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ADI NEWS

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Corrective Reading Program Evaluated with Secondary Students in San Diego

By Marlene L. Campbell
San Diego State University
Reported by Wes Becker

This study used the original *Corrective Reading Program* (Engelmann, S., Becker, W.C., Carnine, L., Meyers, L., Becker, J. & Johnson, G., SRA, 1975) which was later revised and published as *Decoding B* of the 1978 *Corrective Reading Series*. The program provides for daily teacher presentations, group oral reading, silent reading practice, and dual oral checkouts on each story. The program has a built-in point system and charting of progress.

The students selected for the study were seventh and eighth graders with reading levels on the Woodcock Reading Mastery Test (1973) more than one standard deviation below the mean. A non-equivalent control group consisted of students reading at least at the third grade level who were emotionally stable. They were placed in regular English classes. There were 13 subjects in the control group (6 reading at the third grade level, and 7 at the fourth grade level at the start). There were 42 experimental subjects (19 starting at the second grade level, 14 at the third grade level, and 9 at the fourth grade level). A small percentage of experimental subjects were in the program for a second year (e.g., as a seventh grader and an eighth grader). If pretests and posttests were available for each year, they were counted twice. The experimental group was 75% seventh graders and 85% boys, whereas the control group was more evenly divided. 79% of the experimental group and 62% of the control group were non-white. The classes were held in a junior high and a middle school in a minority neighborhood. Both were magnet schools where the principals encouraged the development of reading skills.

The individually administered Woodcock Reading Mastery Test was used to evaluate progress (in most cases Form A at pretest and Form B at posttest). The Woodcock gives a total Reading Score and five subscores: Letter Identification, Word Identification, Word Attack, Word Comprehension, and Paragraph Comprehension, and a Total Reading score.

The students were taught CRP for 50 minutes a day in resource room classes of 8 to 12 students. The teachers and aides received no special training in the use of the program. Checkouts were made by the teachers or aides within the 50 minutes of class time. The students were also required to read six books of their choice each quarter and to give book reports to the class. CRP was not taught on book report days.

Results

Table 1 shows the gains by subgroups and total groups on the Woodcock Total Reading scores. The *Corrective Reading* groups all did better than their comparison groups. Overall there was a gain of 2.2 years in 9 months of instruction by students in CRP, and a gain of .4 months by students in English classes. The lowest performing group, subgroup A, gained 1.2 years in 10.2 months. Considering that these students had gained only 2 years in the last 7, this is an excellent change. It is likely that these low students also needed additional systematic phonics instruction (as provided in *Decoding A*) to make better progress. Subgroup B gained 2.4 years and subgroup C gained 3.4 years. The comparison groups gained .2 and .5 years respectively.

Table 2 breaks scores down by subtest and shows t-tests for statistical significance. On each of the subtests, except Word Identification, there is a highly significant difference. Gains occur for comprehension as well as decoding skills. Magnitude of the gains (with the exception of Word Identification) range from .5 to .7 standard deviation units for the CRP group. The maximum change for the control group was a little over .1 of a standard deviation unit. (Note: To express gains in standard deviation units, the standard score is divided by the standard deviation for the standard scores, which in this case is 10.)

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Table 1

Comparisons of Gains on the Woodcock Mastery Reading Test

			Total Reading Scores		
Groups	N	Months in Program	Grade Level Gain	Terminal Level	Standard Score Gain (SD = 10)
I—Exper.	42	9.0	2.2	5.9	5.9
II—Control	13	10.5	.4	4.4	.5
Subgroups					
A. Pretest—Grade 2					
I—Exper.	19	10.2	1.2	3.7	4.8
B. Pretest—Grade 3					
I—Exper.	14	9.0	2.4	5.4	7.3
II—Control	6	10.8	.2	3.6	-0.5
C. Pretest—Grade 4					
I—Exper.	9	6.4	3.4	6.6	6.0
II—Control	7	10.1	.5	5.0	1.4

ADI Tenth Annual Eugene DI Conference

Accompanying this issue you will find the announcement for the tenth Direct Instruction training conference in Eugene, OR. Members will also find four extra copies of the ADI NEWS. Help us spread the news about the Conference and to increase ADI memberships by giving the extra copies to colleagues and friends who might like to join us. Memberships taken out between now and September 1, are good until August 31, 1985. If you have additional persons who should receive this issue FREE, please send us their names and addresses.

At the Annual DI Conference every one works hard and learns a lot. It is a fun week to spend with others like yourself who want to be better at what they do in teaching. The faces of newcomers on the first day of the Conference are interesting. Their eyes, their expressions, and their reluctance to laugh suggest that they are very serious and somewhat intimidated. But by the end of the week, their faces and behaviors have changed a lot. They are relaxed and happy, and they realize they have been through a week of powerful learning. At the end of the Conference both trainers and participants leave renewed for the coming year. We have seen this happen again and again to ourselves and to those who join with us at the Eugene Conference.

We can't promise perfect weather, but we can promise great accommodations at the new Eugene Hilton and Conference Center, and a fun get-together picnic at the end of the first day. The guest rooms at the Hilton are great and the Conference facilities are the finest. We will have some of the best trainers in the world starting with Ziggy Engelmann, Doug Carnine, and Wes Becker, and a backup cast of pros such as Phyllis Haddox, Susie Hanner, Randy Sprick, Gary Johnson, Geoff Colvin, Lynne Anderson-Inman, Stan Paine, etc., etc., etc. We will provide the best Conference we can design, and our focus will be on providing you with the most information and practice that can be communicated in five days. You will work hard, but it's worth it.

If you haven't attended one of our conferences, give it some serious thought. The Eugene area is gorgeous—close to the ocean, the Redwoods, Crater Lake, and the Cascade mountains. Fern Ridge Lake is 10 miles away for boating and swimming. The Willamette River runs through town and is used for rafting and fishing. Outdoor sports abound. The new Hult Center for the Performing Arts is adjacent to the Hilton and promises a full schedule of outstanding performances during your stay. By doubling up at the Hilton, your cost can be only $22 a night.

If your district cannot support your training, remember that for most of you it can be written off taxes as a professional expense. So consider combining the Conference with a low cost vacation. Send in your Conference application form soon to insure you get the sections you want. See you in Eugene in August!

Dear Editor:

You and your DI group deserve a big THANKS. In my Basic Skills Resource Room, I am using your *Corrective Reading, Mastery Spelling*, and now *Expressive Writing*. It is terrific. Here's an endorsement I want to share with you.

Scene: Faculty Lunch Room (Crowded—including principal).

Regular Ed. Teacher: (To me, loud and clear): "Hey,. Bernice, we did paragraphs today and *your* kids did better than my *regular ed.* kids!"

Boy, was I floating.

Thanks again for a great book. I hope Level II will be coming out this summer. Or what do you suggest for a followup?

Very truly yours,
Bernice Senti Pluchos (Mrs.)
Special Education, Basic Skills
Evergreen School Distric
Vancouver, Washington

Ed. Note: The thanks should go to Ziggy Engelmann! And yes, Level II is on the way.

To the Editor:

In the last issue, (Winter 83-84), in our article on *Sequencing Examples in Discrimination Learning*, there was an error in the results section. It should read "The average percent right for the Arranged Sequence group was only 2 percentage points higher than the Random group on the Maintenance test" instead of 10 percentage points higher. The difference was 13 percentage points on the posttest. The implication we drew from this dramatic drop was that one cannot expect that new learning will be maintained by severely handicapped individuals unless the teacher programs-in review sessions.

Thank you.

Russell Gersten

Dear Editor,

I have been using the *Distar Reading* program for 16 years. About 11 years ago, there was a youngster in the program (in my educable mentally retarded class) who was reading in Distar II. At that time Book F, lesson 300, introduced the alphabet backward. Many lessons were devoted to this task; some of the youngsters did exceptionally well.

Three weeks ago, one of these students came to visit me. He told me that he was in the army and made a gread deal of money betting with some of the soldiers.

How did he make this money?

He bet the others that they could not say the alphabet backwards. He *could*; he came to say "thank you."

Yours truly
Amy H. Cohen
Special Education Teacher
Buckingham School
Norwich, Connecticut

Are You Going to a Conference?

Copies of back issues of *ADI News* will be sent to persons attending conferences where they would have an opportunity to interest others in joining ADI or subscribing to the *News*. If interested write to the Editor, ADI and let him know how many copies you could use.

Do You Need Research Information?

If you are in need of certain kinds of research information about DI programs that is not now available, why not write to the Editor of the *DI News*. We will publish your letter and see if someone "out there" can help you.

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

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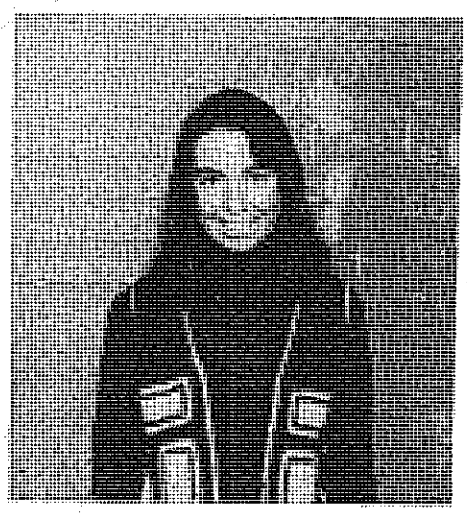
DI Teacher Named Idaho Teacher of the Year

Idaho's Teacher of the Year for 1983-84 is Victoria (Vicky) Roper, Special Education Teacher at Wendell Elementary School in Wendell, Idaho. Ms. Roper was nominated for the award by the parents of one of her students because they were impressed with the tremendous progress their child had made in Vicky's classroom. Vicky combines effective teaching techniques with a supportive manner to motivate students to succeed in her self-contained classroom.



VICKY ROPER

An advocate of Direct Instruction, Vicky has attended DI Conferences in Eugene and uses a variety of direct instruction programs. This year, she and her aide are teaching *Distar Reading I, Arithmetic I, Corrective Reading Decoding B, Corrective Mathematics, Spelling Mastery, Cursive Writing*, and *Time-Telling*. Vicky has also used *Distar Language I*, modified with signing for hearing-impaired students. She works closely with regular classroom teachers to promote interaction between regular and special education.

Vicky gives much of herself when working with exceptional students. She serves as a Special Olympics coach, trainer, and fund-raiser, spending countless out-of-school hours in helping her students achieve the confidence and abilities to participate.

The Association for Direct Instruction would like to extend its congratulations to this enthusiastic, dedicated and well-trained professional.

Call for Award Nominations

The Board of Directors of the Association for Direct Instruction is seeking nominees in four categories for the 1984 ADI Awards for Excellence in Education. Each year, ADI honors people who have made distinguished contributions to educational excellence in one of four categories: (1) elementary teaching; (2) secondary teaching; (3) school administration; or (4) teacher training and research. Last year's honorees were: Karen Garner, Beaverton, Oregon; Nancy Woolfsen, Eugene, Oregon; Tina Rosen, Olympia, Washington; and Alex Maggs, Sydney, Australia, respectively.

The awards seek to recognize those who have distinguished themselves by their continuing commitment to excellence in education for all students. Through this recognition, the ADI Board seeks to illustrate to others what can be accomplished when commitment and Direct Instruction technology are put together.

Honorees are selected by the ADI Board of Directors from nominating letters submitted to them. You may nominate cadidates in any one of the four categories. NOMINATIONS MUST BE RECEIVED BY JULY 1, 1984. Send letters of nomination to ADI BOARD (HONORS), P.O. Box 10252, Eugene, OR., 97440. In your letter, document what your nominee has done to earn your nomination. Please provide an address and phone where we can contact your for more information if needed.

Many more capable and deserving persons will be nominated than can be recognized this year. However, we welcome all nominations.

ADI Financial Report - 1983

During the year 1983, The Association for Direct Instruction had a total income of $169,999.81 and expenses of $161, 763.63. This gave a net income of $8,236.18. About $5000 of this was obligated to support the handicapped preschool and the rest for the Spring and Summer issues of *DI News*.

The San Diego and Eugene conferences produced a net gain of $2927.22 on income of nearly $40,000. Memberships and subscriptions brought in $10,099.50 and book sales nearly $14,000. Expenses in this area (books and *DI News*) exceeded costs by $621, but we have an inventory valued at about $7500, so we remain about $6900 ahead on publications ($4400 of inventory was carried over from 1982).

The handicapped preschool and the 4-J summer school are essentially break even operations.

The Association thus remains financially stable.

1983 Income & Expense Summary

INCOME	
Memberships and subscriptions	$10,099.50
Memberships — 581	
Subscriptions only — 276	
International M & S — 40	
Book sales	$13,973.67
Advertising	$440.00
Interest	$485.00
Conference fees	$39,337.00
Handicapped Preschool (State Funds)	$98,872.64
Handicapped Preschool Other	$2,042.00
Eugene 4-J District Summer School	$4,750.00
Total Income	$169,999.81
EXPENSES	
Cost of books and *DI News*	$24,920.08
Overhead	$699.02
Conference expenses	$36,409.78
Preschool expenses	$85,716.97
Overhead	$9,626.63
Eugene 4-J District Summer School	$4391.15
TOTAL EXPENSES	$161,763.63
NET INCOME FOR 1983	$8,236.18

Using Corrective Reading with Adults

By Cynthia M. Herr
Lane Community College
Eugene, OR

While the *Corrective Reading Program* was originally written for use in grades four through twelve, it is equally effective when used with adults who are non-readers or who read at a very low level. I began using *Corrective Reading* with adults when I started teaching in the Study Skills Learning Center at Lane Community College in 1979.

The Study Skills Learning Center offers developmental courses in language arts for students who are enrolled at Lane Community College. Some of the students are enrolled in vocational courses; some are pursuing academic degrees. Students range in age from young adulthood to middle-age. Among the courses offered in the Study Skills Learning center are several classes designed to provide intensive remedial work in reading, writing, and spelling. These Read, Write, Spell classes, as they are called, require the students to attend class 10 hours per week. This is approximately three times the class time required for most courses at the college. There are three levels of Read, Write, Spell classes. The lowest level is for students who read at less than a fifth grade level, as measured on the Wide Range Achievement Test (WRAT). The second level is for students whose reading levels fall between the fifth and seventh grade levels, and the third level is for students whose reading levels are above the seventh grade level. Enrollment in any of these classes is by instructor permission only, and all students are pretested on the WRAT before being allowed to register for one of the classes. As a matter of department policy, standardized test data are recorded by instructors for all classes offered in the Study Skills Learning Center. The maximum enrollment for the lowest level class is 12 students. For the other two levels, it is 15 students. A classroom aide is assigned to assist the instructor of the lowest level class during the ten hours of weekly class time.

I taught the lowest level Read, Write, Spell class for nine terms between Fall, 1979 and Spring, 1982. During this time, I used *Corrective Reading* as the primary reading program for the class. Besides the WRAT, the Nelson Reading Test (a timed test of vocabulary and comprehension) is typically administered. Many students take a Read, Write, Spell class for only one or two terms. But during the three years I taught the class, three students enrolled in my class for several consecutive terms. This enabled me to gather long term data on their reading progress. I have also had contact with each of the three students over the last two years. Thus, although I do not have test scores on their current reading levels, I do know that all three students have continued their education programs to some degree. The purpose of this article is to describe the use of *Corrective Reading* with these three adults and to present the data on their progress during the time they were enrolled in the Read, Write, Spell class.

For the most part, I used the *Corrective Reading Program* in the same manner with adults as I had with elementary and high school age students previously. Each student was given the placement test and assigned to either *Decoding B* or *Decoding C*. In the cases of these three students, who shall be referred to as W., D., and M., each student began *Corrective Reading* in *Decoding B*, lesson 1. Since the Read, Write, Spell class met for two hours each day, I was able to divide the class of 10-12 students into two skill groups which met with me for a *Corrective Reading* lesson for 45-60 minutes a day. During the other hour of class time, the students worked with the aide. During this time, the aide did timed readings with the students, taught a spelling lesson, and assisted the students in their independent seat work.

Initially, I covered only one *Corrective Reading* lesson a day with each group. The lessons were taught according to the program manuals. One of the most critical aspects of teaching reading to adults who are reading at a very low level is having the students read aloud. Unfortunately, this is the aspect of teaching reading which is most often excluded in teaching adults, primarily because instructors are afraid that adults will be too embarrassed to read aloud. During the first week of class, my students were shy about reading in front of other students. I made a point of explaining to them why it was critical for them to read aloud, and I assured them that no one would laugh at their mistakes. We closed the door to our classroom to facilitate privacy, and the rule about laughing at mistakes was strictly enforced. I never once had a student refuse to read aloud under those circumstances. The students received considerable positive reinforcement, and they were soon quite comfortable about reading aloud in class. One of the nicest benefits of having the students read aloud in each other's presence was that each student quickly realized that his/her reading problem was not unique. The students developed into a very close-knit, supportive group and encouraged each other to continue whenever one of the group members became discouraged.

For most of *Decoding B*, I covered one lesson a day. I found that adult readers with few decoding skills take as long to master beginning reading skills as do children who are just learning to read. However, once these students had successfully mastered most of *Decoding B*, I found that their learning rates accelerated more quickly. I was able to do one lesson in class plus the chalk-board work for the next lesson and assign the second story for homework. The class aide then did both timed readings with the students the next day. The students' error rates did not increase with this accelerated pace. I also found that most of the adults I taught had little trouble comprehending the *Corrective Reading* stories as long as they were decoding them accurately. Because of their receptive language, which for most students was quite good, they had little trouble with the vocabulary in the stories. This also made it possible to cover *Decoding C* at an accelerated pace. Except for their greater expressive and receptive language abilities, these adult learners were very similar to other beginning readers in the types of errors they made in their reading. I found that teaching adults beginning reading skills was very similar to teaching children beginning reading skills.

Often I have been asked whether these adults objected to the content of the *Corrective Reading* stories. They did *not* object. Sometimes they joked about how silly some of the fictional stories were, but all of them were much more concerned about their reading progress than they were about the content of what they read. With *Corrective Reading*, their progress became evident to them within the first couple of weeks. As long as they felt they were learning to read, they likely would have read anything I had asked them to read.

The case histories of the three students demonstrate the kind of reading progress adults can make when they are taught with a well-structured, carefully sequenced reading program like *Corrective Reading*. The test scores for these three students, W., D., and M., are presented in Tables 1 and 2. In addition to the standardized tests, I also administered the *Corrective Reading* mastery tests at the appropriate times in the program. Although Tables 1 and 2 show pretest and posttest scores for each term, the pretest score for most terms is the posttest score from the previous term. In most cases, there was only a few weeks' time between the end of one term and the beginning of a new term. It would have been inappropriate to have tested continuing students on the same standardized tests within just a few weeks' time.

Student W. entered the Read, Write, Spell class Fall term, 1979. At that time, W. was in his mid-twenties. He had attended school only until he was thirteen, at which time he left home and traveled around the United States. At various times in his life he had been enrolled in government funded training programs, but becuase of his poor reading skills, he had always eventually dropped out of such programs. When he entered the Study Skills Learning Center, his reading score on the WRAT was a 1.9 grade equivalent. He knew some sight words, but had almost no phonic skills for decoding regular words. W. was determined that he was going to learn to read, and he spent many additional hours in the Study Skills Learning Center lab practicing the sounds of letters with the aid of a language master machine—a technique which he had heard about and which he insisted on being taught how to use. Since that time, I have often used a language master machine to provide additional drill on both phonics and sight-word skills for my students. W. made very steady progress during the five terms that he was in my Read, Write, Spell class. He learned new skills rapidly and in two terms went from being my lowest student to being the most capable student in my *Decoding B* reading group. W. is a fine example of what a very motivated student of normal ability can accomplish when taught in a structured, phonically based program. In a year and a half of study, W.'s scores on the WRAT went from a 1.9 grade level to a 6.0 grade level. W. made less spectacular progress on the Nelson Test of Reading, primarily because it is a timed test. On a similar reading comprehension test, in an untimed setting, W. scored several grade levels above his 3.8 score on the Nelson. In the Spring, 1981, term, W. moved on to the next level Read, Write, Spell class. Following that term, he stopped coming to the Study Skills Center for classes, primarily because of tuition costs and job conflicts. Periodically though, he would stop in to see me, and he always said that he was still getting help on his reading from Lane Community College's adult non-credit program. This last Fall term, 1983, W. again enrolled in credit classes at Lane Community College. He entered a Textbook Reading class with a 5.5 grade level score on the California Reading Test. He is currently enrolled in an auto mechanics program and is managing the course textbook with some one-to-one tutoring assistance several times a week. W.'s goal is to pass the GED (general equivalency degree) test sometime in the next few years. I believe that he will achieve that goal.

Student D. entered the Read, Write, Spell class at the same time as W. Although his initial WRAT score was higher than W.'s (2.4), his progress over a period of three years was much less

Continued on Page 4

CRP with Adults

(Continued from Page 3)

consistent and slower. D. is probably the most severely learning disabled student I have taught in 12 years of teaching. D. had almost no decoding skills when he entered my class as a young man in his middle twenties. He had earned a high school diploma, but had few of the skills normally associated with that degree. I started D. in *Decoding B*, and he made slow but steady progress over the next three terms. Tables 1 and 2 show that his test scores on both the WRAT and the Nelson increased gradually that year. As is characteristic of many learning disabled students, D. often appeared to have mastered a skill one day only to have forgotten it the next day. This was painfully obvious when I tested D. in September, 1980, after a summer in which he had no reading instruction. His reading level and skill had regressed to almost the level at which he had begun the year before. D. repeated *Decoding B* that Fall and Winter terms. His progress the second time through the program was faster, and he retained skills more easily. He began *Decoding C* Spring term, 1981. As a measure of his increased ability to retain new skills, D.'s test scores the following Fall term show no decrease, in spite of the three months he was without instruction. D. continued to make steady progress in *Decoding C* during the 1981-82 school year. He completed *Decoding C*, but unfortunately, due to a serious illness, he did not complete the last week of school and was not present for the posttesting. D. left Oregon and I did not hear from him for two years. However, he appeared in my office just a few weeks ago. He had come back to get his educational records because he is applying to the University of Washington to complete an art degree. He intends to enroll in their special reading program while he is there. According to D., he is reading regularly and he believes that his reading skills have continued to improve. I believe that if D. had not had three continuous years of direct instruction in reading, he would still be reading at a second-grade level. His learning disability is so severe that without the continual repetition of newly acquired skills, he would quickly forget them. Had D. been in a program that was not flexible enough to allow him to repeat the same class, although not the same material each term, nine times, he would never have received the number of repetitions of each skill that he needed in order to retain those skills. D. is a testament to the fact that truly learning disabled children do not outgrow their disability when they become adults. Learning will probably never be easy for D., but with good teaching he can learn and retain what he learns.

Student M., a woman in her early forties, entered my class Fall term, 1980. Because of her sight word reading skills, she scored at the third grade level on the WRAT. However, I started her in *Decoding B* because she had few decoding skills. M. made good proress that term, but at the end of the term, she moved out-of-state. She returned to the college the following Fall term. She had lost much of what she had learned in that term. Her motivation level was much higher than before, and she was able to complete *Decoding B* and *Decoding C* in the next three terms. In just nine months, M.'s reading score on the WRAT improved 2 years and 6 months. M. continued on in the next level Read, Write, Spell class for one more term, and then she quit school to support her family. Probably the most impressive fact about M.'s experience in the Read, Write, Spell class, besides her reading progress, is that she was able to intervene on her son's behalf when she realized that he was not learning to read in first grade. She knew enough about her own reading problems to recognize that her son was being taught with a sight-word method which was teaching him no decoding skills. Because she was able to judge that the reading program was not appropriate for him, she was able to work with his school to get him into a *Distar* program in which he did very well. I don't know if M. has continued to read very much since she left the Read, Write, Spell class, but I do know that she is successfully supporting her family, and she is keeping a very close watch on her son's progress in school.

I believe that the experience of these students show that *Corrective Reading* is just as effective a program for adults as it is for children and teenagers. Adult non-readers need to be taught just as carefully with a program that stresses decoding skills as do children who are first learning to read. The material content of the program is far less important than many teachers believe. The stories do not have to be relevant to an adult's life. The critical factors to consider in choosing a program for non-readers, whether children or adult, are how carefully the skills are sequenced and taught and how much repetition of those skills is provided. The *Corrective Reading Program* meets those criteria as few other programs do.

Table 1

WRAT Reading Scores (Pretest/Posttest)
(Grade Equivalent Scores)

Student	Fall '79	Winter '80	Spring '80	Fall '80	Winter '81	Spring '81	Fall '81	Winter '82	Spring '82
W.	1.9/2.7	2.7/3.7	3.7/5.0	3.4/4.1	4.1/6.0	–	–	–	–
D.	2.4/3.5	3.5/4.1	4.1/*	2.6/3.6	3.6/4.1	4.1/4.3	4.3/4.7	4.7/5.9	5.9/*
M.	–	–	–	3.3/3.9	–	–	3.4/4.1	4.1/5.2	5.2/6.0

*Student was absent when testing was done

Table 2

Nelson—Total Reading Scores (Pretest/Posttest)
(Grade Equivalent Scores)

Student	Fall '79	Winter '80	Spring '80	Fall '80	Winter '81	Spring '81	Fall '81	Winter '82	Spring '82
W.	2.2/2.1	2.1/3.2	3.2/3.0	3.0/3.1	3.1/3.8	–	–	–	–
D.	2.3/3.0	3.0/3.5	3.5/*	2.5/2.8	2.8/2.5	2.5/2.9	3.4/3.0	3.0/3.6	3.6/*
M.	–	–	–	2.7/2.9	–	–	2.9/3.1	3.1/4.0	4.0/4.1

*Student was absent when testing was done

Tutoring Methods:

By Charles R. Greenwood, Debra Whorton, and Joseph C. Delquadri[1,2]

Juniper Gardens Children's Project
Bureau of Child Research
University of Kansas

Part I: Overview of Procedures

This article reports tutoring methods developed at the Juniper Gardens Children's Project in Kansas City, Kansas. The Project is a community-based research program that has worked cooperatively within the Kansas City Kansas Public Schools since 1965. In 1978, we began a line of research focusing on factors related to effective instruction. Perhaps the most unique contribution of our work has been the development of the concept of "opportunity to respond"—defined as the interaction between instruction (the teacher, the materials, the task, the signals to respond) and student response (reading, writing, pointing, etc.). The importance of "opportunity to respond" is its departure from prior thinking which relied primarily upon consequences to motivate students. In "opportunity to respond", the quality and frequency of instructional antecedents are equally important in promoting high levels of student academic performance (Delquadri, Greenwood, Stretton & Hall, 1983).

Methods that Engage High Levels of Responding

What are the methods that increase "opportunity to respond" and maintain high levels of academic responding and practice?

1. Distar instruction groups are one method. In this arrangement the teacher prompts responding, requires both individual and group responses, uses a high level of pacing, praises and reinforces correct responding, and applies immediate error correction. Frequent testing to assess mastery is also used.

2. Individualized seatwork materials and reinforcement contingencies are another method. This procedure has been used to maintain high task-engagement with each student in their own level of appropriate materials.

3. Computerized programmed instruction is a third method in which student responding can be optimally high, immediate error correction can be applied, and repeated testing for mastery can be used.

4. Large group instruction with group responding to signals has also been used to engage all students.

5. Sustained silent reading is another procedure that requires total group participation; all students read for a sustained time interval.

6. Finally, class-wide peer tutoring, home/parent tutoring, and single peer dyads are three additional procedures. These tutoring procedures have been of particular interest at Juniper Gardens.

Tutoring Models at Juniper Gardens

Tutoring models are a general class of methods that can be used to efficiently increase the quality and frequency of academic interaction. Contrary to the general view of tutoring methods as appropriate only for "remediation", we argue that tutoring methods can be designed and used successfully as a serious instructional methodology within various curricula for all children in a classroom. These methods also have the same characteristics as those just described (e.g., high levels of opportunity, immediate error correction, frequent testing, etc.), and these similarities will be pointed out. The three classes of tutoring investigated at Juniper Gardens have been: (a) class-wide peer tutoring, (b) parent/home tutoring, and (c) single peer dyads. The first and last methods are school based procedures, and the second occurs in the home.

Class-wide peer tutoring. This method involves pairing students who work cooperatively together, one as tutor, and the other as tutee. All students in the class are involved for the entire session. Half-way through the session, pairs trade roles. The tutor becomes the tutee and vice-versa.

Depending upon the subject matter content (e.g., oral reading, spelling, arithmetic, etc.) tutors prompt the tutee to respond by dictating a spelling word for the tutee to write, an equation to solve, or listen to the tutee read a sentence from a reader. The tutor awards points for correct tutee response. If an error occurs, the tutor uses a correction procedure wherein the tutee practices the correct response. Points are intermittently awarded to tutees by the teacher for successfully making these corrections. Typical sessions are thirty minutes long.

Each pair of students is preassigned to a team. At the end of a tutoring session, students add points that each has earned and individual points are tallyed and

[1]Copies of the class-wide and home/parent tutoring materials can be obtained from Dr. Joseph Delquadri, Juniper Gardens Children's Project, 1980 N. 2nd Street, Kansas City, Kansas 66101. A reproduction and mailing fee of $15.00 is required.

[2]The preparation of this article was supported by grant #HD 03144 from the National Institute for Child Health and Human Development.

Increasing Opportunity to Respond & Achieve

summed to form team totals. Winning teams are determined each day and on a weekly basis.

Class-wide peer tutoring has been used for both major instructional purposes and as a means to add supplementary practice. The major advantage of the class-wide technique is that is insures that all children engage in the behavior and do so at high rates during this session.

Home/parent tutoring. The home/parent tutoring procedures are generally the same as those used in the class-wide procedure, but the parent is the tutor. In this case, the material to be covered is assigned via a home/school form sent home by the teacher. The parent times the tutoring session (generally no more than 10 minutes in length), prompts the student to respond, makes error corrections as needed, and checks the child's mastery score. Scores are sent back to the teacher the next day and recorded. The teacher then makes an additional check on the child's mastery of the tutored material at school to insure agreement with the parents' appraisal that mastery has, in fact, occurred.

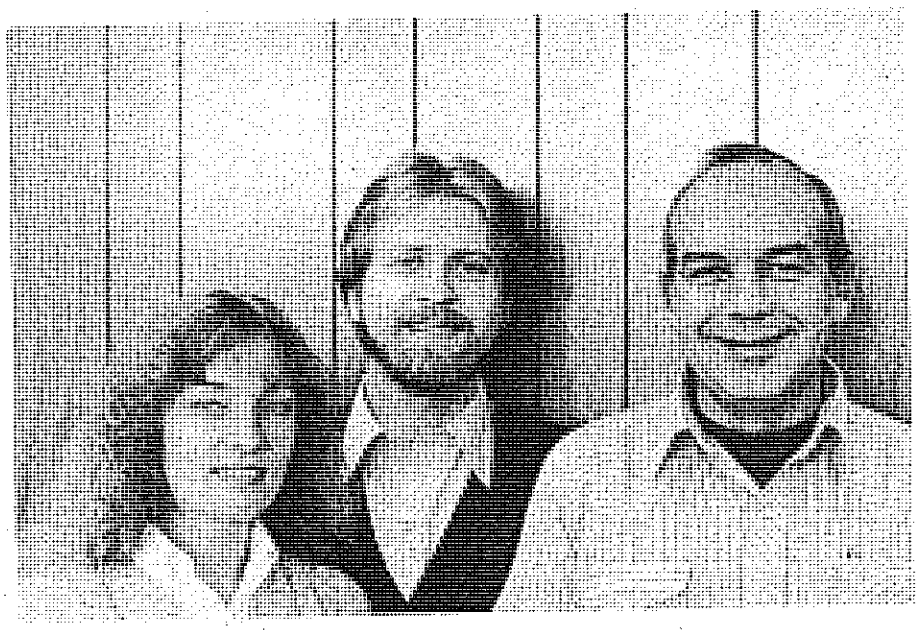
Single peer dyads. The same tutoring procedures can also be used to individualize a particular student's program at school. In this tutoring arrangement a classroom peer or cross-age peer is paired with a student to cover remedial material. While this is a useful procedure, the special problem with it is that it "pulls out" the student from the mainstream instructional program. Not only is the child not receiving the same instruction as the other students in the class (content difference), but she/he is temporarily removed from the class group. This procedure, however, has been most helpful in two instances: (a) when used as a backup in cases where parents at home have not been able to complete home tutoring, and (b) when mainstreaming a special education student into a regular classroom is occurring and the student needs additional tutoring in a specific subject area. In our experience, this procedure, while very effective, is best used temporarily to achieve specific objectives and is not to be maintained as a systematic instructional method.

Features of Tutoring that Engage Responding and Aid Content Mastery

The features of tutoring that facilitate responding and content mastery are: (a) active responding, (b) error correction, (c) pacing, (d) content coverage, (e) point earning, (f) posting and feedback, (g) content selection, (h) testing for mastery, and (i) tutor selection.

Active responding. Tutoring procedures are effective in engaging tutee responding through tutor-tutee interaction. This is particularly true when the tutor's behavior is governed by sound learning principles. In our procedures, tutors are taught to present tasks, reinforce correct responding, and correct errors. Tutees are also required to respond in the same topography as they will be tested (e.g., orally or in writing).

Error correction. One of our major developments was the error correction procedure for reading. A series of studies indicated that *word supply* (tutor stops the tutee, models the correct response), with *review* (tutee repeats the correct response two or three times before continuing) was most effective (Delquadri, 1978). This procedure has a number of beneficial effects. First, it is brief, directs practice on the correct form, and allows the student to resume the task quickly. Second, it is relatively non-aversive to the tutee compared to many alternative procedures (e.g., phonetic prompting). This fact prevents break-down in the activity. Third, tutees earn points for making a correction, so that engaging in corrections is not punishing or aversive. Many alternate procedures interrupt the pacing of the activity, punish the tutee, and can easily create a situation where tutees seek to avoid the tutoring activity.



Debra Whorton, Charles Greenwood, Joseph Delquadri

Pacing. Pacing of students' responding during tutoring is high and gauged to each student's ability. After completing a set of tasks (e.g., spelling words, a reading passage), the tutee simply returns to the beginning to resume practice of the same material, recycling item by item until the end of the session. The objective is to master the materials (no errors) and to earn a maximum set of points.

Content coverage. Content coverage in tutoring occurs at two levels. First, during tutoring sessions students may cover the entire task; after several sessions, they may cover it several times within one session. Thus, pacing and coverage are high and are individually determined in each session. Since the teacher and tutor monitor responding of the tutee, quality controls are in place and help maintain this dynamic interaction with the content. Second, over weeks in the program, mastery of new content is assured and maintained at high levels. Thus, mastery is high and lesson coverage is systematic day to day, week to week, moving the student successfully through the total material.

Point earning. Tutees earn points (two or three) for each item responded to correctly. One point is earned for practicing an error. Tutors earn points intermittently from the teacher for applying the correct tutoring behaviors (one point). Thus, contingencies operate to maintain quality control through the system. At the end of the session, each student has acquired a set of points for responding to the material (as the tutee) and for tutoring someone else (tutor). These points are summed and reported verbally to the teacher. They are recorded, and a team total is computed. Winning teams are applauded.

Point earning is similarly used in the parent/home and single dyad systems. Point totals are posted for each child on a graph. In the majority of uses, backup reinforcers have not been used. Winning or performance feedback has been sufficient motivation in the class-wide procedure; performance feedback provides motivation in home/parent and dyadic tutoring. However, backups can be used to maximize motivation in cases where it is thought or demonstrated to be necessary. Each week, in the class-wide procedure, new teams are formed, typically by random drawing from a box, assuring that children are not bored with the same partners and teams. This also equates each child's opportunity to be on a winning team over time.

Posting and feedback on performance. Both points earned for completing the tutoring material and mastery checks are graphed and posted. These data provide feedback to each student on their performance during tutoring and how it effects their achievement on the criterion tests/checks.

Content Selection. Tutoring procedures can be applied to nearly any content. Thus, they are well suited for use with both Direct Instruction and Basal Instructional approaches. In reading, tutoring is used to increase the fluency and comprehension of passage reading in the basal readers. Tutoring can be used either to supplement reading practice or as a replacement for basal reading groups. The latter application engages each student much more in reading behavior and is much more efficient. In other subject matter areas, content lists may be developed and used by teachers. In spelling, for example, lists of 18-20 items are typically used for each weeks' tutoring. A new list is introduced each week. These lists may be comprised of items selected from basal materials, word lists, or district objective banks, and can be selected from assessments indicating those items which children do not currently know.

Testing and mastery. Repeated testing for mastery is a feature of tutoring procedures. For passage reading, two minute reading rate checks are made by the teacher later, after tutoring sessions are completed. These are scored in terms of correctly read words and error words per minute. These rate checks can be made for various students (e.g., lows) each day, or each week, or several students (5 per day) can be checked (providing one check per student per week). These data can be graphed to provide a progress chart for each student over time. Our data has typically shown that with low readers (30-50 words correct per minute; 5-10 error words per minute), tutoring will at least double the correct rate and halve the error rate (60-100 cwpm; 1-3 ewpm). Rate checks can also be applied to list materials that have been tutored to assess rate and accuracy.

Weekly accuracy tests of the content have also been widely used. Spelling and math fact tests over items tutored Monday through Thursday of each week are typically completed on Friday (Delquadri et al., 1983). These tests indicate a level of obtained mastery for each student. Research has indicated that students typically complete tests at 80% or better and that the percentage of students with perfect papers (no errors) dramatically increases over baseline (Delquadri et al., 1983).

Tutor selection. The ideal tutoring systems, in our view, are those in which any student can tutor any other. Past work with tutoring has been highly involved with the problem of tutor selection and many programs fail (students soon become bored with the same partners) because of strict efforts at ability matching. Our own research argues for random pairing or at most, only moderate matching of tutor-tutee pairs. The problem is that within any classroom group there is only a finite set of optimal matches (high with low or highs with highs). Once these are exhausted, only less than optimal matches remain. These strict criteria, if used repeatedly to pair children, very quickly bore the students, and they will learn to subvert the system. Our research suggests that 100% error correction (which is the rationale for matching) is not necessary, nor is it expected (Whorton, Sasso, Elliott, Highes, Critchlow, Terry, Stanley, Greenwood & Delquadri, 1983). Even in highly matched arrangements, we have found that only about 30% of total errors are corrected by tutors on the average. Yet, mastery data of tutored material indicates good results.

Thus, we conclude that peer tutoring formats offer many unique features, share the features of many effective procedures in the literature, and solve many common management problems that teachers encounter in selecting optimal instructional methods. These procedures have also been highly rated by teachers who have used them systematically. They are time efficient, both in terms of what it takes for teachers to learn to use them (2-3 hours), and in terms of effort required to implement them over a sustained period of time. The procedures are also highly sensitive to content coverage and mastery. The instructional sessions are dynamic, and children engage in academic interactions (engagement) at high rates. The procedures are

Continued on Page 7

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Tutoring Methods (Continued from Page 5)

also sufficiently well developed that peers and parents can easily learn to use them.

Our procedures, when systematically used, solve many of the traditional problems of tutoring encountered in the past, such as: (a) student and parent motivation, (b) maintenance of the tutoring sessions over long periods, (c) use of an effective and unobtrusive error correction procedure, (d) precise tutoring behaviors that facilitate and maintain high response levels, and (e) procedures to select content to be taught over time.

Most important is the fact that these techniques can be established and managed by the classroom teacher without a major investment of time or effort. Since the procedures apply to the natural content materials in most classrooms, additional expense and training of the teacher in curricula is not required. These tutoring techniques will be of interest to users of Direct Instruction, who are looking for ways to expand the scope of their daily programs either in other content areas and/or as supplemental activities during key instructional times in the school day.

Part II: Research Findings

In 1978, we shifted the focus of our research in classrooms from reinforcement contingencies and motivational variables to additional factors related to effective instruction. This shift came as a result of our cumulative observations within these classrooms. We found that very often, in order to implement a motivational program to manage a child's behavior, we also had to engineer the instructional component (Hall, Delquadri & Harris, 1977). For example, we reported that students in one classroom averaged not more than 20 seconds of directed reading instruction each day; and that students spent less than 5 seconds, on the average, practicing basic math facts (Hall, Delquadri, Greenwood & Thurston, 1982; Hall et al., 1977). Subsequent research supported these informal observations of low academic engagement. We demonstrated that children in Title I and non-Title I schools spent on the average 60 and 73 minutes per day, respectively, engaged in academic responding (silent and oral reading, writing, academic talk, asking questions, answering questions, and academic game play) (Greenwood, Delquadri, & Hall, 1983).

These figures give rise to real concern, particularly when it is widely accepted that: (a) student achievement is a function of the quality and frequency of students' academic behavior, and (b) this behavior is a function of how the teacher structures the instructional setting. This is supported by the research concerning *academic engaged time* (Denham & Lieberman, 1980; Rosenshine, 1979; Rosenshine & Berliner, 1978), *pacing* (Carnine, 1976), and *content coverage* (Borg, 1979).

The independent Follow-Through evaluations reported that both the Oregon Direct Instruction Model and the Kansas Behavior Analysis Model, which promoted greater academic gains, also were associated with: (a) greater task engagement, and (b) greater amounts of instruction time (Stallings, 1975, 1977). Both correlational and experimental studies of instructional methods have confirmed the facilitative relationship between procedures that engage student responding and academic achievement gain (Brophy, 1979; Good, 1979; Good & Grouws, 1977, 1979). Studies have also pointed out that academic engagement varies widely across students, classrooms, content areas and schools (Greenwood, Delquadri, Stanley, Terry, and Hall, 1983; Harneschfeger & Wiley, 1978; Reith, Polsgrove & Semmel, 1981).

Our own research with low-achieving fourth graders in inner-city schools has confirmed that these students were engaged significantly less in academic responding than their higher-achieving suburban peers (Greenwood et al., 1983). This has been demonstrated at a number of levels. First, observations of an entire day indicated that inner-city students were engaged in academic behavior 13 minutes less per day. This difference, if compounded over an entire academic year, would require inner-city students to attend school *one and a half additional months* to emit an equivalent amount of academic behavior at school. Across students in the study, we found a range from 9 to 126 minutes of academic engagement! By subject matter area (see Figure 1), these differences in academic response time were also systematically apparent as more engagement occurred in non-Title I classrooms. Differences in engagement ranged from 22% of session time in spelling to 8% in language. Interestingly enough, only during business management and free time, were the inner-city students engaged more in academic responding than the suburban students (see Figure 1).

Analyses to determine the instructional factors related to students' lower level responding revealed that inner-city teachers (compared to their suburban counterparts) used tasks which required less student responding (Stanley & Greenwood, 1983). For example, media (film, overhead projectors, cassette recorders, etc.) was ranked second as a task format used by inner-city students (21% of the day) and was least related to key academic responding (i.e., reading aloud, academic talk, writing, etc.). Media was the sixth used task in suburban schools (7% of the day) after readers, worksheets, workbook, paper/pencil, and discussion.

It should be clear that a major problem confronting teachers is the selection of instructional methods that will maximize student academic-engaged time (or academic responding, as we operationalize it).

Research on Tutoring

One instructional method which increases student involvement is peer or parent tutoring. Research at Juniper Gardens has focused upon demonstrating that tutoring procedures: (a) increase students' interactions (engagement) with the academic task, (b) that this increased interaction is associated with increased mastery of the content materials, and (c) that students and teachers are highly satisfied with use of these procedures.

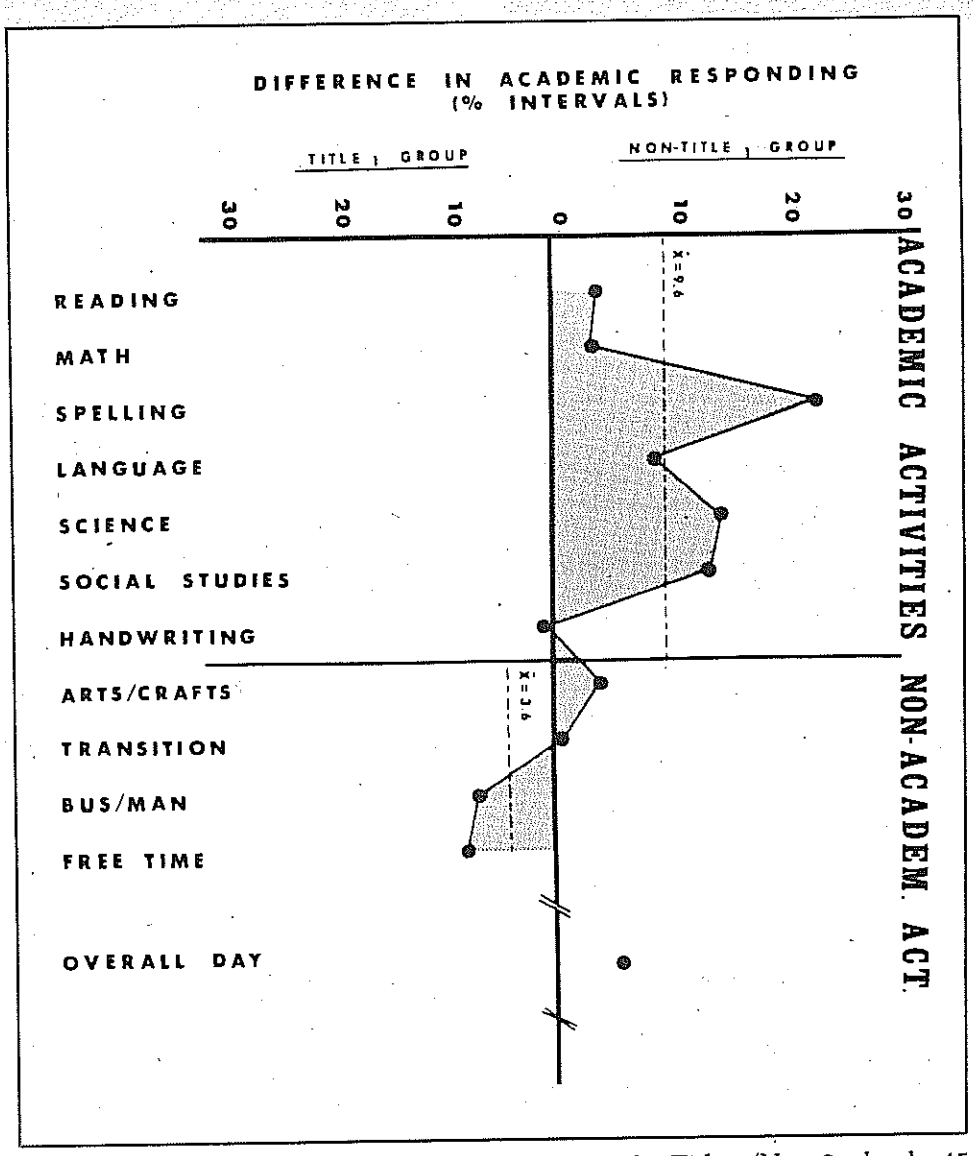

Figure 1. Differences in daily academic response time for Title 1 (N = 2 schools, 45 students) over the entire day and by activities of instruction. Shading to the right indicates more academic responding by non-Title 1 children.

Several studies have demonstrated (in comparisons to naturalistic teacher developed procedures) that class-wide peer tutoring increases the proportion of session time that students are engaged in reading, writing, and academic talk. Greenwood, Dinwiddie, Terry, Wade, Stanley, Delquadri, & Thibadeau (1983) demonstrated that a composite score based upon writing and academic talk increased from 30% to 50-70% during tutoring. Delquadri, Elliott, Whorton, Sasso, Highes, & Greenwood (in preparation) demonstrated that tutoring during reading increased reading aloud from 10% to 60% during the tutoring procedure. These changes in key academic responses have also been associated with gains in mastery and criterion academic performance.

Whorton et al. (1983) implemented the class-wide procedure in an LD classroom with twelve students. An ABAB single-subject design was used. A1 and A2 were baseline conditions. Tutoring was implemented in the B phases. In B1, a matching procedure (students in the same or adjacent readers) was used. In B2, a random-pairing procedure was used. The results for each student and overall showed substantial improvement in oral reading checks. Students doubled their correct rates and reduced their errors by half. Thus, the group average rates were 25.06, 49.01, 35.84, and 46.22 correct words per minute over the four conditions. Equivalent values for errors were 4.34, 1.66, 2.54, and 2.19. The results indicated no clear preference for matching pairs vs. random assignment. Five students did better in the matching phase, 2 were the same, and 4 did more poorly during the matching phase. Similar improvement in skills have been obtained with parent/home tutoring in reading (Hall et al., 1982; Whorton et al., 1983); and spelling, mathematics, and vocabulary (Greenwood et al., 1983; Greenwood et al., in press).

This study also attempted to examine the *fidelity of peer error correction*. During the matched and random phases, one probe was taken for each student pair. The probes consisted of an unobtrusive tape recording of the session, which was later scored. For each probe the number of errors tutors corrected were noted. These ranged from 0 errors corrected out of 10 made (0%) to 13 out of 18 errors corrected (72%). In both tutoring phases, 27% and 28% of errors, respectively, were noted and corrected by tutors. However, given the substantial gains in reading rate students made, error correction on this task appears not to be all that important.[3]

Teachers, parents, and students have generally been well-satisfied with their participation in these tutoring programs. Perhaps the most uniform finding has been participants' views that the program helps students' reading skills. Thus, for home tutoring, ratings of 4.4, 4.7, and 4.5 were obtained from the classroom teacher, the parent, and the students who were tutored at home, respectively (1 = lowest; 5 = highest

Continued on Page 23

[3]These findings for reading have been replicated in several additional studies and support this view.

Minimal Differences & Analytic Assistance During

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Fred Hoffman
Lodi Wisconsin Public Schools

Phyllis Tamarha
University of Oregon

Two recent lines of research have important implications for learning disabled students' ability to use learning strategies: one involves selective attention deficits, a student's ability to attend to the relevant part of a teaching presentation, (Pelham & Ross, 1977; Hallahan, Tarver, Kauffman, & Graybeal, 1978), while the other looks at cognitive deficits—a student's ability to use efficient strategies for learning (Wiens, 1983). Deficits in either of these areas would certainly hinder performance of LD children in most learning tasks.

The present research looks at two instructional-design procedures for improving a student's ability to efficiently learn from teaching presentations: (1) the selection and sequence of positive negative examples, which requires appropriate attention on the learner's part, and (2) analytic assistance during concept learning, which assumes appropriate cognitive functioning.

The purpose of the first experiment was to determine the effect of including minimally different positive and negative examples in a concept teaching set. Subjects were randomly assigned to one of three training groups. Group 1 was trained with positive and negative examples that differed along only one dimension. Group 2 received the same number of examples, but positive and negative examples differed along two additional dimensions. Group 3 also received the same number of examples, but the positive and negative examples differed along yet one more dimension.

Experiment 2 looked at the degree to which LD students benefit from analytic assistance when learning to draw inferences. As was the case for Experiment 1, a determination that LD students do not benefit from analytic assistance could set the stage for instructional interventions designed to compensate for metacognitive deficits. To increase the representativeness of the results, both Experiment 1 and Experiment 2 included an initial study followed by a replication done in a different part of the country.

Experiment 1
Study 1

Method

Thirty-four learning disabled children from the third, fourth, fifth, and sixth grades were selected from two elementary school resource rooms in the Pacific Northwest and randomly assigned within each grade level to three experimental groups, each with eleven members. The mean ages for the groups were 11.2, 11.1 and 11.4. All of the children were certified by the school district as learning disabled (normal IQ, and a severe discrepancy between academic potential and actual achievement) except for one sixth grade boy who was labelled as emotionally handicapped. Training and testing was conducted with individual children in a secluded part of the resource room.

Materials

Training materials for the three groups consisted of three 8 × 11 sheets with line drawings of one positive and one negative example. The differences between positive and negative examples systematically increased across the three groups. For the minimal difference group, the only difference between the positive and negative instances was that the negative instance was raised an inch above the horizontal line; all other features of positive and negative were held constant. (See Figure 1 for a pair of examples from each treatment.) For the intermediate-difference group, the magnitude of the difference between positive and negative instances was increased by raising each negative instance 5″ above the horizontal line, rotating each negative instance ninety degrees, and removing the hand from the positive examples. In the maximal difference group, a third difference was added to the pairs presented by using illustrations of different objects for the negative examples. A 12-item transfer test consisted of 6 positive and 6 negative examples defined by objects (apple, cup, and hat) other than those used in training (triangle, rectangle, and football), and placed in a full range of positions, distances from the base between 1″ and 5″. The positive and negative examples were sometimes rotated ninety degrees from the orientation presented during training, and the hand was removed from all test examples. Each example was presented singly on 8 × 11½″ paper.

Procedure

Positive examples were called "flot." Each of the three experimental groups received six training trials (two examples on each of the three sheets) in which the experimenter pointed to the positive instance first and said, "This is flot. Is this flot?" If the child responded incorrectly to either the positive or negative example, the experimenter repeated the presentation until the child responded correctly. As soon as the six training trials were completed, the child was immediately given the 12-item transfer test. The experimenter would point to the first picture and say, "Your turn. Is this flot?" The experimenter paused five seconds (maximum) or until a response occurred, and then presented the next picture. No feedback was given to the child during the transfer test.

Results

The minimal difference group had the highest mean score, 10.2 (SD=1.9). The mean scores for the intermediate difference group (8.1 with a SD of 2.8) and the maximal difference group (7.7 with a SD of 3.3) were similar. None of the differences between groups was significant.

Replication

Subjects and Setting

The subjects for this study were 30 third, fourth, fifth, and sixth grade learning disabled students. All students had previously been placed into the learning disabilities classroom, according to state guidelines which included at least normal intelligence with a measured severe discrepancy between expected and actual achievement. Training took place in a midwestern town in central Wisconsin. All experimental procedures replicated those used in study 1.

Results

The maximal difference group had the highest mean correct, 8.0 with a standard deviation of 2.7. The other two groups had almost identical mean scores: the minimal difference group, 7.4, (SD = 2.8), and the other group, 7.3 (SD = 1.5). A one-way analysis of variance revealed no significant differences between the groups on their mean number of correct responses on the transfer test.

Discussion

The results of Experiment 1 indicate that including minimally different positive and negative examples does not facilitate LD students' concept acquisition. In contrast, Carnine (1980) demonstrated that when non-handicapped students received similar training, the minimal difference group made significantly more correct responses than both other groups and the intermediate difference group made significantly more correct responses than the maximal difference group. Limiting stimulus variation by presenting only minimally different positive and negative examples seems to increase the saliency of relevant concept dimensions for young non-handicapped students. The hypothesized attention deficits of LD students (Ross, 1980) may diminish the saliency of a relevant concept dimension even when stimulus variation is limited.

The results from Experiment 1 might evoke two types of responses: (1) our understanding of the differences between LD and non-handicapped students has been refined, (2) procedures for concept teaching will have to be modified when applied to LD students.

The first reaction, by itself, can lead to conclusions that lack constructive instructional implications. For example, because LD students exhibit selective attention deficits, teaching sequences that initially use minimally different pairs of positive and negative examples may actually be of no value in helping these students identify relevant concept dimensions. Therefore, the mere juxtaposition of positive and negative examples that are minimally different may be of no use, and may in fact confuse students. Simply put, example sequencing is not important because of the inability of the student to focus attention on the relevant concept feature. The work by Dykman, Ackerman, Clements, and Peters (1971) supports this analysis. These authors have shown that difficulty in focusing attention was a major difference between a group of learning disabled boys and normal controls. In a related study (Sykes, Douglas, Weiss, & Minde, 1973), hyperactive children were shown to be less able to detect the significant stimuli and made more incorrect responses to irrelevant stimuli than a group of normal control subjects.

The trainer at the replication site noted that many of the subjects would focus in on a small detail of the picture on the stimulus card. Because of this, the trainer felt that the students were almost random in their approach in figuring out the concept. This observation is consistent with some of the writing in the area of attentional deficits in learning disabled populations (Ross, 1980).

A greater understanding of differences between LD and non-handicapped students can also produce constructive implications for instructional practice, however. For LD students to benefit from concept instruction procedures like minimally different examples, the students may need to be taught a strategy to use during training: For example, a teacher might teach students to attend to the relevant features of a stimulus by having the students name or point to dimensions along which examples are the same and are different. This identification might increase the students' attention to the various dimensions and to the fact that examples like this one could be coupled with more generic procedures like repetition, rehearsal, guided practice, and reinforcement for improving the attentional abilities of LD students (Ross, 1980).

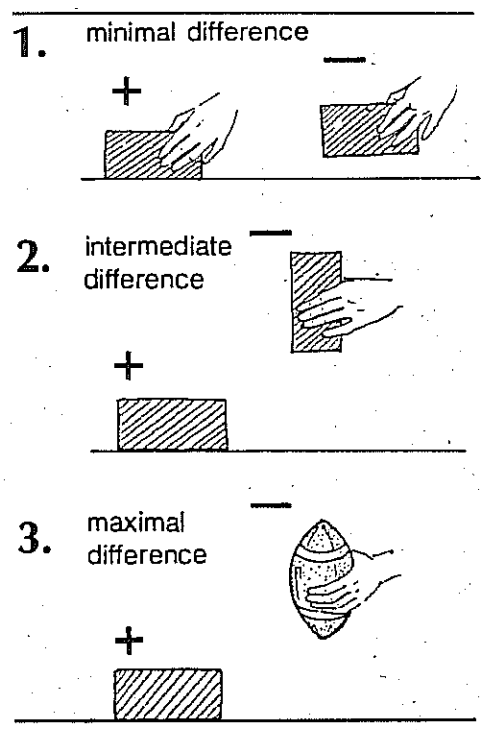

Figure 1. Sample training items for the three treatments.

Experiment 2
Study 1

The second experiment was designed to determine the ability of LD students to benefit from strategy training, a procedure found to be effective for non-handicapped students (Ross & Carnine, 1982). Students were trained with either an examples-plus-definition or an examples-plus-strategy treatment. If the LD subjects failed to perform at a higher level in the strategy group, support would be given to the notion that LD students may not benefit from strategy training until they have had intensive remedial instruction in learning and applying strategies. As was the case with Experiment 1, two studies were implemented, the initial study plus a replication.

Subjects and Setting

Subjects were third, fourth, fifth, and sixth graders from elementary LD resource rooms in the Pacific Northwest.

Concept – Acquisition Instruction with LD Students

All of the children were identified as learning disabled by state and federal guidelines that included: (1) normal IQ and (2) a severe discrepancy between academic potential and actual academic achievement.

Students from each grade were randomly assigned to one of the two conditions: (a) Examples Plus Definition, and (b) Examples Plus Strategy Questions. The experimenter met with the children individually in a quiet part of the resource room that had a table and two chairs.

Training Task

Table 1 shows the sequence of demonstration and test items used for all students. The definition plus examples group had this definition printed above the example sequence: "A *binary duality* is the answer you get when you multiply two numbers. One of the numbers you multiply must be exactly two more than the other number." For example, 5 × 6 = 30 is not a binary duality because six is not two more than five. In contrast, 4 × 6 = 24 is a binary duality because six is two more than four.

Transfer Test

Two related concepts were used in a paper and pencil task to measure transfer of the initial concept learning. The transfer items had nothing specifically to do with the binary duality concept, but did require the students to use similar analysis procedures to acquire concepts. The transfer concepts, illustrated by the demonstration items shown in Table 2, were developed by varying the operation (transfer concept B, used addition rather than multiplication), and the numerical relations involved (in transfer concept A, the numbers differed by one rather than two). Four demonstration items for each concept were followed by ten test items, yielding a total possible transfer score of 20.

Procedure

Training phase. The experimenter explained to each student that the purpose of the experiment was to "find out more about how people learn about new things" and that the results would not affect their grades in the classroom. The experimenter presented one of the two conditions.

1. *Definition.* The definition was read aloud, first by the experimenter, and then by the student. The items were modelled and tested, "My turn. Five times 6 is 30. Is 30 a binary duality? No, it is not." And corrections included reference to the definition through oral re-reading.

2. *Strategy training.* Modelling and testing procedures followed this format: "Six times 5 is 30. Is 30 a binary duality? (No) How do you know? (Because 6 is not exactly two more than 5.)" The student was given feedback on each answer with the experimenter modelling the correct answer in response to errors.

For all groups, the testing procedure continued until the last item had been attempted or until the criterion of five consecutive correct answers was met. If students became frustrated, the testing procedure was stopped and no data were recorded.

Transfer phase. The written transfer test was immediately given after the child had reached criterion. The test was introduced by the experimenter who read the directions aloud and pointed out that the students should look very carefully at the first four sample items which had the correct answers (yes or no) circled. Students were not allowed to seek clarification. They were given as much time as needed. If the child refused to complete the transfer test, the experimenter got up and walked away for five minutes. If on returning, the child still had not completed any items, the child was asked to hand in the test and was told that he/she could return to class.

Table 1

Sequence of Demonstration and Test Items for "Binary Duality"

1)	6 × 6 = 36	14)	3 × 9 = 27
2)	5 × 6 = 30	15)	3 × 5 = 15
3)	5 × 7 = 35	16)	4 × 5 = 20
4)	4 × 6 = 24	17)	10 × 12 = 120
5)	1 × 3 = 3	18)	6 × 8 = 48
6)	4 × 7 = 28	19)	9 × 6 = 54
7)	2 × 3 = 6	20)	12 × 14 = 168
8)	4 × 2 = 8	21)	2 × 20 = 40
9)	7 × 2 = 14	22)	12 × 16 = 192
10)	8 × 4 = 32	23)	20 × 22 = 440
11)	2 × 2 = 4	24)	0 × 2 = 0
12)	9 × 11 = 99	25)	9 × 7 = 63
13)	10 × 8 = 80		

Table 2

Test Items for Two Transfer Concepts

Concept A		Concept B	
3 × 6 = 18	Yes (No)	5 + 6 = 11	Yes (No)
3 × 5 = 15	Yes (No)	6 + 6 = 12	Yes (No)
3 × 4 = 12	(Yes) No	5 + 7 = 12	(Yes) No
10 × 11 = 110	(Yes) No	1 + 3 = 4	(Yes) No
1) 7 × 8 = 56	Yes No	1) 2 + 7 = 9	Yes No
2) 4 × 6 = 24	Yes No	2) 4 + 6 = 10	Yes No
3) 2 × 3 = 6	Yes No	3) 3 + 5 = 8	Yes No
4) 3 × 7 = 21	Yes No	4) 6 + 7 = 13	Yes No
5) 4 × 5 = 20	Yes No	5) 1 + 4 = 5	Yes No
6) 6 × 9 = 54	Yes No	6) 5 + 9 = 14	Yes No
7) 1 × 2 = 2	Yes No	7) 7 + 9 = 16	Yes No
8) 2 × 7 = 14	Yes No	8) 6 + 8 = 14	Yes No
9) 5 × 4 = 20	Yes No	9) 3 + 4 = 7	Yes No
10) 5 × 7 = 35	Yes No	10) 8 + 10 = 18	Yes No

Results

The mean trials to criterion and mean percent on the transfer test for the definition and strategy treatments appear in Table 3. A 2×2 ANOVA (Treatment by grade level) on trials to criterion revealed a significant treatment effect, $F(1,27) = 12.5$, $p = .002$. Transfer differences were not significant.

Replication

Subjects and Setting

The subjects for the replication study were 24 third, fourth, fifth, and sixth grade learning disabled students who had been formally placed into the LD classroom for instruction in academic areas. All subjects had been previously identified as learning disabled by school personnel according to state guidelines, including normal intelligence and a significant discrepancy between expected and actual achievement levels. The mean IQ for the sample was 101. Training for the replication study took place in southeastern Alabama. All procedures in this study replicated those of study 1 in Experiment 2.

Adults

The mean performance of number of trials during training of the Definition group (10.66) was less than the Strategy group (15.83). A *t* test for independent groups was performed on the number of trials to criterion: the result showed a significant treatment effect, $t(22) = 2.70$; $p = .02$. Simply, it took the definition group significantly fewer trials to reach criterion.

Both groups performed similarly on the transfer test; the Definition group had a mean of 8.33 (SD = 2.6), while the Strategy group had a mean score of 9.0, (SD = 2.0). This difference was not significant ($p = .05$).

Discussion

In Experiment 1, the results did not parallel findings with non-handicapped students. The results in Experiment 2 actually contradicted findings with second grade non-handicapped students (Ross & Carnine, 1982). Strategy training hindered LD students' performance in learning to draw inferences. As in Experiment 1, the overriding question is how to interpret the results. One line of thought is reflected in other research describing deficits in the cognitive abilities of LD students. When reviewing the research in cognitive deficiencies that negatively influence the performance of LD adolescents, Deshler, Schumaker, Alley, Warner, & Clark (1982) state "remediation of cognitive deficiencies in LD adolescents is not as simple as altering motivational factors in the adolescents' environments; the cognitive deficiencies themselves must be addressed" (p. 6). This analysis is important because it emphasizes teaching interventions to overcome cognitive deficiencies of LD studetns. For example, research supportive of a training strategy for impulsive children has been reported on a variety of techniques: required delay (Harcum & Harcum, 1973; Schwebel & Berstein, 1970), self-verbalization (Jensen, 1971; Lovitt & Smith, 1972), modeling (Csapo, 1972; Denny, 1972), and direct instruction (Engelmann & Carnine, 1982). The common linkage in each of these trainging areas is to train students to use multistep strategies to help eliminate impulsive responding.

Most handicapped students will need extensive strategy training within specific tasks and also training across a variety of activities. Such extensive training with tasks and across different types of tasks was *not* provided in Experiment 2. Students received a few modeled examples and then feedback on some practice trials.

During the training at the replication site in Experiment 2, the trainer observed that the students taught the strategy approach initially attempted to use it when presented with a problem. Interestingly, the students almost immediately thereafter failed to use the approach in subsequent problems. The trainer reported that some of the subjects appeared to get confused with the application of the strategy after the first or second attempt. It was at this point that the learner gave up attempting to apply the strategy. This observation underscores the importance of intensive strategy training for LD students.

The results of the present research suggests that an instructional perspective toward concept attainment requires melding analysis of three domains: learner variables (individual differences), communication (teaching

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Table 3

Mean Trials to Criterion and Percentage Correct on the Transfer Test for the Two Experimental Groups

	Grade Level	Mean Trials to Criterion	SD	Mean % Correct	SD
Definition	3-4	7.6	1.0	67%	.22
	5-6	8.7	4.3	65%	.18
Strategy	3-4	12.5	5.7	67%	.20
	5-6	13.5	3.2	74%	.22

Effective Grading System

By Randy Sprick

Motivating students to acheive academic success is frequently a difficult job. Teachers often face a lack of parental support. They must work with students who have been neglected or abused. Drug problems, absenteeism and a general apathy about course content can make it seem like student motivation is outside of a teacher's control. Certainly, many factors affecting student motivation are outside of the teacher's control. You cannot control a student's home life, nor eliminate all drug use. No matter how hard you work at making your subject interesting, you cannot make every minute of instruction totally fascinating for every student in your class. Some part of every course is going to be hard work. There are only three factors affecting motivation the teacher has control over: the quality of the instructional program being used, the quality of teaching skills being implemented, and the type of reinforcement system.

Teachers who have taught *Corrective Reading* effectively know that students who have failed in other material can become very motivated. The carefully structured teaching material, paired with effective instructional techniques, demonstrates to students that they can be successful. The point system also becomes a symbol of student success. Students soon realize that their points reflect their hard work and accomplishments. The point system is designed to teach students behaviors that are needed each day to make success possible. This is exactly what an effective grading system should do.

The most turned off students are those who have consistently gotten poor grades. They look at grades like many people look at lotteries or sweepstakes. Of course, it would be nice to receive a million dollars. However, the odds are stacked heavily against winning, so why try? Every student would love to get an "A" or a "B", but many know from experience that their efforts do little to change the odds. Though many students quit trying, few give up hoping. When teachers hand back tests or papers, it is rare to see a student who doesn't care enough to quickly check out his grade. An effective grading system can teach students that they have some control over the odds.

A grading system needs to be more than a simple evaluation tool. Most grading systems base grades solely on assignments, tests, quizzes, and so on. This type of system works very well for college students and high school students who are bound for college. These sophisticated and successful students recognize that daily effort will give them the skills and information necessary to complete assignments and pass tests. However, this type of grading system delays any accountability for "goofing off" until the end of the term. The delay in the consequence results in low performing and immature students failing to learn that they must work consistently through the term to earn good grades.

An effective grading system will not only evaluate student mastery of course objectives, but it will also systematically monitor student performance in class each day. The system will teach students that their daily efforts affect their final grade. This can be accomplished by basing a percentage of the grade on classroom participation and effort, monitoring student performance daily and assigning a weekly participation grade at the end of each week.

The amount of the grade based on participation and effort will vary depending on the age and sophistication level of students, and on the subject of the course. With a class of highly motivated and mature students, participation and effort might affect the grade as little as five to ten percent. With a group of unmotivated students, participation and effort may need to be as high as 50% of the grade. When you know what percent of the grade is based on participation, simply estimate how many points students will earn each week on assignments and tests, and estimate how many possible points they sould be able to earn each week for participation and effort. For example, if students may earn approximately 150 points each week for assignments and tests, a 20% participation and effort grade would be worth 30 points each week. (If you work with very low performing and unmotivated students in a resource room, you may wish to assign participation and effort grades on a daily basis.)

Monitoring student behavior each day can be accomplished with very little additional work. Simply keep a class list available. At the end of each period quickly code any behaviors next to student names that indicate above average performance or effort. For example, you might write an "i" for improvement noted with one student, or you might code a "c" for cooperativeness. Any behaviors that will adversely affect a grade should be recorded immediately. This might include a "d" for disruptive or an "o" for off task. At the end of the week, you will have a daily record for determining each student's weekly performance points. Students with no codings could be awarded 80% of the possible weekly points indicating average performance and participation. For each coding of outstanding effort and participation, 10% of the possible points could be added to the weekly performance grade. On the other hand, if a student demonstrated behavior that interferred with learning, 5% of the weekly points could be subtracted for each negative behavior.

Assigning a weekly grade to every student in a class of 35 can take as few as five minutes of class time on Friday. Quickly calculate the points, and post the scores so students can see how their points were assigned. Privacy can be assured by assigning student numbers and covering student names while the class list is posted. This procedure will teach students that their behavior does make a difference in their grade. The key to the procedure is regularity and immediacy. Each day students will see that their behavior is affecting a weekly grade, and each week they will see that their daily behavior is affecting a final grade.

This type of system will actually teach students *how* to behave in ways that will increase the likelihood of their being successful. Students will learn that working in class each day will help them to complete work and pass tests.

Some districts have a policy that prohibits teachers from using behavior in class as a criteria for grading. If this is the case, follow your district's guidelines. However, you might look at that policy closely. First, find out if the intent of the policy is to restrict you from lowering a student's grade because he has misbehaved. If so, you might be able to use a system that bases part of the grade on behavior. Many districts are concerned that points should not be deducted from tests and assignments because of misbehavior. This does not prevent the teacher from saying that students will earn between 0 and 30 points each week based on how hard they work and how well they behave.

If the school policy prohibits using behavior as a criteria for grading you might also see whether you can justify this procedure because your class objectives involve teaching students the behaviors they need to be successful in class. For example, in a home economics class, the ability to stay on task, to follow directions, and to follow safety rules are critical behaviors for being successful. This same argument could be used to justify grading on participation and behavior in more traditional academic classes like English or history. Students must learn more than just the information and concepts covered in the class. They also need to learn independent study skills, and listening skills. They need to learn to arrive on time, remember their materials and to stay on task. Learning these behaviors will be necessary for all future educational and work endeavors. Your district may agree that these behaviors represent reasonable educational objectives, and may justifiably be reflected in your grading system.

Conclusion: Almost every school system in this country uses some type of grading system, and regardless of what "theorists" say, grades are very important to students (Rosser & Nicholsen, 1984). Unfortunately, the grading systems used by many teachers only serve to reinforce a student's view of himself as a good or a poor learner. If a grading system is designed well, it will help teach students how to behave in ways that make success possible. Students will learn that they are being monitored and that they are accountable for working hard in class. This will not cure problems related to poor instruction, but it can increase the likelihood that the student will at least try to meet the teacher's expectations.

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The AIMS (Assessments for Integration into Mainstream Settings) Assessment System

By Hill M. Walker[1] – University of Oregon

Overview

The AIMS assessment system for use in mainstreaming handicapped children into less restrictive settings is described. AIMS is an ecological assessment system, consisting of five instruments, that makes it possible to: (a) identify the minimal behavioral demands of less restrictive settings, (b) make use of this information in the systematic preparation of handicapped children for the behavioral demands that exist within them, and (c) directly assess the handicapped child's adjustment to academic and free play settings following social integration. Following a brief review of the knowledge base on mainstreaming, three sections of the paper describe respectively: (a) the AIMS assessment instruments and their uses; (b) validation studies, psychometric characteristics, and normative data; and (c) school applications of the AIMS system.

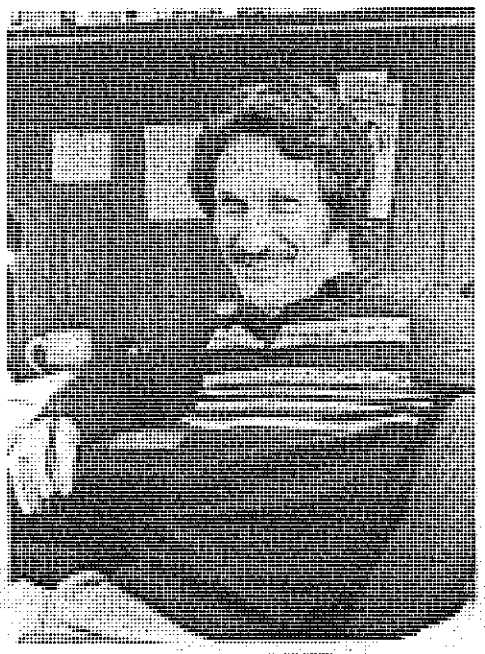
With the passage of P.L. 94-142 in 1975, the regular classroom was viewed as the ultimate and most desirable placement setting for the majority of school age handicapped children. Lilly (1971) proposed a "zero-reject" service delivery model in which all *mildly* handicapped children would be given unlimited and equal access to the regular classroom setting and its normalizing benefits. Nine years after the passage of P.L. 94-142, it is appropriate to ask how well the field has responded to the proposals of Lily and the mandate of the law.

Though large numbers of handicapped children have achieved access to mainstream environments for at least part of the school day, the structure of more restrictive educational placements (e.g., resource rooms, self-contained classrooms, special day schools, residential facilities) for accommodating this population is still very much in evidence.

As first noted by Dunn (1968), the efficacy of most special educational programming efforts continues to be weak in spite of the development of powerful instructional and behavior change technologies (Becker, 1984; Bornstein & Kazdin, in press; Carnine & Engelmann, 1984; Engelmann & Colvin, 1983; Gresham, in press; Strain, 1981; Walker, in press; Walker, Hops, & Greenwood, 1984). Meta-analyses of outcomes attributable to special education programs (Kavale, 1983) consistently demonstrate weak effects, primarily because this technology is not applied systematically (Walker, Reavis, Rhode, & Jenson, in press).

Gresham (1982) reviewed research evidence relating to the three major assumptions underlying the passage of P.L. 94-142. These were that: (a) handicapped children would socially participate with their nonhandicapped peers in mainstream settings, (b) they would be accepted as work and playmates by them, and (c) mainstreamed handicapped children would model and imitate the appropriate behavior of their nonhandicapped peers. Gresham's review shows that none of these assumptions are supported by the empirical evidence that has developed since 1975.

The literature on teacher attitudes indicates that teachers, in general, are not as receptive to mainstreaming as we would perhaps hope. Keogh and Levitt (1976), for example, found that regular teachers are quite concerned with: (a) controlling who is mainstreamed into their classes, (b) their ability to meet the needs of such children, and (c) the availability of support services. Regular teachers also see the social behavior of many mainstream handicapped children as outside the normal range acceptance for the regular classroom (Sarason & Doris, 1978).



HILL M. WALKER

It is apparent that the idealized practices of the P.L. 94-142 mandate have not been realized. In a recent review on mainstreaming, Tawney (1981) describes areas in which the law's goals and recommended practices have not been achieved. Much of the responsibility can be laid to the disinclination of teachers and schools to make radical changes in long-established school practices and service delivery systems.

In my view, the burdens involved in serving mildly handicapped children and in making mainstreaming an effective reality were shifted too strongly to the regular educational system. Regular teachers were not sufficiently skilled or motivated to assume such burdens. Mainstreaming efforts were initiated without careful attention to the amount of preparation that would be required in the regular classroom to respond effectively to the needs of the children.

This paper describes a multimethod/multi-purpose assessment system for use in mainstreaming handicapped children into less-restrictive educational settings. AIMS is used for three primary purposes. These are: (a) to select potential placement settings in the educational mainstream, (b) to produce information on the minimum behavioral requirements necessry for entry into and satisfactory adjustment within these settings, and (c) to assess the receiving teacher's technical assistance needs in accommodating handicapped children placed in their classrooms.

AIMS uses a combination of social validation ratings of adaptive and maladaptive child behavior by teachers and direct observations of teacher and child behavior in mainstream settings to achieve these goals. Two major desired outcomes of the system's use are: (a) to achieve a better match between child characteristics and teacher tolerance levels and skills, and (b) a more effective preparation of both the handicapped child and the receiving setting(s) for the mainstreaming process.

The AIMS Assessment Instruments

AIMS consists of five instruments which are designed to be used as an integrated system in the process of mainstreaming handicapped children. Three of the instruments involve teacher ratings of child behavior and two are direct observations codes.

The SBS Inventory of Teacher Social Behavior Standards and Expectations and *The SBS Checklist of Correlates of Child Handicapping Conditions* (Walker & Rankin, 1980) are two instruments used to conduct pre-assessments of the behavioral demands/expectations of teachers in less restrictive settings and to assess potential resistance to placement of children manifesting correlates of handicapping conditions (e.g., mobility problems, hyperactivity, self-help deficits, sensory impairments, and so forth). The SBS Inventory contains 107 items describing adaptive and maladaptive child behavior in the classroom setting and is divided into three sections. In Section I, teachers rate 56 item descriptions of **adaptive** child behavior in terms of whether they are *critical, desirable,* or *unimportant* to a successful adjustment in their classroom. In Section II, 51 item descriptions of **maladaptive** social behavior are rated along an acceptability dimension of *unacceptable, tolerated,* or *acceptable*. Section III asks the teacher to re-rate the critical and unacceptable items along a technical assistance dimension that indicates whether: (a) a child deficient on a critical-rated item, or outside the normal range on an unacceptable-rated item, would have to be at normal levels prior to social integration into the receiving teacher's classroom, or (b) the technical assistance for specific critical/unacceptable rated items that would be required following placement. Instructions for item format ratings and behavior criteria are carefully specified within the SBS Inventory.

The SBS Correlates Checklist consists of 24 items that describe conditions and

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Figure 1

Sample Items and Rating Formats from the SBS Inventory and Correlates Checklist

SBS Inventory			
Section I	**Critical**	**Desirable**	**Unimportant**
____ Child responds to requests and direction promptly.	( )	( )	( )
____ Child completes tasks within prescribed time limits.	( )	( )	( )
Section II	**Unacceptable**	**Tolerated**	**Acceptable**
____ Child disturbs or disrupts the activities of others.	( )	( )	( )
____ Child is physically aggressive with others, e.g., hits, bites, chokes, holds.	( )	( )	( )

Section III

In the line space to the left of the Section I (critical) items, indicate whether:

a. You would insist that the child have mastered the skill or competency *prior* to entry into your class, or
b. Following entry, you would accept responsibility for developing the skill/competency, but you would expect technical assistance in the process of doing so, or
c. Following entry, you would accept responsibility for developing the skill/competency and would not require technical assistance.

Similarly, for Section II (unacceptable) items, indicate whether:

a. The child must be within normal limits on the social behavior in question *prior* to entry into your class, or
b. Following entry, you will take responsibility for moving the child to within normal limits on the social behavior but only with technical assistance provided, or
c. Following entry, you will take responsibility for moving the child to within normal limits on the social behavior and would not require technical assistance.

SBS Correlates Checklist

Child has severely dysfluent speech and/or impaired language. ____

Child is eneuretic, e.g., has inadequate bladder control. ____

Child requires specialized and/or adapted instructional materials to progress academically. ____

[1]Copies of the AIMS assessment instruments can be obtained from the author for the costs of reproduction and mailing. The SBS Inventory and Child Behavior Rating Scale are *in press* to Western Psychological Services. Copies of the reference list for this paper can be obtained from ADI. Write to Wes Becker.

AIMS ASSESSMENT SYSTEM

characteristics that often cause teacher resistance to placement of children who manifest them. Teachers are asked to check items that would cause them to resist placement and to circle any checked items for which adequate technical assistance would remove or attenuate such resistance.

Sample items from the three sections of the SBS Inventory and the Correlates Checklist are contained below in Figure 1. Critical-rated items on which the child is deficient and unacceptable-rated items on which she/he is outside normal limits are selected for instruction and/or remediation either prior to or during the mainstreaming process. In order to make this determination, it is necessary for someone with knowledge of the child's behavior pattern to rate his/her status on these items.

A third instrument, *The Walker-Rankin Child Behavior Rating Scale*, is used for this purpose. This is a criterion-referenced scale on which a teacher in the sending setting (e.g., special education) assesses the target child's behaviroal status on the critical- and unacceptable-rated items indicated by the receiving teacher(s). The child's status on the adaptive items is rated along a skill dimension using the following rating options: *acceptably skilled, less than acceptably skilled,* and *considerably less than acceptably skilled.* Behavioral status on the maladaptive, social behavior items is rated on a frequency dimension where the rate or frequency is judged to be either *nonexistent, within normal limits* or *outside normal limits.* Items on which the child is judged to be other than acceptably skilled and outside normal limits become targets for instruction/remediation efforts.

Information provided by these three instruments is very useful in selecting mainstream placement settings and in preparing the target handicapped child to meet the minimum behavioral requirements of such settings. They also make it possible for receiving teachers in these settings to specify minimal entry requirements in the form of behavioral criteria and directly assess the teacher's technical assistance needs on the target-behavior-by-target-behavior basis. The remaining two instruments are direct observation codes that are used to assess the adequacy of the child's classroom and peer-to-peer social adjustments following social integration into the less-restrictive setting.

The codes used for this purpose are the CAC (Classroom Adjustment Code) and the SIC (Social Interaction Code). Both are interval coding systems that generate information on the nature and quality of the target child's behavior in academic and free-play settings.

The CAC uses a 5-second recording interval and contains three categories each for measuring child and teacher behavior. Child behavior codes are mutually exclusive, are global in nature, and measure, respectively, *on-task, off-task,* and *unacceptable* dimensions of child behavior. The teacher codes are as follows: *approval/feedback, providing instruction/command,* and *reprimand.* The three teacher codes can be recorded as either group or individual and are not mutually exclusive.

The SIC uses a continuous, 10-second time sampling procedure to record three major classes of events associated with the target child's peer-to-peer social interactions. These are: (a) the structure or activity context in which social interactions occur, (b) the type and quality of the child's interactive behavior, and (c) negative peer reactions to the target child's social behavior. Five structure-code categories are used to measure whether the target child is alone or engaged in structured versus unstructured interactive behavior. If interactive behavior occurs, five appropriate and five inappropriate code categories are then used to record its topography and quality. Negative peer reaction is coded wherever there are negative or punishing peer responses to the target child's interactive behavior. The structure codes are mutually exclusive of each other while the appropriate/inappropriate codes are not.

Validation Studies, Psychometric Characteristics, and Normative Data

Four years of research have been invested in the development and initial validation of the AIMS assessment instruments. The primary focus of these efforts has been on the SBS Inventory and Correlates Checklist. However, validity, psychometric, and normative data are available on the CAC and SIC codes.

Validation Studies

The development and initial validation of the SBS Inventory and Correlates Checklist are reported in Walker and Rankin (1983, in press). Four types of validity have been estimated on the SBS Inventory and/or Correlates Checklist to date. These are *concurrent, item, criterion,* and *factorial* validity.

Statistically significant relationships have been obtained between SBS Inventory and Correlates Checklist scores and the following criterion-related variables: (a) direct observations of teachers' management and instructional behavior during a mathematics period (Walker & Rankin, 1983), (b) direct observations of teachers' instructional behavior during a reading period (Walker & Rankin, in press), (c) a direct instruction measure of implementation fidelity (Walker & Rankin, in press), and (d) reading achievement (Walker & Rankin, in press). Statistically significant relationships have also been obtained between the SBS Inventory and *The Classroom Integration Inventory* (Mandell & Strain, 1978; Proctor, 1967) and *The Problems in Schools Questionnaire* (Deci, Schwartz, Sheinman, & Ryan, 1981).

The factor structure for the SBS Inventory consists of five factors: three in Section I and two in Section II. The factors for Section I items describe respectively: (a) a student with excellent work habits who is organized and efficient, (b) a student who exhibits self-control, is responsive to the teacher, and serves as a behavioral model for others, and (c) a student who is socially skilled and positive with peers. For Section II, items that load strongly on factor one are those that describe maladaptive behavior specific to the child and that does not challenge the teacher's authority (e.g., babbling, self-stimulation) or that describe maladaptive peer interactions. In contrast, items loading on factor two describe disruptive child behavior that challenges the teacher's control and authority.

Two forms of validity have been estimated on the Classroom Adjustment (CAC) and Social Interaction (SIC) observation codes. These are *construct* and *discriminant.* In two experimental studies of social skills training for mildly handicapped children (Walker, McConnell, & Clarke, in press), both the CAC and SIC codes registered changes for experimental subjects that were: (a) significantly different from those of control subjects, and (b) correlated with changes on other dependent measures. In a descriptive, normative study, the two codes powerfully discriminated the behavior patterns of normal and handicapped children (see normative data).

Psychometric Characteristics

Two forms of reliability have been estimated on the SBS Inventory and Correlates Checklist. These are test-retest stability and coefficient alpha. Test-retest stability for a 6-week interval on the SBS Inventory approximated .80 (total score and Section I and II scores) for a sample of 50 regular teachers and 22 special education teachers (see Walker & Rankin, 1983). Three separate estimates of coefficient alpha exceeded .90 for Section I and II scores (see Walker & Rankin, 1983, in press).

Table 1

Profiles of Teachers' Scores on the SBS Inventory and Checklist

SBS Inventory			
Sec. I	Crit.	Desir.	Unimport.
T1	0	36	20
T2	47	9	0
T3	15	40	1
Sec. II	**Unaccept.**	**Toler.**	**Accept.**
T4	51	0	0
T5	8	42	1
T6	28	22	1
SBS Checklist			
	No. Items Checked (✓)	No. Items Circled (O)	
T7	18	0	
T8	20	18	
T9	0	0	

Teachers show considerable *individual* variability in their responses to the SBS Inventory and Checklist. Table 1 presents a profile of regular teachers from the initial validation sample who scored differently from each other (Hersh & Walker, 1983). The scores are for 9 of the 50 regular teachers who participated in the study and reflect substantial differences among teachers in their social behavior standards and expectations. This pattern of variability appears to replicate in any sample of 50 or more teachers.

On the average, teachers mark about 25 percent of the items as unacceptable. Regular teachers check approximately 10 of the 24 SBS Checklist items as causing them to resist placement of a handicapped child who manifests them; special education teachers check approximately 4 to 5 checklist items.

Normative Data

Normative data are available on approximately 2,000 teachers in this country, Canada, and Australia on the SBS

Table 2

Patterns of Teacher Scoring on the SBS Inventory and Correlates Checklist

	Teacher Groups											
SBS Inventory	Regular Elementary (Inservice) N = 50		Regular Secondary (Inservice) N = 191		Special Education Elementary N = 22		Special Education Secondary N = 54		Regular Elementary (Pre-Service) N = 45		Regular Secondary (Pre-Service) N = 45	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
Section I												
Critical	12.78	13.12	24.10	12.36	9.13	12.62	24.90	10.78	14.02	13.64	10.78	6.56
Desirable	39.70	12.30	28.80	11.14	40.63	12.14	27.90	9.87	39.08	12.85	41.29	7.50
Unimportant	3.50	5.80	2.50	3.60	6.22	8.60	2.00	2.91	2.71	4.07	3.80	4.28
Section II												
Unacceptable	27.96	9.14	31.70	8.30	25.22	12.76	29.60	9.19	23.31	11.16	24.24	7.05
Tolerated	22.22	8.79	17.60	7.82	25.00	12.35	18.40	8.62	26.68	10.84	25.56	6.94
Acceptable	0.82	1.73	1.00	1.79	0.77	1.79	1.30	2.10	0.91	1.42	1.07	1.62
SBS Correlates Checklist												
Items Checked ✓	10.81	4.46			5.85	3.92			5.36	3.78	7.13	4.25
Items Circled O	6.21	3.65			4.66	3.01						

(CONTINUED)

Table 3

High and Low Rated Items on the SBS Inventory and Correlates Checklist

SBS Inventory		SBS Correlates Checklist
Section I	Section II	
	High Rated Items	
"Critical"	"Unacceptable"	"Causes resistance to placement"
Child complies with teacher commands.	Child steals.	Child is at times uncontrollably aggressive.
Child follows established classroom rules.	Child is self-abusive, e.g., biting, cutting, or bruising self, head banging, etc.	Child is incontinent.
Child produces work of acceptable quality given her/his skill level.	Child behaves inappropriately in class when corrected, e.g., shouts back, defies the teacher, etc.	Child is eneuretic.
Child listens carefully to teacher instructions and directions for assignments.	Child is physically aggressive with others, e.g., hits, bites, chokes, holds.	Child has deficient self-help skills.
Child expresses anger appropriately, e.g., reacts to situation without being violent or destructive.	Child makes lewd or obscene gestures.	
Child can have normal conversations with peers without becoming hostile or angry.	Child engages in inappropriate sexual behavior, e.g., masturbates, exposes self, etc.	
Child behaves appropriately in nonclassroom settings (bathroom, hallways, lunchroom, playground), e.g., walks quietly, follows playground rules, etc.	Child refuses to obey teacher imposed classroom rules.	
Child avoids breaking classroom rule(s) even when encouraged by a peer.	Child damages others' property, e.g., academic materials, personal possessions, etc.	
Child does seatwork assignment as directed.	Child has tantrums.	
Child makes his/her assistance needs known in an appropriate manner, e.g., asks to go to the bathroom, raises hand when finished with work, asks for help with work, lets teacher know when sick or hurt.	Child ignores teacher warnings or reprimands.	
	Low Rated Items	
"Critical"	"Unacceptable"	"Causes resistance to placement"
Child sits up straight in seat during classroom instruction.	Child ignores the social initiations (overtures, advances, etc.) of other children.	Child has nervous tics.
Child volunteers for classroom activities, e.g., assisting the teacher, reading aloud, classroom games, etc.	Child wants to participate in playground activity in progress but is afraid to ask to join.	Child has mobility problems requiring braces, crutches, or a wheelchair.
Child initiates conversation with peers in informal situations.	Child refuses to play in games with other children.	Child attempts to take advantage of handicap by using it to avoid certain tasks/activities.
Child compliments peers regarding some attribute or behavior.	Child pouts or sulks.	Child drools.
Child uses social conventions appropriately, e.g., says "thank you," "please," apologizes, etc.	Child refuses to share.	Child's school attendance is erratic and unpredictable.
Child can recognize and describe moods/feelings of others and self.	Child is easily distracted from the task or activity at hand.	
Child resolves peer conflicts or problems adequately on her/his own without requesting teacher assistance.	Child is overly affectionate with other children and/or adults, e.g., touching, hugging, kissing.	
Child can work on projects in class with another student.	Child's remarks or questions are irrelevant to classroom discussions.	
Child ignores the distractions or interruptions of other students during academic activities.	Child whines.	
Child responds to teasing or name calling by ignoring, changing the subject or some other constructive means.	Child becomes visibly upset or angry when things do not go his/her way.	

Inventory. There is considerable similarity between different teacher groups (elementary, secondary, special education, preservice, inservice) in their responses to this instrument. This similarity is apparent in both the pattern of scoring and in the content of items consistently rated high (critical/unacceptable) versus low (unimportant/acceptable).

Table 2 below contains characteristic patterns of scoring for different teacher groups on Section I and II of the SBS Inventory and Correlates Checklist. There appears to be less between-groups variability on Section II than Section I of the SBS Inventory among the teacher groups represented in Table 2. On Section I, secondary level regular and special education inservice teachers checked a much larger number of items as critical than did the other four groups represented. This may reflect higher behavioral expectations among practicing teachers at the secondary level.

Table 3 below contains items that are rated high and low by various teacher groups on Sections I and II of the Inventory and the Correlates Checklist. High-rated Inventory items are those most frequently rated critical or unacceptable; low-rated items are those least often rated critical or unacceptable. High- and low-rated Checklist items are those most and least often checked as causing teacher resistance to placement. Inspection of the item content in Table 3 reveals some interesting differences in the highest and lowest rated items on the SBS Inventory and Correlates Checklist. For example, the *lowest* rated Inventory items in Sections I and II have a strong peer social behavior content. This finding consistently replicates for both regular and special education teachers and suggests that peer relations and social skills are assigned a comparatively lower priority by school personnel than compliance, control, and discipline. In this regard, the content of the highest rated Section I items deals almost exclusively with *classroom control, general discipline*, and *compliance with teacher instructions and commands*. In contrast, the highest rated Section II items (i.e., most unacceptable) deal with child behaviors that are: (a) of *high magnitude* or *intensity* and (b) occur at an *extremely low frequency* in most classrooms. A child exhibiting one of these pinpoints, even once, would be labelled problematic or deviant by a majority of teachers.

The most frequently checked items on the SBS Correlates Checklist are highly aversive to most teachers. They exceed teacher tolerance levels, make or represent demands on the teacher, and often require skills not possessed by teachers. None of the lowest rated items share these characteristics.

Tables 4 and 5 below contain normative comparisons for handicapped and nonhandicapped pupils in classroom and free-play settings derived from the classroom adjustment and social interaction codes. The handicapped sample ranged in age from 6 to 11 and were enrolled in grades 1-6. Six of the children were classified as learning disabled, one as language impaired, two as emotionally handicapped, and one as multiply handicapped. The nonhandicapped children ranged in age from 6 to 11 years and were enrolled in grades 1 to 6. The handicapped sample was observed in special education settings and the nonhandicapped sample in regular classroom settings.

Table 4 indicates substantially higher levels of on-task behavior for the nonhandicapped sample. The handicapped sample received much higher levels of individual teacher instructional attention in their respective classrooms. In a subsequent study of 20 mainstreamed handicapped children (Clarke, Walker, Walker, & McConnell, 1984), the authors found that this sample averaged 69 percent on-task behavior (S.D. = 13 percent) in regular classrooms and received approximately identical amounts of teacher attention as did their nonhandicapped peers.

Continued on Page 14

Table 4

Normative Comparisons on the Classroom Adjustment Code (CAC) for Handicapped and Nonhandicapped Children in Academic Settings

	Normal, Non-Handicapped Sample (N = 12)		Handicapped, Non-Mainstreamed Sample (N = 10)	
Code Category	$\bar{X}$	S.D.	$\bar{X}$	S.D.
I. Child Behavior Codes				
On-Task	.92%	.09%	.62%	.25%
Off-Task	.08%	.09%	.38%	.25%
Unacceptable	.00%	.00%	.00%	.00%
II. Teacher Behavior Codes				
Individual				
Approval/Feedback	.011%	.006%	.038%	.021%
Instruction/Command	.015%	.015%	.105%	.040%
Reprimand	.001%	.003%	.008%	.005%

Table 5

Normative Comparison on the Social Interaction Code (SIC) for Handicapped and Non-Handicapped Children in Free Play Settings

SIC Measure	Handicapped Sample (N = 10)	Non-Handicapped Sample (N = 12)
1. Percent of time spent in social behavior	73%	98%
2. Percent of time spent in verbal interactive behavior	32%	48%
3. Percent of time spent alone	29%	2%
4. Percent of time spent in appropriate interactive behavior	21%	53%
5. Percent of time spent in inappropriate interactive behavior	7%	.002%

DI at the Nashville ABA Convention

By Russell Gersten

The national conference for the Association for Behavior Analysis (ABA) will be held in Nashville (at Opryland) on May 28-31. A wide range of seminars, panel discussions, and research symposia are scheduled. Sessions are scheduled on microcomputer applications of DI, research on interactive video in teaching social skills, problems in implementing DI within the public schools, some of the longitudinal research described in earlier issues of *ADI News*, reading comprehension, and innovative applications of DI to special education. This year several of the most prominent behavioral researchers will participate in the symposia—Donald Baer, Beth Sulzer-Azaroff, Tim Heron—in an attempt to explore commonalities between these approaches.

For the first time, mini-training sessions will be offered as part of the conference. There will be one introductory session (DI Variables in Action) on basic presentation skills in beginning reading and spelling. Two intermediate level sessions are scheduled—one on supervision, and one on teaching comprehension in the new *Reading Mastery Series*, Levels 3, 4, and 5.

A schedule of the events follows. For further information on the conference please contact:

ABA
Department of Psychology
Western Michigan University
Kalamazoo, MI 49008

Training Sessions

Monday, May 28	
Morning	Supervision of Direct Instruction Trainer: Linda Youngmayr & Cathy Madigan
Afternoon	Teaching Comprehension of the Low Performer: *Reading Mastery 3, 4, 5* and *Corrective Reading: Comprehension Series* *Trainer: Donna Dwiggins*
Tuesday, May 29	
Morning	Direct Instruction Variables in Action: Introduction to *Reading Mastery* and *Mastery Spelling* Trainer: Carmen Marcy

Symposia

Monday, May 28	
2:00-2:50	Teaching Success to Adolescents with Severe Behavior Disorders Panelists: Carmen Marcy, Donna Dwiggins, Micheal Maloney
4:00-5:20	Implementation of Direct Instruction—Within the Public School System and without the Public Schools Panelists: Kent Johnson, Carmen Marcy, Roberta Weisburg, Mike Roberts, Michael Maloney, Shlomo Cohen
5:30	ADI Meeting (Special Interest Group on Direct Instruction) Followed by informal cocktail hour
Tuesday, May 29	
9:00-10:50	Direct Instruction in Reading Comprehension Papers by: Ed Kameenui, Craig Darch, Russell Gersten, Donna Dwiggins Discussant: Tim Heron Chair: Jane Howard
11:00-12:30	The Interface of DI and Computer Assisted Instruction Papers by: Ron Thorkildsen and Russell Gersten Chair: O. Barker Houghton
1:00-1:50	ADI Conversation Hour. An opportunity to meet the presenters and discuss practical problems in implementing and evaluating DI programs. Hosts: Jane Howard and Russell Gersten
2:00-3:50	DI in Special Education—New Directions Papers by: Ron Thorkildsen, Jo-Ann Sowers, Russell Gersten, Craig Darch Discussant: Beth Sulzer-Azaroff Chair: Robert Taylor
Wednesday, May 30	
9:00-10:20	Long-Term Maintenance of Effects of DI Programs Chair: Beth Sulzer-Azaroff Papers by: Paul Weisberg, Russell Gersten Discussant: Donald Baer
2:00-3:20	Minority Overrepresentation in Special Education: A Case for DI Prior to Referal Panelists: Larry Maheady, Charles Greenwood, Robert Taylor, Russell Gersten, Ethna Reid (and/or a representative of ECRI)

AIMS (Continued from Page 13)

Table 5 presents normative comparisons for the two samples on five measures derived from the Social Interaction Code. They document very different patterns of social behavior for handicapped and nonhandicapped children in free-play settings. All of the comparisons favor the nonhandicapped sample.

These data provide valuable criteria for interpreting CAC and SIC scores recorded on individual children. They also demonstrate the codes' sensitivity in discriminating differences in the classroom and social behavior of handicapped and nonhandicapped children.

School Applications of the AIMS System

The AIMS system was designed to facilitate achievement of the following service goals vis-a-vis the mainstreaming process: (a) to select appropriate placement settings for the social integration of handicapped children, (b) to identify the minimum behavioral requirements for entry into and mainstreaming within them, (c) to make it possible to use this information prescriptively in the systematic preparation of handicapped children to meet the behavioral demands of less restrictive settings, (d) to assess the receiving teacher's technical assistance needs in accommodating the mainstreamed child, and (e) to assess the quality and adequacy of the handicapped child's adjustment to academic and free-play settings following social integration. As yet, the system has not been tested or validated against these goals.

To do so would require demonstrations that mainstreaming placements made with the AIMS system are more accurate or effective than those made with current procedures. In addition, the adjustment status of target handicapped should be improved following social integration. Finally the overall mainstreaming process should receive higher social validation ratings from receiving teachers as a result of the AIMS system's use. Several model demonstrations that would answer these questions are currently being planned by other investigators. Until these comparative evaluations are made and the entire AIMS system is validated, it will not be possible to claim that its use improves the mainstreaming process.

The AIMS system has other potential uses beyond the mainstreaming process. These include: (a) matching child behavioral characteristics to teachers' behavior expectations, (b) the identification of staff inservice training needs, and (c) the selection and training of teachers at the preservice level. The system also generates a number of researchable questions relating to existing school practices.

Conclusion

The AIMS assessment system represents only a partial and as yet unproven solution to the problems that continue to plague the mainstreaming process. It is apparent, however, that conflicts between the behavioral expectations and tolerance levels of teachers in mainstreaming settings and the social behavior deficits and excesses of handicapped children continue to be a major obstacle to mainstreaming. Jones (1978) in commenting on this issue, called for systematic research attention to: (a) the attitudes that regular teachers perceive as impeding their ability to work effectively with handicapped children and (b) strategies to equip both teachers and handicapped children with behavioral competencies to reduce the strain in their interactions with each other and with nonhandicapped pupils. It is apparent that the self-sufficient teacher who can accommodate mainstreamed handicapped children without external support assistance, as envisioned by Lilly (1971), is still an elusive goal.

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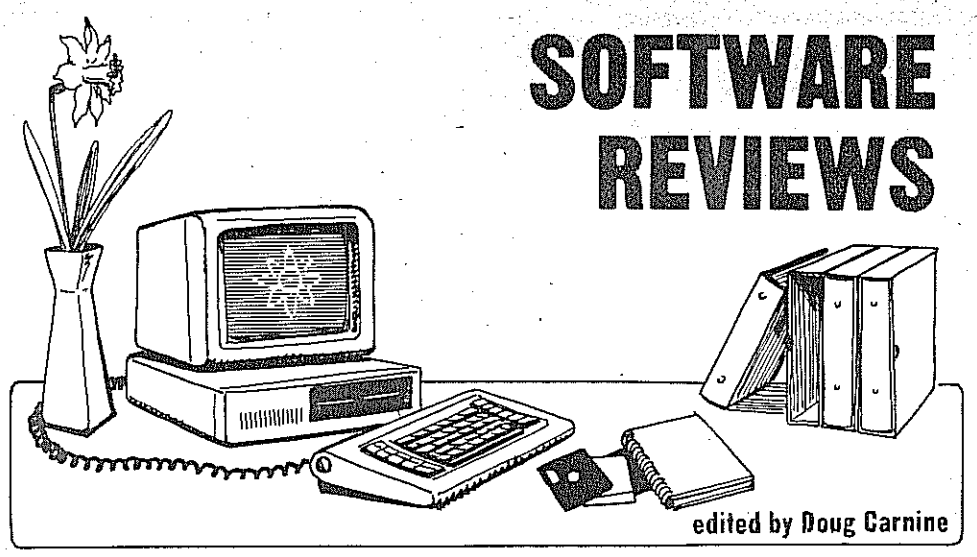


SOFTWARE REVIEWS

edited by Doug Carnine

Master Match

Published by:
Computer Advanced Ideas, Inc.
1443 A Walnut Street, Suite 341
Berkeley, CA 94709
For: Apple II — 48K, dual drive

Reviewed by Betty Aten-Iossi

Editor's note: Betty Aten-Iossi has been teaching special education for 12 years. She is currently a Resource Specialist in Redwood City, CA. Her BA (Elementary/Special Education) and MA (Learning Disabilities/Behavior Disorders) are from the University of Iowa. She is now enrolled in a Master's program in Computer Science Education at the University of Oregon. She has been involved in the educational use of computers for five years. She consults with a private research firm on critical factors in the design of software for children with learning disabilities. She is a software reviewer for Journal of Computers, Reading and Language Arts, *and* Teaching and Computers.

I. *Introduction.* "Master Match" is an example of what is currently being described as "edu-tainment" software. The purpose is to provide a program with educational value in an entertaining format. This one uses animated graphics and follows a popular T.V. quiz format. It attempts to enhance memory skills while teaching vocabulary and concepts. The object of the game is to match information in one box to information in another box by remembering its location. Matches occur between words and definitions, words and pictures, and math problems and solutions. Two points are awarded for each match. Free boxes are hidden in each game, and are worth one point when they are uncovered. An owl acts as moderator. It prompts each player's turn, and keeps track of the score. One or two players may play at one time.

II. *Content.* "Master Match" comes with several game topics included. There is a variety of subjects and difficulty levels. For example, on lower levels, one matches letter patterns, or animals to the sounds they make. More advanced topics include matching geographical names and locations, and French words to their English translation. Specific subject matter disks are available to be used with the main program.

Teachers have the option of creating their own topics or supplementing the ones provided by using the authoring capability of the program. They may also design pictures by using the "Master Match" graphics character set.

While the content offers great flexibility within the game format, one must carefully evaluate its educational value. It is basically a concentration game with limitless content options. As such, it provides practice in visual memory, and can serve as a reinforcer for previously taught concepts.

III. *Instructional design.* One of the best aspects of the instructional design is that it is motivating for students. The rest of the design features are all acceptable for classroom use. The learner outcomes are stated, but the program does not accomplish what it sets out to teach. While the content can be individualized through choices on the menu, the games themselves are rigid in terms of their timing and sequencing of comments to the player(s). The presentation and reinforcement lack variety. On-screen comments to the players are repetitive. There is no help provided during the games. The players continue on a trial and error basis until all of the boxes

Continued on Page 16

Courseware Evaluation Form

Each item is rated using the following code:

E = Excellent
A = Acceptable
M = Marginal
U = Unacceptable
N.A. = Not Applicable

	Rating
CONTENT	
1. Is the content accurate?	E
2. Is the content of educational value?	M
3. Is the content free of stereotypic bias?	E
INSTRUCTIONAL DESIGN	
1. Objectives	
a. Are objectives clearly stated?	A
b. Are objectives defined to the learner?	M
c. Is the program content consistent with objectives?	A
2. Individualization	
a. Is the target audience specified?	E
b. Are entry skills specified?	U
c. Is a pretest or placement test provided?	NA
d. Are a variety of entry points available?	NA
e. Are options for exiting or returning to menu available?	E
f. Can the program be altered?	E
g. Is there a method of record-keeping?	M
3. Presentation	
a. Do the activities optimally match the content?	A
b. All Programs (Tutorials, Drill & Practice/Gaming, Simulation)	A
✓ provides opportunity for frequent interaction	
___ avoids restrictive response formats	
c. Drill and Practice/Gaming	A
✓ provides varying levels of difficulty	
✓ problem type ___ rate ___ number of tasks	
✓ provides cumulative introduction	
___ re-introduces missed tasks or equivalent tasks	
___ provides tutorial instruction when appropriate	
✓ sequences tasks unpredictably	
4. Feedback	
a. Are all errors corrected?	M
b. Does the correction fit the context in which the error occurred?	A
c. Is feedback informative?	M
5. Review	
a. Is review provided for newly acquired skills?	NA
b. Does review incorporate previously-learned skills into more complex applications?	NA
6. Motivation	
a. Is the level of difficulty challenging to the learner?	A
b. Is the material presented at a good pace?	M
c. Are readability levels appropriate to the target audience?	A
d. Is user control granted to the learner where appropriate?	A
e. Does the use of graphics/sound/color increase interest in program content?	E
7. Reinforcement	
a. Is reinforcement age-appropriate?	E
b. Is reinforcement used appropriately?	E
c. Is a variety of reinforcement used?	M
PROGRAM UTILITY	
1. Are user-support materials included?	E
2. Is there a Teacher's Manual?	U
3. Is the program easy to operate?	E
4. Is the program reliable under normal use?	E
5. Can the program analyze a variety of responses?	A
6. Are information displays attractive?	E

Table 5

Evaluation Summary Form

E. Excellent
A. Acceptable
M. Marginal
U. Unacceptable

Title: Master Match

	E	A	M	U
CONTENT	E	(A)	M	U
INSTRUCTIONAL DESIGN	E	(A)	M	U
1. Objectives	E	(A)	M	U
2. Individualization	E	(A)	M	U
3. Presentation	E	(A)	M	U
4. Feedback	E	(A)	M	U
5. Review	E	A	M	(U)
6. Motivation	(E)	A	M	U
7. Reinforcement	E	(A)	M	U
PROGRAM UTILITY	E	(A)	M	U

STRENGTHS: "Master Match" has reliable content in a variety of subject areas, and is appropriate for a wide audience of varying abilities. It is easy to use. The game format is motivating for students.

Teachers may create their own lessons using the carefully outlined procedure in the user support materials.

WEAKNESSES: It offers practice in visual memory rather than reinforcement of previously taught material. Students are thus evaluated in terms of their memory rather than for their knowledge of content.

The presentation format is repetitive, which causes a needlessly long wait between student responses.

RECOMMENDATIONS: This program is intended to be an entertaining educational computer game. As such, it has a place in the classroom as a reward activity. It does not teach or reinforce concepts and should not be used as such.

For Educators of Elementary and Intermediate Students

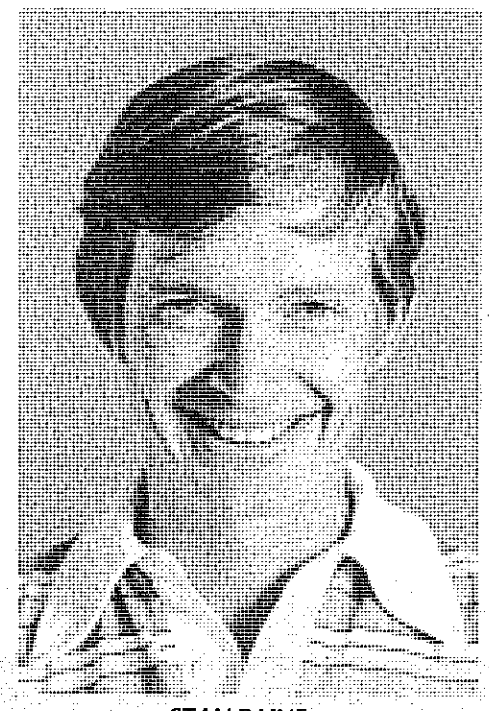
Structuring Your Classroom for Academic Success

Paine, Stan C., Radicchi, J., Rosellini, L., Deutchman, L., & Darch, C. *Structuring Your Classroom for Academic Success*. Research Press (1983), Box 31773, Champaign, IL, 61821. Price: $9.95.

Stan Paine and his colleagues, all advocates and practitioners of the Direct Instruction approach, have written a usable book for educators of elementary and intermediate students. They adeptly apply the fundamental principles of Direct Instruction to often unaddressed, yet everpresent, management dilemmas found in the classroom. The book contains procedures for dealing with every aspect of organizing a classroom initially to managing it on a day-to-day basis. All of the management procedures appear to be based on experimental classroom research. The procedures have proven to be effective in special education as well as regular educational settings.

An exceptional feature of the book is its practical orientation. Teachers should find many of the issues discussed analogous to those encountered in actual teaching situations. The chapters include suggestions for: (1) organizing classroom space; (2) using volunteers and aides in the classroom; (3) using attention to manage student behavior; (4) establishing and teaching classroom rules; (5) structuring and managing classroom time; (6) managing the flow of material in the classroom; (7) handling student requests for assistance; (8) correcting student's work and keeping track of their performance; (9) dealing with minor behavior problems; (10) developing good work habits; and (11) phasing out special procedures.

The primary purpose of the text is to present techniques that will prevent problem behaviors, keep students on task, and make the best use of everyone's time and energy. An example of the management procedures included is the handling of student requests for assistance. Students working independently will inevitably encounter tasks that require teacher aid. As an alternative to conventional practices of interruptions or unproductive waiting periods, Paine et al. describe a nondisruptive, efficient procedure for requesting assistance which utilizes a three-sided card and a folder. Each student is provided a "Please Help Me" card, which is used to signal the teacher for help with assigned work. At the same time, a folder containing work that the student can turn to for practice while waiting for the teacher's help is also recommended. This procedure allows



STAN PAINE
President of ADI

students to make a request for assistance without disturbing classroom proceedings and simultaneously to remain on task. Both of these behaviors comply with Paine's principles of maximizing instructional time and minimizing management time.

Detailed plans for implementation, known as scripts, are provided for procedures. Whether instructing students in correcting their own papers, or establishing classroom rules, individual scripts accompany each new strategy. The scripts are used for introducing desired behaviors and for maintenance of these behaviors through the use of modified scripts. The format includes the teacher's definition of the target behavior and the students' oral repetition of the identical information. The student responses are performed on signal and generally are made in unison. Following the introduction of the new procedure, the remainder of the script consists of the instructor's precise description of the information considered critical for establishing and maintaining new skills. As in the initial definition, students play an active role in rehearsing information contained in the script. Brief scripts are used to remind students after initial teaching of a procedure. They can be used following any break in school routine and with the enrollment of new students in the classroom.

Scripts are explicit and easy to follow, nevertheless, teachers are encouraged to practice them prior to use. The guidelines specified in the scripts may seem overly redundant at times. However, Paine et al. reiterate the necessity of attention to detail. The book's procedures are based on the concept that with sufficient structure of the curriculum, even high-risk learners are capable of succeeding in school. Teachers should find these scripts easily applicable to daily instructional routines.

The authors' proposals for managing classrooms, though thoroughly designed and well developed, place heavy demands on the teacher in the initial stages of implementation. The authors suggest that efficient use of aides and students' familiarity with procedures will reduce teacher requirements. A unique characteristic of this management approach, which also lessens student dependency on the teacher, is the "phasing out" procedure. Paine and his colleagues have cleverly devised a system for removing artificial structures once consistent, acceptable classroom behavior is exhibited by students.

While the authors have designed a set of procedures which must be stringently followed, elements of flexibility have also been included. Implementation of the total program is advised; however, the management procedures have been individually introduced and are not contingent on previous strategies. This approach allows teachers with time or resource constraints to select areas most needed to improve their teaching environment and management skills. The procedures presented address both primary and intermediate grades' needs. A method of managing individual behavior problems through a whole-class approach appears efficient and effective.

As proponents of the preventive approach to education, Paine et al. emphasize that teachers mistakenly assume that students will behave well voluntarily. They argue that the behaviors one wants exhibited in the classroom must be carefully explained and rehearsed, leaving no room for misinterpretation by the student. Included in the book are procedures for teaching students how to behave in a variety of classroom situations such as group instruction periods and transitions.

The writers' positive approach to education is encouraging. Their suggestions are manageable and leave one eager to employ them. Teachers should find these procedures to be very usable—a clearly needed addition to the typical teacher training literature. *Structuring Your Classroom for Academic Success* is a well-developed compilation of management techniques that should prove valuable for novel and experienced teachers alike. When properly implemented, these procedures should ultimately maximize instructional time, minimize management time, and accomplish the goal of improving student performance in the classroom.

Deborah Simmons
Purdue University

Call for Papers

This newsletter is intended to be a consumer-oriented publication. You, the readers, are the consumer group. Therefore, we very much want your input in future issues. The editors invite your contributions of manuscripts, comments, ideas, inquiries, or information suitable for publication in the DI News. Any item relevant to direct instruction is appropriate for the News. A working list of the types of items the News will publish, along with submissions guidelines for each, appears in this issue. All submissions will be edited for length, readability, and technical accuracy prior to publication. Issues will be published in fall, winter, spring, and summer. Please submit (postmark) all items no later than the first of September, December, March, and June.

Master Match

(Continued from Page 15)

have been uncovered. However, the game may be interrupted at any point by pressing the ESC key. The winner is the one with the highest score at that point.

IV. *Program utility*. "Master Match" is easy to use. Most students will be able to use it successfully with minimal adult supervision after the initial introduction. It can best be used as a reward activity in the classroom rather than as a teaching tool.

V. *Summary*. For the most part, this is an entertaining game. Its educational value comes from practice in visual memory and reinforcement of previously taught concepts. However, its *lack of warranty policy makes it unacceptable for school purchase*. Computer Advanced Ideas sells its software "as is." There is no warranty. There is no liability for defects. No responsibility is taken for faulty disks. Until that policy is changed, their products should not be considered for purchase by schools.

My Reactions to the UO Program for Teachers of the Mildly Handicapped

By Diane Kinder
Forest Grove, OR

I entered the University of Oregon Mildly Handicapped Master's program in 1981 after nine years of elementary teaching. Now, after finishing the program and my first year teaching handicapped students, *ADI News* has asked me to evaluate my U of O preparation. To do this, I will describe my training and first special education job.

The University of Oregon Mildly Handicapped Master's includes competency-based practica supported by research-based methods classes, professional course work, and classes relating to exceptional children.

The practica are three terms of supervised, competency-based teaching. Each successive practicum provides more responsibilities, with less supervision. Initially, my supervisor, a Ph.D. candidate and proven teacher, observed my sixth grade practicum group daily and intervened occasionally to model a procedure. She provided suggestions to improve my signals, pacing, corrections, and behavior management—the major competencies of Practicum I. In the final weeks of Practicum I, my supervisor continued her support, but observed less frequently, allowing me to be more independent.

Desiring to experience another level, I taught in a junior high school during my second and third practica. I was observed several times per week. Instead of intervention, I received specific assignments to improve my teaching. Practicum II supervision, competencies, and weekly seminars emphasized Siegfried Engelmann's paradigm for correcting infrequent, frequent, and chronic errors. Practicum III emphasized refinement of presentation skills and advanced corrections, however many other aspects of special education were now emphasized: testing, Individual Education Plan writing, IEP conferences, grouping, and classroom orchestration.

Practica, the center of the U of O program, are coordinated with another major part of the program, the methods classes. All the methods classes, Direct Instruction Reading, Math, and Language Arts, presented research-based skill instruction and required the application of this knowledge. Demonstration of competency in teaching formats, evaluation of basal texts, and basal adaptation for direct instruction were also required.

Most exceptional-child coursework and professional classes were traditional lecture courses. However one class, "Law and Special Education", was a practical nuts and bolts class. After studying Public Law 94-142 and reading dozens of court cases, I was required to apply this knowledge in simulations.

Following my year at the University of Oregon, I was hired by a small rural school district west of Portland, Oregon. During the interviews I learned that the secondary resource room had been established the previous November. I was promised a challenge in this position because of the following conditions:

1. I would be teaching both junior high and high school students.
2. In the past year the resource room had a loose structure.
3. Only fifteen students were identified and placed in the resource room; many more referrals were expected.
4. Many logistical decisions were yet to be made and classroom teachers needed to be familiarized with special education.

Teaching high school students did not develop into a major challenge. My practica provided me with a variety of experiences teaching reading, math, language arts, and study skills. I found that the techniques I had learned in practica with elementary and junior high school students worked well with high school students also. A ninth grader who had never learned the multiplication facts, not only mastered them, but also mastered two place multiplication and long division. However, I was surprised to find and not prepared to use the TRS-80 microcomputer in my classroom. Including computer literacy and software evaluation in the U of O program would be beneficial.

The second challenge, that the classroom had been loosely structurued the previous year, did not prove to be a problem. Since I had taught at two practica sites, I had twice established classroom rules, reinforced students for following these rules and consequated students for breaking rules. These experiences had provided me with a workable management system. Within weeks the principal commented on the resource room's orderliness.

The controlled classroom and the students' success did encourage teachers to refer many students. As a result of my limited testing experience, evaluating and processing students was a challenge. However, I was able to apply my limited knowledge in new situations. Information gained in the law class helped me determine eligibility and proceed through the IEP process. I became quicker at testing, and by the end of the year the secondary resource room census had increased from fifteen to over forty students.

The greatest challenges were those over which I had the least control, logistical decisions and the education of the classroom teachers. Basic decisions regarding scheduling, credit, and reading instruction had not been finalized. These decisions involved many administrators and teachers, and some are still not finalized. Finding time to meet with classroom teachers was difficult. It is only in my second year that I am focusing on increasing their knowledge of special education and helping those who had not previously adjusted their curriculum to meet the needs of handicapped students. It was only because of my excellent preparation for teaching, management, and other special education duties that I was able to look beyond my classroom to the logistics and resource consultant challenges.

The University of Oregon's practica slogan is, "How well you teach equals how well they learn." If this slogan can be extended to "How well the University of Oregon trains teachers equals how well the teachers' students learn," then the University of Oregon has been successful.

Instructional Interventions for LD

By Marilyn Stepnoski – University of Oregon

Learning failure of mildly handicapped students in regular classroom instruction may be due, in part, to the nature of the instruction offered in the regular class. While non-handicapped students may be able to achieve even when instruction is complex or incomplete, mildly handicapped students can become confused or distracted by teaching methods that are less than optimal.

Identifying instructonal variables that lead to improved student performance has been an important aim of educational research. The last five years have witnessed a growing awareness that many of the instructional variables identified in the teacher effectiveness research in regular classrooms have immediate relevance for special education (Rosenshine & Stevens, 1981; Brophy & Good, in press).

For example: "providing academic focus demonstrations and corrective feedback, teaching to mastery and monitoring student performance have been consistently linked to student achievement in the regular classroom." (Rosenshine, 1983).

In this article, I will focus on recent research coming from the Learning Disabilities Institutes and studies that have focused on specific teaching behaviors observed in actual LD classrooms.

Background of the Studies

In the late 1970's, five universities received research funding grants from the U.S. Dept. of Education's Bureau for the Handicapped. The grants were to be used to establish research institutes that would "identify" LD students, then develop and evaluate empirically effective interventions for that group of students. The five universities funded were the University of Illinois at Chicago, the University of Kansas, the University of Minnesota, Teachers College of Columbia University, and the University of Virginia.

Each institute established its research in a manner that differed from that of the other four, and attacked the problems from its own perspective.

The Chicago institute studied "oral communicative competence or adaptive social functioning, the causal attributes of LD successes and failures," and then developed interventions to improve reading skills and comprehension (Bryan, Pearl, Donahue, Bryan, & Pflaum, 1983). Their work was conducted with LD students from inner-city and suburban public schools, private schools, and a special school for LD students. The students studied were in grades one through eight.

The Kansas Institute developed their "learning strategies" intervention model in two developmental stages: (1) during their first two years, they studied the learning characteristics of LD adolescents and their school settings to establish a data base; and (2) based on this data, the researchers developed an intervention instructional methodology, modification of materials, and motivational and evaluation components. They worked with LD students and low-achieving students in three large school districts, each representing a different socio-economic level, in eastern Kansas.

The Univeristy of Minnesota researchers took a very different approach from the other institutes and focused their efforts largely on assessment and decision-making processes involved in identification and placement of LD students.

The Columbia researchers organized into five task forces and studied two major areas: (1) teaching strategies in reading, spelling, arithmetic and study skills; and (2) studies of reading comprehension (Connor, 1983). Resource rooms and special education classes in New York's elementary schools and special schools were used.

The fifth institute, the University of Virginia, studied and developed educational interventions for LD students with attentional problems and academic strategies training for reading, math, and study skills (Hallahan, Hall, Danna, Kneedler, LLoyd, Loper & Reeve, 1983). Their research was conducted in elementary resource rooms and special classes for LD students.

While there is wide diversity in research approaches and interests, the Institutes conducted research that included experimental and quasi-experimental studies, and summative evaluations of an entire intervention model.

Another line of research included in this report which attempted to make finer-grade evaluations of the teaching components or combinations of components linked to academic gains (Leinhardt, Zigmond & Cooley, 1981; Englert, 1983).

Instructional Interventions from the Institutes

Researchers at the Columbia, Kansas, and Virginia Institutes incorporated into their intervention models many features from direct instruction. Stevens and Rosenshine (1981) have desbribed these features as central:

1. Focus on academics,
2. Specifying and ordering objectives,
3. Direct teaching (model and demonstrations),
4. Supervised practice,
5. Corrective feedback,
6. Teaching to mastery, and
7. Continuous monitoring of student progress.

In many of the studies reviewed by this author, the researchers examined more than one of these features or examined the impact of the entire instructional program. First reported are the major research findings on three specific instructional components:

1. Corrective feedback
2. Teaching to mastery
3. Continuous monitoring of student performance.

Feedback and Correction Procedures

While the importance of monitoring errors is clearly documented in the teacher effectiveness literature, much less emphasis has been given to this topic in the LD literature. Deshler (1974), in a review of the most frequently used texts in special education classrooms, found only one text that discussed the important role of monitoring performance and use of feedback in learning and performance of LD students. Most instructional techniques treat it as an incidental by-product of learning rather than a primary instructional goal. Neglect of the topic is ironic, given the problems LD students encounter in discriminating correct and incorrect responses (Schumaker, Deshler, Alley, Warner, Clark & Nolan, 1982).

Given that correcting errors is a critical variable controlling learning and performance, how should teachers respond to students' answers?

Gille and Fayne (1980) compared the effect of practice only and practice with informative feedback on sight word recognition for "normal" and LD readers. Eleven LD students and 9 "normal" students, ages 9-13, reading 2-6 years below grade level, were exposed to randomized blocks of 10 high frequency words (Dolch) and 20 infrequent words. Ten words per week were given for three consecutive weeks. In the Practice Only Group, students received information only about the accuracy of responses. In the Practice Plus Feedback Group, all students received information about their accuracy and "vocalization times." For example: the teacher responded: "that was faster than last time," or "that was slower."

The results showed that, as expected, LD students had significantly slower vocalization times than their normal peers for both high and low frequency words; but the LD students showed a greater difference in magnitude with low frequency words. Normal readers showed a relatively stable performance across both conditions. Most importantly, LD readers exhibited decreasing vocalization time under the Practice Plus Feedback than Practice Only treatment condition.

This study documented that "reaction time can be reduced by supplying informative feedback to students, relative to a pre-established criterion, and can serve as a powerful reinforcer to enhance performance" (Gille & Fayne, 1980).

In a series of studies on students' language skills and reading comprehension, Bryan et al. (1983) developed an intervention strategy that focused students' attention on the meanings of words in sentences. The results showed that only students who could read at 2.0 grade level or above could use the strategy.

In a follow-up study with: (1) LD students, (2) low-achieving, non-handicapped students, and (3) normal third, fourth, and fifth grade students, Bryan et al. (1983) found that students, who could read at or higher than 2.0 grade level, benefitted most from instruction that included correction procedures that focused on relations within sentences and specific word meanings.

Teaching to Mastery

Mastery learning (Bloom, 1968) proposes that the majority of students can master the same material if two conditions are met: (1) each student must be given sufficient time to master each learning step in the instructional sequence, and (2) each student must be given appropriate help and feedback in order to correct and rework the learning steps until each is mastered. The goal is to fix achievement at some constant mastery level (e.g., 80 or 90%) and manipulate instruction (i.e., amount of repetition, feedback or correction) until mastery is achieved (Bryant, 1980a). According to Block (1971), the steps in mastery learning include:

1. Specification of instructional objectives,
2. Well-defined tasks,
3. Mastery of specific steps in the skills hierarchy,
4. Criterion-referenced evaluation, and
5. Provision for repeated instruction.

Since the goal is to reach a specific level of mastery, item 5 above, giving repeated practice, is a crucial factor, particularly for slow learners (Bryant, 1980b).

Bryant, Fayne & Gettinger (1980) applied the mastery learning model to sight word instruction for 36 elementary learning disabled students from special education classes. Thirty sight words were presented in a 9-day instructional sequence that controlled unit size, focus (setting expectations, providing demonstrations, and prompts) and teaching to mastery. The results on an individually-administered criterion-referenced test showed that 84% of the LD students reached 80% accuracy.

Fleischmer, Garnett & Preddy (1982) presented 126 LD students, ages 8-13, basic math fact instruction using instructional principles from direct instruction and mastery learning in their intervention. Their results showed that: (1) systematic direct instruction that included cumulative and distributed practice was effective; and (2) teaching to mastery facilitated retention of facts.

Continuous Monitoring of Student Performance

Rosenshine (1983) has pointed out that "frequent assessments of whether all the students understand the content or skill being taught or the steps in a process" constitutes one important element in monitoring student performance and checking for understanding. Ysseldyke, Thurlow, Graden, Wesson, Algozzine & Deno (1983) found in their observational studies of teachers' decision-making processes that *data* collected at least three times per week facilitates making decisions about student progress. Decisions based on data rather than judgment alone is associated with increased student performance.

Intervention Models

Three research institutes designed intervention models in basic academics incorporating features of systematic instruction : (1) "LD efficient instruction" (Columbia); (2) "Learning Strategies Curriculum" (Kansas); and (3) "Academic Strategies" (Virginia).

LD Efficient Instruction: Characteristics of the Instructional Materials and Research

In developing a strategy to teach basic reading and spelling skills to LD students, the Columbia researchers develped LD efficient lessons. Lessons incorporated five major principles:

1 .providing focus, (setting expectations, using prompts and providing models),

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2 .giving sufficient practice so that a level of mastery is reached (e.g., minimum set at 80%),
3 .allowing time for distributed practice and review,
4 .providing discrimination training, and
5 .training for appropriate transfer.

A study by Bryant et al. (1980) investigated the effects of LD efficient lessons on acquisition of regular and irregular words with 36 elementary LD students from special education classes in New York public schools. A data-based model of remedial phonics instruction was used by special education teachers who taught nine 30-minute lessons. Using a criterion-referenced pre- and posttest, the reults showed that the students learned 75% of the words taught.

In a series of follow-up studies on phonics, sight words, and spelling instruction, Bryant et al. (1983) incorporated revisions of the LD efficient materials which were characterized by six instructional features:

1. Limiting unit size,
2. Providing academic focus and expectations (teacher-directed lessons),
3. Reducing "response competition" by dropping out mastered items,
4. Teaching to mastery (defined as eliciting the correct response on 2-3 consecutive trials),
5. Providing distributed practice and review, and
6. Discrimination training for generalization and transfer.

The results of these studies, which had a duration of three weeks, suggested efficacy for short-term gains; however, no long-term studies have been conducted.

Learning Strategies: Methodology and Research

Based on data describing LD adolescents' academic performance and the setting demands of secondary schools, researchers at Kansas developed an intervention model "to teach students how to learn rather than to teach students specific context." (Schumaker, Deshler, Alley & Warner, 1983).

The nine-step teaching model consisted of:

1. Make the student aware of his/her current learning habits,
2. Describe the new learning strategy,
3. Model the strategy,
4. Have the student verbally rehearse the strategy,
5. Have the student practice the strategy in controlled materials,
6. Give feedback,
7. Have the student practice the strategy in grade-level materials,
8. Give feedback, and
9. Test.

A series of single-subject, experimental studies using this model to teach a variety of academic and social skills, with a variety of LD students and in a variety of settings was conducted. The results on criterion measures of student's performance on classroom assignments, students' grades, regular class teachers' and students' satisfaction measures, and students' performance on school district composition competency evaluations supported the hypothesis that LD students can be taugth specific strategies that they can apply to various materials, even in their regular classrooms. (Deshler, Schumaker, Alley, Warner & Clark, 1982).

Academic Strategies Training: Methodology and Research

The Virginia Institute developed educational interventions for reading and math based on Direct Instruction design and teaching practices. Table 1 shows an attack strategy for the task class of basic multiplication facts (from Callinan, Lloyd & Epstein, 1981).

Table 1
Attack Strategies for Multiplication

Attack Strategy: Count by one number the number of times indicated hy the other number.

Steps in Attack Strategy:	Example:
1. Read the problem.	2 × 5 = ____
2. Point to a number that you know how to count by.	student points to 2
3. Make the number of marks indicated hy the other number.	2 × 5 = ____
	/////
4. Begin counting by the number you know how to count hy and count up once for each mark, touching each mark.	"2, 4 . . ."
	". . . 6, 8, 10"
5. Stop counting when you've touched the last mark.	2 × 5 = 10
6. Write the last number you said in the answer space.	/////

Englert (1983) evaluated and contrasted groups of teacher trainees found to be differentially effective in improving student performance, on specific direct instruction variables. Seventeen teacher trainees were evaluated on four general measures of teacher behaviors: (1) content coverage, (2) student accuracy and success levels, (3) teacher feedback, and (4) maintenance of high task involvement. The results showed that more effective trainees differed significantly from less effective trainees on 4 out of 5 measures of content coverage and in feedback strategies, with the more effective trainees being less likely to tell answers following incorrect pupil responses.

Teaching practices (Hallahan, et al., 1983) include the following steps:

1. "The teacher should demonstrate the use of the strategy using multiple examples of its appropriate and inappropriate application.
2. Students should practice its use under closely monitored conditions in which practice is monitored.
3. Teachers should provide reinforcement for accuracy and corrective feedback.
4. Teachers should fade monitoring as students reach skill mastery."

These procedures were used to teach LD students academic skills in three areas: (1) sounding-out words, (2) long division problem solving, and (3) simple multiplication problems.

The results on academic strategies training showed that LD students can be taught strategies for a variety of academic tasks; strategies can be taught in short-term periods; and LD students who had mastered the strategies on specific tasks demonstrated greater facility in acquiring tasks of the same class (Cullinan et al., 1981). Further research is needed to systematically explore what variables (i.e., student grade level, verbalization of steps in the instructional sequence, etc.) are more closely related to improving student performance.

Teaching Behaviors

To determine the specific teacher behaviors that lead to academic gains, Leinhardt et al. (1981) studied reading instruction and its effects for 105 LD students in self-contained classrooms at the primary level. Their descriptive results showed that three teacher behaviors were significantly related to reading gains: (1) focus on academics, (2) teacher instruction (model, explanation and feedback), and (3) provision of reinforcement.

Trainees were evaluated also on specific direct instruction practices. The results identified 3 significant variables: (1) greater occurrence of lesson objectives, (2) concept examples, and (3) error drill. In other words, teachers who stated the objectives of the lesson, provided many examples and nonexamples of a concept, and provided ample practice were found more effective. This study is one of few observational studies to study teacher effectiveness variables with special education students and documents several teaching behaviors consistent with the teacher effectiveness literature in regular education classrooms.

Although these two studies suggest correlational rather than causal relationships, they do provide several implications for practice.

Conclusions and Implications

By comparing the results of the Institutes' studies to those of the two instructional dimensions studies, areas of agreement are beginning to emerge about effective instructional and teaching practices for mildly handicapped students. Caution is needed in applying these findings since they have dealt primarily: (1) with cognitive learning of basic skills, (2) with learning disabled students, and (3) in controlled special education settings. However, they are consistent with a wide range of findings on effective teaching (Stevens & Rosenshine, 1981). These studies show that:

1. Rather than assessing and developing interventions based on underlying "process dysfunctions," the study of learning deficits and developing interventions to teach explicit strategies for learning specific tasks is productive.
2. Systematic instruction, which incorporated features of direct teaching (corrective feedback, mastery learning, reinforcement, distributed practice, and review) was consistently effective with LD students.
3. Specific teaching behaviors which focused students' attention on academics; used demonstrations, feedback and reinforcement; and provided examples of concepts and ample practice were associated with academic gains for mildly handicapped students.

While teachers can be effective in improving student performance, they can't do it alone. Stallings (1981) suggests that schools should provide on-going opportunities for teachers to receive feedback on their progress. Further, every instructional program should be evaluated for effectiveness by directly observing teachers' behaviors before, during and after interventions, and by measuring students' academic gains. Administrators, supervisors, and teachers must band together to improve education for the mildly handicapped.

In short, each of us, in regular education and special education, must continue to promote the understanding that the aim of special education is not to put a burden on the educational system, but rather to make the tasks of educating all students easier and learning more achievable.

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Fluency and Skill Maintenance by the Handicapped

Julie A. Williams and Richard Albin

Maintenance of learned performance has long been a concern to teachers of severely handicapped students. This paper focuses on one variable that may affect maintenance: fluency of performance. Several recent authors have hypothesized that skills performed fluently are likely to maintain longer than nonfluent behaviors (Baer, 1981; White & Haring, 1980). Direct Instruction literature has long advocated the "firming" of academic skills such as reading and arithmetic (Engelmann & Bruner, 1968; Engelmann & Carnine, 1970). These skills typically are considered firm when the student can perform them quickly and accurately. It becomes more difficult to discuss fluency, however, when teaching the types of skills found on the IEP's of severely handicapped high school students (i.e., ride a bus, do laundry, eat in a fast-food restaurant). To date, there have been few attempts to document empirically "fluency-building" as a strategy for facilitating maintenance. While fluency is only loosely defined (in both the Direct Instruction and general Special Education literature), its relevance appears significant. The purpose of the present paper is to define the importance of "fluency" for maintaining adaptive behavior with severely handicapped students.

In defining fluency, most authors combine accuracy of responding with a time-based measure of performance such as rate, latency, or duration of responding. The stability of responding and the "smoothness" or "rhythm" of performance (i.e., moving sequentially through a chain of responses without perseverating on one step or backtracking to earlier steps) may also define fluent performance. For example, Baer (1981) defines fluency as "any or all of the following: high rate of performance, high accuracy of performance, fast (short) latency given the opportunity to perform, and strong response" (p. 17). In reference to reading, Carnine and Silbert (1979) say, "Fluency is reading smoothly, quickly, and with expression" (p. 33). As advocates of fluency building argue, it is important that students not only perform a skill accurately, but also that they do so at an appropriate rate and/or with a degree of smoothness or rhythm.

Fluency, as defined above, may facilitate maintenance in several ways. First, fluent behavior may be more likely to produce natural reinforcers. Baer (1981) emphasizes that behaviors need to be sufficiently learned, (i.e., fluent) to contact natural communities of reinforcers. He notes that students, paid with tokens to read, initially stop reading when the tokens are stopped. However, when the students gained reading fluency, reinforcement was no longer necessary to maintain the reading. In fact, fluent readers were willing to *pay* tokens for the opportunity to read (Baer, 1981). A response that is not fluent (performed at a rate, duration or latency significantly below the norm) may produce little, if any, reinforcement from the natural environment. For example, a handicapped worker who can bus tables in a restaurant with 100% accuracy, but takes 10 minutes to bus each table will likely experience only aversive contingencies for his/her accurate table bussing behavior.

A second relationship between fluency and maintenance involves the opportunity for responding. Students who perform behaviors both accurately and at a high rate are much more likely to experience the opportunity to perform than are students who are accurate, but very slow. Caregivers may prefer to do the behavior themselves as opposed to waiting for the accurate, but nonfluent, performer to respond (Billingley & Liberty, 1982). For example, a parent may choose to do the student's banking for him/her, because it takes the student too long to do it independently. The end result is that opportunities for nonfluent behaviors are no longer given. The likelihood of any behavior maintaining in the absence of opportunities for performance is low.

Finally, fluent behaviors may demand a lowered response cost from the student and therefore be more likely to maintain. This assumes that a fluent behavior is more easily produced (i.e., take less effort) than a nonfluent behavior. Behaviors associated with higher response costs (nonfluent behaviors) are more likely to extinguish following replacement by more fluent competing behaviors with lower response costs (Horner, Bellamy & Colvin, 1983). For example, a child who has recently learned to tie his or her shoes, but is not fluent (e.g., it takes 10 minutes to tie them), may revert back to asking his or her mother to tie shoes because there is a greater response cost associated with independent shoe-tying than in asking someone else to do it. Only when the cost of engaging in the new behavior becomes equal to or less than that of other competing responses (i.e., equally fluent or more), will the new behavior maintain.

The major implication of the preceding discussionn is that teachers need to teach students both accuracy and fluency in performing target skills. This dual training criterion is especially relevant for severely handicapped learners who are acquiring self-help and community living behaviors.

Several procedures for building fluency have been suggested in the special education literature. For example, adding additional practice time to training (labeled drill and practice by White & Haring, 1980) is one traditional method for increasing fluency of performance. Repetition alone may generate increasingly fluent performance; however, there is increasing evidence that excessive repetition may result in a "bored and frustrated" student who begins performing less competently. The procedures used to make a response fluent should not be assumed to be the same as the procedures used to teach the response initially.

Other fluency building strategies involve the developing of instructions for students to "Go fast," providing rapid presentation of task instructions, and using intermittent reinforcement schedules (Luria, 1946; Koegel, Dunlap & Dyer, 1980; Carnine, 1976; Schroeder, 1972). Providing reinforcement contingent on accuracy plus a specified rate of performance has also been effective at increasing response fluency. Ayllon, Garber and Pisor (1976) for example, gradually reduced the time limits given to mildly handicapped students for correctly completed math assignments and observed a substantial increase in the rate of performance. Bellamy, Inman, and Yeates (1978) used a similar procedure to increase the rate and stability with which severely retarded adults assembled power cables.

Questions such as "How does one know when a student is fluent" or "What is the criterion for fluency" are as yet unresolved. Williams, Brown, and Certo (1975) argue that students must be trained until they are performing at a rate equivalent to normal, same-age peers if they are to contact the natural reinforcers in the environment. It may, however, be unrealistic to expect some severely handicapped people to perform at normative rates in some skill areas due to cognitive or motor impairments. Others suggest training students to perform at a percentage of these standards, although no rules for determining a specific percentage have been proposed. Engelmann and Carnine (1970) suggest using a measure of the student's own performance on a generic task to determine an appropriate fluency criteria. For example, in math a student might be timed on writing the numbers from one to ten. This time can be used as a standard, with the fluency criterion for addition skills defined as 67% of the time it took to complete the standard task. While this approach takes into account each student's motor skills, it does not ensure that the rate will be sufficient for reinforcement in the natural environment. It may be, however, that the type of criterion used in DISTAR Arithmetic is sufficient to maintain performance due to a decrease in response cost, even though the natural environment may not provide reinforcement. Speed is not always the variable in the natural environment that determines if a reinforcer will be delivered. For example, very rapid eating or speaking may index fluency, but they are not often differentially reinforced in the natural environment. Clearly researchers need to develop functional criteria for determining fluency in terms of smoothness and stability, as well as rate.

There are many issues related to fluency that researchers need to investigate. Until these issues of definition and measurement have been clarified by the research community, teachers of severely handicapped students should recognize that if a response is to maintain over time it should be trained to an appropriate fluency criterion as well as an acceptable accuracy criterion.

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DI Pinciples in Teaching Autistic Children

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The past twenty years has brought a proliferation of intensive research and a delineation of educational principles and procedures applicable to autistic individuals (Koegel, Rincover, & Egel, 1982). Paralleling the progress in educating children with autism have been major developments in instructional approaches geared to broader-based populations. In particular, Direct Instruction has evolved into a powerful, systematic model with applications to children with autism, as well as to those with other kinds and degrees of educational problems and needs (Becker, 1977, Becker & Carnine, 1980, 1981; Engelmann, 1977; Engelmann & Colvin, 1983).

The purpose of this paper is to illustrate the generality of techniques by relating some of them to recent developments in instructional research with autistic children. In recent years, we and our colleagues at UCSB and other centers have worked to improve educational interventions for children with autism. Increasingly, we are finding that, despite the unusual characteristics of autism, the underlying variables of effective instruction are surprisingly similar to those that influence the learning of other children. In order to demonstrate this affinity, we will briefly discuss three areas of recent research which can be directly related to previous writings in the DI literature. These areas are stimulus control, task variation, and instructional pacing.

Stimulus Control

A prominent feature of DI theory and procedures is the emphasis on bringing responding under the control of specific, relevant stimuli (Becker, Engelmann, & Thomas, 1971; Becker & Carnine, 1980; Horner, Bellamy, & Colvin, 1983). Research has shown that this is a particularly important aspect of teaching autistic children. For example, studies have shown that autistic children often learn to respond under inappropriate stimulus conditions. As a result, they often fail to perform the response when they are expected to do so in slightly different contexts.

Rincover & Koegel (1975) investigated such stimulus control problems in a study with ten autistic children. The children were taught (in a treatment room) to respond to simple verbal commands such as, "Touch your nose." The children's performance of these responses was then assessed in a novel setting. The children who failed to respond in the extra-therapy settings underwent a stimulus control assessment. The results demonstrated that these children were responding to idiosyncratic and irrelevant stimuli from the training environment, such as the furniture, or inappropriate and inadvertent cues from the teacher. When these irrelevant stimuli were introduced into the extra-therapy setting, the children performed the responses. Such selective responding by autistic children has been labelled stimulus overselectivity (see Dunlap, Koegel, & Burke, 1981, and Lovaas, Koegel, & Schreibman, 1978 for reviews).

Difficulty in establishing appropriate stimulus control can have obvious negative implications for the education and learning of autistic children. However, research conducted over the last decade has provided techniques for helping to remediate or circumvent the overselectivity problem. These techniques include within-stimulus prompting procedures based on distinctive features (Schreibman, 1975; Rincover, 1978), and specific orienting cues (Koegel, Dunlap, Richman, & Dyer, 1981). The work in this area illustrates the attention that must be given to stimulus control aspects of instruction with autistic children, and it suggests that the theory and methodology of Direct Instruction can contribute to the solution of this problem.

Task Variation

The composition of instructional sessions in terms of the variety and type of tasks presented has been addressed by researchers in the areas of both Direct Instruction and autism. For example, Engelmann & Colvin (1983) recommended presenting familiar, well-learned tasks along with new, difficult tasks when the latter are initially presented in order to facilitate compliance and appropriate responding.

The use of previously-learned or maintenance tasks has been investigated with autistic and other severely handicapped students. For example, Gaylord-Ross (1982) demonstrated that the presentation of easy or errorless learning tasks resulted in very low levels of aberrant behavior (self-injury, etc.) for severely retarded children, while difficult tasks were associated with much higher levels of such behavior.

Two additional studies have investigated the effects of these procedures with autistic children. Dunlap & Koegel (1980) compared a *constant task* condition, in which a single task was presented throughout a session, to a *varied task* condition, in which the same task was interspersed with a variety of other tasks. The varied-task sessions produced improved and stable levels of correct responding as compared to constant-task sessions. Also, naive observers judged the children to be more interested, happier, and better behaved during varied task sessions.

Dunlap (1984) examined the influence of task variation on response acquisition. In this experiment, constant-task sessions involving new or acquisition tasks were compared with two types of varied-task sessions. In one type, acquisition tasks were interspersed among several other acquisition tasks; in the other type of varied-task sessions, acquisition tasks were interspersed among previously-learned maintenance tasks. The "varied-with-maintenance tasks" condition produced significantly more efficient learning, with no differences between the other two conditions. In addition, children's affect was rated more positive during the varied maintenance conditions. These results empirically demonstrate the recommendation made by Engelmann (1977) and Engelmann & Colvin (1983)—that maintenance tasks should be presented during instructional sessions in which new acquisition tasks are being taught.

Instructional Pacing

Rate of instructional presentation has also been studied. Direct Instruction emphasizes rapid pacing during task presentation to facilitate attention and appropriate responding (Becker, 1977; Becker & Carnine, 1981; Engelmann & Colvin, 1983). Carnine (1976) compared fast and slow rates (1 second intertrial interval versus 5 second intertrial interval) of task presentation with two low-achieving children. Fast-paced instruction resulted in decreased off-task behavior and increased response accuracy and participation.

Similar studies have been conducted with autistic children. Koegel, Dunlap, & Dyer (1980) compared rapid pacing (very brief intertrial intervals—ITI's) with slow pacing (relatively long ITI's) during instructional sessions with low-functioning autistic children. Short ITI's produced higher levels of correct responding and improving trends in acquisition than long intervals.

A further study (Dunlap, Dyer, & Koegel, 1983) investigated the influence of ITI duration on self-stimulatory behavior. Effects on correct responding and self-stimulatory behavior were assessed. Short ITI's produced higher levels of correct responding and lower levels of autistic self-stimulatory behavior. Other types of self-stimulatory behavior were not systematically related to either ITI duration or correct responding. These studies support the use of a fast-paced instructional format to promote the responsivity and appropriate behavior of severely handicapped autistic children.

The three areas discussed above may be viewed as illustrations of the general applicability of effective instructional methods to training autistic children. In particular, they point out a substantial overlap across Direct Instruction techniques and procedures developed for severely handicapped, autistic children. *This similarity of teaching methods suggests that principles underlying effective instruction may be more influential in the process of learning than the special characteristics of any particular student population.*

As we acquire more and more knowledge about the education of children with autism, we find that their qualitiative learning characteristics are not as dissimilar from other children as was once supposed. While their patterns of responding may seem unusual and relatively difficult to influence, the educational practices which have been proven effective are based on principles which are common to all instruction. Increasingly, we are learning that the tenets of empirically-documented instructional approaches, such as Direct Instruction, apply to students of all levels, regardless of handicap.

[1]For more information about autism and the education of severely handicapped students, readers are encouraged to contact Dr. Glen Dunlap at the UCSB Autism Research Center, University of California, Santa Barbara, CA, 93106. Since October of 1982, the UCSB Autism Research Center has been part of the joint University of Oregon-University of California, Santa Barbara, Extending Competent Performance Institute (see ADI News, 1983, vol. 2, #3). This Institute is actively involved in extending DI procedures to the education of severely handicapped students. For more information about the institute, individuals may contact Dr. Dunlap or Dr. Robert Horner, College of Education, University of Oregon, Eugene, Oregon, 97403.

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Microcomputers and DI

Samuel K. Miller, Contributing Editor

Editor's Note: Beginning with this issue, the ADI News *will present articles pertinent to microcomputer technology and Direct Instruction. Future issues will feature articles written by experts in the field from the United States and abroad. If you are currently using microcomputers and would like to share your experience or viewpoint relative to Direct Instruction, please forward your manuscript to Sam Miller c/o the* ADI News.

We are pleased to welcome Sam Miller to the ADI News *staff as a contributing editor in the area of microcomputers and Direct Instruction. Sam has been an elementary and middle school teacher for the past ten years. He currently teaches at Kennedy Middle School in Eugene, Oregon, and is a Ph.D. candidate in Curriculum & Instruction at the University of Oregon. Sam is co-author of the* Cursive Writing Program *(with Siegfried Engelmann), co-author of* Getting Started with Logo *(with Ron Thorkildsen), and author of* Selecting and Implementing Microcomputer Software. *Sam is a long-time DI trainer with extensive experience in training teachers how to use microcomputers in the classroom. We are pleased to be able to offer his expertise to readers of the* ADI News.

Microcomputers & Teachers Education

Samuel K. Miller

There is a critical need for DI advocates to become involved with the use of microcomputers. The need is particulary acute in the area of software development and teacher training. These two areas are frequently cited by computing experts as being deficient; however, there is no common agreement about how to improve the situation. Three articles have appeared in the *ADI News* that use DI approaches to the use of computers in education ("Direct Instruction On Line," Dixon & Siegel, 1982, "Using DI to Teach Computer Programming to Retarded Institutionalized Adolescents," Berryman & Maggs, 1983, and "Evaluation of Computer Software," Vachon & Carnine, 1984). This article presents an overview of the teacher training dilemma. The next issue of the *ADI News* will present an article that describes a design for training teachers to use microcomputers that is consistent with the DI philosophy of instruction.

The Need for Training

Educators are sometimes criticized because they react to events rather than anticipate and plan for them. This complaint is valid in regard to the use of microcomputers in education. For years, experts warned that courses must be created to prepare teachers for the coming technological revolution. Now that the revolution has arrived and the race to implement microcomputer technology is underway, many teacher-training institutions and school districts are still trying to find the starting line. Meanwhile the general public has already entered the race; students learn about microcomputers via exposure to video games and home computers, and the majority of educational software products are directed at the home market.

Teachers who complain that using one computer with 30 students is like feeding 30 people with a single fork give the impression that more equipment will solve the problem. Concern about equipment is legitimate; however, without systematic, continuous training, educators will probably under-utilize or misuse whatever equipment they have.

A recent article in the *Wall Street Journal* pointed to the extent of the problem, showing for example, that even with a $2.1 million investment in hardware, Broward County, Florida, schools were under-utilizing their 900 Apple II computers because of a lack of instructors and instruction time for teachers, as well as the failure to allocate money for appropriate software. (Emmett, 1983, p. 97)

"Where will teachers be trained to use microcomputers?" "Who will train them?" and "What will the training include?"—are major questions. There is no agreement among experts in the field as to how these problems should be solved, but efforts to provide training to teachers are occurring throughout the United States.

Sources of Teacher Training

Teachers are receiving microcomputer training from a multitude of sources. These sources include local computer stores, computer books and periodicals, professional organizations, and conferences. School districts have formed cadres of trainers, offered evening classes, and allowed teachers to take computers home from school during vacation.

A number of teacher training institutions are beginning to offer courses and degrees that focus on the educational uses of microcomputers. Mandates by state agencies have accelerated the availability of courses to certify teachers in computer science and provided inservice training for teachers in other disciplines. Some states, such as Utah, require all in-coming K-12 teachers and administrators to be certified in computer literacy.

In most cases, some training is certainly preferable to no training. However, there is a tendancy to offer training to teachers in a sporadic way. Training teachers to use microcomputers is frequently predicated on the "inoculation" approach to instruction; teachers are given a quick dose of information, hands-on experience, and encouragement, only to discover that continued support is non-existent. In the meantime, new developments in the field continue to occur, and many teachers adopt the attitude that they can never learn what they need to know.

The content of teacher training programs for conventional education, as well as microcomputer education, varies across the U.S. The result of this variance is that teachers do not have a common training background. Within any given school, teachers will disagree about what methods and materials should be used with learners. Educators tend to affiliate themselves professionally with a particular approach to learning, exhibit a limited repertoire of teaching strategies, and give lip service to the need to be eclectic.

There has been an explosion of ideas about what teachers and their students need to know about microcomputers. Lumped under the heading of "computer literacy," teacher training objectives are diverse—as diverse as the classroom teaching experience of computers-in-education instructors. There are now countless educators who, for one reason or another, find themselves in the position of teaching with and about computers. To what extent are these new "experts" knowledgeable about computers and education?

It is important to remember that the widespread use of computers-in-education is so recent that approaches for training educators in how to implement this new discipline are just emerging. A strategy recommended for all educators is to obtain training in computer education that will contribute to the development of a balanced perspective. Information about computer operation, programming, equipment, *and* information about instructional considerations are necessary to attain a balanced perspective.

External Factors

Public education is similar to an octopus that is being pulled in eight different directions. Parents, students, business interests, the public, and teachers are all pulling educators into microcomputer education. The direction that educators take frequently depends on who "pulls" at them the hardest.

It has become commonplace for different groups to anguish over the quality of American education. The early 1980's have spawned dozens of reports containing recommendations for improving public education. The National Commission on Excellence in Education report, "A Nation at Risk," released in 1983 (and reprinted in *ADI News*), drew much attention to public education. This report and others contain recommendations for improving teacher education and incorporating microcomputer technology into American schools. Underlying many of these reports is a national perception that the United States is losing its position as a leader in technology. The result of these concerns and recommendations from various reports will be a new direction in the 1980's for public education. Increased funding for teacher training, research, and materials development in microcomputer technology will be made available to public education. These developments, along with new technological advances, will solve some existing concerns about educational software and create new issues to replace them.

Conclusion

The microcomputer has presented the public, publishers, and educators with many challenges. The development and purchase of educational software, the microcomputer's "fuel," must overcome limitations left over from the era of printed instructional materials. Learning to "pilot" or use the microcomputer for instructional purposes is a new and developing area. Educators need to clarify the meaning of computer literacy as it applies to training teachers how to use the microcomputer. If these accomplishments occur, then the microcomputer revolution has the potential to be a force of positive change in education.

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Help Us Attract New Members

If you are attending any conventions that would likely attract persons interested in DI we will provide you with copies of this newsletter for distribution.
Write Wes Becker at ADI indicating how many copies you will need.

Savings for New Members

Normal membership covers the period from September 1 to August 31. To encourage new members to join during this period of growth, all new memberships received between April 15 and August 31, will be credited with membership for the following school year (i.e., through August, 1984)

Advertising Policies and Rates

The Direct Instruction News will publish advertisements for materials (programs, books), training (conferences, workshops), and services (consultation, evaluation) related to direct instruction. All proceeds from the sale of advertising space will be used to help pay publication costs incurred by the News. Ad sizes and corresponding costs are as follows:

Full page: $200
Half-page: $125
Quarter-page: $75

Corrective Reading

(Continued from Page 1)

These remarkable findings are consistent with a number of other studies of the original *Corrective Reading Program* and its successor *Decoding B*. The failure of the students in regular English classes to make progress should be noted. Mainstreaming obviously is not the answer at the secondary level when the students lack basic reading skills. In her discussion, Campbell writes:

"One of the real concerns for secondary schools is finding teachers with experience to teach reading. Many of the researchers (in her review of the literature) agreed that this is why successful reading programs for this age group are so difficult to find. 'Corrective Reading,' with its scripted lessons and exact rules, can be used by anyone willing to spend some time learning the method. This researcher had a one-half hour presentation and, with that and practice gained in an afternoon extended day class, used the program so that students had effective gains in reading. The results of this program suggest that secondary schools committed to raising scores can successfully fit 'Corrective Reading' into an all school reading program as long as the size of the small groups stays below fifteen" (Campbell, 1983, p. 150).

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Table 2

Standard Score Gains by Subtests (Woodcock)
(N = 42 E, 13 C)

Subtest	Group	Standard Score Gain/Loss (S.D. = 10)	Significance or Difference (T-Test)
Letter Identification	E	7.17	.007
	C	-1.23	
Word Identification	E	3.26	.098
	C	.46	
Word Attack	E	7.02	.0001
	C	-1.31	
Word Comprehension	E	8.24	.0001
	C	1.54	
Passage Comprehension	E	5.50	.001
	C	.31	
Total Reading	E	5.90	.0001
	C	.54	

Concept Learning – LD Students

(Continued from Page 9)

acts), and knowledge systems (Engelmann & Carnine, 1982). The present research illustrates the intricate relationships between each of these areas.

While non-handicapped students benefit from concept teaching procedures like presenting minimally different positive and negative examples (Experiment 1) and asking strategy questions (Experiment 2), LD students may experience no benefit or even obstructions when these procedures are used. Further research is needed to determine what other instructional design procedures developed with non-handicapped students are not functional for LD students and, more importantly, how instruction can compensate for attention and cognitive deficits so that LD students can learn to benefit from these procedures. Of course, we may find that additional instruction is not the solution, but rather, quite different instructional procedures are needed. Research conducted on some other instructional design procedures (Gersten et al., 1982) and on instructional programs that incorporate these procedures (Lakery & Maggs, 1982; Gersten, in press) suggest that additional instruction may be the answer, but only further research can clearly resolve the question.

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Tutoring Methods (Continued from Page 7)

rating). Similar values for class-wide peer tutoring were 4.3 and 4.7, teacher and students, respectively.

Teachers whose students used home tutoring reported they would use home tutoring in the next year (3.8) and parents thought the home program should also be offered in the next year (4.7). Parents did not report extreme difficulty finding time to tutor at home (3.5). Parents thought that their child enjoyed tutoring (3.8) and they reported that they intended to continue it on their own (4.2).

Students liked peer tutoring (3.6), however, not nearly as much as they thought it improved their reading ability (4.7). Their lowest rating was related to having their tutors identify and correct their mistakes (2.6).

Current research activities at Juniper Gardens are further expanding these techniques by focusing upon: (a) long-term achievement impact, (b) factors affecting the fidelity of tutoring interventions, (c) development of peer group procedures for autistic students, and (d) studies of tutoring effects on reading comprehension.

Tutoring procedures appear to be a promising means of increasing students' performance in school. We hope that our current research will provide additional answers about maximizing the success of this technique.

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