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Direct instruction is successful in raising test scores.

CAMDEN DIRECT INSTRUCTION PROJECT 1984-1985

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This report describes the rationale for the Camden Direct Instruction project and two studies that were completed by the project in the 1984-1985 school year. The first study concerns the improvement of reading instruction. The second study concerns the use of Direct Instruction in “transitional classrooms.”

RATIONALE: CHOICE OF INTERVENTION STRATEGY

Prior to 1978, behaviorally based improvement efforts in Camden had focused on changing teacher behaviors in classrooms that used a traditional basal-dominated instructional model. Adding systematic reinforcement techniques and precision teaching (Brent, 1977) to these classrooms helped accelerate student learning in a few areas but appeared to have only minor effects on total student learning. It seemed that if the curriculum could be directly modified, student improvement would be much

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greater. But how to modify the curriculum significantly, in a manner that was locally acceptable, was not known.

Finally in 1978, Direct Instruction materials began to be used in an attempt to change the curriculum. The Direct Instruction materials and accompanying classroom management and teacher presentation techniques brought a complete systematic instructional program to Camden.

Choosing Direct Instruction to improve student learning was difficult as it is an intact system that forces many changes in traditional classroom practices (Gage, 1985). New instructional materials are introduced to the classrooms. Teachers must become familiar with the materials and learn the teacher presentation and classroom management skills that are specific to the new system (Siegel, 1977). The new instructional materials are the key to the change as they substitute *effective* materials for the traditionally used basals but the content must be presented well so that it reaches the students.

The Direct Instruction materials differ from the majority of instructional materials that are often poorly designed (Collins, 1983; Engelmann, 1982; Holland, 1976; Silbert et al., 1981) and rarely if at all tested (Gall, 1981). Direct Instruction has a clearly defined set of principles governing the design of materials and associated teaching procedures. Characteristics include "specifying objectives, analyzing the objectives into teachable component groups, identifying preskills, selecting examples and sequencing examples" (Becker and Carnine, 1980). The program also features small student-teacher ratios, teacher-directed small group instruction, signal systems, positive reinforcement, immediate corrective feedback, and extensive teacher training. The materials are highly structured scripts for the teachers and include a careful selection of examples for the pupils. Direct Instruction has been extensively field-tested and is effective (Cotton and Savard, 1982).

The Direct Instruction system began in the early 1960s (Becker et al., forthcoming). The most comprehensive use has been in the Follow Through Program. Here Direct Instruction has been used to teach reading, language, and mathematics to K-3 students. This application has been fully described and extensively evaluated.

Follow Through is the model that the Camden project uses as a standard to measure its replication efforts.

Due to a lack of resources, Camden has never fully replicated the Follow Through model. Despite this deficiency, the Camden Direct Instruction Project has been able to achieve dramatic results. The discrepancies between the Follow Through model and Camden's replications suggest that the level of pupil achievement reported in this article can still be improved.

READING IMPROVEMENT STUDY

The Direct Instruction Reading Mastery basal series is used in a small number of elementary classrooms in grades 1-3. It is primarily used with small groups of low achievers. This analysis is based on data from the second-grade students because standardized testing is begun at this grade level. Also, the number of students involved in Direct Instruction is a large enough sample to study using conventional statistical techniques.

The second-grade experimental students consisted of two distinct groups. One group had received instruction in Reading Mastery in grades 1 and 2 from inexperienced Direct Instruction teachers. These teachers were using Direct Instruction for the first time. The other group received instruction from experienced Direct Instruction teachers in both grades 1 and 2. The teachers had used Direct Instruction for more than one year. All the students in the control groups were in classrooms with experienced traditional teachers. The experimental experienced teacher group had 32 students, the inexperienced experimental had 26, and the two control groups had 33 and 29 pupils.

All Reading Mastery teachers used the program as specified in the directions. They received a training workshop prior to using the program and several on-site clinical supervision visits.

RESULTS

Students in the second grade were routinely tested in October and April with the Comprehensive Test of Basic Skills Level D,

Form U. The test provided four scores related to reading instruction. They were word attack, vocabulary, comprehension, and total reading. Scale scores were chosen as the unit of analysis. The test scores from the April administration were analyzed using the October scores as a covariate. A separate 2×2 (treatment by years of teaching Reading Mastery) analysis of covariance was used for each of the four measures. With 1 and 120 degrees of freedom the F value needed for significance at the .05 level is 3.92.

Each of the four measures yielded significant differences in the two main effects and significant interactions. The Reading Mastery treatment was higher than traditional basal reader instruction. The years of experience treatment was significantly higher for teachers who had two years of experience with Reading Mastery than for teachers with one year of experience. However, an analysis of the interactions revealed that the Reading Mastery group taught by teachers with two years of experience accounted for the significant main effects. Post hoc comparisons with Tukey's HSD test indicated the two year Reading Mastery group was significantly higher than the other three groups. There were no other differences between the group means. Results are presented in Table 1.

Table 1 contains the adjusted means, standard deviations, F values for interactions, and the CTBS Norm Means for each of the four measures. The table also contains the percentile ranks for the corresponding scale means. In each comparison, the second-year Reading Mastery group is significantly higher than the other three groups. The percentile ranks of the second-year Reading Mastery group is near the national average whereas the percentile ranks of the other three groups is below. Although not presented here, an analysis of October means, gain means, and unadjusted April means strengthens the inference that the Reading Mastery was a more effective program of instruction for the second-year group. The gain means and unadjusted April means follow the same pattern as the adjusted April means. The analysis of the October means indicated that the two-year treatment groups were significantly higher for word attack ($F = 12.28$), vocabulary ($F = 13.73$), and total reading ($F = 6.56$).

TABLE 1
Means, Standard Deviation, and Percentile Ranks on CTBS Reading

	Reading Mastery N=59		Basal Reader N=60		Interaction F	CTBS National
	Year 2	Year 1	Year 2	Year 1		
<u>Word Attack</u>						
Mean	614	554	539	538	7.35	618
SD	85	70	92	86		
% Rank	48	21	17	16		
<u>Vocabulary</u>						
Mean	565	523	518	521	6.14	582
SD	57	48	47	73		
% Rank	40	22	20	21		
<u>Comprehension</u>						
Mean	581	499	505	491	7.01	578
SD	61	65	88	77		
% Rank	51	17	19	16		
<u>Total Reading</u>						
Mean	571	515	507	507	8.85	582
SD	52	50	65	69		
% Rank	44	21	18	18		

TRANSITIONAL CLASSES

Transitional classes, alternatives to regular first and second grades, are designed to meet the needs of students who experience developmental lag and/or maturational lag. Because their development is progressing at slower than normal pace, they are unable to master a predetermined set of skills necessary for promotion. These students require additional time to acquire specific learning tasks.

Placing children in transitional classes achieves the following:

- (1) provides more time for the instructional process to evolve,
- (2) allows for a period of maturation,
- (3) provides concentrated remedial instruction,
- (4) removes the stigma of retention,
- (5) reduces the number of referrals to special education, and
- (6) serves as an intermediate step for classified and declassified children.

The basic differences between regular first and transitional classes are methodology, class size (no more than 20), and pace. Skills are taught developmentally through highly structured and scripted instructional programs. The pace is geared to the needs of a particular group of students. A great deal of positive encouragement is given.

Students were chosen for the transitional classes on the basis of their kindergarten achievement, a system-developed checklist, and teacher judgment. The four classes were able to include 76 out of 107 identified children. The other 31 were placed in regular first-grade classrooms.

The transitional classrooms were designed to reflect the Direct Instruction Follow Through model. The classes focused on teaching reading, language, and mathematics using the SRA Distar materials. But due to a lack of resources, the classes could not completely adopt the Follow Through model. Language and mathematics were taught to the whole group rather than small groups. Instead of two full-time aides, each class had one part-time aide. Teachers had much less training and supervision. A schedule and list of instructional materials is shown in Table 2.

Regular classrooms in Camden use traditional basals, one part-time aide, and have 25-30 students in them. The teachers use traditional classroom management and teaching practices.

Promotion to the second grade is based on the following guidelines:

<i>Task</i>	<i>Criterion</i>
Reading Inventory Test	75%
Reading Level Completed	Primer
Reading the Dolch Primer list	100%

RESULTS

Table 3 illustrates the promotion data for the identified low achievers. Of the transitional class students, 78% were promoted. Of the low-achieving students from the control classrooms, 0% were promoted. Although a true experimental study was not conducted, the results are so dramatic that the school system can say that the transitional class model is an unqualified success.

TABLE 2
Daily Schedule

<u>TIME</u>	<u>ACTIVITY</u>
8:30 - 8:40	Pupil Preparatory Period
8:40 - 8:45	Opening Exercises
8:45 - 9:15	Reading Mastery - Group I
9:15 - 9:45	Reading Mastery - Group III
9:45 - 10:15	Reading Mastery - Group II
10:15 - 10:35	Recess and P.E. (Gross Motor Skills)
10:35 - 10:50	Penmanship
10:50 - 11:30	Distar Arithmetic
11:30 - 11:35	Preparation for Dismissal
11:35 - 12:30	Lunch
12:30 - 1:30	Reading Mastery (all groups)
1:30 - 1:50	Recess and P.E. (Gross Motor Skills)
1:50 - 2:10	Distar Language
2:10 - 2:50	Unit Study (Science, Social Studies, Art, Music, and Fire Prevention)

<u>SUBJECT</u>	<u>MATERIALS</u>
Reading	SRA Reading Mastery
Arithmetic	SRA Distar Arithmetic
Language	SRA Distar Language
Penmanship	Zaner-Bloser Penmanship
Social Studies	Unit Study (Curriculum Guide)
Science	Unit Study (Curriculum Guide)
Health	Elementary Health Guide
P.E./Motor Skills	Elementary Motor Skill Development Handbook

Art and Music are integrated with other disciplines

TABLE 3
Number of Students Promoted

Transitional Classes:

Total in Classes	= 76
Total Promoted to Second Grade	= 59
Total Going to Regular First	= 17
Improvement Greater than 50 Points on Reading Inventory Test	= 53

Regular Classes:

Total in Lowest Performing Groups	= 31
Total Promoted to Second Grade	= 0
Total Retained	= 31
Improvement Greater than 50 Points on Reading Inventory Test	= 2

DISCUSSION

The two studies in this report used Direct Instruction, a well-tested instructional system. Superior results were expected in Camden if the Direct Instruction programs were actually taught, that is, taught as well as in the situations in which the programs were originally validated.

As discussed above, Camden approached but did not meet the standards set by Follow Through. The student data correlate with the quality of the application. When the Follow Through standards are approached, student scores are highest. For example, student achievement with experienced Direct Instruc-

tion teachers was superior to student achievement with inexperienced Direct Instruction teachers. More precise measures of teacher performance than years of experience are available (Gersten and Carnine, 1982) but were beyond the resources of this project.

RECOMMENDATIONS

This report, last year's report (Brent and DiObilda, 1984), and published reports on Direct Instruction lead to the conclusion that for Camden, Direct Instruction is a system that accelerates elementary-student skill acquisition in reading. The system works if the Follow Through implementation standards are met or at least approached. It works if used as intended.

The major reason for the success of the Direct Instruction system, in comparison with the traditional, is the use of instructional materials that are developed in accordance with effective design principles (Becker et al., forthcoming). In other words, traditional textbooks are replaced with superior instructional materials. In addition, compatible and effective teacher presentation skills and classroom management practices are used. All parts of the system—materials, presentation skills, and classroom management practices—must be used proficiently to achieve superior results. The outcome of the present study indicates that student achievement is higher with teachers who are more experienced with Direct Instruction.

Additional studies in Camden that compare Direct Instruction to traditional approaches are not needed if resources are limited. Camden resources would be used better to ensure that the Direct Instruction classes meet and then maintain the Follow through standards. Of primary concern are the following:

- (1) Providing continued assistance to teachers so that they can reach proficiency levels in teaching Direct Instruction programs. With adequate training and supervision, teachers should reach proficiency in two years (Gersten and Carnine, 1982). Direct Instruc-

- tion materials provide a clear presentation of concepts but these are lost if they don't reach the students.
- (2) Allowing students to have several consecutive years of Direct Instruction. Students starting Direct Instruction in kindergarten have an advantage that is reflected in later grades on standardized test scores (Becker and Carnine, 1980).
 - (3) Emphasizing the use of Direct Instruction for all students in a given classroom. The system works for low, average, and high students (Becker et. al, forthcoming). Teachers will have a better chance to become proficient if they can prepare for a single effective program rather than multiple programs.
 - (4) Using Direct Instruction programs in several content areas. The Direct Instruction language and mathematics programs have not been used extensively in Camden but national research data indicate that their use will result in increased student learning. According to the published research, the language and mathematics standardized test scores should exceed those attained in reading (Becker and Carnine, 1980). Also, a teacher trained in one program can easily use others.

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