ADI Annual Awards for Excellence

ADI Award for Teaching Presented by Bernadette Kelly

When I heard who had been selected for the 1987 ADI Teacher of the Year Award, I was thrilled. Pat Bauer is a regular first-grade teacher who has taught at Westmoreland Elementary School in Eugene, Oregon for many years, but I had heard about Pat in 1979. She heard about it from a parent who had been told her son would never learn to read or write. The mother was subsequently introduced to Zig Engelmann and her son was reading within a few months. Pat Bauer was so impressed that she did all she could to find out more. She listened to Engelmann speak at every opportunity.

I sometimes teach a remedial class in DI Mathematics at the University (of Oregon). When we look at modifying basal texts, I warn students that it is a lot of hard work. It may involve restructuring skills, providing additional practice and supplemental workbooks, and developing ways to integrate DI with traditional teaching strategies. We concluded that it's virtually impossible, but I can tell you I've seen it done very successfully here in Eugene by Pat Bauer. To see her teach her entire class with her basal text's guide in her hand, her DI skills carefully packed in, is amazing.

I spoke to Gerald Kremer, Pat's principal, yesterday. He was thrilled to hear of her award. He said, "She has all the special qualities that make a master teacher. Not only is she able to work with the lower-performing students and make them feel successful, but parents trust her and she is very skilled at motivating other staff. And, of course, she is always willing to welcome practicum students into her classroom."

Because he is a humble person, not expecting to be recognized or honored for what she does, she may not be fully aware of the impact she has had on the 20 or so student teachers who have worked with her in recent years, but I remember the end-of-term conferences I have attended. When I asked practicum students what they had found most valuable about their experiences, I virtually always said, "Having had the privilege of being in Pat Bauer's classroom and watching her teach." They admired her energy level, her positive attitude, her unwillingness to be daunted by any problem, and her respect for her students. They were contagious.

I spoke to one practicum student yesterday (newly qualified) who spent a term with Pat Bauer. When asked what impressed her the most about Pat's instruction, she said, "She was extremely consistent with her students. That, combined with her approach to teaching that's so effective, made me convinced that Direct Instruction is not just for certain kids, but for all kids."

Any teacher who is communicating that message to those who observe her teaching is one who truly merits this award.

ADI Award for Supervision Presented by Geoff Colvin

The award for Excellence in Supervision was given to Ed Schaefer, Director of Special Education, Cape Henlopen School District, Lewes, Delaware. When Ed took over as elementary education director, and subsequently as special education director, he

Correlates of Algebra Gains for High-Performing Secondary Students

by Meredith D. Gall Russell Goepest Dianne Ericson Daniel Grace

University of Oregon


Introduction

Research on teaching past the two decades has shown that quality of teachers' instruction affects students' academic achievement (Gage, 1980). Most of this research has concerned instruction in basic academic skills at the elementary and junior high school levels, and has often involved teachers working with low-performing students. The teaching behaviors found to be effective in these settings have been synthesized into an instructional method by Rosenhain (1968), who has variously labeled it "explicit teaching" and "direct instruction."

The purpose of the present study was to determine whether the direct instruction method would be effective in a different, more complex teaching context, namely, intermediate algebra instruction in high school. The investigation of effective teaching behavior in algebra instruction is timely because recent national commissions (e.g., National Commission on Excellence, 1983) have recommended increased mathematics course requirements for high school graduation. A number of states have already acted on this recommendation. The increasing number of students who will take advanced mathematics courses such as algebra will need to receive high quality instruction if they are to be successful in them. The extension of research on teaching to the high school level requires consideration of students' ability. Elementary school students typically all receive the same curriculum, but teaching is common at the high school level, especially in mathematics. This was the case in the present study, which was done in one of the largest school districts in the United States. Low-performing students were in a track that allowed them to complete a course of study in elementary algebra over a two-year period. High-performing students completed the same course of algebra study in one year, then went on to geometry, and then to intermediate algebra, the topic of the current study. The grouping of students into instructional tracks raises the question of whether teaching behaviors that are effective for one track are also effective for the other track. This paper concerns the students who had completed elementary algebra in one year and were taking intermediate algebra at the time of the study.

Previous research on teaching was reviewed to identify instructional variables that might correlate with student achievement. Data were collected at the conclusion of the fall semester. Research on mathematics instruction, irrespective of grade level, was of particular interest. Also, studies of effective high school instruction were of interest, even if they concerned general academic achievement rather than mathematics achievement specifically.

The variables identified through this review process were grouped into the following categories (see Table 1). The variables were developed in collaboration with teachers, development phase of the lesson, seatwork phase of the lesson, assignment of homework, and classroom management strategies. Research on specific variables is reviewed in the results section of the paper to facilitate comparison with the present findings.

Method

Subjects and Setting

All 34 mathematics teachers who taught Intermediate Algebra classes in 16 high schools of a large urban school district participated in the study. The district has large and small high schools, located in inner-city as well as in middle-class, suburban neighborhoods.

Students in Intermediate Algebra tend to have average or above average ability in math. Most of them completed the elementary algebra prerequisite as ninth-graders and took geometry as sophomores. Therefore, they were eleventh-graders at the time of this study.

Although some of the teachers taught more than one section of Intermediate Algebra, only one section per teacher was observed. Selection of the section to be observed was based on logistics of scheduling observations.

The same intermediate algebra curriculum and textbook were used in all district classes. Also, the length of Section (50 minutes) and number of teaching days per year was the same across district classes. Therefore, all teachers in the study were allocated the same amount of time to teach the same algebra content.

Pat Bauer, ADI Teacher of the Year

She attended her first DI Eugene Conference (the Second Annual) back in 1976, and with no financial support from her school district has been back to 4 or 5 more since then. She also attended workshops and took classes at the University of Oregon. She was and is still eager to learn, because she loves to teach kids, and to teach them well.

I first met Pat Bauer 2 or 3 years ago when I was supervising practicum students in her classroom. She was teaching a K-12/AR Reading group on the other side of the room. I remember that first day because I was so impressed with her teaching skills and the rapport she had with her students that I found it very difficult to attend to the practicum student I was supervising. I just wanted to watch Pat because I thought I would learn a few things.

Continued on Page 3
Dear Editor:

Last summer, I sent you information about a student who came to be called Peter in the Summer ADI News. During the 1986-87 school year, Peter’s school day was split between our Middle School and my Elementary School. He came to my Resource Room for reading and spelling. He was officially a sixth grader and my school is a K-6 elementary school.

He started in Reading Mastery II and Spelling Mastery A. We did not do any lessons in either of those programs. When the year ended, he was close to completing Reading Mastery III, Level A and Spelling Mastery B. The test results below are from September through April. During that time, we lost approximately 20 instructional days due to illness and family vacations.

For the 1987-88 school year, he will be placed full-time in our Middle School.

Test of Written Spelling: 986 / 487
Predictable Words: 2.0 / 3.1
Unpredictable Words: 1.9 / 2.8
Comprehensive Inventory of Basic Skills by Belcastro: 1986 / 487
Word Recognition Grade: Placement
Oral Reading Grade Level: 1-2 / 3
Reading Vocabulary: 1-2-3
Passage Comprehension: 1-2-3

This was Peter’s first experience with DI reading and spelling. Earlier attempts to teach him to read and spell had produced limited results in both public and private schools and in regular and special education settings. Although I would prefer not to use the methods tried in the past, I did believe that the teachers that did work with Peter were well trained. I expected, then, to find a severe learning difficulty. I did not. I can only wonder what Peter’s skill level would be now if he had been placed in a DI program five years ago.

Sincerely,

Roberta Bender
Tuacahnos School, Alhambra

Dear Friends in ADI:

I wish to express my gratitude for the award granted to me at the recent 13th Annual Eugenie Summer Conference. As requested, I have enclosed a picture of myself for use in the next issue of the ADI NEWS. Though given to me, this award also reflects the achievement of the students, teachers, and aids who have worked so hard and so smart for so long. On their behalf and mine, I would thank the governing board of ADI for its thoughtfulness and continuing concern for the education of all our children.

Once again, THANK YOU!

Sincerely,

Edward Schefer

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DISTAR Arithmetic I & II will be revised. New levels 3, 4, 5, & 6 will be written.

Zig and Doug would greatly appreciate feedback on any problems or suggestions for DISTAR 1 & 2 and for Corrective Mathematics.

Please write us at:

Englemann-Becker Corporation PO Box 10459 Eugene, OR 97440

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Treasurer’s Report

by Wes Becker

A comparison of the financial reports for last year and this year (see Table 1) shows the enlarged activity for the handicapped preschool and for conferences. A good deal of the increase in administrative expenses is associated with the expanded preschool, and the increase in "General" is due primarily to the addition of books to our inventory for sale to members. The balance of income over expenses for 1986-87 is very deceptive because it does not show any upcoming conferences expenses (based in Milwaukee and Newport Beach) that pretty much wiped out that gain by August 31st. At the time of this writing, the Association has a carryover of assets of about $30,000. This is enough to allow us to plan for future issues of the NEWS and a new year of conference schedules, but it is much lower than we had hoped for entering into a new fiscal year.

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<th>Table 1: Treasurer’s Report for Fiscal Year Ending June 30, 1987, Association for Direct Instruction</th>
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1 Based on auditor’s report prepared by Jerry C. Mahler, CPA.
2 Based on accountant’s year-end summary, pre-audit.
3 Approximately $5,000 was a late payment for Summer, 1984, services.
4 $11,004 was prepayment for handicapped summer preschool.

Plan Now to Attend these Upcoming ADI Training Opportunities:

March 19 & 20 • Yakima, Washington
• Second Yakima DI Mini-Conference
June 19-21 • Chicago, Illinois
• Second Midwest Direct Instruction Institute
August 1-5 • Eugene, Oregon
• 14th Eugene DI Conference
August 8-12 • Salt Lake City, Utah
• Third Salt Lake City DI Institute
August 8-12 • Kansas City, Missouri
• Kansas City DI Institute

For more information on any of these training sessions, write to
ADI PO Box 10252 Eugene, Oregon 97440
The First Midwest ADI Institute—

by Sara G. Tarver, Ph.D.  
Dept. of Rehabilitation, Psychology and Special Education  
University of Wisconsin-Madison  

Editor’s Note: For the past 14 years, the Continuation Center and the Department of Psychology at Western Michigan University in Kalamazoo has held a regional DI Conference in Kalamazoo. The language used here is not intended to describe the contributions they make to providing Direct Instruction training.

The first Direct Instruction Institute held in the midwest was a great success! 135 teachers, supervisors, principals, and teacher trainers agreed that the institute provided a unique learning experience which they hope will be repeated in future summers.

The consistently positive evaluations of the institute are in line with expectations. I believe, to the variety and the quality of the sessions that were offered. The variety made it possible for each participant to choose sessions appropriate to her level of experience with DI. Equally appropriate learning experiences were provided for the novice DI teacher who was just beginning to learn what DI is all about, the intermediate DI teacher who has used some DI programs successfully, but wishes to learn about others, and the highly experienced DI teacher who wishes to refine her techniques or probe DI about some area that is not yet understood.

Several teachers who probably fall into the novice category commented to me that they were delighted to learn that DI lessons can be delivered in dynamic and natural manner. The surprise they expressed at this discovery lends me to believe that they had probably been exposed previously to the all-too-common misconception of DI as a boring, rote learning approach in which the teacher reads a script and students respond unthinkingly like Pavlov’s dogs. I was glad to know that the DI trainers had successfully dispelled that myth and replaced it with a more positive and more accurate perception of DI.

The novice teachers left the institute with a full appreciation of well-designed curricula and the effective presentation techniques that constitute DI. The variety of sessions offered also made it possible for participants to choose instructional areas of greatest interest. These seeking to improve their teaching of reading would choose from a Correspondence Reading session conducted by Paul McKinney, a Reading Mastery I and II session conducted by Phyllis Hadlock, or a Reading Mastery VI session conducted by Jeann Osborn. Those who wished to improve their teaching of math could choose either a Corrective Math session conducted by Maria Collin or a DISTAR Arithmetic 1 & 2 session conducted by Paul McKinney. Other options included a DISTAR Language I & II session by Jean Osborn, an Expressive Writing session by Joyce Silber, and a Spelling Mastery session by Maria Collins. Those primarily interested in managing and teaching the severely handicapped could attend two sessions offered by Aan Archibut. Highly experienced DI teachers could take Zig Engelman’s session on advanced DI skills and those with a bent toward the theoretical could take his session on DI theory. All the important instructional bases were covered well by this multi-talented group of trainers.

I have had the privilege of working with some teachers who have repeatedly demonstrated effective use of DI programs. Many of these teachers have brought and achieved dramatic gains well in excess if one year’s gain in less than one year’s time with a variety of hard-to-teach students—students labeled LE, ED, or MR. The fact that these teachers produced large gains year after year suggests that the gains do not occur by chance and that the teacher does not just happen to get students who were going to learn regardless of the type of instruction provided. It seems apparent to me that the gains are due to the teachers’ expertise in delivering DI. That expertise did not come easy. Each of these teachers had devoted much time and effort to the study of DI and each had continued to expand and refine his/DI teaching and techniques over a period of years. I was delighted to hear these highly experienced DI teachers say that they, too, had learned through the teaching skills and strategies at the Institute.

The highly experienced teachers seemed to be particularly pleased with the information they gained from Zig Engelman’s presentation of advanced correction techniques and paradigms. I, too, attended Zig’s sessions and acquired new information which I intend to incorporate into my methods of teaching. The University of Wisconsin-Madison. Zig demonstrated, for example, a back-filling procedure for errors that occur infrequently and a slightly different par- 

Annual ADI Awards—Continued from Page 1

determined that two variables were critical in improving students’ performance in school: (1) a strong control over curriculum to insure effective and systematic instruction, and (2) effective training and supervision of teachers to insure implementation. To this end he placed Direct Instruction programs in all special education classrooms and in some selected regular education classrooms. In addition he developed a thorough intervention plan to ensure that teachers were highly competent in teaching these programs.

The following year he spoke for himself on the effectiveness of the plan and on Ed’s supervisory and leadership skills. In Delaware, each school district is required to test all students in basic skills (Comprehensive Test of Basic Skills). Cape Henlopen

ranked about in the middle of the state the year before Ed became director of special and regular education. Following Ed’s first year as Director, and every year since, Cape Henlopen has placed on the state on the average score for elementary regular and special education students across the total test battery score. Prior to Ed’s assumption of the directorate position, it was standard procedure for 25 percent of the first grade students to report the first year. Ed introduced a transition class from kindergarten to first grade (see ADI News Spring, 1987) for students designated as likely to fail first grade. Again Direct Instruction principles were implemented and extensive staff training was conducted. The average grade level increase for these “at risk” students, measured by Woodcock Reading Mastery Tests, was 1.7 grades. In addition, the average increase was one standard deviation above the mean performance predicted from IQ scores. Finally, the Normative Curve Equivalent scores (NCES) for special education students in this district this past year averaged 41. The national average in regular education on this scale is 50. These changes attest to the effective leadership given by Ed Schafer.

Ed has been the key organizer of the Annual Atlantic Coast Conference on Direct Instruction and Effective Teaching. Some 350 participants attended the Third Annual Conference this past July, Ed also presented two popular workshops at the ADI conference in Eugene this summer on implementing and supervising DI programs in schools. Ed Schafer deserves our congratulations for providing us with a comprehensive overview of what can be accomplished by a truly effective and dedicated supervisor in the best of DI traditions.

thefirming procedure for errors that occur frequently. He also taught a paradigm for correcting chronic errors on tasks that require the same student response and compared it to a paradigm for correcting chronic errors on tasks that require different student responses.

To my knowledge, those particular correction paradigms had not been made explicit in previously published DI materials. I have been aware that teachers in training have more difficulty mastering correction techniques than any other DI techniques, such as signalum and cueing. Zig’s paradigms should help alleviate that problem. And, by the way, some of those who like the currently popular term “strategies” may find paradigms as difficult to use. In any case, they are designed to be applicable to, or generalizable across, all examples in specified sets of or- rors.

I was glad to find that many of my friends and colleagues in regular education, as well as those in special education, attended the Institute. A number of principals and curriculum coordinators in Wisconsin are working with their directors of special education to carry out pilot projects in which DI is being implemented in the regular classroom— with "low” reading groups in some situations, with both “low” and “superior” groups in other situations, and with all students in still other situations. Thus it is clear that this DI Institute has been a unique experience in many respects. It was certainly different from other professional conferences that I have attended over the years. Perhaps that uniqueness can best be summed up by a teacher’s comment that I overheard toward the close of the Institute: “Boy, this has been a hell-get-down-to-business-and-start-learning-how-to-teach-those-mildly-handicapped-students-at-last!” That’s the kind of experience that good teachers are looking for. Obviously, they found it at the DI Institute in Milwaukee last summer.

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DIREC T INSTRUCTION NEWS, FALL, 1987 3

Ed Schafer, Supervisor of the Year
Correlates of Algebra Gains

Measures

Classroom Observation System
A classroom observation form was developed to permit both low inference and moderate inference observation of teacher and student behavior. The observed variables were derived primarily from studies of elementary mathematics instruction by Good and Grouws (1977, 1979), the study of junior high mathematics instruction byEverton, Anderson, Anderson, and Brephly (1980), and Piasters' System of Interaction Analysis (Piasters, 1970). Each teacher's class was observed for three lessons during February and March 1983. The lessons were consecutive, or close to consecutive.

Observers collected data on the low-inference variables by coding which teacher and/or student behaviors occurred during each five-second interval of the 50-minute lesson. If just one behavior was coded, it was scored as having occurred for five seconds. If two behaviors were coded, each was scored as having occurred for 2.5 seconds. After every four minutes of each observation, the observers took a twenty-second break during which they counted the number of students who were off-task.

At the end of each lesson, observers used a series of Likert-type scales to rate teacher performance on several moderate-inference variables such as the degree of teacher clarity, enthusiasm, and variety of teaching methods used in the lesson.

Five observers were trained to use the observation system. Eight of the 34 teachers were observed by pairs of observers to check interobserver reliability. The reliability for one of the variables—pacing—was unacceptably low (r=.10), primarily because of its low frequency of occurrence. The reliability of the other variables ranged from .88 to .93, with a median reliability of .73. A definition of each variable, and its interobserver reliability where available, are presented in the appendix.

The temporal stability of teachers' scores on each observational variable across the three observed lessons was determined. The reliability coefficients for selected variables are as follows:

Teacher academic talk. .62
Teacher asks lower-cognitive questions. .79
Whole class has opportunity to answer question. .83
Student asks a question. .55
Teacher monitors seatwork. .55
Teacher does not monitor seatwork. .38
Teacher is interrupted, in transition, or engaged in non-academic talk. .75

It appears that the observed behaviors reflect a fairly stable individual differences in teaching style.

Questionnaire Measures
Each teacher and student was administered a questionnaire about a variety of algebra instruction practices near the end of the school year. Items concerning class attendance, homework, and review of previously studied content were included in the data analysis reported here.

Achievement Measure
District high school math teachers helped the researchers assess a test that might impact their major course objectives. The Algebra Test I, Form A, of the Cooperative Mathematics Test (Educational Testing Service, 1980) was utilized for the present. Although the test is old, the teachers considered the test valid and relevant to their curriculum. The mean score of the 34 classes on the present was 22.26 (S.D.=.50), putting them at the 65th percentile on national norms. The posttest was the advanced form of this test (Algebra Test II, Form A). The mean score of the 34 classes on this test was 30.50 (S.D.=6.30). Each form of the test includes 40 items and measures primarily application of algebraic algorithms.

The pretest was administered in September 1984, and the posttest was administered the following May. The research team administered both tests a residualized posttest score, adjusted for pretest score, was computed for each student, and then these scores were averaged to yield a mean score for each of the 34 observed classes. The mean residualized class scores were used in the data analysis.

Fifteen of the 34 teachers taught another intermediate algebra class in addition to the one that was observed. Because the algebra pre and post test was administered to all classes, it was possible to compute a residualized posttest score for these classes as well. The correlation between the mean scores of the observed and unobserved classes for the fifteen teachers was .73, indicating that teachers were fairly consistent in their level of algebra achievement that they produced in their classes.

Results

Correlational Analysis
Data for the three observations of each class were averaged to yield a mean score for each of the instructional variables. These variables were correlated with the class residualized achievement scores. The results are shown in Table 1.

Instructional Time
Time allocated for instruction has been found to have a positive correlation with high school student achievement (Rommes, 1986). This variable could not be examined in the present study, because time allocated for math class was held constant by the school district. The study did examine a number of variables that could be used to explain variations in the amount of instruction that occurred within the standard fifty-minute class. Variations occurred because some teachers deviated from the allocated time or used up time making transitions from one phase of the lesson to the next. Also, some teachers were interrupted during class time more than others. Frederick (1977) found that higher-achieving secondary schools had fewer interruptions than lower-achieving secondary schools.

These non-instructional uses of time (digestions, transitions, and interruptions) were combined to form the variable, amount of non-instructional time. As expected, the correlation between this variable and student achievement was negative at a statistically significant level (see Table 1).

Just as teachers must allocate time for instruction, students must allocate time to benefit from it. Students' time allocation is an important variable at the high school level, since school attendance is somewhat voluntary. DeJung and Dockworth (1985) demonstrated that absenteeism is a serious problem among high school students. Therefore, the questions to which students skipped or missed class was included as a variable in the study. Both teacher and student reports on this variable resulted in significant negative correlations with residual achievement scores.

Demonstration Phase of the Lesson
Mathematics teachers usually begin their lessons by expounding a concept or algorithm that will be the subject of the day's seatwork and homework. Emphasis on this "demonstration" phase, rather than seatwork, has been found to be effective in several studies (carnacrical study of ninth-grade math classes by Everton et al., 1980; correlational study of algebra classes by Stillert and Toch, 1984; experimental study of elementary math classes by Shipp and Dearn, 1960, and by Hustler and Piggins, 1965; an experimental study of high-school geometry classes by Zahor, 1960). Dobbel (1977), however, did an experiment with first-year algebra classes and found that emphasis on development of seatwork rather than seatwork did not affect students' achievement.

Surprisingly, the correlation between teacher academic talk and residual achievement scores for the algebra classes studied here was significantly negative.

The ninth-grade math study by Everton and her colleagues found that asking frequent questions during the demonstration phase was effective. However, Good and Grouws found in their correlational study of fourth-grade math classes that asking prod-
The present study found that asking lower cognitive questions was ineffective (the coefficient was marginally significant, $p = .10$), and higher cognitive questions were neither effective or detrimental. Contrary to the Everett study, it was not as effective for the teacher to call on a student directly to answer the question than to give all students the opportunity. While singling out students to answer the questions, the more effective teachers also made it a point to call on many different students during the demonstration phase (see correlation for “number of students called on” in Table 1). This led to the Everett’s study, allowing students to initiate questions and comments were negatively correlated—but not significantly so—with student achievement.

Two studies (a correlational analysis of data from an experiment with fourth-grade math classes by Good and Grouws, 1977; an experimental study of algebra classes by Saxen, 1982) both found that spending some time during the demonstration phase in reviewing previous lessons would have a positive effect on student achievement. The present study also found a positive correlation that approached statistical significance ($r = .30$, $p = .13$) for this variable.

The demonstration phase of a math lesson is usually dominated by teacher talk. The extent to which this talk was judged to be clear was found to correlate positively with student achievement (Good and Grouws, 1977; a study of fifth-grade math classes by McCombs, 1977). Clarity in the present study was measured by observer ratings and by looking linking statements, which have been found to be an indicator of teacher clarity (Taylor, 1971). Although in the previous studies, clarity did not correlate positively with residual achievement scores. The strong negative correlation for linking statements probably reflects a tendency for more talkative teachers to have more opportunities to make such statements.

Classroom Management and Climate

*Classroom Management and Climate* is the study of high-achieving secondary schools. The study of ninth-grade math classes by Grouws and her colleagues found that the type of monitoring in important. Brief, precise, student-created academic comments more positively with student achievement, but long contacts of this type had a negative correlation. The present study produced the same results during metacognitive, inquiring, and asking many students was positively correlated with residual achievement scores, but taking time to work with only a small number of students had a negative correlation.

Good and Grouws found in their fourth-grade math experiment that the practice of teachers holding students accountable for their homework had a positive effect with achievement. The two variables relating to the participants' accountability for their homework were positively correlated.

Slavin (1980), among others, researchers, has found positive effects of cooperative learning on student achievement. This practice was operationalized in the present study by counting the number of students who worked together during metacognitive. A modest, nonsignificant positive correlation was found for this variable.

Assignment of Homework

Homework has been commonly found to have a positive effect on student achievement among grade levels and subject areas (Walberg, 1985). For example, Good and Grouws (1977, 1979) found such an effect in two studies of fourth-grade math classes. In the present study, neither frequency nor correlation of homework affected residual achievement scores.

Discussion

A previous study of algebra instruction (Dubrit, 1977) found no effect for emphasis on development over seatwork. Conversely, the present study found negative correlations for seatwork. While there was no significant difference in the amount of seatwork in the two studies, the present study found higher cognitive questions to be positively associated with student achievement, and lower cognitive questions to be negatively associated with student achievement.

Table 2 shows how the five highest-ranked subjects used their time in the standard fifty-minute lesson. The most effective teachers spent approximately 29 minutes of the lesson on the development phase, whereas the least effective teachers spent 36 minutes. Within the development phase, however, the most effective teachers spent more time than the least effective teachers or controlled practices (i.e., asking questions that require students to solve a problem independently) and in asking questions directed to a particular student.

The most effective teachers allowed for approximately 16 minutes of seatwork during the lesson, but the least effective teachers allowed only five minutes. Differences between the two groups in non-academic time and time spent on classroom management and praise were negligible.

Table 2. Time Use (in Minutes) by the Five Most Effective and Five Least Effective Teachers

<table>
<thead>
<tr>
<th>Development Phase of Lesson</th>
<th>Most M (SD)</th>
<th>Least M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher academic talk (p=.01)</td>
<td>16.60 (5.53)</td>
<td>27.09 (4.40)</td>
</tr>
<tr>
<td>Teacher use of explaining links (p=.03)</td>
<td>.24 (.07)</td>
<td>.72 (.05)</td>
</tr>
<tr>
<td>Teacher gives directions</td>
<td>.87 (1.06)</td>
<td>.43 (.14)</td>
</tr>
<tr>
<td>Teacher asks lower-cognitive questions</td>
<td>2.22 (1.66)</td>
<td>1.66 (1.45)</td>
</tr>
<tr>
<td>Teacher asks higher-cognitive questions</td>
<td>.06 (.05)</td>
<td>.20 (.34)</td>
</tr>
<tr>
<td>Teacher asks questions that check for understanding</td>
<td>.38 (.25)</td>
<td>.43 (.33)</td>
</tr>
<tr>
<td>Teacher asks questions that ask students to solve a problem independently (p=.03)</td>
<td>3.43 (.03)</td>
<td>.52 (.22)</td>
</tr>
<tr>
<td>Whole class has opportunity to answer questions</td>
<td>1.89 (1.29)</td>
<td>2.03 (1.50)</td>
</tr>
<tr>
<td>Only one student has opportunity to answer question (p=.03)</td>
<td>1.53 (1.04)</td>
<td>.22 (.04)</td>
</tr>
<tr>
<td>Student asks a question</td>
<td>1.37 (1.04)</td>
<td>1.95 (1.13)</td>
</tr>
<tr>
<td>Student initiates a comment (p=.03)</td>
<td>.26 (1.25)</td>
<td>.86 (.44)</td>
</tr>
<tr>
<td>Seatwork Phase of Lesson</td>
<td>Most M (SD)</td>
<td>Least M (SD)</td>
</tr>
<tr>
<td>Teacher monitors seatwork (p=.05)</td>
<td>12.75 (7.46)</td>
<td>3.67 (3.89)</td>
</tr>
<tr>
<td>Teacher does not monitor seatwork</td>
<td>3.02 (1.09)</td>
<td>4.00 (1.60)</td>
</tr>
<tr>
<td>Teacher gives quiz</td>
<td>0.00 (0.00)</td>
<td>1.06 (0.23)</td>
</tr>
<tr>
<td>Non-academic Time</td>
<td>Most M (SD)</td>
<td>Least M (SD)</td>
</tr>
<tr>
<td>Teacher is interrupted, in transition, or engaged in non-academic talk</td>
<td>5.24 (3.61)</td>
<td>7.46 (1.75)</td>
</tr>
<tr>
<td>Classroom Management and Climate</td>
<td>Most M (SD)</td>
<td>Least M (SD)</td>
</tr>
<tr>
<td>Teacher praises students work or behavior</td>
<td>.09 (.09)</td>
<td>.09 (.38)</td>
</tr>
<tr>
<td>Teacher criticizes student behavior</td>
<td>.11 (.11)</td>
<td>.03 (.03)</td>
</tr>
<tr>
<td>Teacher reminds students of expectations for appropriate classroom behavior</td>
<td>.13 (.17)</td>
<td>.30 (.18)</td>
</tr>
</tbody>
</table>
A powerful tool for teaching:
- A basic vocabulary
- A rich body of knowledge about the world
- The oral language and writing skills needed to ask precise questions and to communicate ideas.

These are the abilities that a new report, Becoming a Nation of Readers, lists as being important to all children who are learning to read—critical for children who have not grown up with oral language that resembles the language of school and of books—because these abilities are the basis of comprehension.

And these are the abilities that teachers have been successfully teaching children for almost twenty years with Distar Language programs.

But Distar Language does more than teach the complex language skills needed to understand classroom instruction and comprehend written text. Distar Language programs go beyond the content of other language programs to give you the help you need to teach critical thinking skills, skills that enhance a child's intellectual development.

With Distar Language you teach logical thinking through:
- Classification
- Analogy
- Deductive reasoning
- Inductive reasoning

You teach students to be "THINKERS" who use language as a tool. And that is the foundation for eventual success in all school subjects.

And now the Distar Language program is better than ever! Distar Language I has been revised to give you:

Expanded Language Activities—ideas for fun-to-do songs, read-aloud stories, nursery rhymes, and plays. These informal lesson extensions encourage students to apply their language skills in classroom activities. Language achieves full naturalness at a remarkably early stage.

First Cycle—an in-class double-rhythms schedule eliminates unnecessary drill and practice for average and above-average students. A "star" identifies the tasks that you teach to all students. You are free to skip the remaining exercises with the faster children. Lessons are easier to adapt to student ability.

Take-Home—lively pencil and paper activities teach color, shape, and workbook skills. Activities reinforce skills, demonstrate that students can apply language concepts. Illustrations are improved. There is more to do on each page.

Use this order form to receive these exciting new materials as soon as possible.
Using DI in a Victoria, B.C. Resource Room

by Lawrence A. Chamberlain

While Special Education teachers, and in particular Learning Assistance teachers, over the last decade have been exposed to the claims of various "innovative" approaches to remedial reading, the latter has been popularized by a recent interest in "back to basics". The purpose here was to describe the effects of one "back to basics" approach to Reading called "Direct Instruction" in a Learning Assistance classroom from 1980 to 1986. The three essential components of the Direct Instruction Program, "Progran Design, Instructional Organization", and "assessment" are described in detail by Comnine & Silbert (1979). By their nature and purpose, experimental studies do not necessarily reflect the day-to-day realities of the Learning Assistance or Resource Room setting. For example, which teacher would knowingly "enroll a student to a control group," which may indeed adversely affect that child's future by not providing effective and efficient instruction? It is descriptive only, hopefully reflecting a realistic Learning Assistance environment.

Method

The Children

The participating children attended grades 1 to 6. Proctor (1976) in a sumptuous middle class elementary school in Victoria, British Columbia, Canada. Regular classroom teachers, and sometimes parents, identified these children who experienced difficulty in acquiring basic reading skills. These children were referred to the Learning Assistance teacher. Each child was involved individually with the Learning Assistance teacher and was assessed. The child was then either: 1. Placed in the appropriate Learning Assistance program, or 2. Referred for evaluation by the district psychologist who at times resulted in placement in a special class program, or 3. Placed on a program (sometimes modified) in the regular classroom without receiving Learning Assistance help.

Procedures

The children in the Learning Assistance program were tested, taught and then tested again at the end of the year. Many children who were diagnosed by the psychologist as "learning disabled" or as possible "slow learners", continued in regular class with the support of Learning Assistance. Each group consisted of 6 to 9 children from grades one to two, and 9 to 11 children from grades three to six. Each group met for about 45 minutes every day, five days a week. Most groups began in early September and finished in mid-May. While other groups began in January or February and ended the following December. Most Learning Assistance children received help in grades one and two. Children from grades three to six with grade three as well as with some grade two and four children. It is interesting to note that the Corrective Reading Program: Decoding Level B from 1976 to 1979 was taught predominately to children in grades five, six and seven, but from 1983 to 1986 was taught only in grades two, three and four. Although only 4 programs have been identified here, there are 11 Reading, Spell, 7 Language/Comprehension, and 7 Arithmetic programs available to the teachers at this school. Many of these children have therefore been introduced to a variety of Direct Instruction programs. Some of these 34 programs were taught in the Learning Assistance class while others were taught in the regular class by regular classroom teachers. Many reading tests are available, including group, individual, diagnostic, norm-referenced, criterion-referenced, and Mastery. Mastery testing is an important part of each Direct Instruction program. The tests described below are individual, norm-referenced, and may be typical of those used in Learning Assistance or Resource Room classes. The Schonell Reading Test and the Classroom Reading Inventory (C.R.I) were used to determine baseline and summative performance levels. The Schonell Reading Test is a graded word list which tends to reflect the performance (grade score) of children in the daily classroom reading. It is also somewhat sensitive to change in word recognition performance.

The Classroom Reading Inventory is an informal reading inventory. Only the Decoding and Comprehension scales were used. Ten graded stories are read orally with yard recognition scores being recorded. For those children in Reading Mastery or those children who have not completed Reading Mastery or both the Schonell Reading Test and the Classroom Reading Inventory are presented to them using the modified orthography (font) found in the reading program.

Results 1980-1986

The results presented in Table 1 are from pre- and post-test data collected from September 1980 to June 1986. As the children at each grade level change from one year to the next, the means will vary when cross-checking grade and year for a particular group of children. The data are further fragmented by children entering and leaving the program at different points in time. However, these results are similar to those of the previous years 1976-1980.

<table>
<thead>
<tr>
<th>Year/Grade</th>
<th>1 2 3 4 5 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>.47</td>
</tr>
<tr>
<td>1981</td>
<td>.16</td>
</tr>
<tr>
<td>1982</td>
<td>.20</td>
</tr>
<tr>
<td>1983</td>
<td>.21</td>
</tr>
<tr>
<td>1984</td>
<td>.22</td>
</tr>
<tr>
<td>1985</td>
<td>.23</td>
</tr>
<tr>
<td>1986</td>
<td>.25</td>
</tr>
</tbody>
</table>

* No classes at these grades for these years

The expected mean gain for children not requiring Learning Assistance would be about ten months for each year of instruction. The average amount of measured gain for Learning Assistance children in grades two to six when collapsed across all years was eighteen months for Decoding and thirteen months for Comprehension. This represents the combined test results for over 220 children. Continued on Page 5

Figure 1. Classroom Reading Inventory Months Gained

Decoding

Comprehension

<table>
<thead>
<tr>
<th>Grades</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected Gain for Average Children</td>
<td>2 3 4 5 6 7 8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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will help to answer this question. 

There are a few special concerns for those who are new to Direct Instruction that need to be examined. The modification or possibly even the use of any Distor, Mastery or Corrective program by a person who has not had the intensive training needed to carry out Direct Instruction could most certainly destroy its effectiveness. Presented below is an opinion offered by two Educators from London, Ontario.

As with any kind of teaching method, successful implementation of Direct Instruction is not a simple matter. Direct Instruction is almost doomed to fail if teachers are forced to use the program, or if the system fails to provide the teacher with the basic support necessary for successful implementation.

"Direct Instruction may not be new, but it is sufficiently different and specific enough that teachers require thorough initial training. Simple attendance at an information session, or the mere provision of materials and a brief overview through Direct Instruction Reading videos (or similar sessions in this regard).

"Errors, omissions, or changes in program presentation can be made and should be corrected at the earliest opportunity. Direct Instruction teachers require regular opportunities to meet together as a group to discuss any problems, 'trouble-shoot' for possible solutions, and generally support each other." (Francis and Posner, 1978)

If one intends to use Direct Instruction programs and wants to be effective, first one must be able to use them. The National Institute for Educational Management (INEM) has a good selection of programs and manuals. Direct Instruction programs must be supported and published in such a way that they will not be neglected. This might mean that the teacher should be a member of the direct instruction movement. If not, the teacher should be provided with adequate material to support the program. Direct Instruction programs must be supported and published in such a way that they will not be neglected. This might mean that the teacher should be a member of the direct instruction movement. If not, the teacher should be provided with adequate material to support the program.

"Direct Instruction teachers require regular opportunities to meet together as a group to discuss any problems, 'trouble-shoot' for possible solutions, and generally support each other." (Francis and Posner, 1978)
Corrective Reading Evaluation Study

by Stacey J. Kaseadorf and Peter McQuaid
East County Special Education Region, San Diego County

The following report is the final evaluation study for the Corrective Reading Project, Direct Instruction for Low Achieving and Special Education Students, funded by the County Office of Education for the 1986-1987 school year. It includes the background, evaluation design, training, and results of the year-long project.

The small and mid-sized districts which made students eligible from the East County Special Education Regional Office have substantially higher percentages of low-achieving "qualifying" pupils than their larger district counterparts. Some of the small rural schools find as many as 50% of their pupils eligible for Chapter I programs and possess limited resources to meet this challenge. This situation tends to lower their CTBS scores and precipitates large numbers of referrals to already over-taxed special education programs.

With these circumstances in mind, the project was designed to increase the effectiveness of reading instruction in selected regular and special education classes by introducing direct instruction materials and methods. In addition, because of the large number of students in the special education classes, the ability to provide individualized attention is greatly hampered. The selected materials help this situation by providing effective small-group versus individualized instruction.

Teacher Selection

A representative sample from Mc.Empl, Alpine, Lakeside and Lemon Grove were approached with the project proposal. It was explained that the Corrective Reading Series, Decoding B, developed by Scientific Research Associates, was designed for use with 4-12th graders who are having difficulty in reading. Principals recommended special and regular education teachers who appeared willing to participate and who taught students with low reading performance. Ultimately, 14 teachers were chosen to participate in the study.

Training

In September, the two project directors met first with principals and directors and then with teachers to explain the involvement and commitment required. At that time, the instructional materials were introduced and the study design was outlined. On October 17, 1986, a daily inservice was held at the County Office of Education. Dr. Gary Johnson, staff development specialist with the Washington School District in Phoenix, Arizona, conducted the training. Dr. Johnson is one of the authors of the Corrective Reading Series and is an expert in the use of the materials.

Throughout the fall, the two project directors observed, coached and monitored the teachers. On January 30, 1987, a follow-up workshop was held in Alpine for the teachers. At this in-service, Dr. Johnson returned with additional training and more ideas for continued motivization of both teacher and students to be taught. The teachers were feeling very well with the materials and were encouraged to continue with as much enthusiasm.

Evaluation Design

In October, two or three randomly selected students from each of the 14 participating classrooms were pretexted on the Woodcock Reading Mastery Test. Any student's scores were sent to the Regional Special Education Office. During the last week of May and first week of June, posttesting was conducted on the same students if they were still in the program. Thirty-six students were tested in the fall and 32 remained for testing in May. Test results were compiled and analyzed by the project directors.

Results

The duration of implementation varied by classroom from 7 to 8 months. Number of sessions ranged from 40 to 55. A teacher started in Decoding A and then taught 40 lessons in Decoding B. The other teachers taught Decoding B. Thus, the results obtained were from two different types of tests. The results were not fully reflective of what could be accomplished if a full 140 lessons had been taught.

The means and standard deviations for gain scores are presented in Table 1. Because of the way the Woodcock is constructed, grade equivalent scores had to be used for the statistical computations. This is not the most desirable state of affairs, but the results are strong enough to override any doubts about averaging grade equivalent scores.

As can be seen in Table 1, the greatest gains were made in word attack skills (mean decoding). However, it is not unexpected for students to improve on decoding skills and the study design was outlined.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Mean (Years)</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word Attack</td>
<td>2.38</td>
<td>2.44</td>
</tr>
<tr>
<td>Passage Comprehension</td>
<td>.75</td>
<td>.59</td>
</tr>
<tr>
<td>Total Reading</td>
<td>.88</td>
<td>.54</td>
</tr>
</tbody>
</table>

The results show that the students gained 2.38 years on the Word Attack subscale which involves reading some 59 words. Fifteen of the 32 students gained 2 years or more. The results show that these "poor readers" were gaining at an average rate in comprehension skills, and three times an average rate in decoding skills.

The teachers in the study were asked for their comments about the program. Their feedback is summarized in Table 2. Clearly, the teachers found the program most helpful in achieving their goals.

Table 2. Comments from Participants

- "The boys in our group are finally working together on something."
- "One mom said her son was becoming a 'school-phobic' last year - dreading going to school, was constantly in trouble. This year he did one day by day, he's improved a lot. He made it through reading group, and then went home with his fever at 101.""We have been visited by the principal, school psychologists, a principal from another school, and other staff members. They are all impressed with how quietly the class is working during reading. In fact, many staff members have expressed an interest in using the same program next year."
- "The high levels of concentration and enthusiasm "improve the students progressing and becoming residents of their ability" "the rapid pace of instruction and growth of the students" "the built-in discipline" "enthusiasm of the children caught with (or because of) the kids being able to see and feel their individual growth" "easy to administer" "improved improvement in both reading skill and behavior" "the structure of the 'script' and the consistency of the program" "the positive attitude shown by the students' awareness of their improvement" "it's intensity, effectiveness, built-in management system; the students want to do reading and are excited about reading!" "not much preparation needed" "the structure allows children to be successful and results in progress"

A Dissertation on Math Instruction

by Barbara Diane Kinder
Special Education University of Oregon

Recent studies have begun to qualitatively examine effective (expert) math instruction and to explore the phenomenon of transfer of training. This study described in detail the instruction provided to a group of 4 highly trained Direct Instruction teachers who were, until recently, part of the Follow Through Program.

The subjects were teachers in low-income, black elementary schools in Flint, Michigan. The experienced former Follow Through teachers were selected based on recommendations from supervisors, consultants, and student achievement. Their math classes were observed on 3 consecutive days. The observations included low-influence items—such as number of product and process questions, interaction rate, the number and types of corrective feedback, and student success rate. Moderate-influence items included ratings of organization, instructional effectiveness, accountability, and clarity. Each teacher was also interviewed.

Data were analyzed from three perspectives. "The teachers' performance was compared to empirically derived effective instruction principles. These teachers' performance was compared to teachers in the districts who had no contact with Follow Through. Finally, transfer of Direct Instruction components to traditional basal materials was assessed.

The results showed that the former Fol-

low Through teachers' instruction matched descriptions of effective math instruction for low socioeconomic status students (e.g., Good, Ehrmeier, & Beckman, 1978) with the exception of "frequent use of praise." Their instruction was significantly different from the other teachers in their use of product questioning; strategy models; adequate ex-

amples; guided practice; and routines for or-

ganization, managerial effectiveness, accoun-
tability, and clarity. Each teacher was also inter-

viewed."

About the author: After 7 years and 2 degrees in Education, the author started spending summers in Eugene, Oregon where he began to learn about Direct Instruction from Zig Engelmann, Doug Carnine, Jerry Silbert, John Chapouth (all from the University of Oregon); and Jean Osborn, Gary Johnson, Susan Hamner, Bob Dixon, Linda Meyers and many oth-

ers (all from the ADI Conferences). The author has also been a research assistant and instructor at the University of Victoria, Special Class teacher, Supervisor of Special Education Services for over ten years, a Learning Assistance teacher.

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Graduate Training in Special Education

by John Woodward
douglas carns
Russell Gersten
Stephen Fagan
Mary Gleason

University of Oregon

This article describes one of the doctoral program options in Special Education at the University of Oregon. This program places central emphasis on actual classroom details and realities, such as how much practice does it take for the average student to learn a specific skill, and how much practice is required for the teacher to present acceptably. This doctoral program, which is in its fifth year, is supported by the U.S. Department of Education through a grant for preparation of leadership personnel. The assumption of the doctoral program is that an instructional leader in a school district or educational testing must be fully versed in the specific details of instruction. Only with this knowledge can the leader make decisions that will lead to desired outcomes.

Improving the Quality of Instructional Services in Special Education

Current school improvement efforts have increased expectations for special education services in the public schools. A recent evaluation in New York City, for example, has indicated the need of a major overhaul (Turgend, 1985). Among the problems cited in the commission report was that the least qualified teachers were educating these special education handicapped students. Moreover, the report argued that far too much time was spent on evaluation and diagnosis over the expense of actual instruction. Our recent research in a major California school district (Gersten, Davis, Miltie, & Green, 1986) found that instructional supervisors, though well-intentioned, were neither knowledgeable nor skilled enough to provide systematic teacher feedback that would result in improved instruction for handicapped students. Special education personnel were unable to offer sufficiently detailed recommendations that would lead to better teaching. These shortcomings are largely attributable, in this large part, to teachers training programs at colleges and universities.

Changing Definitions of Instructional Leadership

These problems are part of a time when a changing definition of effective educational leadership has been emerging in the research literature (Clark, Lott, & McCartney, 1980; Edens, 1985). Gersten's recent research has shown that effective instructional leaders—those who provide school administrators, supervisors, or professors at teacher training institutions—must be knowledgeable in the precise, day-to-day details of education. This includes a thorough understanding of reading, language, and mathematics curricula programs; the ability to observe and analyze teacher performance; use of classroom performance on academic tasks as criteria for placement and grouping students; and procedures for consistent, criterion-referenced monitoring of student progress.

Analyses of successful adaptations of innovative educational programs by Berman and McCaughan (1975), Huberman and Miles (1984) and Loozy (1983) indicate that two elements are consistently related to success. First, when implemented, these educational programs succeed with "hard to teach" students. Second, these programs are based on well-developed classroom problems to consultants or supervisors, the consultants offer specific, concrete solutions (Loozy, 1983). Above all else, these solutions work.

In our view, the training of these interested leadership positions in special education should be rooted in a working knowledge of the details of instruction. These individuals should know how to implement educational models that have empirically proved success with handicapped students.

We are in full agreement with Markul's (1984) assertion that advanced graduate training is not merely an art, one based on insight, empathy, and elusive, interpersonal communication skills. The central concerns of advanced graduate work are detailed knowledge of instructional techniques and procedures for evaluating classroom teaching situations.

Training Special Educators to be Leaders

Over the last five years, we have developed a graduate level program at the University of Oregon that trains instructional leaders in special education. Our graduate students complete projects in providing concrete, specific solutions to the problems encountered in classrooms serving handicapped students and in training teachers of the handicapped. They are particularly adept in translating the research on instructional procedures into day-to-day, effective teaching practices. In the end, we expect that the training in instructional design and effective teaching will deeply influence the eventual work our graduates pursue as teacher training institutions and in school districts as administrators and instructional supervisors.

Our program is based on the principle that have extensive empirical support—direct instruction and effective teaching (e.g., Entsminger, 1984; Fábrega, 1983; Gersten, 1983; Reits, Polsgrove, & Semmel, 1982). Thus we are confident that we are training graduate students in procedures and practices that do, in fact, have the capability of improving a special education student's learning. Furthermore, the program is being carried out by faculty members who are experienced in both the design, implementation, and evaluation of practices that improve student learning. The research also supports the idea of a unified training program that stresses a tight interaction between coursework, practice, and other academically related activities.

Content of the Instructional Leadership Training Program

Essential to our training program is work in (a) supervision (b) inservice training and college teaching, and (c) research and evaluation. In our program, the three areas must be integrated. The graduate student is continually building his or her working knowledge through a series of supervised, structured experiences in teacher training, curriculum design, and research. Unlike many training programs, where students earning a master's or a professional degree will practice the same techniques over and over, the different experiences in our program are integrated (see Figure 1 below). What is learned from supervising training teachers, for example, is later applied in re-search activities and college teaching. Throughout training, these experiences interweave, allowing the graduate student to apply his or her knowledge in broader and more challenging situations.

A second theme that runs through these areas is the gradual movement from observer to autonomous decision maker. Repeatedly, these graduate students have been paired with mentor teachers, core faculty, or researchers who guide them toward an increasing independence in their work. This mentor relationship permits a high degree of feedback, and it enables the core faculty to coordinate objectives across the three areas of training. Nowhere is this theme more evident than in the program's dominant and most unique area: supervision training.

Supervision Training

Throughout supervision, graduate students observe concrete examples of how teachers react in situations. They also tell us that the experience change on the learning performance of the trainee's reliability handicapped students. The context provides our graduate students with a range of experiences that allow them to clearly see the impact of instructional variables discussed in the effective teaching literature. Graduate students in our program learn to identify a specific instructional problem and provide specific instructional remedy. Furthermore, they learn to follow up on return visits to the trainee team is consistently providing the remedy, and it is succeeding with the children.

For example, new teacher trainees often conduct lessons at a slowpace. Inadvertently, they may add a lot of distraction, off-task behavior from their students. Supervisors will model for trainees how to react at a faster pace, and managed this behavior by reminding students of rules at the beginning, class and/or ignoring mildly off-task behaviors until a break in the lesson. The trainee team mais the role of the teacher, and at the end of the session he or she receives feedback from the supervisor. Over the coming weeks, the supervisor will continue monitoring the trainee's ability to maintain an acceptable pace, ignore minor off-task behavior, and documented this improvement in the performance and in the critical supervision skills used by our graduates are listed in Figure 2 below.

In our supervision training, all graduate students take on more responsibility and gradually moving into more difficult supervision situations. In the first term, our new graduate student will always be accompanied by a mentor supervisor (usually a senior doctoral student) or a core faculty member. This "novice" supervisor will practice diagnosing and prioritizing teaching skills that the trainee teacher needs to improve. The mentor supervisor will demonstrate how to assist teacher trainees who are weak in a range of critical teaching skills—such as correction procedures, pacing of a lesson, and/or classroom management skills. At times, this may mean that the mentor "steps in" and teaches a part of the lesson. Most of the time, the feedback is verbal and follows the lesson. However, feedback is always specific.

Under the guidance of the mentor supervisor, the novice will assist in conducting the supervisor—teacher training conference, and with follow-up on the teacher trainee in the coming weeks of the term. As our novice supervisor becomes more competent, he or she will take on more responsibility and be introduced to more demanding situations (e.g., situations where the children have more severe learning/behavioral problems). This will probably begin during the last term of the first year. Increasingly, the novice supervisor will supervise teacher trainees independently.

In the second year, the novice supervisor will reflect on his or her skills learned in the first year without direct guidance from mentor supervisors. As in the first year, these skills will be enhanced in the weekly supervision seminar conducted by two core faculty members throughout the year and by required coursework in instructional design. The seminars provide problem solving opportunities for all supervisors, while the coursework allows students much practice opportunities in designing curriculum (e.g., brief instructional routes for teaching an addition skill, more complex formats for module applications in science).
--A Focus on Instructional Leadership

Figure 2. Skills Used in Supervision

Monitoring Group Instruction
- Are you close enough to see the children's faces?
- Are you close enough to intervene without disruption?
- Have the children been informed of your role (e.g., by the trainee, cooperating teacher, by you)?

Diagnosis of Trainee's Performance
- Are you focusing on the major problems and not picky details?
- Are you correlating student performance with the trainee's instruction?
- Can you prioritize these major areas for assistance?
- Are you using the trainee's data on student performance to help in diagnosis?
- Is the trainee giving mastery or criterion tests?
- Is the trainee familiar for skipping skills when appropriate?

Remediation and Intervention Techniques
- Can you model the remed or specific technique yourself?
- In light of the trainee's current skills, have you chosen a remedy that he or she can implement?
- Are you providing enough practice for the trainee (e.g., before and after teaching, at another time in the day)?
- Are you consistent in your recommendations?
- Are you following up in subsequent sessions to see if the remedy is maintained?
- Can you fade your direct assistance appropriately?

Verbal Communication
- Is the trainee comfortable when you supervise and give feedback?
- Is your feedback clear, concise, and specific?
- Do you maintain eye contact?
- Do you check to make sure that the trainee understands the feedback?

Written Communication
- Are you limiting your recommendations (maximum of 3)?
- Do the recommendations refer to learner performance?
- Are you reinforcing trainee improvement?
- Are you using the trainee's own words, concepts, and specific?
- Are you following up on your recommendations in later observations?

Figure 3. Technical Assistance Form

Observation of:
- Date:
- Subject Taught:
- Supervisor:
- Well Implement Teaching Skills:
  - Following Formations
  - Maintaining a Good Pace
  - Correcting Errors
  - Planning Students on Weak Skills

Further Comments:

Recommendations for Improvement:

A similar pattern is established in the college teaching. Second year graduate students enroll in two terms of practice in college teaching and work closely with a third year graduate student — typically, the instructor for the course — and a faculty member. In this practice, the second year student will prepare some course materials and teach several sections of the course lectures. Each activity is reviewed beforehand by the course instructor, and lectures are critiqued afterwards.

In the second term, the second year graduate student teaches the entire class, with frequent visits by a faculty member. Lecture style, appropriateness of class activities and assignments, etc., are critiqued. Not only is the graduate student given the experience of college level teaching, but also the opportunity to transfer the knowledge obtained from supervision and instructional design coursework to lectures and activities in the course. This knowledge goes well beyond entertaining anecdotes, and graduates are more likely to infuse lectures with specific examples of errors mildly handicapped students typically make at different points in a curriculum, methods for correcting these errors, strategies for teaching various skills, etc. In this way, experiences in supervision and inservice training fold over into college teaching, allowing the graduate student to use his or her supervision training in a broader context.

Research Training

For those students pursuing a doctoral degree, a range of research activities occur over the three years of their program. Coursework is in statistics, research design, and computer-based instructional research by the foundation. Next, they assist in at least one research project — either a project being conducted by a faculty member or another graduate student’s dissertation. Throughout this research practicum, the student helps develop curriculum, measures used in the study, and teach one of the experimental conditions.

The final research activity is the dissertation. The very nature of the program and the amount of experience up to the point of a dissertation make an instructional issue — usually examined through an experimental study — the most likely topic. Recent dissertation work has been in reading comprehension, math word problems, coaching techniques for in-service training of paraprofessionals, and instructional design issues in CAL. A dissertation of this kind provides opportunities for students to participate in the process of detailed knowledge of effective instruction with research skills in a sophisticated fashion.

In virtually all cases, the dissertation research has led to publication in a professional journal.

Conclusion

The graduate program at the University of Oregon trains special education leaders who are knowledgeable in the day-to-day details of instruction. The training — which includes initial and advanced supervision, collective instruction, and research activities — is contingent upon the commitment of a core faculty to a specific area of instruction, leadership, and content. The program then considers implementation of the research on effective teaching practices by both special and regular educators as a paramount concern. The program requires cooperation with the master’s level special education practice in direct instruction for teacher trainers and highly skilled cooperating teachers in the local schools.

By focusing on the learners, the graduate student in our program develops an understanding of the intricate relationships between the actions of the supervisor, the teacher trainee’s instruction, and the performance of the handicapped students being taught. Training with this kind of focus enables the special education leader to offer detailed, effective solutions to instructional problems that typically occur in the classroom. These skills are essential for those who return to their districts after a year or two of training to act as resource consultants, as well as for those graduates of the doctoral program who become faculty in teacher training institutions or take on administrative positions in the public schools.

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—less time than the least effective teachers, but still a substantial amount of time. Good and Grouws (1977), however, observed very low amounts of development time in elementary school classes. In fact, the lowest goal of their intervention program, designed for use in several experiments, was to get teachers to spend at least five minutes on development before next week. In another study (Gall, Fielding, Schaloek, Charters, and Wilczynski, 1984) in which time spent on development was measured precisely, elementary teachers were found to spend only an average of 12 minutes on the development phase of their math lessons. By this standard, the 29 minutes spent by the most effective teachers was very substantial. Furthermore, the effective teachers used the development phase in ways that were likely to promote learning — allocating time for review of previously learned concepts, controlled practice, and directing questions to many students.

The real problems aren’t not to be developed, but rather with rework. The least effective teachers spent only minutes on rework. This seems hardly enough time for students to practice algebra skills. Even the six hours spent by the most effective teachers does not seem excessive considering that the lessons lasted 50 minutes. It appears that, that least effective algebra teachers spend too much time talking and not enough time allowing students to practice their algebra skills. The tendency to talk excessively was a phenomenon observed by Keylilba (1989) in a study comparing verbal behavior of algebra and social studies teachers. He found that algebra teachers talked much of the lesson, even more so than social studies teachers.

The strong positive correlation for the number of mathematics was surprising. In fact, during data collection the observers commented to each other that they were finding little evidence of variety of instruction among the teachers they observed. Further research is needed to better understand what variety of algebra instruction means.

Classroom management was found to have an effect on student learning in basic algebra classes but not in the intermediate algebra classes reported on here. This lack of effect can be explained by the characteristics of students who take intermediate algebra. Generally, they are college-bound students who understand the importance of obtaining a satisfactory grade in this course. Therefore, effective classroom management would not be necessary to keep these students motivated and on task.

The negative correlation for number of students missing class is not surprising: if students miss class, they have less opportunity to learn and practice algebra skills. It is not clear, however, why students miss class. Is it because of teachers’ management policies or weak instruction? Is it because they are doing poorly in the class and so find attending class is aversive? Or is some other factor involved? The present study does not provide an answer to these questions.

A positive effect for lower-cognitive (i.e., motive application) questions, approaching statistical significance, was found. Higher-cognitive questions were neither effective nor ineffective. Since the creation algebra test consisted entirely of items measuring routine application of algebra skills, lower-cognitive questions would be appropriate for fostering such skills. We do not know what types of instructional practices might be effective if a test of algebra problem-solving had been administered as a criterion measure of achievement in the course. The observers found virtually no instruction in problem solving, so administration of such a test probably would not have been appropriate in this study.

The many significant correlations obtained in this study demonstrate the utility of instructional variables found to be effective in previous research on teaching. However, the relationship of some of these variables to student achievement gains was different in this study than in previous research. It appears that a general model of effective instruction, such as the direct instruction model proposed by Rosenshine, may need to be modified when applied to a particular type of teacher (in this case, algebra teachers) and a particular type of learner (in this case, motivated college-bound students).

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