashing. The erratic character of the line is typical of Jack's performance during skill training. The dashed line represents the point at which skill training was suspended and the component response of rub was practiced. Jack reached criterion on the second training session and maintained it for three consecutive sessions. The task was reintroduced with the rub integrated and Jack was quickly able to perform the whole task.

Summary
Severely handicapped students with behavior problems are frequently in dangerous environments. They are placed in large congregate care institutions or nursing homes where they are treated as indigent medical patients. They are not exposed to the normal challenges and rewards of community living and are treated as a deviant population rather than as fellow citizens. New techniques and service delivery systems are needed to allow institutionalized students to renenter society or to prevent placement of those who are at risk for institutionalization.

References
Engelman, S. & Colvin, G. Generalized Compenent Training. Dallas, TX: Pre-Eid, Inc.
Schuster, N. Schuler, G. & Singer, D. Instruction for severely inconherent performers. Buck, J.
Variables — Pacing and Praise

deline 1
During this phase, the teacher presented one material from the DISTAR
icons by closely following the daily
innocents with the exception of the
was correct or incorrect, the teacher
 improvised social behavior. If the group
s a correct response, the teacher
told student the teacher was correct, and move on to the
next step in the lesson. If the students
taught that the students would model the correct response and
reduced to the next part of the lesson.

RAPID PACING 1
This phase lasted four days and was
naturally the same as Baseline 1 except
that the pace of instructional presenta-
tion was increased. Instead of creating a
five-second pause between the comple-
tion of one task and the introduction of
the next task, the teacher was instructed
to complete immediately to the next part of
the lesson. It must be emphasized that
increased pacing had nothing to do with
the task to which the teacher spoke. In-
stead, pacing was defined as the time
between task presentations.

RAPID PACES AND PRAISE 1
This phase replicated the rapid pacing
procedure and added praise for ap-
propriate responses and the presentation of
correct academic responses. During each in-
structional presentation, the teacher
provided instances of appropriate
behavior and praised students, using
short specific statements. The teacher
provided behaviors such as eyes fo-
cused on the text, keeping hands and feet
to oneself, sitting in one’s seat, and
repetitive verbal responses. Also,
the teacher would praise student(s)
or the group for responding correctly.
This phase lasted five days.

PRAISE ONLY
Next, rapid pacing was dropped to
represent again the use of praise alone.
The teacher represented material at a slow pace,
using the five-second-pause technique.
The teacher replicated the verbal rein-
forcement procedure described in the
previous condition. This phase lasted
days.

RAPID PACING 2
This phase was identical to Baseline 1
and lasted three days.

RAPID PACES AND PRAISE 2
This phase, a replication of Rapid
Pace and Praise 1, was important in
again showing the effects of the two
variables in combination. It lasted three
days.

DEPENDENT VARIABLES

PERCENT CORRECT
Percent Correct was calculated by dividing the
number of opportunities available to respond to a
teacher or question or direction by the
number of correct answers. If the
student did not correctly respond within
one second of the teacher’s signal, the
response was marked incorrect. In order
for a student’s response to be consi-
dered correct, the student had to voice the
answer loudly enough to be heard by the
observer, who was seated approxi-
mately four feet away. Data were taken
during both individual turns and group
responses. Procedures are discussed below.

PERCENT ON-TASK BEHAVIOR
On-Task was defined as eyes on the
teacher or on the presentation book,
keeping hands and feet to oneself,
looking at the bag, and following the
teacher’s signal. Also, the teacher
would praise student(s) or the group
for responding correctly. This phase
lasted five days.

Three university graduate students served
as primary data collectors. One
collected data on On Task Behavior
while the other recorded Correct
Responses. On alternating days,
the third graduate student would
collect data on either On Task Behavior
or Correct Responses to assess inter-
observer reliability. Data were collected
on the subjects in the following manner.
Observers coded On Task Behavior
using a ten-second time sampling
teaching. They would observe the
student for nine seconds and record
the student’s behavior during the
thenth second. If the student was engaged
in behavior appropriate for the entire nine
seconds, the observers would record
a slash (/) in the appropriate interval
on the data sheet. If the student was
engaged in any inappropriate
durings the nine seconds, the
observer would record a 0 in the
specific interval. A
different student was coded
each interval. The
observers systematically coded the
four subjects in a
predetermined order; therefore
observer
were recording the same
subject at the end of each
ten-second interval.
progression.

RESULTS AND DISCUSSION

INTER-OBSERVER AGREEMENT
The results of inter observer agreements on four
behaviors are shown in Table 1. Each student was
performed well below acceptable level during
the Baseline condition. Each
student’s performance was affected by the
introduction of each phase of the
experimental intervention. With the
introduction of the first component of the
Rapid Pace 1, each student demonstrated an increase in accuracy.
This increase in performance was
continued on Page 11

FIGURE 1

DIRECTIONS NEWS SUMMER 1983

CRAIG DARCH

academic performance merely by in-
creasing the rate of instructional pre-
sentation. This finding replicates Carnine’s
(1976) study. This result also supports
the findings of a correlation study con-
ducted by Gersten, Carnine, and
Williams (1982), in which the students of
teachers who consistently paced their
lessons briskly gained more in reading
achievement than their peers. It is im-
portant to note that this increase in pac-
ing was not due to the teacher’s speaking
more quickly. Rather, the pauses
between each segment of the lesson were
reduced.

The combination of Rapid Pacing and Praise led to an even stronger effect.
Students 1 and 2 improved from a
baseline accuracy of 40% to 86% and
78%, respectively. Student 3’s growth
was not as dramatic from 51% to 65%.
Student 4 was the lowest performer in
the group. Though he demonstrated
some growth in accuracy (38% to 31%),
he continued to perform well below ac-
apropriate levels.

When the Praise Only condition was
administered, performance gains on
Correct Responses are maintained in stu-
dent 5, while slight decreases are shown
in three other students.

Levels of performance during the last three phases replicated the results of
the first two conditions of the experiment.
The finding that the combination of
Rapid Pacing and Praise can produce
powerful increases in performance of
LD students is an important finding for
the classroom teacher.
APPELS FOR TEACHER

Cursive Writing Program

AUTHORS: Samhu Miller, Siegfried Engelsmann

RANGE: Third and fourth grade students or older

DESCRIPTION: The Cursive Writing Program is a 140 lesson direct instruction program that teaches how to form the various letters, create words, write sentences, and write faster and more accurately. Special features include a simplified orthography, emphasis on high-frequency combinations, and design features such as the start arrow to insure correct paper placement. Exercises require only 15-20 minutes of daily work.

ADMINISTRATION: The program is suitable for individuals, small groups, or an entire class.

COMPONENTS: Teacher Presentation Book • Detailed specifications for each lesson • Complete information and reproducible material for placement testing • Information on how to supplement the program • Student Workbook includes • Practice papers for each lesson • Point Summary Chart

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I Love Library Books

AUTHORS: Janice Jensen, Siegfried Engelsmann

RANGE: Students with first grade reading skills

DESCRIPTION: I Love Library Books provides details for introducing 37 popular children's books as an integral component of a first grade reading program. A computer analysis has keyed each book's vocabulary with the words presented in 8 major basal reading programs so that the selected books will match the child's skills and ensure a successful reading experience. Children using this program usually start reading library books by February.

ADMINISTRATION: Either the librarian or teacher may administer this program.

COMPONENTS: Teacher Presentation Book includes: • Complete lesson plans for introducing 37 books • Computer analysis chart matching each book with a specific page and text of 8 basal reading programs • Procedures for record-keeping and assessment • Creative, time-efficient reinforcement activities • Student Workbook includes: • Introductory sheets for each book • Student record sheet • Supplementary worksheets

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<td>446</td>
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Your World of Facts

AUTHORS: Siegfried Engelsmann, Karen Davis, Gary Davis

RANGE: Third through fifth grade students, and remedial learners who read on at least the beginning third grade level.

DESCRIPTION: Your World of Facts is designed to supplement science and social studies programs, preteaching key facts and relationships. The series was written in response to the problem that students are often so concerned with the vocabulary of science and social studies texts that they fail to understand the concepts. Simple charts and pictures present each set of facts, and a game format provides impetus and practice. The 40 lessons require 45-50 minutes each, but only 15 minutes of teacher-directed time.

COMPONENTS: Teacher Presentation Book contains guide information and instructions for each lesson • Student Workbooks are nonconsumable and contain 25 topics, including the solar system, the respiratory system, continents, oceans, and the internal combustion engine • Reproducible score sheet • Reproducible certificate

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Speed Spelling

AUTHOR: Judy Post-Witt

RANGE: Learning disabled and retarded children who have not mastered grade school spelling skills.

DESCRIPTION: Speed Spelling is an individualized, phonic program designed to increase spelling speed and accuracy following a systematic development of sound-letter correspondence. A placement test determines each student's level. Each of the 53 lessons teaches word reading, word writing, and sentence writing, and contains instructional objectives and detailed directions.

ADMINISTRATION: Teachers, students, aides, or other paraprofessionals may act as tutors.

COMPONENTS: Manual includes: • Placement test • Cycling tests • 52 lessons with complete instructions • Adaptation procedures for classroom settings • Student Book includes a record of performance and is the only consumable part of the program • Word List Packet contains large-letter words and is reproducible

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Gene Mazeroiff is an award-winning educational writer for the New York Times. He has written a far-reaching and provocative book which will raise the eyebrows of teachers, administrators, school boards, parents, and other taxpayers. If these various audiences each take an evening or two to peruse this highly readable volume, then begin discussing it with each other, the book could provide a beginning for educational change in many communities.

Mazeroiff’s nine chapters cover a broad range of contemporary topics in public education, including: attributing blame for student failure, societal pressures on the schools, minimum competency testing, inner city schools, teaching the basics in education, the high school, college, costs, issues in the teaching profession, school finance, and parent involvement.

Most of the pages in this volume seem to be dedicated to lambasting how bad things have in public education. If the book had a fault, it is this lack of balance between lamentations and proposed solutions. Still, Mazeroiff consistently concludes with a reminder about what the schools can accomplish and issues a charge to his readers to go out and accomplish similar—or better things.

I agree with Mazeroiff’s assessment that it is the students who are to blame for the woes of education. Neither are those problems the fault of teachers, parents, or administrators alone. Perhaps the fairest indictment would be to blame all adults, collectively; when we blame when students do not learn. The responsibility is often pinned on the teachers, but not so fairly. If—not predominantly—by school administrators and parents, the final authority by virtue of attendance, respectively. Fixing blame is not as productive however, as is expecting leadership, communication, and an expectation on all fronts—at the classroom, building and district levels, and in the home. Mazeroiff makes this point, and it is hard to argue with it.

Mazeroiff does an excellent job of providing a clear, concise discussion of the influence of time on school achievement. He addresses this issue in all its facets: school entry age, length of school year, length of school day, relative time allocation, efficiency of time use, and time on task. In his chapter on high school programs, Mazeroiff critically examines the issue of time allocation in discussing core subjects vs. electives. His treatment of the gap between high school and college and his suggestions for bridging it are important contributions to our understanding the teaching-learning relationship across the entire range of public school grades.

Overall, the light format of the book, Mazeroiff returns to a discussion of external forces which significantly affect the doing of our schools: teacher training, school finance, public support, and parent involvement. Here, too, present-day, disinterest, does not seem to us concerned about what is going on. If enough of us become carnivorous by his message to act, perhaps we can begin to correct some of education’s problems.

Reviewed by Stan Paine

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Administrator’s Briefings

by Linda Carnine

John Chadwick

Irvington Elementary School

Portland, Oregon

The challenges associated with properly implementing Direct Instruction programs in public schools are undoubtedly familiar to many readers. My own experience may be instructive. I serve as the principal of a school with 785 children from kindergarten through 5th grade and a staff of 50 teachers, aides, and support personnel. Our population of children is a liberal mix of every socioeconomic and racial background. Chapter 1 (Title 1) children are “hard to teach,” but they are not the most difficult children in Portland. Last year (1982-83) we began using DISTAR I and II with all 1st and 2nd grade children in our Chapter 1 reading program. At these grade levels, we served approximately 60 children. Children are grouped for instruction within and across classes as needed. The classroom teacher and the Chapter 1 teacher work on consecutive lessons, thus doubling the number of lessons covered per day. Every child finishes DISTAR Reading 1 and many finish Reading II in 1st grade. Children transferred to our school during or after 1st grade take longer. Our adopted reading program is Houghton-Mifflin. When a child completes DISTAR II we provide (with some difficulties) a transition to Houghton-Mifflin. Spring scores on the CTBS (California Test of Basic Skills) show children in 1st grade achieving at the 50th percentile (N = 27) and 2nd graders at the 47th percentile (N = 31).

These results, while encouraging, are balanced against significant implementation problems that have more to do with the politics of program implementation than with the details of teaching or teacher supervision. Some problems that we have addressed are: (1) teacher indifference to the programs, (2) parent opposition to programs, and (3) district inertia with respect to change. Other problems that remain unsolved have to do with the teachers’ contract and a lack of serious resolve at the district level to do meaningful implementation.

Teacher indifference to Direct Instruction (as well as some vocal opposition) was not an issue I met head on. Prior to program selection, I appointed a representative group of teachers to serve as a visitation team. They observed good Direct Instruction implementations and reported back to the staff. They were enthusiastic. As long as the schools visited are the same, the issue of political posture of the school serves, this is a good way to gain support from teachers. I strongly recommend the use of DISTAR programs. I also avoided the use of district “experts” or publisher representatives to do presentations. I was skeptical about the opposition from the schools where we observed to discuss program details, answer questions, and to get feedback and present available data. Following presentations by representatives of other publishers, it was evident to many school districts that the program was going to meet the children’s needs. At the end of the selection process, we voted DISTAR I and II as the program choice for our Chapter 1 children. A vocal minority staff continued to resist the program, but not in any direct ways.

Parent opposition to Direct Instruction was handled similarly. No parent was made to feel that their child had to be in the Chapter 1 program. However, it was made clear that if the child was to participate in supplementary instruction in Chapter 1, that the program would be DISTAR I and II. Vocal parent opposition was often encouraged by a minority of staff resisting the program and wanting to “serve a parent following their child.” Most parent opposition of the form, "not a creative program for my child," "a lock-step program," etc., was dealt with by emphasizing the program’s many creative forms: (a) there were elaborate rationales to write justifying the use of DISTAR, (b) the place of district recommend programs for Chapter 1 children, (c) the withholding of district resources for inservice training of teachers, and (d) frequent difficulties in securing books, workbooks, and other materials. All of the above problems were successfully tackled. Our school had the resources to order additional materials, we were able to pay teachers to take needed training (not, however, when it was most desirable), and rationales were easily written. The most difficult problem was providing in-service to teachers and trying to work around their teaching days. Without a contract provision making it possible to command teachers’ workshop participation, I had to work by agreement with them as to when, how, and under what circumstances they would receive program rationale and format practice. This was after the school year had begun. I had to cover their classes in order to...

Continued on Page 15

DIRECT INSTRUCTION NEWS, SUMMER, 1983 7
Direct Instruction for those with Limited English (DILIE) at Marina Del Mar School, Monterey

Reported by Russell Gersten
University of Oregon

Evolution of the Program

In 1969 there were no non-English or minority children at the Marina Del Mar school in Monterey, California. The school population was composed primarily of low-income (or welfare) families. Because of the low income level, the school became known for its Title I status. DISRTAR Reading and Language were introduced in kindergarten and the primary grades.

In 1979, four non-English speaking kindergarteners entered the program. Since there was no structured instruction as a Second Language (ESL) program, these children were taught using DISRTAR Reading and Language Programs. This appeared to be an efficient and successful approach, so all new ESL students in the primary grades were instructed in the DISRTAR Reading and Language Program. The DILE program was developed by and directed by Mary Alice Brockway and Nancy Henares. At that time, 4th-grade ESL students at Marina Del Mar School were not taught any reading at all for three to five months to allow for English language development. In the meantime, their younger siblings in the primary grades were being instructed in both DISRTAR Reading I and DISRTAR Language I from the time they entered kindergarten. Often, the intermediate students did not "pick-up" the language and felt inferior to the children who spoke more fluently, and also could read English. Many parents (and children as well) wanted their children placed in DILE. Intermediate children came voluntarily after school in the youngest grades to learn DISRTAR Reading. A group of parents requested a night DILE class so that they could also learn the same method as their children. At this point, the project teachers realized that all K-6 ESL students could benefit from the DILE Language Program.

Beginning in 1979, an ungraded model was designed for students attending kindergarten through sixth grade. Some of the content of the developmental (DILE) and intermediate (DILE-L) programs were too simple or childish for the intermediate grade students. A combination program was designed for them including the newly developed remedial Direct Instruction programs in oral reading and reading comprehension—both DILE and DILE-L. The DILE program has always included some English-speaking students. As soon as ESL students become proficient in the English language, they are placed in regular classes in the school.

Major Components of the DILE Program

1. The Direct Instruction: Model of classroom organization and teaching strategies. Approximately 95 students are served in the program. The Direct Instruction takes place in an ungraded learning complex, staffed by 3 teachers and 4 paraprofessional aides. 1% of the 4 aides are bilingual. The ungraded complex allows for students to be placed according to academic correctness level. Both English-speaking and limited English-speaking students are involved in the program.

Almost all instruction takes place in small groups of 6 to 10 students. Students are grouped by ability in instruction reading, oral language, and mathematics. The Direct Instruction settings provide the opportunity for many student/teacher interactions within a 30-minute group. Most of the responses are oral. This is particular important for ESL students. Oral practice is followed by worksheet practice. The worksheets require the students to use and apply the skills that they have just practiced orally.

The teaching strategies built into the DISRTAR programs are designed to assure mastery of each lesson by every child. These strategies are detailed in the DISRTAR manual (Gersten & Baker, 1984).

2. Use of developmental and remedial Direct Instruction programs for ESL students. Professional resources are available from the DISRTAR Through Programs in Uvalde, TX, and San Diego, CA, has demonstrated that the Direct Instruction Model can be effective in teaching mathematics and oral reading accuracy to non- and limited English-speaking students in the primary grades (Gersten, 1981a, 1981b; Gersten, Cramm, & Williams, 1982).

However, no program has been developed which adapts and refines these procedures to include:

- The needs of limited English-speaking students in the intermediate grades.
- The domains of comprehension and written language expression assessed in the intermediate grades.
- Beginning students with no English language skills, regardless of grade level, receive two language lessons a day. In the kindergarten level students receive two lessons from Language I. The second session includes strands from Language II and III that teach children to "phrase" meanings for English words, and some children seem to learn English more easily from their peers. However, they needed intensive instruction and more "contextual" models were developed and spoken in English, since sentence construction is totally different in Korean, Japanese, and Vietnamese.

In its intermediate grade (3-6) program, the DILE model combines developmental materials, intended for 5-8 year olds with remedial programs intended for 9-17 year olds. The remedial reading programs used in the Comprehensive Reading Program in Decoding and Comprehension. In math, the remedial programs used in the mathematics content is not as important. When students in the intermediate grades comm
Intermediate (Third through Sixth) Grades
The students in the program in grades 3 to 6 spoke Vietnamese, Korean, Japanese, Latvian, Hispanic, and German languages. Significant improvement in all achievement domains for the 1980-81 students. For the 1981-82 students, significant growth was found in Reading and Language for third graders and Reading, Language, and Math for grades 4 to 6 (see Table 3).

Summary
These data indicate that non-English speaking students in a structured immersion program following the DILE model: (a) make significantly greater gains in bilingual programs, and (b) perform at or above national median levels after only one or two years of the program. In addition, the followup data show that students who began in DILE at grades one or two years maintain their level of performance after they leave the program and enter the mainstream.

In a recent, exhaustive review of research on the effectiveness of approaches toward teaching limited English speaking students, Baker and DeKanter (1981) reported a dearth of empirical findings on effective approaches toward teaching these students. Two Canadian studies (Lambert & Tucker, 1972; Bark et al., 1977) found structured immersion approaches superior to traditional bilingual approaches. The Joint Dissemination Review Panel had validated the English immersion Direct Instruction Follow Through programs in San Diego, California, and Uvalde, Texas, as effective approaches for teaching mathematics and beginning oral reading to NES/ESL students.

References

Sixth Annual DI Conference in Kalamazoo
August 15-19

The Sixth Annual Direct Instruction Conference at Kalamazoo will be held August 15-19, 1983, at Western Michigan University, Kalamazoo, MI. The conference is co-sponsored by the Department of Psychology and the Division of Continuing Education. Graduate credit in psychology is also available. For more details please write: Division of Continuing Education, Direct Instruction Conference, Western Michigan University, Kalamazoo, MI 49008.
Report by T.H. Bell's Commission on Achieving A Nation at Risk: The Imperative for Educational Reform

Editor's note — Last year, U.S. Education Secretary T.H. Bell appointed a National Commission on Achieving A Nation at Risk to do a comprehensive study of the state of education in America. Last month, the Commission released its report. In the past few weeks, the report has stirred considerable discussion in educational circles. We felt that a number of our readers might not have had the opportunity to read the full text of the report but would be interested in doing so. Therefore, we are reprinting the entire text in two parts. In this part, we present the content of the second of the report, which focuses on the problems facing education in this country today and with what is possible to achieve in educating our children. In the next issue, we will reprint the Commission's findings, recommendations, and conclusions. A related editorial appears on page 2.

Our nation is at risk. Our once unchallenged preeminence in commerce, industry, science, and technological innovation is being overaken by competition from throughout the world.

This report is concerned with only one of the many factors that contribute to that risk. It is the one that undermines American prosperity, security, and survival: the education of our people. If we are to remain a world power and the well-being of its people, the educational direction we choose will be determined by the need, as expressed by a broad range of political, social, and economic forces, to use our ability to retrain and redeploy a large and diverse labor force. That need is expressed by a singular goal: to be competitive.

Unless we can face this issue fairly and honestly, we cannot see the full scope of the problem, nor can we develop a strategy for solving it. This issue is the one that Americans face: Can we meet the challenge of the new skills and knowledge that will be needed in the 21st century, or will we be left behind as a group of people who are not educated enough to succeed in the global economy?

The Commission on Achieving A Nation at Risk has concluded that our schools and colleges are not doing a good enough job of preparing our young people for the jobs of the future. The Commission believes that our educational system is not doing enough to ensure that all American children receive a quality education. It also believes that the United States is failing to prepare all our young people for the demands of the 21st century economy. The Commission states that our educational system is not meeting the needs of all students, and that it is not doing enough to prepare them for the challenges of the future.

The Commission recommends that the federal government, states, and local communities work together to improve the quality of education in this country. It suggests that schools and colleges should be held accountable for their performance, and that they should be given the resources they need to succeed. The Commission also recommends that students should be given more choices, and that they should be encouraged to take challenging courses. The Commission believes that these changes will help to ensure that all American children receive a quality education.

Robert V. Hockett, immediate past president, National School Boards Association (Garden Grove, Calif.), which represents 13,000 school boards and 50 million students, states: "We must be prepared to work with the federal government, states, and local communities to improve the quality of education in this country. We must also be prepared to support the reforms that are necessary to improve the quality of education." He adds: "We must be prepared to work with the federal government, states, and local communities to improve the quality of education in this country. We must also be prepared to support the reforms that are necessary to improve the quality of education."
Excellence in Education

We define "excellence" to mean several related things. For one thing, it means performing on the boundary of individual abilities, in ways that no one can touch. And excellence also means adopting the best educational policies for the country as a whole. The worst educational policies are not ones that yield to the other side's criterion or in practice. And we believe that your work will not help students to learn and live according to their aspirations and abilities, but that it will also provide a general accomodation to mediocrity in the society on the one hand or the creation of an undiscerning elitism on the other.

Our goal must be to develop the talents of all to the extent of their abilities, and that we must be concerned with their skills. This is a goal that we must achieve. We are trying to develop the talents of all students, including those who are not yet ready to compete. Our goal is to help students to learn, and that is why we must be concerned with the development of their skills. We must not allow them to be satisfied with mediocrity, but rather to strive for excellence in every aspect of their lives.

The Learning Society

In a world of ever-increasing competition and diversity, it is important to develop a society of lifelong learners who can adapt to changing circumstances. This is especially true in today's world, where technological advancements are rapidly changing the way we live and work. In order to succeed in this rapidly evolving society, it is essential that we continue to invest in education and learning.

The Public's Commitment

All of the tools at hand, the public's support for education is the most powerful. In a message to the National Academy of Sciences on January 1983, President Reagan commented on this fact when he said, "The public awareness—and I hope public action—is long overdue. This country was built on a public commitment. Our challenge now is to create a resurgence of that public commitment that today, more than ever, is needed to achieve educational excellence."

The results of On-Task Behavior replicate those for correct Responding. Rapid Pacing and Praise both contributed to increased On-Task Behavior. These findings have implications for teachers whose high levels of Off-Task Behavior.

Conclusions

Teachers can adopt both instructional modifications and use of consequences when developing instructional programs for skill deficient students. The powerful effects of praise and praisability can be important in allowing students to succeed in the early stages.
performed significantly better on Piaget-Bruner tests. This indicated that they were able to generalize concepts taught through two-dimensional visual materials to three-dimensional concrete objects. They also exhibited superior verbal, cognitive, and visual-spatial skills, indicating generalization to everyday situations.

Generalization to the tasks on the Stanford-Binet Intelligence Test occurred in a mean gain of 221/2 mental age months over the 24 month period, compared with the control group's mean gain of 7/4 mental age months over the same period. This indicated that many of these children, who entered the program with huge deficits in cognitive skills, were able to exhibit the acquisition of cognitive processes by generalizing their learned intellectual behaviours to new, but related, situations, thus maintaining a near 'normal rate of cognitive development — skills previously considered unattainable by such children.

Related studies using Direct Instruction programs have been conducted with developmentally disabled children by various investigators (Booth et al., 1979; Bracey et al., 1976a; 1976b; Clum, 1979; Maggs & Morris, 1976a; 1976b) over periods of up to five years. The results of these studies indicate similar findings, relating the time allocated to instruction and the duration of the particular study.

The instructional materials in these studies have been the DISTAR Language 1, 2, and 3, and DISTAR Arithmetic 1 & 2 programs developed by Siegfried Engelmann and others at the University of Oregon. These programs were designed to teach basic literacy and numeracy to native learners. They employ indirect teaching strategies where the general case of concepts and operations is taught through a set of examples culminating in the teaching of rules.

The most recent study (Berryman, Maggs & Parr, in preparation) using Direct Instruction with institutionalized developmentally disabled learners (traditional classification: moderately to severely intellectually handicapped) was conducted at the Lorna Hodgkinson Sunshine Home School in Sydney. In this study, all children aged 6-18 years in the school received Direct Instruction in basic language and numeracy over a two-year period. After the 24 months of instruction, using DISTAR Language, Reading, Arithmetic, and Mathematics, the mean gain in mental age months of a random sample of the subjects (33 of the 41 children entered was 19 mental age months as assessed by independent assessors using the Stanford-Binet Intelligence Test. A significant gain in the acquisition of reading, language, and mathematical concepts (intellectual behaviour) was also demonstrated.

The most advanced group of students in this study are now functioning in the high intermediate class, which is considered intellectually handicapped and are aged 12-19 years. Several have sensory and motor impairments in addition to their intellectual impairment. They have demonstrated the acquisition of all the intellectual behaviours taught abstractively in the DISTAR Language 1 & 2, DISTAR Reading 1 & 2 and DISTAR Arithmetic 1 & 2. Generalization to the items on the Neale Reading Analysis test resulted in mean reading ages as follows: Rate = 8.9 years; Accuracy = 9.6 years; and Comprehension = 9.5 years.

Due to the hierarchical nature of learning where understanding of more complex forms assumes understanding of simpler forms (Engelmann & Carnine, 1982; Gagne, 1977) it becomes possible for non-handicapped learners who have reached this level of basic skill mastery and cognitive development to learn rule-governed behaviour, an essential for higher-order thinking and problem-solving, through indirect instructional techniques (Becker et al., 1979). It also becomes possible for learners who have reached this level to generalize the previously learned concepts, for use as prerequisite skills, to novel advanced learning domains (Gagne, 1977).

Thus, it appears logical to predict that the students in this group, who exhibit these prerequisite behaviours, can now further reduce the gap between 'retarded' and 'normal functioning' by generalizing the concepts already learned through indirect instructional strategies for use with their normal cognitive and advanced rule-governed behaviours in novel learning situations.

In order to test this assumption, these adolescents are now receiving Direct Instruction employing deductive instructional techniques in teaching through rules, in the novel advanced skill area of microcomputing in addition to their normal literacy and numeracy programmes.

Microcomputing was selected as the context for investigating this assumption, as these adolescents are now receiving Direct Instruction employing deductive instructional techniques in teaching through rules, in the novel advanced skill area of microcomputing in addition to their normal literacy and numeracy programmes.

Microcomputing was selected as the content for investigation because of the applicability of instruction in advanced skills in a novel knowledge area for this population for several reasons.

Firstly, microcomputing by its very nature requires higher-order rule-governed intellectual behaviours and cognitive processes. The computer can only arrive at a conclusion concerning specific problems if the general solutions have already been worked out by the computer programmer and stored in its "memory". It does this by executing the instructions it receives step by step. Thus competence in the ability to identify a problem, analyze a higher-order programme, put into step compress and arrange the solutions in a sequential manner is essential. Skills in judging the appropriateness of a module and solution are also necessary.

Finally, as the students have no prior knowledge of this content area, it can be regarded as novel or 'knowledge free'. An essential for researching the generalization of previously taught basic concepts in one content area to another higher-order learning domain. The specific concepts previously taught that are required as prerequisites for this programme appear in Table 1.

Finally, the impact of the rapid development in power, ability, types and numbers of computers over the last thirty years leaves little doubt that our future will be essentially a technological one. A future in which the computer will play an increasingly important role. Thus, skill competence in this area may possibly widen the life options of these students by opening up new leisure and employment opportunities.

The Direct Instruction Microcomputing Programme

The programme used for these developmentally disabled students is a modified version of the Direct Instruction Microcomputing Programme (Cross, Hermann, and Maggs, in press) developed by a research team at Macquarie University for Year 5 and Year 6 primary school children.

Taking the view that an essential outcome of contemporary education in this technological society ought to be to produce computer literate citizens, the objective of this course in microcomputing is to introduce the students to those skills necessary for the development of computer literacy. Thus it attends to the development of skills in designing and applying microcomputer programs that fit with an accurate working knowledge of the capabilities, limitations and applications of computers in modern society.

As is characteristic of all programmes developed along the lines of the Direct Instruction paradigm, both thinking operations and content areas are specifically programmed for in this fifty module instructional course. A summary of the specific thinking operations and the modules in which they are taught is shown in Table 2.

The content areas covered are:

- deductive problem solving
- algorithmic construction
- structure diagram drawing
- knowledge of computers and computer languages
- computer programme construction in BASIC

Deductive problem solving skills include defining, identifying, and analyzing simple problems and complex problems. The concept that an algorithm is a way of sequentially solving a problem "step-by-step" is central to this content area. Examples of problems are worked through until algorithms are refined into solutions that are easily written into computer programmes.

These phraseology refinements and the students' understanding of structured diagrams is ready for writing in the computer language, BASIC.

Instructional writing programmes in BASIC include the writing of assignment statements, input statements, statements using variables, operations, print statements, GO TO, IF, THEN, FOR, NEXT and FOR... NEXT... statements.

The specific knowledge of how computers work, how they operate, the advantages and disadvantages of computer-and the simpler computer languages.

Teaching Strategies and Lesson Presentation

Each content area is taught in a cumulative manner, where new concepts, rules and principles are built upon previously learned intellectual behaviours. The shift is from simpler forms to more complex forms. In this way memory storage and recall are facilitated as the instructional sequences make the interrelatedness of the content...
Table 2
Programme Tracks for Thinking Operations
in the Direct Instruction Microcomputing Programme

<table>
<thead>
<tr>
<th>Level</th>
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Explanations and residence

References


Acknowledgments

We acknowledge the actual work effort and valuable suggestions made to us by Philip B. Swain, the teacher involved in this pilot project, and the children of a Redington Sunset School, Claudette Parr.

Pacing and Praise

Continued from Page 11

a remedial education program. The finding that rapid pacing alone increases performance might be helpful as a method to enhance the effectiveness (or at least, at some point in a student's instructional program, supplemental reinforcement programs (i.e., tokens, tokens, high rates of praise). A number of investigators have suggested that use of extrinsic reward systems may produce more rapid learning than the teaching techniques. These students may fail to develop intrinsic motivation for academic tasks that are modified instruction delivery variables (i.e., pacing) some students may not need supplementary instructional procedures, but if a student has already been placed on a point system, an increased instructional pace may produce a more early quick removal of this intervention.

References


Inquiry vs. Direction Instruction — Continued from Page 1

All students received the same reading materials, a booklet of 16 legal cases on the constitutional rights of high school students. The cases involved freedom of speech, freedom of the press, personal privacy, freedom of religion, and discipline-practice. The cases were written in non-technical language and were easy enough to be understood by all the students for validity and accuracy of the summaries. Each student also viewed three films produced by the Committee for Constitutional Education (Prentice Hall Media, 1976). The films included historical background on the cases covered in the booklet.

Instruction was covered in one hour and a half, with ten minutes allowed for discussion. The remaining three hours were for teaching.

Teaching Procedures
The DI and Inquiry treatments differed in four aspects of teacher behavior: (1) structuring, (2) modeling, (3) questioning, and (4) providing feedback.

1. Structuring. The DI treatment was more structured. The specific concepts to be taught were implicit in DI. They were not as well specified as in the Inquiry treatment.

2. Modeling. The DI treatment was more structured. The specific concepts to be taught were implicit in DI. They were not as well specified as in the Inquiry treatment.

3. Questions. In DI, students were asked to respond to questions. The questions were structured around the cases and the concepts of the legal issues. In the Inquiry treatment, the questions were more open-ended and focused on the students' own ideas and conclusions.

4. Feedback. In DI, feedback was explicit. The teacher used clear-cut expressions to indicate the correctness of a student's response, e.g., "Yes, that's right," or "No, that's not right." In the Inquiry treatment, feedback was more subtle, with the teacher indicating agreement or disagreement in a more general manner.

5. Attitude Scale. In DI, the scale was used to measure the students' attitudes toward the teacher and the course material. In the Inquiry treatment, the scale was used to measure the students' attitudes toward the course content and their own abilities to understand it.

Three measures were designed to evaluate the outcomes of the DI and Inquiry treatments. A Multiple Choice test and an Essay test were used to assess knowledge of the law and the ability to apply the legal concepts and principles to the cases covered in the DI and Inquiry treatments. The Multiple Choice test was readministered two weeks later to test retention.

Table 2 shows the results for the first two treatment groups. The Inquiry students scored significantly higher on the test than the DI students (p < .05). The magnitude of the difference, about 10 points, was substantial. The DI students had higher scores than the Inquiry students in their first session, but the difference was not significant.

Discussion
The finding that DI can be used to teach concepts and skills at the secondary level. DI students performed significantly better on both knowledge and skill tests, and significantly higher in the material they did not learn over a two-week period.

The Inquiry approach led to a more elaborate use of the concepts and skills. The Inquiry students scored significantly higher on the test than the DI students. This is likely due to the fact that these students had more practice expressing their opinions, rather than because such expression is unique to the Inquiry method. The fact that the Inquiry students regarded the material as more challenging and consistent with the claims of Inquiry proponents is also true. It is probable also true that for some students the line between being challenged and being confused is difficult to draw. Several of the students in the Inquiry treatment told the teacher that they found the teaching "interesting" but "too hard to follow." It appeared that some students had very little idea of how to respond to the difficulties posed in the Inquiry treatment, as the following excerpt from a taped lesson illustrates (T = teacher; S = student):

<table>
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<th>Instructional Methods</th>
<th>Direct Instruction</th>
<th>Inquiry</th>
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<td>(N = 18)</td>
<td>(N = 15)</td>
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<tr>
<td>Multiples Choice</td>
<td>13.27*</td>
<td>12.53*</td>
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<td>Retention^3</td>
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<td>2.93</td>
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<td>3.98</td>
</tr>
<tr>
<td>Personal Opinion^2</td>
<td>1.7</td>
<td>1.7</td>
</tr>
<tr>
<td>p = .05</td>
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</tbody>
</table>

All the students received the same reading materials, a booklet of 16 legal cases on the constitutional rights of high school students. The cases involved freedom of speech, freedom of the press, personal privacy, freedom of religion, and discipline practices. The cases were written in non-technical language and were easy enough to be understood by all the students for validity and accuracy of the summaries. Each student also viewed three films produced by the constitutional Education Committee for Constitutional Education (Prentice Hall Media, 1976). The films included historical background on the cases covered in the booklet.

Instruction was covered in one hour and a half, with ten minutes allowed for discussion. The remaining three hours were for teaching.

Teaching Procedures
The DI and Inquiry treatments differed in four aspects of teacher behavior: (1) structuring, (2) modeling, (3) questioning, and (4) providing feedback.

1. Structuring. The DI treatment was more structured. The specific concepts to be taught were implicit in DI. They were not as well specified as in the Inquiry treatment.

2. Modeling. The DI treatment was more structured. The specific concepts to be taught were implicit in DI. They were not as well specified as in the Inquiry treatment.

3. Questions. In DI, students were asked to respond to questions. The questions were structured around the cases and the concepts of the legal issues. In the Inquiry treatment, the questions were more open-ended and focused on the students' own ideas and conclusions.

4. Feedback. In DI, feedback was explicit. The teacher used clear-cut expressions to indicate the correctness of a student's response, e.g., "Yes, that's right," or "No, that's not right." In the Inquiry treatment, feedback was more subtle, with the teacher indicating agreement or disagreement in a more general manner.

5. Attitude Scale. In DI, the scale was used to measure the students' attitudes toward the teacher and the course material. In the Inquiry treatment, the scale was used to measure the students' attitudes toward the course content and their own abilities to understand it.

Three measures were designed to evaluate the outcomes of the DI and Inquiry treatments. A Multiple Choice test and an Essay test were used to assess knowledge of the law and the ability to apply the legal concepts and principles to the cases covered in the DI and Inquiry treatments. The Multiple Choice test was readministered two weeks later to test retention.

Table 2 shows the results for the first two treatment groups. The Inquiry students scored significantly higher on the test than the DI students (p < .05). The magnitude of the difference, about 10 points, was substantial. The DI students had higher scores than the Inquiry students in their first session, but the difference was not significant.

Discussion
The finding that DI can be used to teach concepts and skills at the secondary level. DI students performed significantly better on both knowledge and skill tests, and significantly higher in the material they did not learn over a two-week period.

The Inquiry approach led to a more elaborate use of the concepts and skills. The Inquiry students scored significantly higher on the test than the DI students. This is likely due to the fact that these students had more practice expressing their opinions, rather than because such expression is unique to the Inquiry method. The fact that the Inquiry students regarded the material as more challenging and consistent with the claims of Inquiry proponents is also true. It is probable also true that for some students the line between being challenged and being confused is difficult to draw. Several of the students in the Inquiry treatment told the teacher that they found the teaching "interesting" but "too hard to follow." It appeared that some students had very little idea of how to respond to the difficulties posed in the Inquiry treatment, as the following excerpt from a taped lesson illustrates (T = teacher; S = student):

1. A pretest was used to assess students on the knowledge of legal cases. With 16 questions, the scores ranged from 0 to 8. The mean was 5.2, suggesting that the students did not know much about the material at pretest. Grade point averages were compared for the two groups.

2. The mean for the DI group was 12.2, for the Inquiry, 8.7. The difference between the groups was not significant.
Table 3: Student Attitudes Toward the Unit

<table>
<thead>
<tr>
<th>Direct Instruction (N = 15)</th>
<th>Inquiry (N = 15)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>I learned a lot in this unit.</td>
<td>3.23</td>
<td>3.13</td>
</tr>
<tr>
<td>SD</td>
<td>.49</td>
<td>.40</td>
</tr>
<tr>
<td>I feel that the logical concepts and principles we studied are important to know about.</td>
<td>3.33</td>
<td>3.03</td>
</tr>
<tr>
<td>SD</td>
<td>.49</td>
<td>.20</td>
</tr>
<tr>
<td>I liked the way the unit was taught.</td>
<td>3.00</td>
<td>3.07</td>
</tr>
<tr>
<td>SD</td>
<td>.65</td>
<td>.28</td>
</tr>
<tr>
<td>I wish more units in social studies were taught this way.</td>
<td>3.00</td>
<td>2.70</td>
</tr>
<tr>
<td>SD</td>
<td>.10</td>
<td></td>
</tr>
<tr>
<td>The material was challenging.</td>
<td>3.03</td>
<td>3.67</td>
</tr>
<tr>
<td>SD</td>
<td>.24</td>
<td>.49</td>
</tr>
</tbody>
</table>

Note: Scores are on a 4-point scale, ranging from Strongly Disagree (1) to Strongly Agree (4).

In the Tinker case the judges formulated a general rule or principle. What do you think this war?

S3: Non-violence. It's non-violent, it's okay.

T: Like a long time ago, like, or in the 1960's. Martin Luther King was non-violent, it was all non-violent, and it was okay.

T: What makes that a general principle or rule?

S2: Violence doesn't pay.

T: What I mean is not why you should believe it or not believe it, or accept it or not accept it. But how do you know that what you just said is an example of a general principle or rule?

S2: Well, if students are having a demonstration, and there's an uprising or a big disruption that causes harm—usually to someone or something—it damages someone or something or a group of people and... I mean it's not why you should believe it or not believe it, it's why it's not acceptable. And how do you know that what you just said is an example of a general principle or rule?

T: That's the definition of a principle or rule?

S2: A standard you have to live by.

T: Then tell me why what Joe is saying represents a rule or principle. Not whether or not you like it or think it's good, or whether you should obey it or not, but why does it represent a principle or rule?

S2: Because it's the protection for the people.

T: If I built a big shelter for people, that protected people, would the shelter be a principle or rule?

S1: No.

T: Why not?

S1: Because it's a shelter constructed, but doesn't have the obvious purpose to enforce it and to back it up.

T: Inquiry teaching may require a much longer period of time to produce desired outcomes than EL. Personal accounts of first year law students, for example, often indicate that they are confused and frustrated by the Socratic teaching method during the first few months of the term, only to emerge as strong advocates of the method by the end of the year (Turov, 1977). It may be that Inquiry teaching cannot be operationalized effectively in a six hour treatment condition.

In addition to the time factor, student characteristics may affect what is learned under Inquiry condition. Last students obviously have a more extensive academic background than high school students, which might help them organize ideas and arguments when no organizing structures are provided to them. Insofar as there are affective, payoffs to Inquiry instruction, they may be limited to those who already possess the basic concepts and skills in the area being studied.

Our observations of the experimental treatments suggest that the main value of DI lies in the early phases of the treatment, which focused on the acquisition and application of basic legal concepts, for example, issue, decision, division, rule, or principle. These concepts provided a common framework with which to analyze new legal cases, and to compare them with cases studied earlier. The Inquiry treatment students generally did not develop this common framework and as a result, the time period appears to be less productive in this treatment. It may be that inquiry teaching is best used in conjunction with more structured approaches, at least in content areas that are near to students.

References

Carnine, D.W., & Silbert, J. Direct Instruction reading, Columbus, Ohio: Charles Merrill, 1979.

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DIRECT INSTRUCTION NEWS, SUMMER, 1983
Oregon Gets Leadership Training Grants in Special Ed

by Douglas Carrie

Special education at the University of Oregon has recently received several grants for training special educators. Two of the grants are in the mildy handicapped area, focusing on the preparation of leadership personnel at the doctoral level as well as teachers of handicapped students. The three-year leadership training grant increases the likelihood of financial aid for entering Ph.D. students.

The Ph.D. Leadership Training grant proposes to develop leaders in special education who are experts in providing concrete, specific solutions to the problems encountered in classrooms serving handicapped students, in training teachers of the handicapped, and in designing research on instructional procedures for the handicapped. In addition, the program will also foster a sense of professionalism in the doctorial students. This grows from an understanding of the issues that are beyond instruction (including interpersonal communication, scholarship and research, skills in writing, and the like). What is unique about this problem is that while students pursue these areas of professional development, the link between these areas and instructional issues will be explicitly and implicitly addressed by the faculty. Our goal is that students will utilize their core knowledge of instructional design and effective teaching to develop a basis for their research projects, and/or curriculum development projects for handicapped students in areas such as computer-assisted instruction, science curriculum, interventive projects, work on legal issues, interactions with parents and consumer advocacy groups, and the like.

All candidates for the program will have to be reasonably proficient teachers. If they are not, they will be directed to practice teaching until they meet specific performance criteria.

Candidates will supervise in the Handicapped Learner Norm practice. This program phase master's level students into increasingly more difficult or technically demanding teaching situations, with a one year daily practice experience.

Just as the trainees in the Handicapped Learner Norm program begin with "basic" teaching assignments and are then phased into more difficult situations, the Ph.D. special education candidates would be phased into increasingly demanding training situations. At first, they would accompany an experienced trainer who has demonstrated extreme proficiency in teaching all types of handicapped children and training student-teachers.

During the first few weeks the experienced trainer performs all necessary "interactions" (taking over a group and demonstrating how to solve a serious problem that the trainer is experiencing), gives all assignments to the trainee, arranges schedules for monitoring, and deals with interpersonal problems. When the candidate exhibits high reliability in observing problems and in describing what would constitute an effective remedy, the candidate becomes the primary supervisor of a group of Handicapped Learner Norm trainees, with the supervisor now serving the role of back-up and facilitator. This careful progression from supervision in training to "main line" supervisor is the foundation from which the students will come to be experts in providing quality service to handicapped students. While the core part of the program is not the only aspect of the proposed program that directly relates to the educational needs of handicapped individuals, it is the major part.

Successful teacher-trainers are the key to successful implementation of programs for the handicapped. But they do not grow on trees. They must first be excellent teachers, measured by their ability to teach any child (from the highly noncompliant to the seriously language-delayed) in any situation. They must be able to provide immediate solutions to problems that the teachers or trainees are incapable of solving. They must understand and appreciate the nature of the practice required for different skills, how to "diasgnose" the "instruction" that the teachers are providing, and, based on observed flaws, the instructors can predict specific student outcomes. They must be able to communicate the relationship between the observed flaws and the procedures and the predicted outcome, and they must be able to demonstrate that the problem is solvable by changing the procedure, so that the flaw has been eliminated. In addition, they must have skills associated with appropriate scheduling of activities within the classroom, scheduling time so that they observe teachers or trainees at times that are most likely to reveal specific problems (such as transitional activities in the classroom) and deal with a full range of administrative and interpersonal problems in a way that is both time efficient and effective in solving the problems. They must be able to communicate these problems to supervisors, teachers, school administrators, and parents. This includes the ability to write clearly and effectively about educational issues, and to make presentations at professional conferences, teacher training sessions, meetings of parent groups, and meetings with administrators.

Finally, they will need the expert and scholarship required to conduct research that is relevant to a technology of improving teacher performance, program design, student performance, and support systems.

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