DOCUMENT RESUME

ED 236 552/ CS 007 338

AUTHOR Romberg, Thomas A.; and Others
TITLE Reading Instruction in IGE and Non-IGE Schools. Report from the program on Student Diversity and School Processes. Working Paper No. 318.
INSTITUTION Wisconsin Center for Education Research, Madison.
SPONS AGENCY National Inst. of Education (ED), Washington, DC.
PUB DATE Feb 82
GRANT NIE-G-81-0009
NOTE 158p.
PUB TYPE Reports - Research/Technical (143) -- Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC07 Plus Postage.
DESCRIPTORS Classroom Observation Techniques; Comparative Analysis; Elementary Education; Grade 2; Grade 5; *Instructional Materials; *Program Evaluation; *Reading Instruction; Reading Research; *Reading Skills; Research Methodology; Student Needs; *Teaching Methods
IDENTIFIERS *Individually Guided Education; *Wisconsin Design for Reading Skill Development

ABSTRACT

As part of a larger evaluation of the Individually Guided Education (IGE) system in Wisconsin elementary schools, a comparative study was conducted of the effectiveness of reading instruction and the Wisconsin Design for Reading Skill Development (WDRSD) program in IGE and non-IGE settings. Data on students in grades five and two in 11 different schools were collected from achievement monitoring tests, classroom observations, teachers' logs, and observers' interviews with teachers and principals. Analysis of the data, which failed to reveal significant, consistent patterns across the 22 classrooms, indicated that WDRSD use and reported IGE adoption were not good indicators of instructional patterns in reading skills. Although second grade classrooms emphasized word attack skills, for example, fifth grade classrooms showed little consistent emphasis on any objectives. Classrooms at both grade levels revealed no linear relationship between time allocated to skill development and student needs. The lack of significant findings suggested that schools adopting the IGE system or the WDRSD materials may not always have reflected the underlying concepts guiding the developers of the programs or materials. (MM)

Working Paper No. 318

READING INSTRUCTION IN IGE AND NON-IGE SCHOOLS

by

Thomas A. Romberg, Deborah M. Stewart, Norman L. Webb,
Anne G. Nerenz, Mary Pulliam, and Dinesh Srivastava

Report from the Program on
Student Diversity and School Processes

Wisconsin Center for Education Research
The University of Wisconsin
Madison, Wisconsin

February 1982

The research reported in this paper was funded by the Wisconsin Center for Education Research which is supported in part by a grant from the National Institute of Education (Grant No. NIE-G-81-0009). The opinions expressed in this paper do not necessarily reflect the position, policy, or endorsement of the National Institute of Education.

Wisconsin Center for Education Research

MISSION STATEMENT

The mission of the Wisconsin Center for Education Research is to understand, and to help educators deal with, diversity among students. The Center pursues its mission by conducting and synthesizing research, developing strategies and materials, and disseminating knowledge bearing upon the education of individuals and diverse groups of students in elementary and secondary schools. Specifically, the Center investigates

- diversity as a basic fact of human nature, through studies of learning and development
- diversity as a central challenge for educational techniques, through studies of classroom processes
- diversity as a key issue in relations between individuals and institutions, through studies of school processes
- diversity as a fundamental question in American social thought, through studies of social policy related to education

The Wisconsin Center for Education Research is a noninstructional department of the University of Wisconsin-Madison School of Education. The Center is supported primarily with funds from the National Institute of Education.

Table of Contents

	Page
List of Tables	vii
List of Figures	ix
Abstract	ix
I. Introduction to the Study	1
An Overview of the Evaluation Project	1
Individually Guided Education	3
Overview of Phase IV	7
Model for Phase IV	9
The WDRSD Program	10
II. Design of the IGE/WDRSD Comparative Study	17
Research Questions	17
The Basic Design	19
Data Aggregation and Scaling	24
The Analysis Plan	38
III. Schools and How They Group	41
School Descriptions	41
IGE/WDRSD	41
IGE/non-WDRSD	46
Non-IGE/WDRSD	49
School Scores	53
IGE/WDRSD	55
IGE/non-WDRSD	56
Non-IGE/WDRSD	57
Cluster Analysis	58
VI. Time Use in Grade 2	65
Allocated Time	66
Proportion Observed	71
Nonapplied Time, Available Time, and Engaged Time	75
Means of Instruction	78
V. Time Use in Grade 5	81
Allocated Time	82
Proportion Observed	87
Nonapplied Time, Available Time, and Engaged Time	87
Means of Instruction	95

Table of Contents (continued).

	Page
VI. Achievement Results	99
Achievement Gains: Real and Relative	99
Grade 2	103
Grade 5	108
VII. Predictive Results	113
Grade 2	113
Grade 5	115
VIII. Summary	121
General Findings	122
Specific Findings	123
Limitations	124
Conclusions	125
References	127

List of Tables

Table		Page
1	WDRSD Skills by Element and by Traditional Grade Level	14
2	Student Achievement Variables for the IGE/WDRSD Comparative Study	30
3	Background and Program Use Variable Scores for Label Groups	54
4	Background and Program Use Variable Scores for Cluster Groups	61
5	Grade 2 Allocated Hours of Reading Instruction per Child over the Total Study Period, by Objective	67
6	Relationship of Allocated Time to Observed Time by Objective	72
7	Nonapplied Time, Available Time and Engaged Time as a Percentage of Observed Allocated Time, Grade 2	76
8	Estimated Hours Allocated and Engaged for Each Child Each Week, Grade 2	77
9	Instructional Process Variables as a Percentage of Available Time, Grade 2 Reading	80
10	Grade 5 Allocated Hours of Reading Instruction per Child over the Total Study Period, by Objective	84
11	Relationship of Allocated Time to Observed Time by Objective	88
12	Nonapplied Time, Available Time and Engaged Time as a Percentage of Observed Allocated Time, Grade 5	92
13	Estimated Hours Allocated and Engaged for Each Child Each Week, Grade 5	94
14	Instructional Process Variables as a Percentage of Available Time, Grade 5	96
15	Number of Items Contributing to Achievement Scores for the IGE/WDRSD Comparative Study	100
16	Achievement Results for the Grade 2 Schools	104

List of Tables (continued)

Table		Page
17	Achievement Results for the Grade 5 Schools	109
18	Data Summary for Objective 13, Word Attack, Grade 2	114
19	Data Summary for Objective 14, Study Skills, Grade 2	116
20	Data Summary for Objective 15, Comprehension, Grade 2	117
21	Data Summary for Objective 13, Word Attack, Grade 5	118
22	Data Summary for Objective 14, Study Skills, Grade 5	119
23	Data Summary for Objective 15, Comprehension, Grade 5	120

List of Figures

Figure		Page
1	Framework for an IGE evaluation	5
2	Phase IV model of anticipated relationships between variables	11
3	Observation periods and test times for the study	29
4	Cluster groups and distances	60
5	Achievement on vowels at times 1 and 8	102
6	Achievement on vocabulary meaning at times 1 and 8	102

Abstract

The report summarizes the data from a comparative study of Grades 2 and 5 reading instruction and the use of the Wisconsin Design for Reading Skill Development (WDRSD) in IGE and non-IGE settings. These results are part of a five-phase evaluation of the IGE system of elementary schooling. Use of the WDRSD and reported adoption of IGE were not found to be good indicators of instructional patterns in reading skills. At Grade 2, the instructional emphasis was on word attack skills; at Grade 5, there was no pattern across schools. Although a lower limit on allocated time is needed to increase achievement on any objective, the relationship between allocated time and achievement is not linear.

I

Introduction to the Study

This paper reports the results from one of two comparative studies which were a part of Phase IV of the Individually Guided Education (IGE) Evaluation Project. Phase IV was one of five related phases comprising an extensive evaluation of IGE. This report summarizes the data from a comparative study of reading instruction and the use of the Wisconsin Design for Reading Skill Development (WDRSD) in IGE and non-IGE settings. These results should be seen as a part of a larger evaluation of the IGE system of elementary schooling.

An Overview of the Evaluation Project

Through the combined efforts of the Wisconsin Research and Development Center for Individualized Schooling, the University of Wisconsin IGE Teacher Education Project, the Kettering Foundation (I/D/E/A), and IGE coordinators in 25 states, more than 2,000 elementary schools have adopted a system called Individually Guided Education.

The purpose of the IGE Evaluation Project, which began in 1976, was twofold. First, we intended to evaluate IGE to gain a more comprehensive view of the system's operation and effectiveness. Second, we hoped to identify which features contribute most to the success of reading and mathematics instruction as a result of a reform/change model, and to use the findings to study larger theoretical issues about instructional variables, curriculum planning, school change, and so forth.

The work of the project was separated into five phases. Phase I was a large sample study which provided basic information about IGE schooling. Certain features of IGE schooling were reputedly crucial to IGE success, and the purpose of Phase I was to examine the extent to which those features had been implemented in IGE schools and to assess the effectiveness of that implementation. Information was obtained from the staffs of approximately 155 IGE schools using self-report surveys and from students using standard paper-and-pencil instruments. The data were intended to provide a functional understanding of IGE features, processes, and outcomes by relating a broad scope of variables in an interpretative manner (Price, Romberg, & Janicki, 1981).

Phase II verified and extended the self-report data gathered in Phase I to include more fully the range of variables that determine the process of schooling (Ironside & Conaway, 1979).

Phase III focused on the social meaning which emerges as IGE is implemented on a day-to-day basis. The problem of understanding the impact of educational reform can be approached by viewing schools as social institutions whose characteristics shape and are shaped by the behaviors of their members. This focus allows us to think of a school as a complex social arrangement consisting of underlying patterns of conduct which channel thought and action within that setting (Popkewitz, Tabachnick, & Wehlage, in press).

Phase IV was designed to examine how effectively the three curricular programs (prereading, reading, and mathematics) developed for IGE meet their objectives and to investigate the relationship of instructional time and means of instruction to pupil outcomes.

Finally, the goal of Phase V is to synthesize the results of Phases I through IV and to address the significant issues in contemporary schooling raised by the project as a whole. Thus, each phase of the evaluation was designed to complement and strengthen the validity of the data gathered by the previous phases. For example, data on means of instruction, gathered by the large-sample study of Phase I, were examined in somewhat greater depth in fewer schools by the Phase II studies. Phase III's analysis developed a view of instruction from a different perspective. Phase IV explores means of instruction in reading and mathematics. Phase V was designed to integrate and interpret the data from all the preceding phases into a series of statements of the project's implications for educational issues.

Individually Guided Education

IGE is a complex system based on theoretic and pragmatic ideas about schooling, children's learning, and the professional roles of school staffs (Klausmeier, 1977). This system has seven components:

1. Multiunit organization
2. Instructional programming for the individual student
3. Assessment and evaluation for educational decision making
4. Curricular and instructional materials and activities for each child's instructional program
5. Home-school-community relations program
6. Facilitative environments for professional growth, and
7. Continuing research and development for system improvement

To relate these seven components, a descriptive framework was developed that considers outcomes of IGE as a function of both instructional means and the degree of implementation (Romberg, 1976). Four types of variables were identified to guide the evaluation of IGE: pupil and staff outcomes, means of instruction, support systems, and pupil and staff background. Figure 1 shows how the four types of variables were related.

1. Pupil and staff outcomes, and the extent to which these outcomes have been attained, should be the initial basis of an IGE evaluation. Both pupil and staff outcomes are illustrated in Figure 1 as being multivariate and multilevel. In this study a set of curriculum-specific pupil achievement scores in reading was used.

2. The instructional means of formal schooling must be a second basis for an evaluation of IGE. It has been fashionable in evaluation circles to concentrate on ends or outcomes and to ignore the means by which they are reached. Reform movements, such as IGE, invariably attack the properties of means. To this extent judging the value of the means is as important as assessing outcomes.

The means of instruction considered in the evaluation project were separated into three sets of activities based upon the operating characteristics of IGE schools: staff activities of the Instructional Improvement Committee (IIC) and the Instruction and Research Units (I&R Units), activities of the staff teacher both in curriculum management and pupil interactions, and activities of pupils related to reading and mathematics instruction.

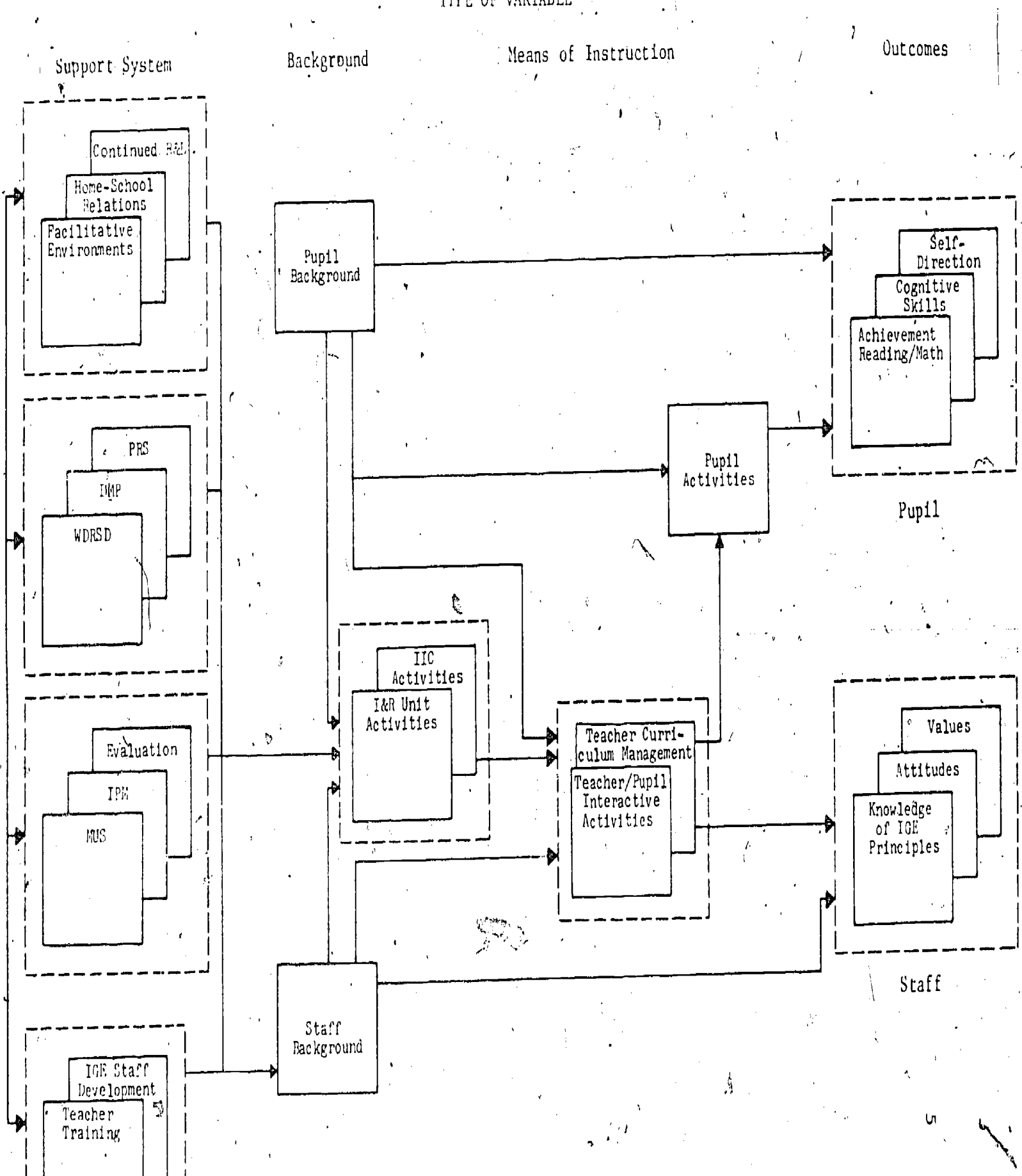


Figure 1. Framework for an IGE evaluation (Romberg, 1976).

3. Both pupil and staff backgrounds are shown as influencing means of instruction and outcomes. Also, staff background is in turn influenced by training in the support systems. For pupil background both initial achievement and demographic data were collected.

4. The degree and manner in which support systems of IGE have been incorporated and developed in a school must be judged. The seven components of IGE have evolved as practical ways of supporting new instructional methods, which in turn produce desired pupil and staff outcomes. It can be argued that the efficiency of an IGE school depends upon the components implemented and the manner in which they are operating.

The support systems for an IGE learning environment were separated into four categories as indicated in Figure 1. The second category, curricular materials compatible with instructional programming and evaluation (IGE Component 4), is shown by identifying the three major curricular products developed for IGE, the Wisconsin Design for Reading Skill Development (WDRSD) (Otto, 1977), Developing Mathematical Processes (DMP) (Romberg, 1977), and the Pre-Reading Skills Program (PRS) (Venezky & Pittelman, 1977). The functional relationships illustrated in Figure 1 convey the following premises: (a) the degree to which IGE support systems have been implemented, together with pupil and staff backgrounds, directly influences the means of instruction in an IGE school; and (b) the means of instruction, along with pupil and staff backgrounds, account for pupil and staff outcomes.

Although much has been written about the conceptual background of IGE, no comprehensive picture now shows how IGE has been implemented

in elementary schools. Thus, the IGE Evaluation Project was designed to gain a more comprehensive view of the system's operation and effectiveness. The desired outcome is to identify which features contribute most to the success of reading skills and mathematical instruction as a result of individualized schooling.

Overview of Phase IV

The intent of Phase IV was to describe in considerable detail the actual operating characteristics of a sample of schools which were using curriculum materials designed to be compatible with IGE. Phase IV was restricted to the investigation of three groups of variables--pupil outcomes, instructional time, and means of instruction--in IGE and non-IGE settings in which the Center's curriculum programs as well as alternative curriculum materials were being used. Pupil attainment of program objectives is the main variable. The other two variables, instructional time and means of instruction, are essential in explaining and understanding how the programs work and how objectives are attained. These two variables are also important from a practical point of view because they can be manipulated by teachers. Describing the use of each program in terms of allocated time, engaged time, and instructional activities provides concrete factors that teachers can work with (Webb & Romberg, 1979).

In addition, instructional time was included because of recent studies and reviews that stress its importance and its relationship to pupil outcomes (Harnischfeger & Wiley, 1975; Rosenshine, 1977; McDonald & Elias, 1976; Fisher et al., 1975). As Harnischfeger and Wiley state,

"All influences on pupil achievement must be mediated through a pupil's active and passive pursuit" (1975, p. 15). Certainly, there is enough evidence to suggest that instructional time is an important measure of pupil pursuits. Its use as a variable in Phase IV, then, had two purposes. First, the amount of time during which students are actively engaged in learning when using one of the three programs is a means of describing how the programs are being used. The assumption is that the programs should maximize student engagement by attending to the individual's needs. Second, Phase IV provided an excellent opportunity to study in more detail the relationship of pupil outcomes to instructional time.

In summary, the primary purposes of Phase IV were:

1. to determine the degree to which WDRSD and DMP meet their goals of having students master specified objectives and skills
2. to determine how time is allocated for instruction in implementing WDRSD and DMP
3. to relate instructional time to the means of instruction and mastery of content for WDRSD and DMP, and
4. for each curriculum program, WDRSD and DMP, to contrast two situations--IGE schools using the program with non-IGE schools using the program and IGE schools using the program with IGE schools using alternative programs--on the variables of pupil outcomes, instructional time, and means of instruction

Five studies were conducted as part of Phase IV, three descriptive studies and two comparative studies. The descriptive studies were small sample studies designed to describe how the curriculum programs DMP, WDRSD, and PRS were being used in IGE schools. The studies were conducted during the winter and spring of 1978 at two IGE schools

using DMP (Webb, Nerenz, Romberg, & Stewart, 1980), two IGE schools using WDRSD (Nerenz, Webb, Romberg, & Stewart, 1980), and three IGE schools using PRS (Stewart, Nerenz, Webb, & Romberg, 1980). The two comparative studies also focused on the use of WDRSD and DMP in IGE settings. This report is on the use of WDRSD.

Model for Phase IV

A structural model for predicting student achievement was developed for Phase I (Price, Janicki, Howard, Stewart, Buchanan, & Romberg, 1978) from the three premises on which IGE is based.

1. Certain organizational features make it more likely that certain desirable instructional practices will occur. These organizational features also make it more likely that the staff will be satisfied with their jobs.

2. The use of certain curriculum materials and associated systems of information collection and record keeping makes it more likely that certain desirable instructional practices will occur.

3. Those instructional practices which are deemed desirable in IGE make high student achievement more likely. They also make it more likely that desirable changes in other student characteristics, such as self-perception and locus of control, will occur.

Phase IV was designed to provide more detail on the last two premises posed in Phase I, with specific attention paid to means of instruction and curriculum-related student achievement, while providing sufficient background information that each school in the smaller Phase IV sample might be related on several significant dimensions to the findings of the larger Phase I sample. Thus, some information was collected on five of the six school-wide variables used in Phase I--General Implementation of the Instructional Programming Model (IPM), Intraorganizational

Structure (IOS), Procedures Fostering Coordination and Improvement of the School Program (GOS), Interorganizational Relations (IOR), and General Staff Background (GSB). In Phase IV the program use variables--Curriculum Implementation and Program Customizing--included the kinds of information provided in the Phase I curriculum-specific variables. More detailed information about classroom procedures and achievement outcomes was also collected in Phase IV. A model depicting the Phase IV variables and the anticipated relationships is shown in Figure 2.

Four groups of variables are shown in Figure 2--school background, curriculum program use, classroom activities, and pupil outcomes. As stated above, the school variables, which were assessed through structured interviews with school staff, provide a link between the Phase IV sample and the larger Phase I sample. Curriculum program use variables, also measured through structured interviews, have a linking function to Phase I and provide a descriptive background for the measures of classroom procedures. These procedures were assessed through logs maintained by teachers for selected students and through observations in the classrooms; means of instruction and the use of instructional time are detailed measures of how programs are used in classrooms and relate directly to pupil attainment of objectives. Pupil outcomes were specified in terms of stated objectives of WDRSD and were assessed through achievement monitoring procedures.

The WDRSD Program

In order to better understand the data gathering procedures used in this study, a brief introduction to the Wisconsin Design for Reading

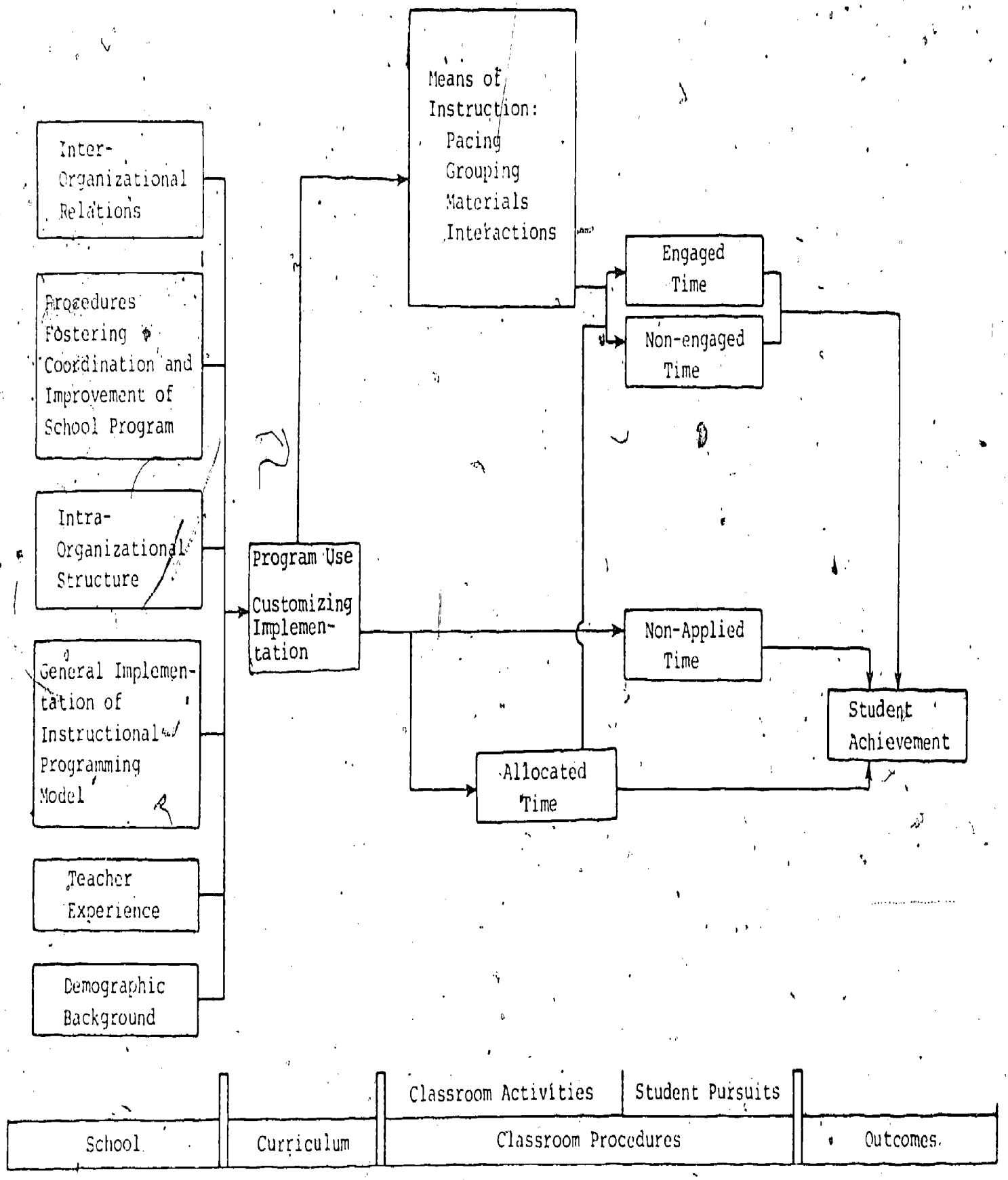


Figure 2. Phase IV model of anticipated relationships between variables (Romberg, Webb, Stewart, & Nerenz, 1980, p. 24).

Skill Development (WDRSD) may be helpful. The WDRSD is an objective-based system that was developed to provide both structure and substance for an elementary school reading program to be compatible with the components of IGE. The focus is on developing the essential subskills of reading, which once acquired and applied enable students to read successfully. It has four fundamental purposes:

1. to identify and describe instructional objectives for the skills which appear essential for competence in reading
2. to assess individual pupils' skill development status
3. to manage instruction of children with different skill development needs, and
4. to monitor each pupil's progress (Otto & Askov, 1974)

The WDRSD provides a framework for teaching reading skills as the basis of a curriculum in which individual differences in students' rate and style of learning are accommodated. This organization of instruction includes five major operations:

1. identification of a list of essential reading skills, with consensual, historical, and/or empirical support
2. statement of objectives specifying the criterion behaviors related to each skill
3. assessment of children to determine who has or has not already mastered each skill
4. identification of appropriate materials and activities for instruction in each skill, and finally
5. evaluation of learning

Based on these operations, the following material components for the WDRSD curriculum program were developed:

1. descriptions of the skills which appear essential for competence in reading
2. assessment instruments for determining students' skill strengths and weaknesses
3. management guidelines for skill instruction, grouping, testing, and monitoring
4. sample instructional activities to develop the skills, and
5. evaluation guidelines

In the skills and objectives component, six skill areas have been identified: Word Attack, Study Skills, Comprehension, Self-directed Reading, Interpretive Reading, and Creative Reading. Behavioral objectives were written for each skill in the first three of these six areas. Assessment exercises and teachers' resource files accompany each of these objectives. The skills in the other three areas are not behaviorally described and assessment exercises are not included. Skills in each of the six areas are clustered at levels that correspond to traditional grade levels, as shown in Table 1, in order to facilitate initial implementation and to help in general skills assessment and regrouping.

Formal tests of demonstrated reliability which are suitable for individual or group administration and which aid in the preparation of skill developmental profiles have been developed for most of the skills in Word Attack, Comprehension, and Study Skills. There are two available forms, Form P and Form Q. The forms are parallel and may be used interchangeably.

Each test is keyed to a specific objective, and tests are available in two formats: separately for a single skill, or in booklets which

Table 1

WDRSD Skills by Element and by Traditional Grade Level

Skill Area	Grade						
	K	1	2	3	4	5	6
Word Attack	A	B	C	D	–	–	–
Comprehension	A	B	C	D	E	F	G
Study Skills	A	B	C	D	E	F	G
Self-directed Reading		A–C		D–E		F–G	
Interpretive Reading		A–C		D–E		F–G	
Creative Reading		A–C		D–E		F–G	

include all the skills at a given level. The tests are criterion referenced and generally machine-scorable. Certain skills which could not be assessed adequately with paper-and-pencil tests are assessed with individually administered performance tests.

II

Design of the IGE/WDRSD Comparative Study

Details of this study of reading instruction in IGE and non-IGE schools are described in this chapter. Included are the research questions to be examined; the basic design of the study, including the sampling procedure used; how the data were collected, aggregated, and scaled; and the analysis plan.

Research Questions

As discussed in Chapter I, this study examined three primary research questions:

1. What are the effects on reading instruction of using the WDRSD reading program in an IGE and a non-IGE school environment?

To answer this question, data were gathered from a sample of IGE schools using the WDRSD and a similar sample of non-IGE schools using the same program.

2. What are the effects on reading instruction of using WDRSD and using other reading programs in the IGE school environment?

To answer this question, data from the sample of IGE schools using WDRSD used to answer Question 1 and data from a sample of IGE schools using other reading programs were gathered.

3. What are the relationships between the variables presented in Figure 2?

To answer this question, data from the total sample of schools used to examine the first two questions will be used. The diagram in Figure 2 could be considered as a structural design, path diagram, or causal model. Ideally, if each of the variables specified in the diagram was scaled, a set of structural equations corresponding to the model could be written. Then these equations could be statistically examined for their agreement with the data collected in the Phase IV study. Within the limits imposed by measurement error in the procedures used to collect the data, this approach would test the theoretical model. Unfortunately, this structural analysis could not be carried out. The small number of cases coupled with difficulty in scaling some variables (leading to several separate variables--in particular, a larger set of student achievement variables) and disagreement on the existence (or non-existence) of some relationships (paths) made such an analysis unfeasible. Instead a two stage multiple regression analysis was carried out. For the first stage, student engaged times on content objectives were used as the dependent variables and the classroom activities, curriculum, and school variables were entered as independent variables. At the second stage, student achievement scores were used as the dependent variables and the student pursuit variables were then added to the other variables.

Operationally, there were three problems associated with answering these questions. First, reasonable samples of schools had to be recruited for the study so that appropriate comparisons could be made. The sampling plan is described later in this chapter. Second, since the schools differed only in "labels" for their instructional

environment (IGE or not) or their reading program (WDRSD or not), and since we knew schools varied in their degree of commitment and manner of use with regard to both IGE and WDRSD, some data were needed to demonstrate that the labels reflected actual operational differences. Third, we needed to aggregate and scale the variables associated with reading instruction. Details of how this was done follow in this chapter.

The Basic Design

Data were gathered for this comparative study from October until May during the 1978-79 school year. As described, three types of schools were included in the study:

1. IGE schools using WDRSD
2. Non-IGE schools using WDRSD
3. IGE schools not using WDRSD

Data were collected only from students in Grades 2 and 5 and their teachers in those schools. Data were collected by four means: tests on general objectives of WDRSD, observations of specific students during the reading instruction period, teacher logs for reading instruction of specific students, and questionnaires which served as the basis for structured interviews with school staff.

Sample. Four WDRSD triads of schools were identified to participate in this study. Each triad was to have one school of each of the three types. Schools within each triad were matched according to location,

socio-economic level, composition of student body, size, and, for the IGE schools, "IGE-ness." The same demographic categories used in Phase I (Price et al., 1978) were used to classify the communities in which the schools were located:

1. Extreme rural--community with a population under 3,500 where most of the residents are farmers or farm workers
2. Small place--community with a population of less than 25,000
3. Medium city--city with population between 25,000 and 200,000
4. Main big city--community within the city limits of a city with population over 200,000 and not included in the high or low metro groups
5. High metro--area in city with a population greater than 150,000 where a high proportion of the residents are in professional or managerial positions
6. Low metro--area in city with a population greater than 150,000 where a high proportion of the residents are on welfare or not regularly employed
7. Urban fringe--community within the metropolitan area of a city with a population greater than 200,000 outside the city limits and thus not in the high or low metro groups

The four triads of schools in the WDRSD study represented extreme rural, small place, medium city, and urban fringe. One urban fringe IGE school not using WDRSD withdrew from the study just prior to the beginning of the data collection. Thus, the urban fringe group was reduced to two schools, an IGE school and a non-IGE school both using WDRSD, bringing the number of schools in this study to 11.

Data collection. Four procedures were used to collect data from second- and fifth-grade pupils and teachers in the 11 schools.

Pupil outcomes were measured using an achievement monitoring procedure with item sampling. The WDRSD program contains units of instruction skills based on the IGE instructional programming model (IPM). Once a pupil has mastered the objectives, he or she is to be regrouped with the other pupils with similar needs and given instruction on a new skill. The instructional sequence of skills should vary from pupil to pupil. Because of this variation in the instructional programs which pupils receive, an achievement monitoring procedure with tests administered at eight points during the school year was chosen to provide information on the attainment of objectives. Such a procedure is more sensitive to the individualization of the programs than other designs, such as pre- and posttesting.

The tests used in the IGE descriptive studies (Webb & Romberg, 1979) were refined for use in the comparative studies. The tests were compiled by identifying 25 WDRSD skills in Grade 2 and 26 WDRSD skills for Grade 5. Two to four items for each of the WDRSD skills were then prepared to form an item pool for each grade level. Items from each pool were distributed among four forms using an item sampling technique. All achievement monitoring test items were constructed in a multiple-choice format and used terminology which would be understood by pupils in programs other than the curriculum under consideration.

The achievement monitoring tests were administered eight times during the school year. The pupils at each grade level were divided at random into four groups and the four test forms at each level were rotated among

the groups so that each group was given a different form of the test for any two consecutive administrations and, over the school year, each student took each form twice. The maximum time for any one testing for a student was 50 minutes.

Observations were carried out using the same system as in the Phase IV descriptive study (Webb & Romberg, 1979). Initially, six target students were randomly identified in the unit or class. The target students changed over the year, since in some IGE situations students are regrouped periodically, making it physically impossible to observe the same six students. The target students were observed in sequence using a time sampling procedure. The first student was observed for a moment and his or her activity was coded. Then the next target student was observed for a moment and his or her activity coded. The procedure continued until all six target students had been observed, taking approximately three minutes. Thirty seconds were then taken to record the major role of the teacher(s) and general activities occurring in the classroom. This cycle was repeated, observing each target student in sequence and recording general comments, during the time allocated for work on the curriculum program.

Seven major categories of data were coded:

1. General content--time devoted to other than the curricular program being observed
2. Specific content--reading skill
3. Pace--whether or not the student is working at his or her own pace

4. Grouping--size of group of which the student is a member
5. Materials--the materials being used by the student
6. Learner moves--student engagement or non-engagement
7. Interaction--persons with whom the student is interacting and the direction and focus of that interaction

The event occurring at the moment the target student was observed was characterized by checking subcategories under each of these main categories. This observation system was used to provide measures of the amount of time spent in general content areas such as waiting, transition, and management and, for specific content areas in reading, measures of the amount of time spent by students with different types of groupings, materials, and interactions as well as different types of engagement.

The observers were trained to use the observation system in a four-day training workshop held in Madison in October 1978. The first day of the workshop was spent reviewing the materials and procedures used in each of the programs and explaining the observation system. Then the observers spent three days at a school doing observations and discussing the coding procedures. Percentage agreement on individual events and intercoder reliabilities on sums over events were calculated to assess the level of proficiency the observers had attained in using the observation procedures (Webb, 1979). In addition, a sample of schools was visited during the year to check the percentage agreement and intercoder reliability. The observers returned for a two-day retraining session in February 1979, most

of which involved observations in schools to check on the intercoder reliabilities.

Teacher logs were kept by the teacher who was directly responsible for the reading skills instruction of the students in the target population. These logs were kept daily for six to eight students, including those students being observed, in order to obtain a measure of the total time allocated to instruction on specific objectives over the investigation period. On the logs the teachers recorded the amount of instructional time allocated to specific reading skills, the group size, and type of materials used during instruction.

Interviews were conducted in each school by the observer for that school with members of the Grade 2 and Grade 5 instructional staff and with the principal. Background information about the school, the staff, and use of the reading curriculum products was obtained from these interviews. The questionnaires used as the basis for the interviews were developed from two sources: the Phase I survey instruments and the curriculum developers' questionnaires about product use.

Instructional staff provided information about their own teaching experience, how the curriculum product was used, and how the overall instructional program was planned and carried out. Each principal described the school's organization, its relationship to other educational agencies, and some procedural aspects of the school's ongoing operation.

Data Aggregation and Scaling

Literally millions of separate pieces of information were gathered

about reading instruction in the schools in this study. The aggregation of this mass of data into scaled variables was no easy task. The model given in Figure 2 (Chapter I) had five general categories of variables (school, curriculum, classroom activities, student pursuits, and pupil performance). Then within each category one or more general variables was specified (13 in all). However, the actual number of variables into which the raw data was aggregated was considerably more than 13 for four reasons. First, all classroom and performance data had to be aggregated separately for Grades 2 and 5 in each school. Second, for some general variables (like means of instruction), specific subcategories (like pacing, grouping, materials, and interactions) had to be considered as separate variables. Third, student achievement in reading was considered to be multidimensional. Pupil performance on specified program objectives was gathered, which led to aggregation of performance data into 12 general content objectives for reading, as mentioned. However, the related time variables (allocated time, engaged time, and non-engaged time) were also aggregated with respect to the same categories. Fourth, since data were gathered at several points in time, all of the data could also be aggregated in terms of when the data were gathered.

The content aggregation for reading skills instruction was used with the teacher logs, classroom observations, and achievement monitoring tests. The data were grouped for analysis at three progressively more specific levels, the most inclusive being the "content area" followed by the "general objective" and the "specific objective."

As outlined in the Wisconsin Design for Reading Skills Development (WDRSD) (Otto & Askov, 1974), reading skills for which behavioral objectives are stated are organized into three domains: Word Attack, Comprehension, and Study Skills. Within each of these content areas, from one to six general objectives were developed for the present study. The general objectives were based on the specific objectives of WDRSD. The Word Attack, Comprehension, and Study Skills aggregations for Grades 2 and 5 are as follows: (See Nerenz & Webb, 1980a, P.P. 80-3 for details.)

Word Attack: Phonic Analysis-Consonants (01). Phonic Analysis-Consonants focuses on consonant sounds in real or nonsense words. Sounds may be in the initial or final position and include single consonants, two- and three-letter consonant blends, variant consonant sounds, and consonant digraphs.

Word Attack: Phonic Analysis-Vowels (02). In this general objective, children are to attend to vowels in real or nonsense words. Long and short vowels, vowels in the final position, vowels plus r, l, or w, two vowels together, and vowel combinations including diphthongs are considered.

Word Attack: Phonic Analysis-Silent Letters (03). This general objective asks children to identify silent letters and pronounce words containing them. Particular attention is given to seven high frequency consonant combinations (kn, gn, wr, mb, bt, igh, tch), although silent vowels are also considered.

Word Attack: Structural Analysis (04). Reading skills in this general objective deal with word structure, and children are asked

to identify and use particular inflected forms. This includes skills in seven areas: possessives, rhymes, word structure, plurals, contractions, word analysis, and special meanings.

Word Attack: Vocabulary Meaning (05). Skills included in this general objective deal with the meaning of words, generally in a particular context. Data were obtained for synonyms and antonyms, multiple meanings, and sight vocabulary.

Study Skills: Map Skills (06). This general objective is designed to provide students with skills in deriving information from maps. It includes instruction in interpreting pictorial and non-pictorial symbols, using color keys, analyzing maps and synthesizing information, using grids, applying conventional directional systems, using latitudinal and longitudinal information, measuring size and distance, and using various scaling units.

Study Skills: Graph and Table Skills (07). Helping children interpret graphs and tables is the focus of this general objective. Instruction in comparison and direct extraction, manipulation of extracted values, location and comparison of cells, and development of purpose and summary statements is included.

Study Skills: Reference Skills (08). Skills in this general objective focus on locating and deriving meaning from varied standard reference sources and on recording and evaluating the obtained information. This includes alphabetizing, dictionary skills, locating information in books, locating specialized information, recording, and evaluation.

Comprehension: Word Meaning Skills (09). This first general objective deals with skills which help children derive meaning from unfamiliar words. Both word analysis and contextual strategies are included.

Comprehension: Sentence Meaning Skills (10). This general objective focuses on skills which are useful in understanding sentences of varied complexity in short written selections.

Comprehension: Passage Meaning Skills (11). Instruction in passage meaning skills is designed to help children derive meaning from longer texts, presented either orally or in writing. Children are to focus on the central thought in passages with and without an organizer, on the sequence of events, and on the validity of outcomes or conclusions.

General Reading (12). This general objective represents the three "expressive" elements of the WDRSD (Creative, Interpretive, and Self-directed Reading) and general enrichment and application activities.

Both log allocated time and observed times were aggregated separately for each grade and then reaggregated according to the three content areas. Achievement data, however, were gathered only on a subset of the general objectives (see Nerenz, 1980). At Grade 2, ten general objectives were measured (Objectives 01, 02, 03, 04, 05, 06, 07, 08, 10, 11), and at Grade 5, eight general objectives were assessed (Objectives 03, 04, 06, 07, 08, 09, 10, 11). These differences reflect the change in emphasis from Word Attack to Comprehension in reading programs between Grades 2 and 5.

Thus, the pupil performance data yield 13 variables at Grade 2 and [illegible] Grade 5 (the general objectives measured plus the content areas).

The potential number of variables is dramatically increased because of the repeated measures design of the study. All pupil performance data were gathered eight times during the year, teacher logs were kept, and classroom observations occurred in all the periods between test times (see Figure 3). Thus, eight different sets of achievement data, seven different sets of log data, and seven different sets of observational data were available for analysis. However for several reasons, it was decided not to analyze the data at this level of detail. These reasons included lack of resources, lack of support for distinctions between types of schools (see Chapter III), and a failure to discern meaningful patterns in the achievement data (Nerenz, 1980). For this report only achievement data from test time 8 (adjusted for test time 1 differences) are presented.

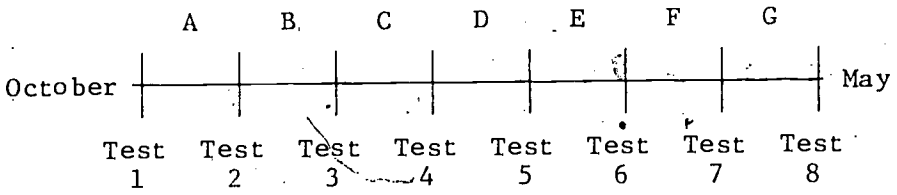


Figure 3. Observation periods and test times for the study.

All the teacher log and classroom observation data were aggregated over the seven observation periods into school year totals. Admittedly this aggregation obscures the fluctuations in content emphasis that occur during a year. However, the patterns of emphasis (allocated

times to various general content objectives) appear not to be associated with IGE or use of WDRSD (Nerenz & Webb, 1980b, P.P. 80-4).

The actual variables used in this study are as follows:

Student Achievement. Residualized mean gain scores (Test 8 adjusted for differences on Test 1) were calculated for 13 variables at Grade 2 and 11 variables at Grade 5 (see Table 2).

Table 2

Student Achievement Variables for the IGE/WDRSD Comparative Study

	Variable	Grade 2	Grade 5
01	Phonic Analysis-Consonants	✓	
02	Phonic Analysis--Vowels	✓	
03	Phonic Analysis--Silent Letters	✓	✓
04	Structural Analysis	✓	✓
05	Vocabulary Meaning	✓	
13	Word Attack	01+02+03+04+05	03+04
06	Map Skills	✓	✓
07	Graph and Table Skills	✓	✓
08	Reference Skills	✓	✓
14	Study Skills	06+07+08	06+07+08
09	Word Meaning Skills		✓
10	Sentence Meaning Skills	✓	✓
11	Passage Meaning Skills	✓	✓
15	Comprehension	10+11	09+10+11
12	General Reading Skills		

Student Pursuits. Time was used as the unit for describing student pursuits. The observed number of minutes coded for the sample of children was used as the measure of four categories of variable at each grade level: non-applied time, available time, engaged time, and non-engaged time.

Non-applied time is that time within the designated skills period spent in activities which are unrelated to reading skills. This includes time spent in transition, waiting, management, break, or other academic or nonacademic content area. These six types of non-applied time were aggregated into three subvariables: undirected time (transition, waiting), supervised time (management, break), and other content (other academic or nonacademic content) for each grade level.

Available time equals the total amount of observed time less the non-applied time and thus is that portion of the instructional period which remains once undirected, supervised, and other content time have been subtracted. As indicated by the variable name, it is the time which is actually available for skills instruction. The total minutes and percentages of available time were reported in terms of the 15 content variables at each grade level.

Engaged time is that portion of the instructional period during which students are actively involved in learning the particular content. When summed, engaged time and its complement, non-engaged time, equal available time. Total minutes and percentage of engagement or non-engagement are reported as the aggregated variables for each of the 15 content categories for reading at each grade level. In creating

these variables, the three types of coded engaged student behavior (engaged-writing, engaged-oral, engaged-covert) were summed. Similarly, total non-engagement was created by summing the three categories of non-engaged behavior (non-engaged writing, non-engaged interim, non-engaged off-task).

Classroom Activities. Time was also used as the unit for describing classroom activities. There are two categories of variables, allocated time and means of instruction, and both were measured using teacher log data and observational data.

Allocated time is the amount of time in minutes which is designated for instruction in reading skills; it represents the total amount of planned instruction for the 25 weeks. In each school, teachers recorded this information in logs. The time allocated by these logs was aggregated into the 15 content categories for reading at each grade level. A proportion of all allocated time was observed in each school. These observations were used to check the validity of the teacher's estimates of allocated time.

Means of instruction includes the teaching procedures and materials used to implement a curriculum program and convey subject matter to the learner. Four types of information were coded for each of the 15 content categories at each grade.

Pacing included either self-paced activities or other-paced activities. Pacing correlated so highly with Grouping in the descriptive study that no separate data for Pacing were tabulated for this study (Nerenz, Webb, Romberg, & Stewart, 1980).

Grouping included one of three group sizes on the teacher logs: individual, small group (8 or fewer), and large group. On the observation forms, data on student groupings were coded into one of four categories: individual, pair, small group (fewer than 8), and large group. However, because pair and small group activities were rarely observed, these two categories were combined, resulting in the same three grouping categories that were used on the teacher logs.

Materials used during instruction were recorded on the teacher logs and the observations. On the teacher logs, four types of materials were considered: WDRSD, text or other curriculum series, teacher-made, and other. Seven categories of materials were considered on the observation forms: paper/pencil, manipulative, game, audiovisual, printed material, other, and can't tell. Because very little time was observed in the audiovisual, other, and can't tell categories, these were aggreaged into a single subvariable. Manipulatives and games were also merged to form a single subvariable.

Interactions between the target student and the teacher, other adults, and other students were recorded by the observer. These categories were combined into two: student to teacher (or other adult) and teacher (or other adult) to student.

Curriculum. Two variables were created to characterize the use of the reading program, WDRSD, in schools: curriculum implementation and program customizing. Both are school variables estimated for each grade level. Data came from interviews with school staffs.

Curriculum implementation is a measure of the extent to which WDRSD is used. WDRSD was designed to be compatible with IGE's Instructional Programming Model; that is, it includes instructional objectives, related evaluation procedures, record-keeping procedures, and suggested instructional activities in sufficient variety that instruction may be adapted to student characteristics. Users of WDRSD may choose to use all parts of the program or only selected elements; users may also choose to use other products in the same curriculum area, either jointly or with one product supplemental to the other(s).

To develop a curriculum implementation scale, points were assigned differently at Grades 2 and 5, with the total possible number of points at each grade level the same. Points were given for use of Word Attack, Study Skills, Comprehension, and other materials in WDRSD. To derive a total score for each grade level, points were summed to a number no larger than the maximum number of points assigned for any single type of implementation. Then, scores for each teacher were summed across all elements to a maximum of 30 points and divided by 3 for scores ranging from 0 to 10 (see Nerenz, Stewart, & Webb, 1980 for details).

Program customization is a measure of alterations made to meet the specific needs of individual students. Three aspects of customization were measured: adaptations to children's instructional needs, provision for review and reinforcement, and teacher development of materials. Adaptations were defined as changes, additions, and deletions in the curriculum program, and two facets of program adaptations were considered.

The first is whether the program is adapted to meet instructional needs. The second is whether the existence of multiple instructional programs leads to duplication of instruction. Points obtained for these two responses were summed for each teacher. Provisions for review and reinforcement were considered to be an essential aspect of program use. Points were assigned if provisions for reviewing skills in other content areas, application and continuation of skills, scheduling of formal skill/review sessions, or frequent teaching and reinforcement of reading skills during instruction in other areas were reported. Also, teacher development of materials was assigned one point if a teacher indicated preparation of special materials.

Subscores for customizing were summed for each teacher and averages were calculated for each grade level in each school. Possible values ranged from -3 to 9 (Nerenz, Stewart, & Webb, 1980).

School. As described in the IGE Evaluation Project, it was assumed that certain organizational features would make it more likely that certain desirable instructional practices will occur (Romberg, 1976). Data related to this premise were organized into five variables: Interorganizational Relations, Procedures Fostering Coordination and Improvement of the School Program, Intraorganizational Structure, General Implementation of the Instructional Programming Model, and Teacher Experiences. These describe in detail the organizational structure and staff background in the school. A sixth variable, Demographic Background, was also included as a description for each school.

Interorganizational Relations (IOR). This variable is a measure of school affiliations and staff activities which involve persons and organizations outside of the school. Subscores were developed for (a) school interactions with parents, (b) district support of the curriculum program, and (c) district-wide meetings about program issues and, for IGE schools only, membership in a regional group of IGE schools. Teacher scores were summed and averaged for a school score ranging from 0-6 points. Data on district support of the school's reading curriculum program were obtained from the principal's questionnaire with a maximum of 3 points possible. All principals reported the frequency of district-wide meetings focused on curricular issues; points were allocated differently for IGE and non-IGE schools, although each group could receive a possible total of 3 points. An IOR total score is a sum of the three subscores and has a possible range of from 0 to 12 points (Nerenz, Webb, & Stewart, 1980).

Procedures Fostering Coordination and Improvement of the School Program (COS). This variable is a measure of the school-wide procedures and practices which are designed to promote continuity and refinement of the overall school program. Scores for (a) release time for staff planning, (b) orientation programs for new teachers, and (c) inservice procedures were developed. A COS total scale was derived by summing the points for these three elements (Nerenz, Webb, & Stewart, 1980).

Intraorganizational Structure (IOS). This variable is a measure of the school's internal organization and the mechanics of its functioning. Scores indicate the extent to which students and staff are organized into

multiaged instructional units and the amount of time available for regular meetings of the school's governing body. Unit leaders indicated how their school organization was best described: multigrade units, self-contained classrooms with some team teaching and coordination within grade levels, or self-contained classrooms. Information was also provided by the principal on a chart of school organization. All points for reports of multigrade units were developed from that chart. On the organization chart, principals reported grade range of units or teams, number of pupils per unit, and number of units holding regular weekly planning meetings.

An IOS total score is the sum of the school governance and school organization subscores yielding a school-wide IOS score of up to 29 points (Nerenz, Webb, & Stewart, 1980).

General Implementation of the Instructional Programming Model (IPM). This is a measure of the extent to which the school is organized around the following steps of the IGE Model for Instructional Programming for the individual student:

1. setting school-wide instructional objectives
2. selecting a subset of objectives for children in each unit
3. keeping and using records of assessment results
4. planning for instruction, including short-term grouping procedures
5. providing instruction, including variety in materials and in group size
6. assessing mastery of individual objectives, and
7. planning and evaluating the overall instructional program

Scores were developed by summing seven subscores, one for each of the seven steps, yielding a maximum of 120 points (Nerenz, Webb, & Stewart, 1980).

Teacher Experience (TEXP). This variable is a measure of staff teachers' overall experience in education as well as their experience in IGE schools. Scale values were assigned for each teacher. Results were then averaged yielding a school score ranging from 1 to 5 points (Nerenz, Webb, & Stewart, 1980).

Demographic Background (DB). This variable provides a description of the student population of the school. This scale was derived from the National Assessment of Educational Progress (NAEP) which used seven categories of size and type of community in reporting results. These seven categories (see sampling section earlier) were used to assess DB in Phase I of the IGE study and in Phase IV (Nerenz, Webb, & Stewart, 1980).

The Analysis Plan

In light of the research questions posed at the start of this chapter and of the operational problems faced in doing the study, a four-step analysis plan was followed:

Step 1--School Descriptions. Differences in the operating characteristics among the three types of schools (IGE WDRSD, non-IGE WDRSD, and IGE-non-WDRSD) were anticipated to predict differences in the way instructional time was used and in turn predict student performance on specific reading objectives. At this initial step, the schools were to be described in terms of the school background and program use

variables in order to demonstrate that the labeled differences (IGE or not, WDRSD or not) were reflected in operational differences. This analysis is presented in Chapter III.

Step 2--Time Use Difference. The difference in how time was allocated and used in each school at each of the two grade levels (Grades 2 and 5) was then summarized. The analysis for Grade 2 is presented in Chapter IV and for Grade 5 in Chapter V.

Step 3--Student Achievement Differences. The presentation of differences in student achievement on each of the content variables for each of the schools was the next step. In Chapter VI reading performance for both Grades 2 and 5 is presented.

Step 4--Predictive Analysis. It was planned that student on-task behavior (as measured by engaged time) for each content objective and area in this step would be used as a dependent variable for each grade level and that student performance on content objectives for each grade would be used as the dependent variable in a second set of regression analyses. However, these regression analyses were not carried out; the final number of participating schools made this analysis unfeasible.

III

Schools and How They Group

The study design specified that triads of schools would comprise the sample. Within each triad, schools were to represent the same demographic setting, differing on use of the WDRSD and on adoption of IGE. Thus, within each triad, there was to be one IGE school using the WDRSD. After school opening in fall of 1978, the urban fringe IGE school not using the WDRSD withdrew from the study. Remaining triads and the schools in each of them--listed in IGE/WDRSD, IGE/non-WDRSD, non-IGE/WDRSD order--are as follows: extreme rural, Schools 372, 466, and 900; small community, Schools 451, 410, and 901; medium city, Schools 476, 493, and 902; urban fringe, Schools 507, --, and 903. Differences in operating characteristics among the three types of schools, background variables, were anticipated to predict differences in the way instructional time was used; time use, in turn, was anticipated to predict student performance on objective-based assessments.

The schools are described by type in the following section. After the descriptions, scores on background and program use variables are presented and discussed.

SCHOOL DESCRIPTIONS

IGE/WDRSD

School 451. School 451 was one of the two IGE elementary schools using the WDRSD in a small midwestern town. Although the building was

composed of self-contained classrooms, students were regrouped by ability and skill needs and they rotated from room to room for skill instruction. Logs were maintained only for the equivalent of one class, all students were tested and four second-grade and six fifth-grade teachers and aides were involved with the students on a regular basis. Because of this regrouping, 20 different students were observed at some point during the year.

The strongest force behind IGE both in School 451 and in the district as a whole was the principal. She believed that IGE was the most effective way of meeting individual needs and she spent considerable time with the teachers and aides in order to make IGE work. This enthusiasm was reflected by the teachers, and even students recognized the relationship between their pretest performance and the resulting pace of instruction.

Reading instruction at Grade 2 was provided for two hours daily, and skill instruction was given twice a week for a total of 90 minutes. Varied materials were used, although the observation notes indicate that teacher-made materials--primarily worksheets--were most common during skill instruction. In addition to these skill periods, instruction in comprehension and general reading time were also scheduled on a daily basis. At Grade 5, one hour per day was allocated to reading instruction. Of this time, 90 minutes per week was allocated to skills.

School 466. School 466 is located in a small rural midwestern community adjacent to a larger city. It is an IGE school with just over 400 students, Grades 1-6, organized into three units: 1-2, 3-4, 5-6.

There were about 55 second-graders in the primary unit and about 70 fifth-graders in the 5-6 unit during the 1978-79 school year. While only three second-grade and three fifth-grade "homerooms" were included in the study, six second-grade teachers and four interns, and six fifth-grade teachers and two interns actually conducted the classes. The school is composed of self-contained classrooms, and students moved from room to room for skills instruction. It was noted, however, that some students had problems moving among the rooms and to the larger central open area so that class time was spent taking attendance to be sure all group members were present.

At Grade 2, two hours per day was allocated to reading instruction of which one-half hour was skills instruction provided four days a week. Regrouping occurred every two weeks, with alternating blocks of Word Attack and Comprehension skills. Reading instruction was scheduled only two days a week for 30 minutes at Grade 5. Students were systematically regrouped every six sessions (three weeks). This regrouping explains why 14 second graders and 11 fifth graders were observed. While some Word Attack was taught at Grade 5, instruction focused primarily on Comprehension skills. A small number of Study Skills were also taught; however, since teachers were using a field test version of those materials, they often had difficulty obtaining tests and integrating those skills into the updated Study Skills program.

School 476. School 476 is located in a medium city in a neighborhood of primarily blue collar workers. With nearly 500 students in its K-6 grades, the school is the largest in the district. The building was designed with open areas for flexibility and has three open pods for the

1-2, 3-4, 5-6 grade units as well as self-contained classrooms in each area. IGE was initiated in the district in response to teachers' desires for greater flexibility for teaching procedures. At one time, all four of the elementary schools were termed IGE schools but with recent decreases in aides and some conflicts over school structure within the district, School 476 is the only IGE school remaining. In addition, the principal expressed concern over what he perceived to be a slow decline in "IGE-ness" at even this school.

Most of the teachers at School 476, like those at most other schools in the study, reported seven or more years of teaching experience. Of the five teachers in the 1-2 unit, two worked primarily with the second graders. Such a division of staff by grade level was also characteristic of the 5-6 unit and the teachers noted that students were rarely grouped across ages.

In Grade 2, 90 minutes of instruction was provided each day, of which about 30 minutes was allocated to Word Attack skills two days per week. Reading groups were also used to teach comprehension and general reading skills; however, the "skill" groups and "reading" groups appeared to function quite differently. At Grade 5, two 25-minute skill periods were provided each week during the 90 minute daily reading periods. Instruction was provided in Comprehension and Study Skills. Although students and groups rotated between teachers for instruction, it is interesting that all six of the target students were observed together at each observation and thus the composition of the skill groups was not substantially altered by the rotation process.

School 507. School 507 is one of seven elementary schools in a suburban midwestern school district serving a middle class neighborhood. The K-6 school has about 55 students in each grade and is arranged in 4 units--K, 1-2, 3-4,5-6. It has been an IGE school since 1972 and was the first school in the district to use the WDRSD and to implement a systematic skill-based instructional program which emphasized specification of objectives and a computerized record-keeping system. The building allows a great deal of flexibility in group sizes and students moved quickly from one skill group to another throughout the day. Overall, in arranging groups, providing instruction, and maintaining records, efficiency seemed to be very important.

The principal was very committed to the effective functioning of IGE at School 507. To that end, he developed the computer system which formed the skill groupings and maintained the records, and he arranged for aides to be hired in the place of a teacher who was leaving. Like the principal, the teachers seemed to understand the "system" of IGE and were generally supportive of such an individualized, skill-based approach. Teachers at School 507, as at most other schools, typically reported seven or more years teaching experience. Teacher aides also played an important role in the functioning of IGE at this school.

The WDRSD was used at both Grade 2 and Grade 5. At Grade 2, skill instruction in Word Attack was provided for 25 minutes each day, and another 85 minutes daily was allocated in general reading instruction using another reading series. In the 5-6 unit, 25 minutes was allocated to instruction in Study Skills every other day and another 50 minutes to general reading instruction on a daily basis. Students were regrouped

every two to three weeks, and as indicated by the fact that 42 Grade 2 and 40 Grade 5 students were observed, the composition of these skill groups changed dramatically at each regrouping.

IGE/non-WDRSD

School 372. A K-8 IGE school with about 50 pupils per grade, School 372 is the only elementary school located in a rural midwestern area. However, these demographic characteristics belie the actual school population in that many residents commute to work in or near the two large urban areas nearby. Thus, while School 372 was originally categorized in the triad of "extreme rural" schools, the townspeople and the school are, in actuality, considerably more urban. Reflecting the diversity of the town itself, the school board is composed of businessmen and farmers who have always lived there as well as suburbanites who have moved from the larger cities. Due to the gradual changes in the school population, the school district has been consolidated so that all elementary and junior high students are bused into the expanded elementary/middle school building, while the senior high students are bused to a new high school complex in another area.

Three of the four teachers participating in the study reported seven or more years of teaching experience, while the fourth was in the category of three to six years experience. The principal came to School 372 in 1974 and at that time IGE was first implemented in the district.

Instructional groups were based on student ability in reading and mathematics, and, although instruction was always provided in self-contained classrooms, children changed classrooms, thus experiencing different teachers and instructional groups. At School 372, reading instruc-

tion was allocated 90 minutes per day. This reading time was divided among basic word attack skills, spelling, and comprehension skills with a variety of commercially developed and teacher-made materials being used. The principal and teachers seemed very pleased with both the curriculum materials and the time allocations.

School 410. School 410 is one of two IGE elementary schools located in a small midwestern town. The very modern, one-floor building serves about 25 pupils in each of the school's K-6 grades, including all of the exceptional or handicapped students in the district. While there were several open library and conversation areas in the center of the building, second-grade instruction was provided in a self-contained classroom and the fifth-grade area was converted into a self-contained classroom using folding doors. Students at neither grade level seemed to move among instructional areas or to teachers outside of their classroom, although students were regrouped within each classroom. The number of students in the class and the number tested (Grade 2: 25, 17; Grade 5: 23, 16) differ because the mainstreamed handicapped children were not tested.

The principal of School 410 was very supportive of IGE and saw it as the most effective way to deal with his very diverse school population. He often taught small groups of students in particular subject areas and worked one-on-one with many of the handicapped children. The second-grade teacher was beginning his first year of full-time teaching and seemed to dislike the mechanics of IGE regrouping and record keeping, believing that for only 25 students, the process was too cumbersome. In addition to this teacher, a full-time intern worked with the Grade 2

students for a portion of the observation period. The Grade 5 teacher had been teaching for several years and was more enthusiastic about IGE, keeping careful records of skill groupings, mastery levels, and materials used.

At School 410, a variety of instructional materials was used in addition to the Scott-Foresman, SRA, and Ginn reading series. Grade 2 instruction was provided in two blocks--a 70-minute block first thing in the morning and a 30-minute period just before lunch--and focused on word attack and comprehension skills. In addition, students often worked out of the Barnell-Loft Skill Series during their free time. In Grade 5, reading instruction was scheduled from 8:20 to 9:30 each day and focused on vocabulary, spelling, and comprehension. Many teacher-made materials were used at each grade level.

School 493. School 493 is located in a medium-sized midwestern city within 15 miles of two other similarly-sized cities, which form a fairly continuous urban area. One of eleven K-6 schools in the district, it has about 45 pupils in each grade, with 39 second graders and 50 fifth graders enrolled during the 1978-79 school year. Although instruction was provided in self-contained classrooms, students were taught in multi-age groups for reading, math, science, and social studies. Only six students were observed at each grade level, however, and it appears that students were not frequently regrouped.

The school principal was very much in favor of a skill-based approach to reading instruction, and word attack, study skills, and comprehension skills were taught at each grade level even though the WDRSD was not implemented. The three Grade 2 and three Grade 5 teachers

who participated in the study over the entire observation period each reported from three to six years of experience and primarily used materials from the Harper and Row or the Economy Series. Few teacher-made worksheets were reported by the observer.

Non-IGE/WDRSD

School 900. School 900 was one of two elementary schools in a rural area, in the same town as the district's junior and senior high schools. The school included 40-50 children in each grade, K-5. Although School 900 was not an IGE school and instruction was provided in self-contained classrooms, children were rotated from room to room for skills instruction and multi-aged groupings were in evidence.

The dominant figure within the program was the reading coordinator. She had been involved in the development of certain activities in Comprehension and Study Skills and she seemed to make decisions about program content as well as time allocation and the type of skill instruction provided. The teachers who worked with WDRSD were enthusiastic about the quality of individualization that could be achieved with the program, and as shown in the data to follow, they used the program in much the same way as many "IGE" schools. The staff was stable: One of the participating teachers reported more than three years experience while the other three reported seven or more. Few aides were present, although the Phase IV observer also worked as an aide and was responsible for arranging the skill groups and keeping the records.

For the "unit" composed of Grades 1-3, 15-20 minutes of skill instruction was provided four days per week. Instruction in the Word

Attack and Study Skills elements was provided alternately in two-week blocks. In addition to WDRSD skill instruction, general reading using a variety of basal readers was provided for about 90 minutes daily. In the cross-age group for fourth and fifth graders, the WDRSD was also used four days a week, with instruction again provided in Word Attack and Study Skills. Other reading series were also used and, as at Grade 2, students were regrouped after eight instructional sessions (every two weeks).

School 901. School 901 is the second largest of 77 elementary schools in a suburban district and at one time served as many as 1,300 children in a neighborhood of mixed socio-economic levels. The principal reported 20-30% turnover in the student population each year and very little parental interest in the school. In each grade, there were approximately 130 students assigned to self-contained classrooms during 1978-79. Teachers participating in the study each reported having seven or more years experience.

Before coming to School 901, the principal had taught in IGE schools and served as an IGE facilitator and state IGE coordinator. Although School 901 was not an IGE school, he noted that the district curricula and aspects of the school functioning had more characteristics of IGE than many schools using the IGE label. School 901 is part of a county district which has used the WDRSD since the national field test of the Word Attack element in 1968, adding the Study Skills and Comprehension elements as they became available. Objective-based materials with pre- and post-assessment as well as regrouping were used in reading, math, science, and social studies. In addition to

the classroom teachers, several aides worked at School 901 and each teacher was allocated two hours of aide time each day. These aides were responsible for some of the mechanics of instruction and also circulated among the skill groups during instruction to answer questions and help students with seatwork, thus freeing the teacher to focus on her small group.

The two second-grade classrooms are in a small separate building near the main school building and all observations, logs, and tests are based on one classroom of 25 students. One hour per day of the 195 minute language arts period was allocated for reading skills instruction. During both on-site visits, a large number of activities were going on simultaneously in the Grade 2 classroom. No more than five children were working on any activity at a time, yet students moved from activity to activity in a quiet and purposeful way.

Since the fifth graders were regrouped for skill instruction with fourth and sixth graders and had different teachers for Word Attack Study Skills, and Comprehension, logs were kept by many teachers and many students were observed. The children who were observed and for whom logs were kept were all from the classroom in which tests were administered. At Grade 5, three hours each week was allocated for Word Attack and Comprehension skills instruction and another two hours for skill instruction in Study Skills. As at Grade 2, several activities and skill groups occurred simultaneously in the Grade 5 classroom.

School 902. School 902 is in a medium-sized city and serves a population of blue collar workers of medium socio-economic status; its location in a valley outside of the town requires the students to be bused to the school. The K-6 school has about 60 students in

each grade and is organized into three units--K, 1-3, and 4-6. Instruction is still provided in self-contained classrooms but students are regrouped across ages on the basis of a fall pretest. All teachers interviewed reported seven or more years of experience, and, while they were interested in using the WDRSD, they noted that it was "a lot of work." In addition, because many of the teachers who had received the initial inservice training had since left the school, implementing the program as prescribed by the school district had become more and more difficult. Thus, during the 1977-78 school year--the year prior to this study--a committee of teachers at School 902, including a representative from each grade, clarified "operation" of the program in the school, specifying skills to be taught and tested in each grade, record-keeping procedures, and pretest procedures; answers to common questions were a part of the specification. The committee report is strong evidence that staff at School 902 understand the WDRSD as a management system for skills instruction. Also during this time, the entire staff participated in cleaning the files, keeping effective materials for each skill and discarding those that teachers had not found useful.

All three elements of the WDRSD were implemented at School 902 and skills were taught in order (A1, A2, A3, . . ., B1, B2, . . .) according to a year-long calendar schedule set up in the fall. The total reading block each day lasted two hours and second graders were grouped with third graders for 30 minutes of skills instruction. Fifth graders were grouped with fourth and sixth graders for their 30 minutes of skills instruction in addition to which they received 60 minutes of general reading instruction. Students were regrouped for instruction in a

different skill every two weeks, except for a few skills that the teachers found to require additional time.

School 903. School 903 was one of six elementary schools in a suburban district serving a middle to upper-middle class population. The K-6 school had only 190 students and was to be closed after the 1979-1980 school year. At School 903, variations in the number of children per grade resulted in many multigrade groups--only four of the eight classrooms had only one grade and it was not unusual for second and sixth graders to be scheduled together in the same skill group on the basis of their pretest score.

Reading skills instruction was allocated one-half hour each day and children were grouped according to skill need, with the principal and librarian, in addition to the eight teachers, assigned one or more instructional groups. WDRSD was used as a supplement to a basal series in both units and about one additional hour per day was allocated to general reading instruction on the basal series, for a total of 90 minutes of instruction. Each member of the teaching staff reported seven or more years experience.

SCHOOL SCORES

Background variable scores are shown in Table 3 for each school separately; averages for the three school types and the total sample are also provided. The first four variables (IOR, IOS, GOS, and IPM) represent IGE characteristics; the next two (TEXP and DB) were included for descriptive purposes; the last two represent program use.

Table 3

Background and Program Use Variable Scores for Label Groups

School	IOR (12)[a]	IOS (29)	GOS (24)	IPM (120)	TEXP (5)	Scaled DB	IMPL (10)	CUST (6)
IGE/WDRSD								
451	7.50	22.00	22.00	94.75	4.75	4	7.25	2.00
466	5.00	25.00	20.25	75.25	3.25	2	4.50	1.25
476	3.50	24.00	9.00	71.00	4.75	5	6.75	.50
507	3.00	22.00	11.50	80.75	4.50	6	6.25	.75
Mean	4.75	23.25	15.69	80.44	4.31	4.25	6.19	1.13
SD(n)	1.75	1.30	5.54	8.96	.62	1.48	1.04	.57
IGE/non-WDRSD								
372	6.00	25.00	18.50	72.50	4.75	2	0	1.50
410	6.00	22.00	10.00	75.50	4.50	4	0	2.50
493	0.00	25.00	12.00	56.00	4.00	5	0	1.00
Mean	4.00	24.00	13.50	68.00	4.42	3.67	0	1.67
SD(n)	2.83	1.41	3.63	8.57	.31	1.25	0	.62
Non-IGE/WDRSD								
900	6.50	15.00	17.00	72.00	3.75	2	4.25	1.50
901	5.50	16.00	17.50	82.25	4.00	6	9.25	4.00
902	4.50	14.00	16.25	69.25	4.00	5	7.75	2.25
903	9.00	20.00	19.50	82.50	4.00	6	4.00	1.50
Mean	6.38	16.25	17.56	76.50	3.94	4.75	6.31	2.31
SD(n)	1.67	2.28	1.20	5.96	.11	1.64	2.25	1.02
Grand Mean	5.14	20.91	15.77	75.61	4.20	4.27	4.55	1.70
SD(n)	2.30	3.94	4.23	9.31	.46	1.54	3.16	.93

NOTE: Variables are defined on pages 34-38.

[a]Numbers in parentheses indicate maximum possible score.

IGE/WDRSD

School 451 had high background variable scores, ranking first on GOS and IPM and second on IOR. The IOS score ranked sixth in a tie with Schools 410 and 507; there was also a three-way tie for the highest score. Program use scores were also high: third for implementation of the WDRSD and fourth for reading program.

Background variable scores for School 466 had no clear pattern. On IOS, it was one of three schools with the highest score of 25 out of 29. Similarly on GOS, School 466 had a score of 20.25 out of 29.00 which ranked second in the study. The school's IOR score was 5 out of 12, seventh, and the IPM score was 75.25, ranking sixth. Program use scores were both relatively low. For implementation of the WDRSD, the school ranked sixth of the eight users with a score of 4.50 out of 10.00, and for program customizing, the school's rank was eighth with a score of 1.25 out of 6.00.

On three of the four background variables, School 476 had low scores. The exception was IOS on which School 476 ranked fourth with a score of 24 out of 29; the first three schools tied with 25 points. On both IOR and IPM, the school ranked ninth with scores of 3.50 and 71, respectively. School 476 had the lowest GOS score, 9 out of 24. The school ranked fourth for implementation of the WDRSD with a score of 6.75. Its program customizing score was .5, lowest in the study.

On IPM and IOS, School 507 scored high: 80.75 out of 120, ranking fourth, and 22 out of 29, ranking sixth because of ties but having the third score numerically. In contrast, the school's IOR score of 3 out of 12

ranked tenth and its GOS score of 11.5 out of 24 ranked ninth. A similar contrast occurred in the program use scores. For implementation of the WDRSD, School 507 had a score of 6.25 out of 10 which ranked fifth. For program customizing, its score was .75 out of 6, rank tenth.

IGE/non-WDRSD

School 372's IPM score ranked seventh, 72.5 out of 102. Other background variable scores were much higher. On both IOR and GOS, School 372 ranked fourth with scores of 6 out of 12, a tie with School 410, and 18.5 out of 24, respectively. The IOS score of 25, obtained by two other schools, was highest in the study. For program customizing the school, along with two others, had a score of 1.5 out of 6, the ties ranking sixth.

On three of the four background variables, School 410 ranked just above average: IOR, 6 points, rank 4.5; IOS, 22 points, and IPM, 7 points, both rank 5. On GOS, the school's score was 10 out of 24 which ranked tenth. For program customizing, School 410 had a score of 2.5, second highest.

On two of the four background variables, School 493 had the lowest score: Its IOR score was zero and its IPM score was 50 out of 120. The score of 12 out of 24 on GOS ranked eighth. For IOS, School 493 was one of the three schools with the high score of 25 out of 29. The school's program customizing score was 1 out of 6 which ranked ninth.

Non-IGE/WDRSD

Background variable scores for School 900 were consistently at or above the middle of the possible score range; however, the school's ranking among the 11 schools in the WDRSD study varied considerably. School 900 was third for IOR with a score of 6.50 out of 12.00. For GOS, the score of 17 out of 24 ranked sixth. The IOS score of 15 on a 29-point scale ranked tenth; the IPM score of 72 out of 120 ranked eighth.

On program use variables, School 900 ranked seventh of the eight users on WDRSD implementation and sixth of the 11 schools on program customizing; scores were 4.25/10.00 and 1.5/6.00, respectively.

Background variable scores for School 901 varied widely. It ranked sixth on IOR and fifth on GOS with scores of 5.501/12.00 and 17.50/24.00, respectively. The IOS score for School 901 was 16 out of 29, which ranked ninth. For use of the IPM, School 901 ranked third with a score of 82.25 out of 120.

On both program use variables, School 901 had the highest score: 9.25 out of 10 for use of the WDRSD and 4 of 6 for customizing the program.

Background variable scores for School 902 were lower than for any other non-IGE schools using WDRSD and below the median for all 11 schools in the study. The IOR score was 4.50 of a possible 12.00 points and ranked eighth; GOS, 16.25 out of 24, rank seven; IOS, 14.00 out of 29, rank 11; IPM, 69.25 out of 120, rank 10. These scores are in sharp contrast to those on the program use variable. The school's score of 7.75 out of 10.00 for use of the WDRSD ranked second in the study; the program customizing score of 2.25 out of 6.00 ranked third.

On all background variables School 903 scored higher than other non-IGE schools using the WDRSD and on three of the four variables ranked quite high among the 11 schools in the study. The school's IOR score was highest in the study, 9.00 out of 12.00; GOS third, 19.50 out of 24.00; IOS eighth, 20 out of 29; IPM second, 82.50 out of 120.00. On program use variables, School 903 had lower scores. For implementation of the WDRSD, the score was 4.00 out of 10.00, lowest of the eight schools using the WDRSD. For program customizing, the score was 1.5 out of 6.00, a score obtained by two other schools; the three schools ranked sixth out of 11.

CLUSTER ANALYSIS

For both IOR and GOS, the non-IGE schools had the highest average; in addition, for IPM the average for non-IGE schools was between the averages for the two groups of IGE schools. Thus, for these three of the four IGE-related scores, the label IGE school was not useful in grouping schools.[1] Rather than reject the idea that in schools with similar operating characteristics instructional time was used in similar ways and student background outcomes were similar, we submitted the background variable scores to a cluster analysis.

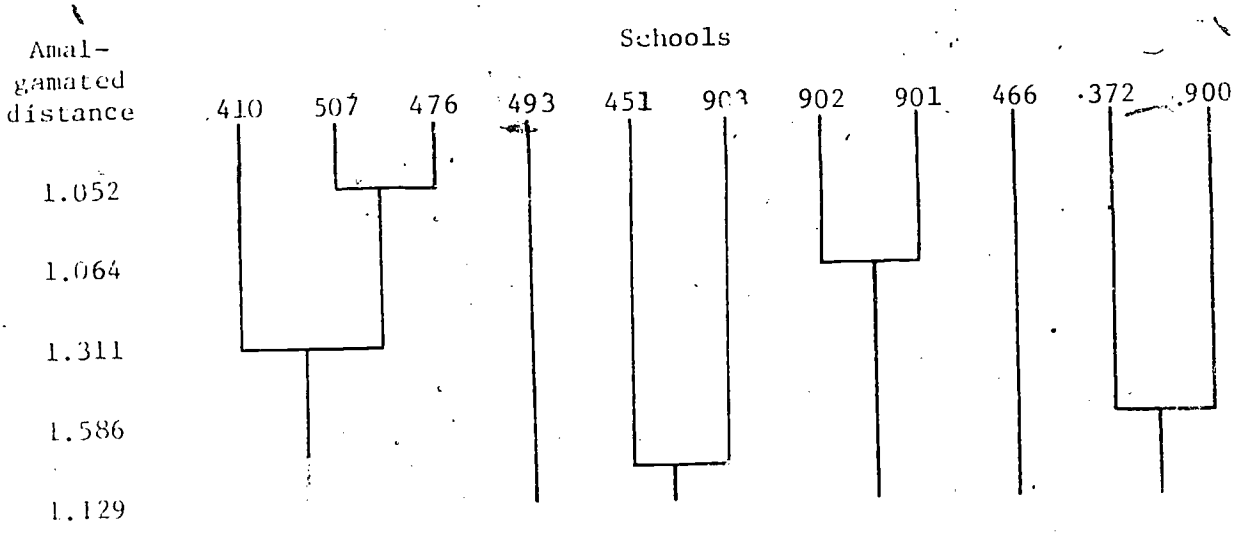
---

[1] IGE was not developed or disseminated as a simple new idea. Rather IGE is a synthesis of many existing ideas which, implemented together, represent a comprehensive alternative to traditional schooling. (For additional information, see Klausmeier, 1977.) It is not surprising, then, that schools not self-labeled IGE have characteristics that one would expect in an IGE school.

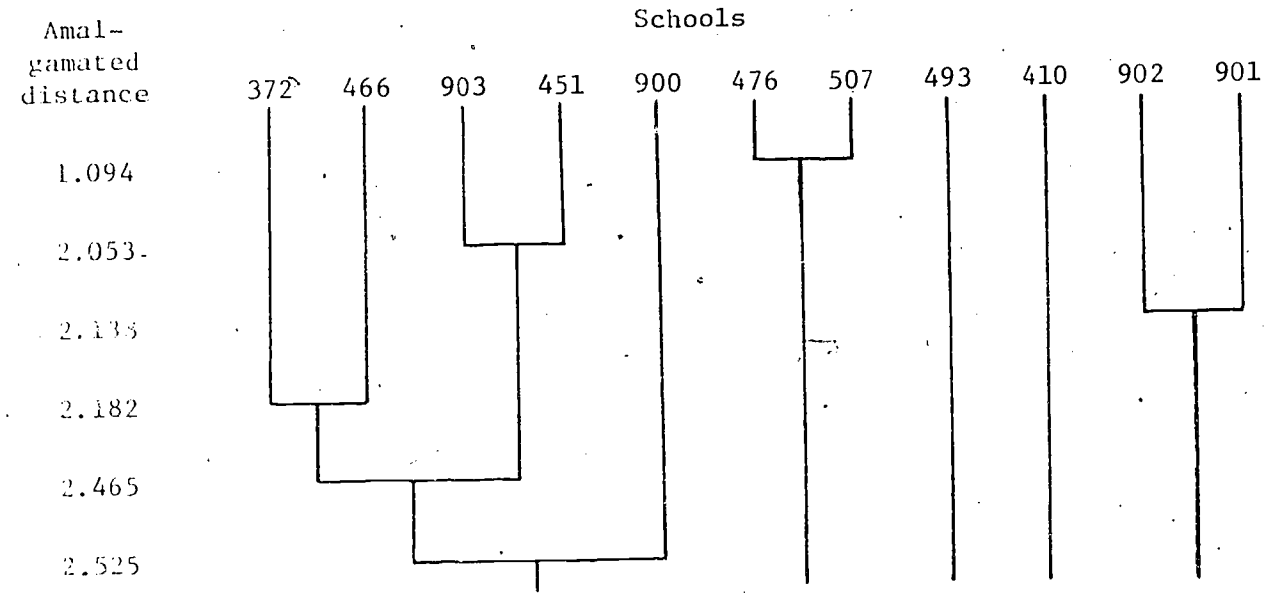
This analysis groups cases, in this instance schools, into pairs, triplets, and so on. The basis for grouping is the scores on the variables. Grouping continues until all cases are combined; at each step, the school added to a cluster is the one with variable scores least different from the variable scores of the existing cluster. The particular program used was P2M, cluster analysis of cases (April 1977 revision), from the Biomedical Computer Program series developed at the Health Sciences Computing Facility, UCLA. Euclidean distance was the measure used; all variable scores were standardized.

Two cluster analyses were carried out. The first used only background variables (IOR, IOS, GOS, IPM, TEXP, and scaled DB). For the second analysis, the two program use variables were added. Results of both analyses are shown in Figure 4. Schools 476 and 507 clustered in both analyses with a combined distance less than 2.00. Other pairs emerging from both analyses were Schools 451 and 903 and Schools 901 and 902. School 493 was a outlier in both analyses. School 372 clustered with School 900 in the analysis using background variables only and with School 466 in the analysis that included program use variables. Background variable scores are shown in Table 4 in which schools are arranged in cluster groups.

One cluster is composed of the three schools located in very small towns or extreme rural areas (Schools 466, 372, and 900). Although the score for demographic setting is the only average distinctly different from those for other clusters, the standard deviation for this cluster is quite small for both IOR and IPM and fairly small for



Background variables



Background and program use variables

Figure 4. Cluster groups and distances.

Table 4

Background and Program Use Variables Scores for Cluster Groups

School	IOR (12)[a]	IOS (29)	GOS (24)	IPM (120)	TEXP (5)	Scaled DB	IMPL (10)	CUST (6)
466	5.00	25.00	20.25	75.25	3.25	2	4.50	1.25
372	6.00	25.00	18.50	72.50	4.75	2	0	1.50
900	6.50	15.00	17.00	72.00	3.75	2	4.25	1.50
Mean	5.83	21.67	18.58	73.25	3.92	2	2.92	1.42
SD(n)	.72	4.71	1.33	1.43	.62	0	2.06	.12
410	6.00	22.00	10.00	75.50	4.50	4	0	2.50
507	3.00	22.00	11.50	80.75	4.50	6	6.25	.75
476	3.50	24.00	9.00	71.00	4.75	5	6.75	.50
Mean	4.17	22.67	10.17	75.75	4.58	5.00	4.33	1.25
SD(n)	1.31	.94	1.03	3.98	.12	.8	3.07	.89
451	7.50	22.00	22.00	94.75	4.75	4	7.25	2.00
903	9.00	20.00	19.50	82.50	4.00	6	4.00	1.50
Mean	8.25	21.00	20.75	88.63	4.38	5.00	5.63	1.75
SD(n)	.75	1.00	1.25	6.13	.38	1.00	1.63	.25
902	4.50	14.00	16.25	69.25	4.00	5	7.75	2.25
901	5.50	16.00	17.50	82.25	4.00	6	9.25	4.00
Mean	5.00	15.00	16.88	75.75	4.00	5.00	8.50	3.13
SD(n)	.50	1.00	.63	6.50	0	.50	.75	.88
Isolate								
493	9.00	25.00	12.00	56.00	4.00	5	0	1.00
Grand Mean	5.14	20.91	15.77	75.61	4.20	4.27	4.55	1.70
SD(n)	2.30	3.94	4.23	9.31	.46	1.54	3.16	.93

[a]Numbers in parentheses indicate maximum possible score.

GOS. Program use variables show the same pattern of results. The exception to the small standard deviation, IOS, is a measure of the paper organization of the school rather than the actual operation; for example, IOS scores reflect, in part, whether staff and students are organized in multigraded units rather than whether instruction is provided to multigraded groups of students. Three school features are represented in the IOR score: parent visitation/participation, district support for the school's reading program, and regularly scheduled meetings with representatives of other schools. GOS scores reflect the quality of new teacher orientation (in schools that have appreciable teacher turnover), the extent of inservice opportunities, and, with half the weight of the previous two features, the amount of release time for instructional planning.

The IPM scores are a sum of seven scores, each representing the school's implementation of one step of the IPM.[2] Score differences result almost entirely from differences in implementation of steps 4 and 5: basis for and frequency of regrouping students for instruction and instructional variety in group sizes, materials used, and rates of progress.

The second cluster of three schools (Schools 410, 507, and 476)

---

[2]The seven steps are as follows: 1. setting schoolwide instructional objectives, 2. selecting a subset of those objectives for students in teacher's instructional units, 3. assessing to determine students' instructional needs, 4. planning instructional programs based on those needs, 5. providing instruction with variations reflecting both instructional needs and learning styles, 6. reassessing to determine effects of instruction, and 7. feedback and recycling to the next instructional objective.

is distinguished by low GOS and IOR scores. Both IOS and IPM scores are moderate; teacher experience is high.

High program use scores are common to the two pairs of schools; however, both schools in one pair have high background scores (Schools 451 and 903) and both in the other pair have low background scores (Schools 902 and 901).

School 493's extremely low IOR and IPM scores separate it from any of the groupings of schools in the study.

Analyses based on these school groupings should be useful tests of the predictions in the study design. On IOR, GOS, and IPM, the pair of 451 and 903 has a much higher average than any of the other three groups of schools. The other three groups differ slightly from one another on IOR; on GOS the primary difference is of the triad of 410, 507, and 476 from the other triad and from the pair of 902 and 901; differences among the two triads and the 902-901 pair are negligible.

On both program use variables, the 902-901 pair has the highest average, in marked contrast to its low background variable scores. As mentioned previously, the 451-903 pair also has high program use variable scores compared to the two triads.

Examination of the background and program use variable scores indicates that the original hypothesis, that differences in background variables among types of schools would be useful in predicting time use, means of instruction, and pupil performance, is not sensible to test. The labels IGE school and WDRSD user do classify schools, but by intent rather than by actual operation.

IV

Time Use in Grade 2

Time allocated to reading instruction, the amount of time a teacher intended to spend in various reading instruction activities, is a gross measure of opportunity to learn. The number of hours allocated overall indicates the relative importance of reading in the elementary curriculum at various schools. Broken down by objective, allocated time informs us about the focus of instruction at various schools. However, not all of the time allocated to a particular curriculum area is active learning time for the students. A portion of the allocated time is not applied to the planned topic; during this time, students might be making the transition from the previous subject, participating in classroom management activities, or working on other content. During the remaining time, that available for instruction in the content area, all students are not always engaged in the instructional activities; some may be passing out papers, waiting for assistance, or simply not paying attention.

In this chapter, time is first discussed as it was allocated to the general objectives; these data come from teacher logs. Next, observed allocated time is discussed as a proportion of log allocated time. Available and engaged time are then discussed as proportions of observed allocated time. Finally, data are presented about variables representing the instructional process: use of three grouping patterns, use of three different types of materials, and the relative amount and origin of talk in the classroom.

Summary tables in this chapter are derived in part from data given by Nerenz and Webb (1980, P.P. 80-4 and 80-8) and Webb and Nerenz (1980, P.P. 80-5). The tables are arranged by label group (IGE/WDRSD, IGE/non-WDRSD, non-IGE/WDRSD), with cluster group indicated by T1 and T2 for the two triplets of schools, P1 and P2 for the two pairs of schools, and -- (da) for the outlier.

Allocated Time

In the two groups of WDRSD schools, generally logs were kept only for WDRSD skills instruction; the exception occurred at School 901, a non-IGE/WDRSD school, at which all reading instruction time was logged as it was at the non-WDRSD schools. Using reports from the schools about the total time scheduled for reading and the proportion of that time allocated to skill instruction, estimates were made of the amount of general reading time allocated per child. The estimated total hours of reading instruction and the assignment of those hours to the eleven skill objectives and to general reading are given in Table 5. In developing this table, it was necessary to assume that time for each objective was allocated equally to all children for whom logs were maintained; that is, if 18 hours were allocated during one period to phonic analysis-vowels (02), that time would have been recorded as 3 hours per child where logs were maintained for six children, 2 1/4 hours per child where logs were maintained for eight children, and so on.

Word attack skills (13) received the primary instructional emphasis in reading at Grade 2, with most schools allocating from one-half to two-thirds of the skill time to that area. At one of the exceptions,

Table 5

Grade 2 Allocated Hours of Reading Instruction per Child over the Total Study Period, by Objective

School	Cluster	Phonic Analysis--Consonants 01 Hours	%	Phonic Analysis--Vowels 02 Hours	%	Phonic Analysis--Silent Letters 03 Hours	%	Structural Analysis 04 Hours	%	Vocabulary Meaning 05 Hours	%	Word Attack Aggregate 13 Hours	%
IGE/WDRSD													
466	T1	8.3	19	9.7	22	-	-	13.6	30	-	-	31.6	71
451	P1	.5	4	3.4	24	1.4	10	-	-	3.4	24	8.7	61
476	T2	7.6	31	5.6	23	.1	0+	10.8	44	.2	1	24.3	100
507	T2	1.8	4	14.2	34	-	-	6.9	17	.6	1	23.5	57
Mean		4.6	15	8.2	26	.4	3	7.8	23	1.1	7	22.0	72
IGE/non-WDRSD													
372	T1	28.3	16	38.7	22	.1	0+	36.9	21	8.0	5	112.0	64
410	T2	2.6	10	7.6	29	.5	2	3.9	15	1.2	5	15.8	60
493	--	10.4	19	8.9	16	.7	1	11.8	21	4.4	8	36.2	65
Mean		13.8	15	18.4	22	.4	1	17.5	19	4.5	6	54.7	63
non-IGE/WDRSD													
900	T1	.8	5	1.0	6	1.7	10	3.9	23	.8	5	8.2	49
902	P2	5.5	12	8.1	17	.6	1	13.5	29	.8	1	28.5	61
901	P2	3.0	3	19.9	20	-	-	8.9	9	6.3	6	38.1	39
903	P1	.5	2	5.0	23	-	-	4.7	22	2.6	12	12.8	59
Mean		2.5	6	8.5	17	.6	3	7.8	21	2.6	6	21.9	52
T1 Mean		12.5	13	16.5	17	.6	3	18.1	25	2.9	3	50.6	61
T2 Mean		4.0	15	9.1	29	.2	1	7.2	25	.7	2	21.2	72
P1 Mean		.5	3	4.2	24	.7	5	2.4	11	3.0	18	10.8	60
P2 Mean		4.3	8	14.0	19	.3	1	11.2	19	3.6	4	33.3	50
Grand Mean		6.3	11	11.1	21	.5	2	10.4	21	2.6	6	30.9	62
Standard deviation		8.1	9	10.5	7	.6	4	9.8	11	2.7	7	28.9	15

Table 5 (continued)

School	Cluster	Map Skills 06 Hour	%	Graph and Table Skills 07 Hours	%	Reference Skills 08 Hours	%	Study Skills Aggregate 14 Hours	%
IGE/WDRSD									
466	T1	-	-	-	-	-	-	-	-
451	P1	1.3	9	-	-	-	-	1.3	9
476	T2	-	-	-	-	-	-	-	-
507	T2	3.4	8	3.9	9	-	-	7.3	18
Mean		1.2	4	1.0	2	-	-	2.2	7
IGE/non-WDRSD									
372	T1	2.1	1	-	-	7.7	4	9.8	6
410	T2	-	-	-	-	.8	3	.8	3
493	--	1.1	2	.6	1	.4	1	2.1	4
Mean		1.1	1	.2	0+	3.0	3	4.2	4
non-IGE/WDRSD									
900	T1	2.7	16	5.7	34	-	-	8.4	51
902	P2	17.0	36	.6	1	1.0	2	18.6	39
901	P2	19.7	20	8.5	9	5.0	5	33.2	34
903	P1	-	-	-	-	-	-	-	-
Mean		9.9	18	3.7	11	2.0	2	15.1	31
T1 Mean		1.6	6	1.9	11	2.6	1	6.1	19
T2 Mean		1.1	3	1.3	3	.3	1	2.7	7
P1 Mean		.7	5	-	-	-	-	.7	5
P2 Mean		18.4	28	4.6	5	3.0	4	25.9	37
Grand Mean		4.3	8	1.8	5	1.4	1	7.4	15
Standard deviation		7.1	12	2.9	10	2.6	2	10.3	18

Table 5 (continued)

School	Cluster	Word Meaning Skills 09 Hours	%	Sentence Meaning Skills 10 Hours	%	Passage Meaning Skills 11 Hours	%	Comprehension Aggregate 1[illegible] Hours	%	Total Skills Hours	%	General Reading Skills[a] 12 Hours	%	Total Hours[a]
IGE/WDRSD														
466	T1	-	-	2.3	5	10.7	24	13.0	29	44.6	23	178.4	77	233.0
451	P1	-	-	.5	4	3.7	26	4.2	30	14.2	15	80.5	85	94.7
476	T2	-	-	-	-	-	-	-	-	24.3	13	158.0	87	182.3
407	T2	-	-	3.4	8	7.3	18	10.7	26	41.5	23	141.1	77	182.6
Mean		-	-	1.6	4	5.4	17	7.0	21	31.2	19	139.5	82	173.2
IGE/non-WDRSD														
372	T1	28.5	16	6.8	4	19.0	11	54.3	31	176.1	76	55.4	24	231.5
410	T2	2.1	8	.6	2	7.1	27	9.8	37	26.4	41	37.9	59	64.3
493	--	3.3	6	3.6	6	10.4	19	17.3	31	55.6	58	40.0	42	95.6
Mean		11.3	10	3.7	4	12.2	19	27.1	33	86.0	58	44.4	42	130.5
non-IGE/WDRSD														
900	T1	-	-	-	-	-	-	-	-	16.6	20	67.9	80	84.5
902	P2	-	-	-	-	-	-	-	-	47.1	25	141.3	75	188.4
901	P2	3.6	4	7.5	8	14.8	15	25.9	27	97.2	68	45.5	32	142.7
903	P1	.3	1	1.9	9	6.6	31	8.8	41	21.6	33	43.2	67	64.8
Mean		1.0	1	2.4	4	5.4	12	8.7	17	45.6	37	74.5	64	120.1
T1 Mean		9.5	5	3.0	3	9.9	12	22.4	20	79.1	40	100.6	60	183.0
T2 Mean		.7	3	1.3	3	4.8	15	6.8	21	30.7	26	112.3	74	143.1
P1 Mean		.2	1	1.2	7	5.2	29	6.5	36	17.9	24	61.9	76	79.8
P2 Mean		1.8	2	3.8	4	7.4	8	13.0	14	72.2	47	93.4	54	165.6
Grand Mean		3.4	3	2.4	4	7.2	16	13.1	23	51.4	36	89.9	64	141.3
Standard deviation		8.4	5	2.7	3	6.2	11	15.8	15	47.6	22	53.7	22	64.4

[a]Numbers are estimates for all WDRSD schools except School 901.

NOTE: Percentages for objectives 1-11 and aggregates 12-15 are of skill time; total skill time and general reading are expressed as a percentage of total hours reading instruction. No allocated time is indicated by -; less than .05 hours is indicated by .0; 0+ indicates less than 0.5%.

School 476, the total reading skill instruction time was given to word attack. At the other, School 901, only 29% of the skill time was spent on word attack.

Study Skills (14) were taught very little at the non-WDRSD schools, and not at all at three of the eight WDRSD schools. At three of the non-IGE/WDRSD schools, study skills were allocated over one-third of the skills instructional time.

There seem to be two distinct ideas about the teaching of comprehension skills (15) in Grade 2. Three schools, all WDRSD schools, allocated no time to instruction in comprehension skills. At the other eight schools about one-third of the skills instruction time was allocated to comprehension.

The last three columns of Table 5 give skills instruction and general reading times in hours and as a percentage of total reading instructional time. General reading and total reading hours are estimates for all the WDRSD schools except School 901. At that school and at the non-WDRSD schools, teachers maintained logs for all reading instruction. Total reading estimates cover the range of total reading allocations. Since the estimates for total reading are based on schools' reported schedules and cover the range of allocations for total reading, they appear to be reasonable. The non-WDRSD schools and School 901 reported a much larger percentage of time allocated to skills instruction, 61%, than did the remaining seven schools which averaged 22% allocated to skills. This seeming reduced emphasis on

skills at most of the WDRSD schools reflects a distinction between WDRSD skill instruction and skill instruction and application that occurs in other components of the reading program. At seven of the eight WDRSD schools, hours of specific skill instruction appear fewer than actually occurred.

Proportion Observed

The relationship of log allocated time and observed time is shown in Table 6. From 16 to 24 formal observations were made in each school during the 25-week study. Since testing occurred in six weeks during the period that teachers maintained logs of allocated time for the target students, observations were made in most of the remaining 19 weeks.

Overall, from 11% to 36% of the log allocated time was observed. In most cases, the relative emphasis on general objectives that was shown in the logs was maintained in the observations; for example, for Objective C1, little or no instructional time was observed in those schools in which a small percentage of time had been allocated, and a large proportion of time was observed where over 10% of the instructional time was allocated to Objective 01.

At most schools, the correspondence between proportion of time allocated and proportion observed is quite close for the aggregate objectives 13, 14, and 15. At School 410, less Word Attack time and more Comprehension time was observed than allocated; at School 901, more Work Attack time and less Study Skills time was observed.

Table 6

Relationship of Allocated Time to Observed Time

by Objective

School	Cluster	Observations No.	Total Hours	% of Allocated Time	Phonic Analysis--Consonants 01	Phonic Analysis--Vowels 02	Phonic Analysis--Silent Letters 03	Structural Analysis 04
IGE/WDRSD								
466	T1	19	59.19	22	19,27	22,28	--,--	30.12
451	P1	16	47.12	36	4,7	24,27	10,23	0,1
476	T2	20	44.84	19	31,28	23,22	0+,--	44,50
507	T2	22	105.38	32	4,15	34,24	--,--	17,7
IGE/non-WDRSD								
372	T1	24	258.41	19	16,15	22,26	0+,--	21,17
410	T2	20	118.55	29	10,4	29,4	2,1	15,8
493	--	20	104.70	18	19,28	16,9	1,2	21,19
non-IGE/WDRSD								
900	T1	19	43.09	32	5,5	6,--	10,23	23,32
902	P2	21	42.13	11	12,20	17,19	1,--	29,24
901	P2	20	104.38	12	3,6	20,31	--,--	9,10
903	P1	19	46.57	31	2,--	23,32	--,--	22,27

Table 6 (continued)

School	Cluster	Vocabulary Meaning 05	Word Attack Aggregate 13	Map Skills 06	Graph and Table Skills 07	Reference Skills 08
IGE/WDRSD						
466	T1	--,--	71,68	--,--	--,--	--,--
491	P1	24,21	61,79	9,--	--,--	--,--
476	T2	1,--	100,100	--,--	--,--	--,--
507	T2	1,--	57,46	8,10	9,12	--,--
IGE/non-WDRSD						
372	T1	5,7	64,65	1,1	--,--	4,4
410	T2	5,4	60,20	--, 1	--,1	3,1
493	--	8,14	65,73	2,1	1,0+	1,1
non-IGE/WDRSD						
900	T1	5,6	49,55	16,31	34,12	--,--
902	P2	1,10	61,73	36,23	1,4	2,--
901	P2	6,7	39,55	20,5	9,--	5,4
903	P1	12,--	59,59	--,--	--,--	--,--

Table 6 (continued)

School	Cluster	Study Skills Aggregate 14	Word Meaning Skills 09	Sentence Meaning Skills 10	Passage Meaning Skills 11	Comprehension Aggregate 15
IGE/WDRSD						
466	T1	--,--	--,--	5,2	24,30	29,32
451	P1	9,--	--,--	4,3	26,18	30,21
476	T2	--,--	--,--	--,--	--,--	--,--
507	T2	18,22	--,0+	8,10	18,22	26,32
IGE/non-WDRSD						
372	T1	6,4	16,16	4,5	11,9	31,30
410	T2	3,3	8,22	2,7	27,47	37,77
493	--	4,2	6,9	6,5	19,11	31,25
non-IGE/WDRSD						
900	T1	51,43	--,2	--,--	--,--	--,2
902	P2	39,27	--,--	--,--	--,--	--,--
901	P2	34,9	4,8	8,5	15,23	27,36
903	P1	--,--	1,--	9,21	31,20	41,41

NOTE: For each general objective, the proportion of allocated time is given first followed by the proportion of observed time. Percentages of allocated time and of observed time may not sum to 100 due to rounding. 0+ indicates less than .5%.

Nonapplied Time, Available Time, and Engaged Time

Formal observations were made during the time period in which reading instruction was scheduled in each school. Data on time use were developed from these observations. Briefly, the time use variables are as follows: nonapplied time, the portion scheduled for but not devoted to reading instruction; available time, difference between scheduled observed time and nonapplied time; engaged time, the portion of available time that students were observed to be attending to instructional activities. (These variables are described in more detail in Chapter II.)

As shown in Table 7, the percentage of nonapplied time and, of course, available time varied among schools. Little nonapplied time was observed in the three schools in T2; members of no other cluster group and no label group were consistent in percentage of nonapplied time.

At all schools, students were engaged in instructional activities over half of the allocate time, with the highest percentage of engaged time at the three schools in T1. Again similarities were not found among members of other groups.

The allocated instructional hours for each child from Table 5 and the overall percentage of engaged time from Table 7 together provide estimates of the time allocated to reading instruction each week and the average engaged time for each child (Table 8).

Five schools reported allocating less than five hours a week, or one hour a day, to reading instruction. These schools represent all three label groups and include both members of P1, Schools 451 and

Table 7

Nonapplied Time, Available Time and Engaged Time as a

Percentage of Observed Allocated Time, Grade 2

School	Cluster	Nonapplied Time	Available Time		Engaged Time	
			Total Study	Range for Periods A-G	Total Study	Range for Periods A-G
IGE/WDRSD						
466	T1	22	78	71-86	53	46-70
451	P1	16	84	68-100	62	46-80
476	T2	7	93	87-96	68	59-74
507	T2	7	93	87-97	71	65-77
Mean		13	87		64	
IGE/non-WDRSD						
372	T1	14	86	76-92	62	58-71
410	T2	3	97	92-100	77	69-82
493	--	22	78	59-87	66	49-80
Mean		12	88		68	
non-IGE/WDRSD						
900	T1	30	70	41-88	58	29-85
902	P2	26	74	52-90	63	42-88
901	P2	16	84	75-90	54	46-67
903	P1	14	86	77-100	55	51-70
Mean		22	78		58	
T1 Mean		22	78		58	
T2 Mean		6	94		72	
P1 Mean		15	85		59	
P2 Mean		21	79		59	
Grand Mean		16	84		63	
Standard deviation		8.4	8.4		7.5	

Table 8

Estimated Hours Allocated and Engaged for

Each Child Each Week, Grade 2

School	Cluster	Hours Allocated per Child: Total Study[a]	Hours Allocated per Child: Per Week	Engaged Time: %[b]	Engaged Time: Estimated Hours/Week
IGE/WDRSD					
466	T1	223.0	9.32	53	4.94
451	P1	94.7	3.79	62	2.35
476	T2	182.3	7.29	68	4.96
507	T2	182.6	7.30	71	5.19
Mean		170.7	6.93	64	4.36
IGE/non-WDRSD					
372	T1	231.5	9.26	62	5.74
410	T2	64.3	2.57	77	1.98
493	--	95.6	3.82	66	2.52
Mean		130.5	5.22	68	3.41
non-IGE/WDRSD					
900	T1	84.5	3.38	58	1.96
902	P2	188.4	7.54	63	4.77
901	P2	142.7	5.71	54	3.08
903	P1	64.8	2.59	55	1.43
Mean		120.1	4.81	58	2.81
T1 Mean		[illegible].7	7.32	58	4.21
T2 Mean		[illegible].1	5.72	72	4.04
P1 Mean		[illegible]9.8	3.19	59	1.89
P2 Mean		165.6	6.63	59	3.93
Grand Mean		142.2	5.69	63	3.54
Standard deviation		64.45	2.57	7.5	1.58

[a] From Table 5.

[b] From Table 7.

903, one member each of T1 and T2, Schools 900 and 410, and the outlier, School 493. Engaged time at these schools ranged from one and one-half to two and one-half hours a week. Engaged time uses about five or more hours a week at all other schools except School 901, at which it was three hours a week.

Means of Instruction

The IGE Instructional Programming Model provides for the use of a variety of group sizes and of instructional materials to meet children's individual instructional needs. The WDRSD was developed to be consistent with the IGE philosophy. Thus, all schools were expected to use a variety of group sizes and types of materials. Only the skill development aspect of reading instruction is included in the WDRSD, with the developers expecting that a total program would be worked out at the local level (Otto & Askov, 1974). In the WDRSD schools in which only formal skill instruction was logged and observed, there is no information about instructional time with a basal reader series or in language experience groups; in both of these instances, data for the WDRSD schools would provide underestimates of the time students spent in small groups and, in schools using a basal reader program, underestimates of the time that print materials were used. Since student interactions should increase with increased use of small groups, underestimates of the use of small groups will be accompanied by underestimates of student interactions.

Use of the three group sizes and the three primary types of materials and incidence of teacher and student interactions are summarized in

Table 9 as percentage of available time. Of all cluster groups and label groups, only the pair of Schools 451 and 903, P1, consistently used instructional group sizes with similar frequency. At all IGE/WDRSD schools large groups were used extensively but the schools differed in their use of individual and small groups. Similarly, at all IGE/non-WDRSD schools, individual work was predominant but small and large groups were used for different percentages of time at the three schools.

In use of materials, the only consistently similar schools in a label or cluster group were, again, the members of P1. The schools at which all reading time was observed, IGE/non-WDRSD schools and School 901, appear to use print materials more than other schools, for the reasons mentioned above. At six of the eight WDRSD schools manipulatives were used more than the minimal percentage observed at the non-WDRSD schools.

In incidence of interactions, again only for cluster group P1 were observations of group members similar. A lower incidence of teacher interactions was observed at the non-WDRSD schools and School 901 than where only formal skill instruction was observed.

Table 9

Instructional Process Variables as a Percentage of Available Time, Grade 2

	Cluster	Group Size[a]			Materials[b]			Interactions[b]	
		Individual	Small	Large	Paper-and-Pencil	Manipulatives	Print	Teacher	Student
)									
	T1	19	4	77	53	6	4	31	8
	P1	31	13	56	82	6	–	31	15
	T2	26	–	72	54	1	3	45	10
	T2	41	0+	59	64	1	7	31	11
		29	4	66	63	4	4	35	11
DRSD									
	T1	64	15	21	64	2	35	14	13
	T2	56	42	2	68	0+	60	15	20
	--	49	1	51	56	–	37	20	15
		56	19	25	63	1	44	16	16
DRSD									
	T1	29	10	61	52	9	4	46	11
	P2	49	1	49	56	26	3	36	18
	P2	55	16	29	70	6	23	15	9
	P1	36	9	53	79	8	0+	32	12
		42	9	48	64	12	8	32	13
		37	10	53	56	6	14	30	11
		41	14	44	62	1	23	30	14
		34	11	55	81	7	–	32	14
		52	9	39	63	16	13	26	14
n		41	10	48	63	6	16	29	13
deviation		14	12	22	10	7	20	11	4

may not sum to 100 due to rounding.
need not sum to 100.

V

Time Use in Grade 5

Time allocated to reading instruction, the amount of time a teacher intended to spend in various reading instruction activities, is a gross measure of opportunity to learn.[3] The number of hours allocated overall indicates the relative importance of reading in the elementary curriculum at various schools. Broken down by objective, allocated time informs us about the focus of instruction at various schools. However, not all of the time allocated to a particular curriculum area is active learning time for the students. A portion of the allocated time is not applied to the planned topic; during this time, students might be making the transitions from the previous subject, participating in classroom management activities, or working on other content. During the remaining time, that available for instruction in the content area, all students are not always engaged in the instructional activities; some may be passing out papers, waiting for assistance, or simply not paying attention.

In this chapter, time is first discussed as it was allocated to the general objectives; these data come from teacher logs. Next, observed allocated time is discussed as a proportion of log allocated time. Available and engaged time are then discussed as proportions of observed allocated time. Finally, data are presented about variables representing the instructional process: use of three grouping patterns, use of three different types of materials, and the relative amount and origin to talk in the classroom.

Summary tables in this chapter are derived in part from data given by Nerenz and Webb (P.P. 80-4 and 80-8) and Webb and Nerenz (P.P. 80-5).

[3] The introduction and much of the text of this chapter are repeated for the benefit of those readers who may not have read Chapter IV.

The tables are arranged by label group (IGE/WDRSD, IGE/non-WDRSD, non-IGE/WDRSD), with cluster group indicated by T1 and T2 for the two triplets of schools, P1 and P2 for the two pair of schools, and -- (dash) for the outlier.

Allocated Time

In the two groups of WDRSD schools, generally logs were kept only for WDRSD skills instruction; the exception occurred at School 901, a non-IGE/WDRSD school, at which all reading instruction time was logged as it was at the non-WDRSD schools. Using reports from the schools about the total time scheduled for reading and the proportion of that time allocated to skill instruction, estimates were made of the amount of general reading time allocated per child. The estimated total hours of reading instruction and the assignment of those hours to the 11 skill objectives and to general reading are given in Table 10. In developing this table, it was necessary to assume that time for each objective was allocated equally to all children for whom logs were maintained; that is, if 18 hours were allocated during one period to word meaning skills (09), that time would have been recorded as 3 hours per child where logs were maintained for six children, 2 1/4 hours per child where logs were maintained for eight children, and so on.

Word Attack skills were taught in all four of the schools in which all reading time was logged--372, 410, 493, and 901--and in School 466. The Word Attack element of the WDRSD was developed to end formal skill instruction, independent of a basal reader or other series, at third or fifth grade depending on students' reading ability. These results are consistent with the developers' expectations.

The five schools that provided Word Attack skill instruction allocated a relatively smaller proportion of their reading time to Study Skills than did other schools. At School 903 no time was allocated to Study Skills during the skill period. In contrast, at School 900 virtually all skill instruction time was allocated to Study Skills.

In 9 of the 11 schools, about half of the reading skill instruction time at Grade 5 was allocated to Comprehension skills. The two exceptions differed not only from the other schools but also from one another. At School 903, nearly all of the skill instruction focused on Comprehension; at School 900, no skill time was allocated to Comprehension.

The last three columns of Table 10 give skill instruction and general reading times in hours and as a percentage of total reading instructional time. General reading and total reading hours are estimates for all the WDRSD schools except School 901. At that school and at the non-WDRSD schools, teachers maintained logs for all reading instruction. Total reading estimates cover the range of total reading allocations. Since the estimates for total reading are based on schools' reported schedules and cover the range of allocations for total reading, they appear to be reasonable. The non-WDRSD schools and School 901 reported a much larger percentage of time allocated to skills instruction, 57%, than did the remaining seven schools which averaged 21% allocated to skills. This seeming reduced emphasis on skills at most of the WDRSD schools reflects a distinction between WDRSD skill instruction and skill instruction application that occurs in other components of the reading

Table 10

Grade 5 Allocated Hours of Reading Instruction per Child over the Total Study Period, by Objective

	Phonic Analysis-- Consonants 01		Phonic Analysis-- Vowels 02		Phonic Analysis-- Silent Letters 03		Structural Analysis 04		Vocabulary Meaning 05		Word Attack Aggregate 13	
Cluster	Hours	%	Hours	%	Hours	%	Hours	%	Hours	%	Hours	%
T1	.5	3	.9	6	1.4	9	3.8	24	-	-	6.6	41
P1	-	-	-	-	-	-	-	-	-	-	-	-
T2	-	-	-	-	-	-	-	-	-	-	-	-
T2	-	-	-	-	-	-	-	-	-	-	-	-
											1.7	10
SD												
T1	4.8	5	5.8	6	.1	0+	14.8	15	1.6	2	27.1	28
T2	-	-	1.4	2	.1	0+	8.5	15	6.2	11	16.2	29
—	.4	1	.3	1	-	-	4.2	14	2.0	6	6.9	22
											16.7	26
SD												
T1	-	-	-	-	-	-	.1	0+	-	-	.1	0+
P2	-	-	-	-	-	-	-	-	-	-	-	-
P2	.1	0+	2.5	3	-	-	9.1	11	-	-	11.7	14
P1	-	-	-	-	-	-	.7	3	-	-	.7	3
											1.1	2
											11.3	23
											5.4	10
											5.9	12
											.4	1
											6.3	12
viation											8.9	15

Table 10 (continued)

ool	Cluster	Map Skills 06 Hour	%	Graph and Table Skills 07 Hours	%	Reference Skills 08 Hours	%	Study Skills Aggregate 14 Hours	%
/WDRSD									
56	T1	-	-	1.5	9	.9	6	2.4	15
51	P1	1.1	11	-	-	4.8	49	5.9	60
46	T2	2.9	13	5.0	23	1.9	9	9.8	45
07	T2	3.6	12	9.4	30	3.9	12	16.9	54
ean								8.8	44
/non-WDRSD									
72	T1	.8	1	.2	0+	9.8	10	10.8	11
10	T2	1.5	3	.5	1	13.7	24	15.7	28
93	-	1.1	4	.3	1	7.9	26	9.3	30
ean								11.9	23
-IGE/WDRSD									
80	T1	4.4	30	2.9	20	7.3	50	14.6	100
92	P2	8.0	22	6.5	18	2.6	7	17.1	46
91	P2	4.8	6	6.2	8	20.9	26	31.9	39
93	P1	-	-	-	-	-	-	-	-
ean								15.9	46
Mean								9.3	42
Mean								14.1	42
Mean								3.0	30
Mean								24.5	43
d Mean								12.2	39
dard deviation								8.7	27

Table 10 (continued)

Cluster	Word Meaning Skills 09 Hours	%	Sentence Meaning Skills 10 Hours	%	Passage Meaning Skills 11 Hours	%	Comprehension Aggregate 15 Hours	%	Total Skills Hours	%	General Reading Skills[a] 12 Hours	%	Total Hours[a]
T1	2.9	18	-	-	4.2	26	7.1	44	16.1	13	104.7	87	120.8
P1	.8	8	-	-	3.1	32	3.9	40	9.8	30	22.8	70	32.6
T2	3.3	15	1.6	7	6.9	32	11.8	55	21.6	11	172.8	89	194.4
T2	4.8	15	.8	3	8.8	29	14.4	46	31.3	17	156.5	83	187.8
							9.3	46	19.7	18	114.2	82	133.9
D													
T1	31.5	32	4.3	4	24.5	25	60.3	61	98.2	67	48.2	33	146.4
T2	14.0	25	1.5	3	9.4	17	24.9	44	56.8	50	56.9	50	113.7
--	5.0	16	2.1	7	7.6	25	14.7	48	30.9	35	57.9	65	88.8
							33.3	51	62.0	51	54.3	49	116.3
D													
%1	-	-	-	-	-	-	-	-	14.7	13	94.5	87	109.2
P2	10.3	28	-	-	9.5	26	19.8	54	36.9	33	73.8	67	110.7
P2	19.3	24	6.2	8	12.1	15	37.6	46	81.2	77	24.7	23	105.9
P1	1.0	5	1.9	10	16.2	85	19.1	96	19.8	33	39.6	67	59.4
							19.1	49	38.2	39	58.2	61	96.3
							22.5	35	43.0	31	82.5	69	125.5
							17.0	48	36.6	26	128.7	74	165.3
							11.5	68	14.8	32	31.2	69	46.0
							28.7	50	59.1	55	49.3	45	108.3
							19.4	49	37.9	34	77.5	66	115.4
iation							17.1	22	28.9	22	50.2	22	48.3

estimates for all WDRSD schools except School 901.

ntages for objectives 1-11 and aggregates 13-15 are of skill time; total skill time and general reading are ex-
ed as a percentage of total hours reading instruction. No allocated time is indicated by -; less than .05 hours
; 0+ indicates less than 0.5%.

program. At seven of the eight WDRSD schools, hours of specific skill instruction appear fewer than actually occurred.

Proportion Observed

The relationship of log allocated time and observed time is shown in Table 11. From 15 to 21 formal observations were made in each school during the 25-week study. Since testing occurred in six weeks during the period that teachers maintained logs of allocated time for the target students, observations were made in most of the remaining 19 weeks.

Overall, from 11% to 56% of the log allocated time was observed. In most cases, the relative emphasis on general objectives that was shown in the logs was maintained in the observations; for example, for Objective 08, little or no instructional time was observed in those schools in which a small percentage of time had been allocated, and a large proportion of time was observed where over 10% of the instructional time was allocated to Objective 08.

At most schools, the correspondence between proportion of time allocated and proportion observed is quite close for the aggregate Objectives 13, 14, and 15. At School 410, less Word Attack time and more Comprehension time was observed than allocated; at School 901, less Word Attack and Comprehension time and more Study Skills time was observed.

Nonapplied Time, Available Time and Engaged Time

Formal observations were made during the time period in which reading instruction was scheduled in each school. Data on time use

Table 11

Relationship of Allocated Time to Observed Time

by Objective

	Observations			Phonic Analysis— Consonants 01	Phonic Analysis— Vowels 02	Phonic Analysis— Silent Letters 03	Structural Analysis 04
Cluster	No.	Total Hours	% of Allocated Time				
D							
T1	15	43.90	44	3,--	6,6	9,--	24,37
P1	16	56.89	56	--,--	--,--	--,--	--,--
T2	20	68.86	30	--,--	--,--	--,--	--,2
T2	20	64.65	25	--,--	--,--	--,--	--,--
WDRSD							
T1	21	166.32	19	5,9	6,6	0+,0+	15,16
T2	21	93.25	14	--,--	2,0+	0+,--	15,6
--	20	82.36	12	1,--	1,--	--,--	14,5
WDRSD							
T1	18	52.91	45	--,--	--,--	--,--	0+,10
P2	19	46.22	11	--,0+	--,--	--,--	--,--
P2	20	91.72	14	0+,--	3,0+	--,--	11,7
P1	20	46.19	38	--,--	--,--	--,--	3,--

Table 11 (continued)

School	Cluster	Vocabulary Meaning 05	Word Attack Aggregate 13	Map Skills 06	Graph and Table Skills 07	Reference Skills 08
IGE/WDRSD						
466	T1	--,--	41,43	--,5	9,1	6,--
451	P1	--,--	--,--	11,--	--,--	49,51
476	T2	--,--	--,2	13,37	23,13	9,3
507	T2	--,--	--,--	12,15	30,22	12,19
IGE/non-WDRSD						
372	T1	2,5	28,36	1,1	0,0+	10,12
410	T2	11,1	29,8	3,3	1,--	24,16
493	--	6,0+	22,5	4,9	1,--	26,21
non-IGE/WDRSD						
900	T1	--,--	0+,10	30,12	20,24	50,47
902	P2	--,--	--,0+	22,29	18,13	7,6
901	P2	--,--	14,7	6,1	8,14	26,41
903	P1	--,--	3,--	--,--	--,--	--,--

Table 11 (continued)

School	Cluster	Study Skills Aggregate 14	Word Meaning Skills 09	Sentence Meaning Skills 10	Passage Meaning Skills 11	Compr Agg
IGE/WDRSD						
466	T1	15,7	18,24	--,--	26,26	
451	P1	60,51	9,16	--,--	32,34	
476	T2	45,53	15,10	7,--	32,34	
507	T2	54,57	15,22	3,1	29,20	
IGE/non-WDRSD						
372	T1	11,13	32,35	4,4	25,20	
410	T2	28,19	25,43	3,6	17,25	
493	--	30,30	16,30	7,5	25,30	
non-IGE/WDRSD						
900	T1	100,82	--,7	--,--	--,--	
902	P2	46,48	28,40	--,--	26,11	
901	P2	39,56	24,26	8,2	15,9	
903	P1	--,--	5,5	10,4	85,91	

NOTE: For each general objective, the proportion of allocated time given first followed by the pr of observed time. Percentages of allocated time and of observed time may not sum to 100 due t ing. 0+ indicates less than 0.5%.

were developed from these observations. Briefly, the time use variables are as follows: nonapplied time, the portion scheduled for but not devoted to reading instruction; available time, difference between scheduled observed time and nonapplied time; engaged time, the portion of available time that students were observed to be attending to instructional activities. (These variables are described in more detail in Chapter II.)

As shown in Table 12, the percentage of nonapplied time and, of course, available time varied among schools, averaging 19% of the allocated time. The extreme deviations occurred at Schools 466 and 902 where nearly one-third of the allocated time was nonapplied time, and School 410, where only 3% of the allocated time was nonapplied. These three exceptional schools account for the apparent difference of the non-WDRSD schools from the two groups of WDRSD schools and of T2; both members of P1 had a lower than average percentage of nonapplied time.

Students were engaged in instructional activities nearly two-thirds of the time, on the average. School 466, at which students were engaged only 50% of the time, and School 410, where students were engaged 89% of the time, were again exceptional. At School 900, where the percentage of nonapplied time had been average, engaged time was only 55% of the allocated time. Again the exceptional schools account for the apparent differences among label groups and cluster groups.

Table 12

Nonapplied Time, Available Time and Engaged Time as a Percentage of Observed Allocated Time, Grade 5

l	Cluster	Nonapplied Time	Available Time		Engaged Time	
			Total Study	Range for Periods A-G	Total Study	Range for Periods A-G
DRSD						
	T1	33	67	59-79	50	42-70
	P1	15	85	72-95	65	61-73
	T2	18	82	38-100	69	30-86
	T2	17	83	67-91	66	54-80
n		20	80		64	
on-WDRSD						
	T1	18	82	63-90	64	53-71
	T2	3	97	95-100	89	78-97
	--	23	77	59-94	65	50-89
n		14	86		72	
GE/WDRSD						
	T1	19	81	64-92	55	39-71
	P2	29	71	55-90	59	44-78
	P2	20	80	70-93	61	50-70
	P1	10	90	73-87	65	56-66
n		21	79		60	
an		23	77		58	
an		13	87		75	
an		12	88		63	
an		24	76		60	
Mean		19	81		64	
ard deviation		8	8		10	

The allocated instructional hours for each child from Table 10 and the overall percentage of engaged time from Table 12 together provide estimates of the time allocated to reading instruction each week and the average engaged time for each child (Table 13).

On the average, nearly five hours a week, almost one hour a day, was allocated to reading instruction. At Schools 476 and 507, both IGE/WDRSD schools and both members of T2, much more time was allocated, an estimated 7.8 and 7.5 hours a week, respectively. Very little time was reported to be allocated to reading in members of P1: School 451, 1.3 hours a week, and School 903, 2.4 hours a week. At School 493 the allocated time was fairly small, 3.5 hours a week.

Engaged time is estimated to be 3.0 hours a week on the average. The estimated engaged hours at Schools 476 and 507, 5.3 and 4.9 hours a week, respectively, are high due to both the greater number of hours allocated to reading at these schools and the higher than average percentage of engaged time. At School 410, the third member of T2, allocated hours had been about average but the very high percentage of engaged time, 89%, resulted in a higher than average estimate of engaged hours each week. The consistently larger estimate of engaged hours each week for members of cluster group T2 results from different time use practices. The pair of schools with very low allocated hours, Schools 451 and 903, had only average percentages of engaged time and thus the lowest estimated engaged hours a week.

Table 13

Estimated Hours Allocated and Engaged for Each Child Each Week, Grade 5

School	Cluster	Hours Allocated per Child: Total Study[a]	Hours Allocated per Child: Per Week	Engaged Time: %[b]	Engaged Time: Estimated Hours/Week
IGE/WDRSD					
466	T1	120.8	4.8	50	2.4
451	P1	32.6	1.3	65	0.8
476	T2	194.4	7.8	69	5.3
507	T2	187.8	7.5	66	4.9
Mean		133.9	5.3	64	3.4
IGE/non-WDRSD					
372	T1	146.4	5.8	64	3.7
410	T2	113.7	4.5	89	4.0
493	--	88.8	3.5	65	2.3
Mean		116.2	4.6	72	3.3
non-IGE/WDRSD					
900	T1	108.9	4.3	55	2.4
902	P2	110.7	4.4	59	2.6
901	P2	105.9	4.2	61	2.6
903	P1	59.4	2.4	65	1.5
Mean		96.2	3.8	60	2.3
T1 Mean		125.3	4.9	56	2.8
T2 Mean		165.3	6.6	75	4.2
P1 Mean		45.9	1.8	65	1.1
P2 Mean		108.3	4.3	60	2.6
Grand Mean		115.4	4.6	64	3.0
Standard deviation		48.3	1.9	10	1.4

[a] From Table 10.

[b] From Table 12.

Means of Instruction

The IGE Instructional Programming Model provides for the use of a variety of group sizes and of instructional materials to meet children's individual instructional needs. The WDRSD was developed to be consistent with the IGE philosophy. Thus, all schools were expected to use a variety of group sizes and types of materials. Only the skill development aspect of reading instruction is included in the WDRSD, with the developers expecting that a total program would be worked out at the local level (Otto & Askov, 1974). In the WDRSD schools in which only formal skill instruction was logged and observed, there is no information about instructional time with a basal reader series or in language experience groups; in both of those instances, data for the WDRSD schools would provide underestimates of the time students spent in small groups and, in schools using a basal reader program, underestimates of the time that print materials were used. Since student interactions should increase with increased use of small groups, underestimates of the use of small groups will be accompanied by underestimates of student interactions.

Use of the three group sizes and the three primary types of materials and incidence of teacher and student interactions are summarized in Table 14 as percentages of available time. None of the label groups or cluster groups were consistent in any of the three instructional process variables. For example, the non-IGE/WDRSD schools were similar in the proportion of individual work and varied in the use of small groups; at the two schools in P1 nearly the same

Table 14

Instructional Process Variables as a Percentage of Available Time, Grade 5

	Cluster	Group Size[a]			Materials[b]			Interactions[b]	
		Individual	Small	Large	Paper-and-Pencil	Manipulatives	Print	Teacher	Student
	T1	41	7	52	81	5	3	24	8
	P1	52	2	45	90	3	16	25	6
	T2	33	9	58	68	0	30	52	5
	T2	77	4	20	90	9	62	22	10
		51	6	44	82	4	28	31	7
SD									
	T1	82	4	14	92	0+	50	13	2
	T2	60	34	6	84	0	46	23	2
	--	42	2	56	88	0	17	26	13
		61	13	25	88	0	38	21	6
SD									
	T1	48	1	50	77	7	14	29	6
	P2	48	5	47	66	13	17	36	16
	P2	50	10	41	69	3	41	23	11
	P1	45	12	44	72	7	11	27	15
		48	7	46	71	10	21	29	12
		57	4	39	83	4	22	22	5
		57	16	28	81	3	46	32	6
		49	7	45	81	5	14	26	11
		49	8	44	68	8	29	30	14
		53	8	39	80	4	28	27	9
viation		15	9	18	10	4	19	10	5

ay not sum to 100 due to rounding.
eed not sum to 100.

proportion of time was observed for large groups but the schools used small groups and individual work in different proportions.

In use of materials, the non-IGE schools used paper and pencil materials for a smaller proportion of time than most IGE schools; School 476 was like the non-IGE schools. Manipulatives were not used at the non-WDRSD schools or at School 476; percentage of use varied among the WDRSD schools.

Teacher interactions were observed more frequently than student interactions at all schools, particularly at Schools 476 and 410, where teacher interactions occurred at ten times the proportion of student interaction. On the average, interactions were observed over one-third of the time, with no clear pattern for label groups or cluster groups.

VI

Achievement Results

All general objectives and aggregate objectives were identified in Table 2. They are listed in Table 15 along with the number of items contributing to the score for each general objective and aggregate. Scores are reported as proportions of actual number of correct responses to possible number of correct responses. For aggregate objectives, scores are weighted averages of the scores for contributing objectives; for example, the score for Comprehension (15) at Grade 2 is the sum of .25 of the score for Sentence Meaning Skills (10) and .75 of the score for Passage Meaning Skills (11).

Achievement Gains: Real and Relative

The distinction between actual changes in achievement between time 1 and time 8 and the amount of change at one school compared to the amount of change at all schools is important for interpretation of the results in this chapter and those that follow. The expected change, of course, is an increase during the school year from time 1 to time 8, an actual gain in achievement. If scores for all schools were identical at time 1 and time 8, or if scores for all schools at time 8 were, say, half again as large as they had been at time 1, there would be no difference in the relative change in achievement. Since scores differed at time 1 and at time 8 and since the proportion of change was different among schools, the relative change in achievement differs among schools. Relative change is expressed as residualized mean gain scores, or

Table 15

Number of Items Contributing to Achievement Scores for the IGE/WDRSD Comparative Study

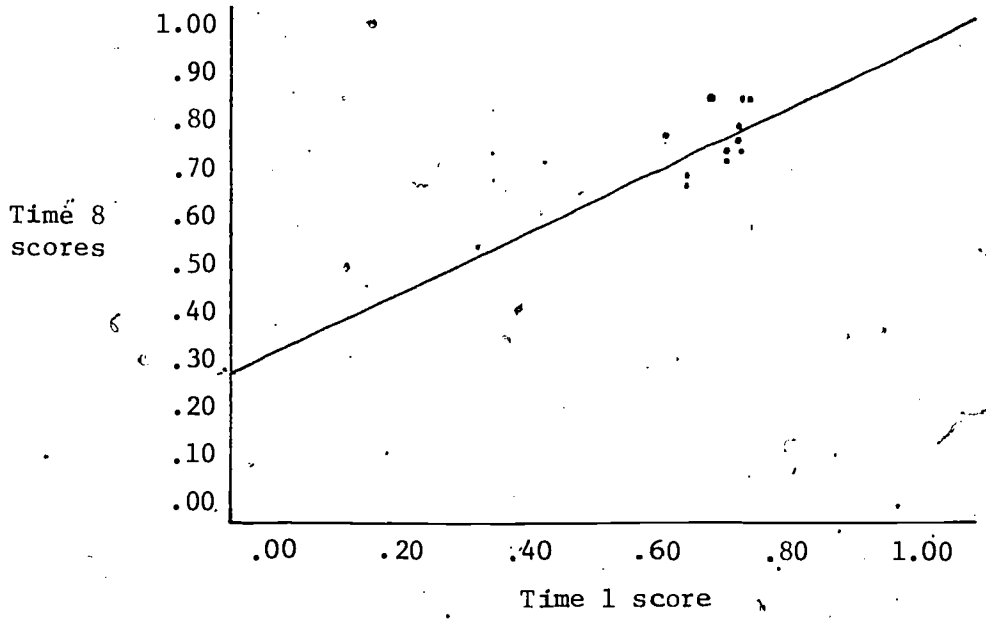
	General Objective	Number of Items Grade 2	Number of Items Grade 5
01	Phonic Analysis--Consonants	6	
02	Phonic Analysis--Vowels	18	
03	Phonic Analysis--Silent Letters	3	3
04	Structural Analysis	15	6
05	Vocabulary Meaning	6	
13	Word Attack	48	9
06	Map Skills	9	15
07	Graph and Table Skills	6	11
08	Reference Skills	3	24
14	Study Skills	18	50
09	Word Meaning Skills		6
10	Sentence Meaning Skills	3	3
11	Passage Meaning Skills	9	10
15	Comprehension	12	19

residuals; these scores are both positive and negative even when actual achievement increased for all schools.

Since the intent of this study was to identify relatively more effective instructional processes, the discussion in this chapter and the analyses in the next chapters use residualized mean gain scores. Negative residuals nearly always indicate relatively less effective instruction, a small positive change, rather than ineffective instruction, a negative change.

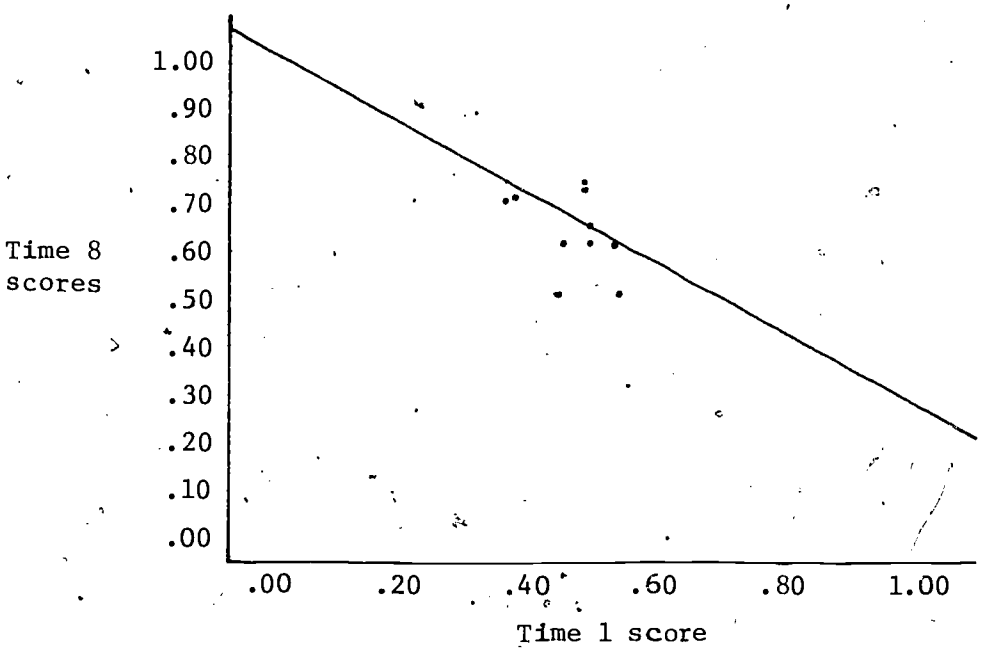
Grade 2 results from Phonic Analysis--Vowels (02) and Vocabulary Meaning (05) illustrate the difference between achievement gains and residual gains. In Figure 5, scores for vowels increased with changes ranging from +.03 to +.18. The change of +.03 at School 901 brought scores from above the average at time 1 to average at time 8. At School 493 scores increased .18 from just below average at time 1 to well above average at time 8. The dashed line indicates the time 8 scores that would be predicted for these schools if change at all schools had occurred at the same rate. The mark for School 901 is below the line; the residual for that school is -.04. A score of .80 was predicted for School 901. For School 493, the mark is above the dotted line and the residual is +.09; the predicted score for School 493 is .75.

Figure 6 includes the same kind of information for Vocabulary Meaning. The average increase is more than double the increase for Vowels and the greatest positive change occurred in schools with low



School	1
466	.62
451	.67
476	.76
507	.67
372	.62
410	.60
493	.66
900	.69
902	.74
901	.73
903	.69
Average	.67

Figure 5. Achievement on vowels at times 1 and 8.



School	1
466	.56
451	.49
476	.49
507	.40
372	.45
410	.50
493	.39
900	.50
902	.38
901	.53
903	.45
Average	.47

Figure 6. Achievement on vocabulary meaning at times 1 and 8.

scores at time 1. Schools 451 and 507 both have residuals of +.09. At the former, scores were above average at time 1 and increased by .25. Scores at the latter were well below average at time 1 and increased by .42. Schools 493 and 902 increased more than average but still had small negative residuals due to their low scores at time 1. In contrast, Schools 410 and 901 have small positive residuals with less than average increases because their time/scores were above average.

On Vocabulary Meaning, scores at School 466 actually decreased, yielding a residual of -.07. Although the relationship among time use, instructional process, and change in achievement is the topic of Chapters VII and VIII, an additional caution in interpreting negative residuals is needed here. At School 466, no time had been allocated to objective 05 (Table 5), so no conclusion may be drawn about the effectiveness of instruction on Vocabulary Meaning.

Grade 2

Results are shown in Table 16 which includes, for each objective, scores at times 1 and 8, change, and residual gain score. Mean scores are reported for label groups, for cluster groups, and for all schools combined. Test results at all eight test times are provided by Nerenz (P.P. 80-10, 1980).

Average scores increased for all objectives from time 1 to time 8. At both test times 1 and 8, average scores were high for Sentence Meaning Skills (10); averages for Graph and Table Skills (07) were consistently low. The smallest average gain, .05, was on Sentence Meaning, due at least in part to the very high scores at time 1 and the perfect or near-perfect scores at time 8. The greatest increase in

Table 16

Achievement Results for the Grade 2 Schools

School	Cluster	Phonic Analysis--Consonants 01				Phonic Analysis--Vowels 02				Phonic Analysis--Silent Letters 03				Structural Analysis 04				Vocabulary Meaning 05			
		1	8	Change	Residual	1	8	Change	Residual	1	8	Change	Residual	1	8	Change	Residual	1	8	Change	Residual
GE/WDRSD																					
466	T1	.63	.78	+.15	-.02	.62	.69	+.07	-.03	.17	.48	+.31	-.07	.55	.61	+.06	-.10	.56	.52	-.04	-.07
451	P1	.65	.88	+.23	+.07	.67	.72	+.05	-.04	.36	.53	+.17	-.09	.46	.66	+.20	-.00	.49	.74	+.25	+.09
476	T2	.62	.80	+.18	-.00	.76	.84	+.08	+.01	.79	.69	-.10	-.10	.62	.73	+.09	-.02	.49	.75	+.26	+.10
507	T2	.74	.70	-.04	-.12	.67	.73	+.06	-.03	.50	.72	+.22	+.04	.58	.75	+.17	+.02	.40	.82	+.42	+.09
Mean		.66	.79	+.13		.68	.74	+.06		.46	.60	+.14		.55	.69	+.13		.48	.71	+.23	
GE/non-WDRSD																					
372	T1	.67	.81	+.14	+.00	.62	.70	+.08	-.02	.26	.47	+.21	-.11	.42	.68	+.26	+.04	.45	.52	+.07	-.16
410	T2	.77	.82	+.05	-.01	.60	.76	+.16	+.05	.31	.59	+.28	-.01	.54	.68	+.14	-.03	.50	.67	+.17	+.03
493	-	.73	.85	+.12	+.03	.66	.84	+.18	+.09	.48	.82	+.34	+.15	.48	.70	+.22	+.03	.39	.73	+.34	-.00
Mean		.72	.83	+.09		.63	.77	+.14		.35	.63	+.28		.48	.69	+.21		.45	.64	+.19	
on-ICE/WDRSD																					
900	T1	.76	.77	+.01	-.05	.69	.75	+.06	-.03	.52	.60	+.08	-.09	.52	.74	+.22	+.05	.50	.63	+.13	-.01
902	P2	.83	.91	+.08	+.07	.74	.86	+.12	+.05	.40	.86	+.46	+.22	.63	.81	+.18	+.06	.38	.71	+.33	-.03
901	P2	.91	.85	-.06	+.00	.73	.76	+.03	-.04	.39	.68	+.29	+.05	.73	.71	-.02	+.01	.53	.63	+.10	+.02
903	P1	.68	.83	+.15	+.02	.60	.71	+.11	+.00	.23	.58	+.35	+.01	.50	.63	+.13	-.05	.45	.63	+.18	-.05
Mean		.80	.84	+.04		.68	.77	+.08		.38	.68	+.30		.54	.72	+.18		.46	.65	+.19	
Mean		.69	.79	+.10		.64	.71	+.07		.32	.52	+.20		.50	.68	+.18		.50	.56	+.06	
Mean		.71	.77	+.06		.68	.78	+.10		.53	.67	+.14		.58	.72	+.14		.56	.75	+.29	
Mean		.67	.86	+.19		.64	.72	+.08		.30	.56	+.26		.48	.65	+.17		.47	.69	+.22	
Mean		.87	.88	+.01		.74	.81	+.07		.40	.77	+.37		.68	.76	+.08		.46	.67	+.21	
and Mean		.73	.82	+.09		.67	.76	+.09		.40	.64	+.24		.54	.70	+.16		.47	.67	+.20	
andard deviation		.09	.06			.06	.06			.17	.13			.09	.06			.06	.09		

Table 16 (continued)

ol	Cluster	Word Attack Aggregate 13				Map Skills 06				Graph and Table Skills 07				Reference Skills 08				Study Skills Aggregate 14			
		1	8	Change	Residual	1	8	Change	Residual	1	8	Change	Residual	1	8	Change	Residual	1	8	Change	Residual
WDRSD																					
6	T1	.56	.64	+.08	-.06	.62	.69	+.07	-.03	.33	.42	+.09	-.08	.48	.51	+.03	-.17	.50	.57	+.07	-.07
1	P1	.56	.71	+.15	+.01	.57	.85	+.28	+.16	.44	.63	+.19	+.06	.38	.63	+.25	-.03	.49	.74	+.25	+.11
6	T2	.67	.78	+.11	-.02	.74	.74	.00	-.06	.49	.55	+.06	-.05	.47	.72	+.25	+.05	.61	.67	+.06	-.06
7	T2	.61	.74	+.13	-.01	.64	.76	+.12	+.03	.38	.62	+.24	+.09	.39	.82	+.43	+.16	.51	.72	+.21	+.08
an		.60	.72	+.12		.64	.76	+.12		.41	.56	+.15		.43	.67	+.24		.53	.68	+.15	
non-WDRSD																					
2	T1	.52	.67	+.15	+.00	.62	.68	+.06	-.04	.30	.47	+.17	-.01	.35	.62	+.27	-.03	.47	.60	+.13	-.02
0	T2	.57	.72	+.15	+.01	.51	.64	+.13	-.00	.41	.54	+.13	-.01	.75	.88	+.13	+.16	.52	.65	+.13	+.00
3	-	.57	.78	+.21	+.07	.54	.57	+.03	-.09	.25	.48	+.23	+.02	.60	.68	+.08	-.02	.45	.56	+.11	-.04
an		.55	.72	+.17		.56	.63	+.07		.32	.50	+.18		.57	.73	+.16		.48	.60	+.12	
IGE/WDRSD																					
0	T1	.61	.73	+.12	-.02	.56	.68	+.12	+.00	.52	.68	+.16	+.02	.65	.72	+.07	+.12	.56	.69	+.13	+.01
2	P2	.65	.83	+.18	+.05	.73	.81	+.08	+.01	.40	.53	+.13	-.01	.47	.75	+.28	+.08	.58	.71	+.13	+.02
1	P2	.64	.74	+.10	-.03	.81	.88	+.07	+.03	.56	.58	+.02	-.06	.47	.65	+.18	-.02	.67	.74	+.07	-.01
3	P1	.54	.68	+.14	-.01	.48	.62	+.14	-.00	.30	.47	+.17	-.01	.67	.53	-.14	-.18	.45	.56	+.11	-.04
an		.61	.75	+.14		.64	.75	+.11		.44	.56	+.12		.56	.66	+.10		.57	.68	+.11	
ean		.56	.68	+.12		.60	.68	+.08		.38	.52	+.14		.49	.62	+.13		.51	.62	+.11	
ean		.62	.75	+.13		.63	.71	+.08		.40	.57	+.17		.54	.81	+.27		.55	.68	+.13	
ean		.55	.70	+.15		.53	.74	+.21		.37	.55	+.18		.53	.58	+.05		.47	.65	+.18	
ean		.65	.79	+.14		.77	.85	+.08		.48	.56	+.08		.47	.70	+.23		.63	.73	+.10	
l Mean		.59	.73	+.14		.62	.72	+.10		.40	.54	+.14		.52	.68	+.16		.53	.66	+.13	
dard		.05	.05			.10	.10			.10	.08			.13	.11			.07	.07		
viation																					

Table 16 (continued)

School	Cluster	Sentence Meaning Skills 10				Passage Meaning Skills 11				Comprehension Aggregate 15			
		1	8	Change		1	8	Change	Residual	1	8	Change	Residual
IGE/WDRSD													
466	T1	.88	.85	-.03	-.08	.66	.78	+.12	-.00	.78	.80	+.02	-.02
451	P1	.77	.95	+.18	+.07	.68	.90	+.22	+.12	.70	.91	+.21	+.08
476	T2	.76	.81	+.05	-.06	.67	.81	+.14	+.03	.69	.81	+.12	-.02
507	T2	.92	.98	+.06	+.03	.66	.76	+.10	-.02	.73	.82	+.09	+.00
Mean		.83	.90	+.07		.67	.81	+.14		.73	.84	+.11	
IGE/non-WDRSD													
372	T1	.96	.07	+.01	-.00	.62	.79	+.17	-.00	.71	.84	+.13	+.01
410	T2	.88	1.00	+.12	+.07	.74	.78	+.04	+.01	.78	.84	+.06	+.04
493	-	.88	1.00	+.12	+.07	.65	.74	+.09	-.05	.71	.81	+.10	-.02
Mean		.91	.99	+.08		.67	.77	+.10		.73	.83	+.10	
non-IGE/WDRSD													
900	T1	.89	.90	+.01	-.04	.61	.80	+.19	+.01	.68	.83	+.15	-.00
902	P2	.94	.97	+.03	+.01	.59	.80	+.21	+.01	.68	.84	+.16	+.01
901	P2	.89	.89	+.00	-.05	.63	.76	+.13	-.03	.70	.79	+.09	-.04
903	P1	.91	.95	+.04	+.00	.72	.71	-.01	-.06	.77	.77	.00	-.04
Mean		.91	.93	+.02		.64	.77	+.13		.71	.81	+.10	
T1 Mean		.91	.91	.00		.63	.79	+.16		.72	.82	+.10	
T2 Mean		.85	.93	+.08		.69	.78	+.09		.73	.82	+.09	
P1 Mean		.84	.95	+.11		.70	.81	+.11		.74	.84	+.10	
P2 Mean		.92	.93	+.01		.61	.78	+.17		.69	.82	+.13	
Grand Mean		.88	.93	+.05		.66	.78	+.12		.72	.82	+.10	
Standard deviation		.06	.06			.05	.05			.04	.04		

average scores, .24, was on Silent Letters (03), one of the objectives on which time 1 scores were low.

In general, there was little variance in scores at time 1 and the same or less at time 8. Variance increased slightly on Vocabulary Meaning.

To simplify comparisons of the groups of schools, only the aggregate objectives Word Attack (13), Study Skills (14), and Comprehension (15) will be discussed. The lack of constant clear-cut distinctions among label groups and among cluster groups that emerges in the aggregates also appears in the scores for general objectives. In Word Attack and Comprehension, there was very little difference among the three label groups and overlap in the scores of schools in the groups; the overlap also occurred in Study Skills, but the IGE/non-WDRSD schools averaged lower than the two WDRSD groups at both times 1 and 8. Overlap of the ranges of the cluster groups is also typical, although their average scores differed more than the label group averages. At test time 1 and time 8, the pair of non-IGE/WDRSD schools, P2, scored highest on both Word Attack and Study Skills and the triplet of Schools 476, 507, and 410, T2, had the second highest average. On Comprehension, P2 was lowest at time 1 and had the same average score as the two triplets at time 8. The most extreme instance of score overlap occurred for Comprehension at time 8; P1's highest average for cluster groups was composed of School 451's score of .91, highest of the 11 schools, and School 903's score of .77, lowest in the set.

For the aggregate of objectives, Schools 451, 410, and 902 had consistently positive residuals and Schools 466, 476, 901, and 903, consistently negative. School 493 had the highest positive residual for Word Attack; for both Study Skills and Comprehension, School 451

had the highest. School 466 had the lowest negative residual for both Word Attack and Study Skills; Schools 901 and 903 had equally low Comprehension residuals.

Grade 5

Results are shown in Table 17 which includes, for each objective, scores at times 1 and 8, change, and residual gain score. Average scores are reported for label groups, for cluster groups, and for all schools combined. Results of testing at all eight times are reported by Nerenz (P.P. 80-10, 1980).

For most objectives, average scores were at a moderately high level at time 1, .50-.60, with little variance. Average scores for all objectives increased from time 1 to time 8, with little or no change in variance. The greatest variability in scores was on Silent Letters (03) which had the smallest average gain, .03. The largest average gain, .11, was on Word Meaning (09), increasing scores from .64 to .75. Only on Sentence Meaning (10) was the average score at time 8 higher.

The group of non-IGE/WDRSD schools showed more positive average change on all three aggregate objectives than either of the groups of IGE schools. IGE/WDRSD schools had higher positive gains than IGE/non-WDRSD schools on both Word Attack and Study Skills. The average differences are slight; score ranges for all three groups overlap considerably on both Word Attack and Comprehension.

One difference among cluster groups appears to be consistent for the aggregate objectives: Average scores for P2 were higher than averages

Table 17

Achievement Results for the Grade 5 Schools

School	Cluster	Phonic Analysis--Silent Letters 03				Structural Analysis 04				Word Attack Aggregate 13			
		1	8	Change	Residual	1	8	Change	Residual	1	8	Change	Residual
IGE/WDRSD													
466	T1	.52	.49	-.03	-.06	.62	.58	-.04	-.08	.59	.55	-.04	-.08
451	P1	.44	.83	+.39	+.34	.50	.64	+.14	+.00	.48	.70	+.22	+.11
476	T2	.49	.51	+.04	-.02	.67	.63	-.04	-.04	.61	.59	-.02	-.04
507	T2	.64	.60	-.04	-.04	.59	.60	+.01	-.06	.61	.60	-.01	-.03
Mean		.52	.61	+.09		.60	.61	+.01		.57	.61	+.04	
IGE/non-WDRSD													
372	T1	.32	.19	-.13	-.21	.54	.60	+.06	-.05	.47	.46	-.01	-.13
410	T2	.25	.31	+.06	+.12	.55	.70	+.15	+.05	.45	.57	+.12	-.01
493	-	.75	.55	-.20	-.18	.71	.69	-.02	+.01	.72	.64	-.08	-.03
Mean		.44	.35	-.09		.60	.66	+.06		.55	.56	+.01	
non-IGE/WDRSD													
900	T1	.54	.49	-.05	-.08	.62	.73	+.11	+.07	.59	.65	+.06	+.02
902	P2	.60	.83	+.23	+.22	.58	.78	+.20	+.13	.59	.80	+.21	+.17
901	P2	.58	.77	+.19	+.17	.53	.58	+.05	-.06	.55	.64	+.09	+.03
903	P1	.56	.46	-.10	-.12	.60	.70	+.10	+.04	.59	.62	+.03	-.01
Mean		.57	.64	+.07		.58	.70	+.12		.58	.68	+.10	
T1 Mean		.46	.39	-.07		.59	.64	+.05		.55	.55	.00	
T2 Mean		.46	.47	+.01		.60	.64	+.04		.56	.59	+.03	
P1 Mean		.50	.65	+.15		.55	.67	+.12		.54	.66	+.12	
P2 Mean		.59	.80	+.21		.56	.68	+.12		.57	.72	+.15	
Grand Mean		.52	.55	+.03		.59	.66	+.07		.57	.62	+.05	
Standard deviation		.14	.20			.06	.07			.08	.09		

Table 17 (continued)

School	Cluster	Map Skills 06 1	8	Change	Residual	Graph and Table Skills 07 1	8	Change	Residual	Reference Skills 08 1	8	Change	Residual	Study Skills Aggregate 14 1	8	Change	Residual
IGE/WDRSD																	
466	T1	.48	.59	+.11	-.02	.49	.61	+.12	-.00	.38	.43	+.05	-.04	.43	.52	+.09	-.01
451	P1	.66	.69	+.03	-.02	.65	.65	.00	-.05	.49	.51	+.02	-.06	.58	.59	+.01	-.06
476	T2	.50	.65	+.15	+.02	.61	.66	+.05	-.02	.43	.53	+.10	+.02	.49	.59	+.10	+.01
507	T2	.70	.72	+.02	-.01	.76	.78	+.02	+.02	.46	.60	+.14	+.06	.60	.68	+.08	+.02
Mean		.59	.66	+.07		.63	.68	+.05		.44	.52	+.08		.53	.60	+.07	
IGE/non-WDRSD																	
372	T1	.50	.54	+.04	-.09	.51	.57	+.06	-.05	.34	.35	+.01	-.08	.43	.46	+.03	-.07
410	T2	.59	.69	+.10	+.02	.71	.67	-.04	-.06	.44	.41	-.03	-.11	.54	.55	+.01	-.07
493	-	.61	.77	+.16	+.08	.68	.74	+.06	+.02	.51	.56	+.05	-.02	.58	.66	+.08	+.01
Mean		.57	.67	+.10		.63	.66	+.03		.43	.44	+.01		.52	.56	+.04	
non-IGE/WDRSD																	
900	T1	.59	.67	+.08	-.00	.68	.71	+.03	-.01	.43	.65	+.22	+.14	.53	.67	+.14	+.06
902	P2	.62	.69	+.07	-.00	.63	.78	+.15	+.09	.43	.60	+.17	+.09	.53	.67	+.14	+.06
901	P2	.43	.63	+.20	+.04	.54	.62	+.08	-.02	.30	.44	+.14	+.04	.39	.54	+.15	+.04
903	P1	.59	.66	+.07	-.01	.54	.71	+.17	+.07	.40	.46	+.06	-.03	.49	.58	+.09	+.00
Mean		.56	.66	+.10		.60	.71	+.11		.39	.54	+.15		.49	.62	+.13	
T1 Mean		.52	.60	+.08		.56	.63	+.07		.38	.48	+.10		.46	.55	+.09	
T2 Mean		.60	.69	+.09		.69	.70	+.01		.44	.51	+.07		.54	.61	+.07	
P1 Mean		.63	.68	+.05		.60	.68	+.08		.45	.47	+.02		.54	.59	+.05	
P2 Mean		.53	.66	+.13		.68	.70	+.02		.37	.52	+.15		.46	.61	+.15	
Grand Mean		.57	.66	+.09		.62	.68	+.08		.42	.50	+.08		.51	.59	+.08	
Standard deviation		.08	.06			.09	.07			.06	.09			.07	.07		

Table 17 (continued)

School	Cluster	Word Meaning Skills 09				Sentence Meaning Skills 10				Passage Meaning Skills 11				Comprehension Aggregate 15			
		1	8	Change	Residual	1	8	Change	Residual	1	8	Change	Residual	1	8	Change	Residual
IGE/WDRSD																	
466	T1	.59	.59	.00	-.14	.77	.74	-.03	-.00	.62	.64	+.02	-.05	.63	.64	+.01	-.07
451	P1	.68	.75	+.07	-.01	.84	.56	-.28	-.16	.65	.70	+.05	-.01	.69	.69	.00	-.04
476	T2	.69	.76	+.07	-.01	.74	.78	+.04	+.03	.65	.68	+.03	-.03	.68	.72	+.04	-.01
507	T2	.64	.82	+.18	+.07	.67	.86	+.19	+.09	.68	.73	+.05	+.00	.67	.78	+.11	+.06
Mean		.65	.73	+.08		.76	.74	-.02		.65	.69	+.04		.67	.71	+.04	
IGE/non-WDRSD																	
372	T1	.67	.63	-.04	-.13	.73	.65	-.08	-.10	.[illegible]	.54	-.01	-.10	.62	.59	-.03	-.11
410	T2	.58	.69	+.11	-.04	.46	.86	+.40	+.02	.54	.74	+.20	+.11	.54	.74	+.20	+.07
493	-	.75	.80	+.05	+.02	.86	.86	+.00	+.15	.66	.73	+.07	+.02	.72	.77	+.05	+.03
Mean		.67	.71	+.04		.68	.79	+.11		.58	.67	+.09		.63	.70	+.07	
non-IGE/WDRSD																	
900	T1	.66	.76	+.10	+.00	.62	.78	+.16	-.01	.63	.68	+.05	-.01	.64	.72	+.08	+.01
902	P2	.62	.80	+.08	+.06	.80	.86	+.06	+.13	.56	.74	+.19	+.09	.62	.78	+.16	+.08
901	P2	.47	.77	+.30	+.07	.70	.68	-.02	-.08	.45	.53	+.08	-.04	.50	.63	+.13	-.02
903	P1	.70	.88	+.18	+.11	.78	.63	-.10	-.06	.62	.70	+.08	+.01	.67	.75	+.10	+.03
Mean		.61	.80	+.19		.73	.75	+.02		.57	.66	+.09		.61	.72	+.11	
T1 Mean		.64	.66	+.02		.71	.72	+.01		.60	.62	+.02		.63	.65	+.02	
T2 Mean		.68	.76	+.08		.62	.83	+.21		.62	.72	+.10		.63	.75	+.12	
P1 Mean		.69	.82	+.13		.81	.62	-.19		.64	.70	+.06		.68	.72	+.04	
P2 Mean		.55	.79	+.24		.75	.77	+.02		.51	.64	+.13		.56	.71	+.15	
Grand Mean		.64	.75	+.11		.72	.76	+.04		.60	.67	+.07		.63	.71	+.07	
Standard deviation		.08	.08			.11	.10			.07	.08			.07	.06		

for the other cluster groups and the lower score in the pair was above the high score for other cluster groups in five of nine comparisons. Score ranges for the other three cluster groups overlapped for all three aggregates. Schools 902 and 901 which are in P2 are both non-IGE/WDRSD schools.

School 902 is the primary source of the differences noted in the preceding two paragraphs; residuals for that school were consistently high positive for the aggregate. Schools 466 and 372, IGE/WDRSD and IGE/non-WDRSD, both members of cluster group T1, had consistently negative residuals and, on both Word Attack and Comprehension, negative or low positive changes. The differences that seem to exist among groups of schools can be attributed to extreme differences among specific schools. The analysis must be conducted on individual schools rather than groups.

VII

Predictive Results

In this chapter, results for each of the three aggregate objectives are discussed. The intent was to relate achievement to time and means of instruction, emphasizing instructional patterns that were particularly effective in raising children's achievement. No such patterns could be identified. The difficulty in identifying effective instructional patterns suggests that instruction was not well targeted; that is, instruction seems to have been provided less on the basis of individual instructional needs than on the basis of skills customarily taught at grade level.

As noted previously, achievement was fairly high at time 1; only in Study Skills at both grades and in Word Attack at Grade 5 were any initial scores below .50. Standard deviations were small at both times 1 and 8 indicating little overall difference among schools. Average gains from time 1 to time 8 were from .10 to .14 for Grade 2 and from .05 to .08 for Grade 5.

GRADE 2

The contrast between School 476 and School 493 for second-grade instruction in Word Attack provides a striking example of this effect (see Table 18). School 476 had the highest score at time 1; all of the reading skill instruction time was allocated to Word Attack; the score at time 8 was above average but the score gain was less than average. School 493 had a nearly average score at time 1; about two-thirds of the reading skill time was allocated to Word Attack; the score at time 8 was the same as that at School 476; the score gain at School 493 was half again as high as the average.

Table 18

Data Summary for Objective 13, Word Attack, Grade 2

School	Demog-raphy	Use of WDRSD	Use of IPM	Est. hrs/wk	Allocated Hrs.	Allocated %	Engaged Hrs.	Engaged %	Grouping Indiv.	Grouping Small	Grouping Lg.	Materials P&P	Materials Manip.	Materials Print	Interactions Stud.	Interactions Tchr.	Achievement 1	Achievement 8	Achievement Ch.	Achievement Resid.
IGE/WDRSD																				
466	2	4.50	75.25	4.9	189.3	71	20.72	67	6.39	11.47	12.96	16.25	1.98	1.55	2.57	8.61	.56	.64	+.08	-.06
451	4	7.25	94.75	2.4	67.4	60	21.49	77	6.98	4.88	15.98	25.53	1.21	00	4.15	9.17	.56	.71	+.15	+.01
476	5	6.75	71.00	5.0	23.1	100	30.62	74	10.85	00	30.81	22.35	.47	1.06	4.29	18.83	.67	.78	+.11	-.02
507	6	6.25	80.75	5.2	188.5	57	33.51	75	18.44	.30	26.24	30.91	.35	5.21	3.87	13.91	.61	.74	+.13	-.01
IGE/non-WDRSD																				
372	2	00	72.50	5.7	671.7	64	59.93	56	65.04	11.28	31.18	80.75	4.81	16.30	11.70	17.28	.52	.67	+.15	+.00
410	4	00	75.50	2.0	94.5	60	13.69	82	7.91	8.87	00	14.17	.47	3.05	1.17	5.66	.57	.72	+.15	+.01
493	5	00	56.00	2.5	217.1	64	25.81	85	17.22	.31	12.76	23.34	00	1.70	1.87	6.67	.57	.78	+.21	+.07
non-IGE/WDRSD																				
900	2	4.25	72.00	2.0	65.3	49	14.37	85	4.45	1.97	10.49	7.27	2.98	.12	2.76	3.91	.61	.73	+.12	-.02
902	5	7.75	69.25	4.8	224.5	61	18.35	85	8.65	.40	12.55	10.79	6.04	.45	3.87	8.37	.65	.83	+.18	+.05
901	6	9.25	82.25	3.1	235.9	39	22.19	65	15.49	6.41	12.39	25.97	4.06	5.76	3.16	6.29	.64	.74	+.10	-.03
903	6	4.00	82.50	1.4	86.9	57	13.19	56	9.40	2.29	11.76	19.59	1.72	.06	2.34	6.97	.54	.68	+.14	-.01
Mean	4.2	4.55	75.6	3.5	187.7	62	24.90	73	15.53	4.38	16.10	25.17	2.19	3.21	3.80	9.61	.59	.73	+.14	
Standard deviation	1.8	3.31	9.8	1.6	177.3	15	13.37	11	17.05	4.48	9.51	19.73	2.03	4.70	2.80	4.90	.05	.05	.04	

For Study Skills (Table 19), similar contrasts can be drawn between Schools 451 and 507 and Schools 900, 902, and 901. From time 1 to time 8, the gain at School 451 was nearly double the average; the time 8 score was .74 as it was at School 901 where more time and a greater proportion of time had been allocated. The gain at School 507 was well above average although as at School 451, there was less emphasis on study skills in the overall reading skills program than at Schools 900, 902, and 901. There is no clear difference in the instructional patterns at School 507 and at Schools 900, 902, and 901.

For Comprehension Skills (Table 20), achievement at time 8 was quite high at all schools and outstanding at School 451. Again, at this school, the emphasis on comprehension skill instruction was no greater than at most other schools and the instructional pattern did not differ from other less effective patterns.

GRADE 5

In all three skill areas, initial achievement was at a moderate level with little variation among schools; achievement at time 8 was not much higher and there still was little variation among schools.

Large achievement gains in Word Attack skills (Table 21) occurred at two of the schools that allocated no time to formal skill instruction in Word Attack, Schools 451 and 902. Only skill instruction and not the total reading program was studied in these schools so knowledge of the reasons for the improvement is not available.

In Study Skills (Table 22), above average achievement gains were made at Schools 900, 902, and 901. These gains were not extremely large and did not lead to impressively high achievement at time 8. No distinct instructional pattern was observed at these three schools.

Table 19

Data Summary for Objective 14, Study Skills, Grade 2

School	Allocated Hrs.	Allocated %	Engaged Hrs.	Engaged %	Grouping Indiv.	Grouping Small	Grouping Lg.	Materials P&P	Materials Manip.	Materials Print	Interactions Stud.	Interactions Tchr.	Achievement 1	Achievement 8	Achievement Ch.	Achievement Res
IGE/WDRSD																
466	0.0												.50	.57	+.07	-
451	12.0	11											.49	.74	+.25	+
476	0.0												.61	.67	+.06	-
507	58.3	18	18.16	83	12.96	00	9.00	13.86	00	00	2.20	6.02	.51	.72	+.21	+
IGE/nonWDRSD																
372	58.8	6	5.53	77	5.64	1.18	.38	.86	.14	1.73	.56	1.39	.47	.60	+.13	-
410	5.0	3	1.86	76	1.98	.47	00	2.28	00	1.03	00	.18	.52	.65	+.13	+
493	19.1	6	.67	77	.30	00	.57	.42	00	.45	00	.37	.45	.56	+.11	-
non-IGE/WDRSD																
900	68.9	51	11.60	89	4.78	00	8.24	9.15	00	00	.44	7.24	.56	.69	+.13	+
902	146.0	39	6.70	86	5.44	00	2.40	6.05	1.75	00	1.53	2.11	.58	.71	+.13	+
901	203.4	34	3.93	69	3.41	.15	2.15	5.43	00	.14	.61	2.57	.67	.74	+.07	-
903	0.0												.45	.56	+.11	-
7 Schools																
Mean	79.9	22	6.92	80	4.93	.26	3.25	5.44	.27	.48	.76	2.84	.54	.67	+.13	
Standard deviation	70.7	19	6.11	7	4.04	.44	3.78	4.85	.65	.67	.82	2.75	.07	.07	.04	
11 Schools																
Mean	42.9	15											.53	.66	+.13	
Standard deviation	59.5	18											.07	.07	.06	

Table 20

Data Summary for Objective 15, Comprehension, Grade 2

	Allocated		Engaged		Grouping			Materials			Interactions		Achievement			
School	Hrs.	%	Hrs.	%	Indiv.	Small	Lg.	P&P	Manip.	Print	Stud.	Tchr.	1	8	Ch.	Resid.
IGE/WDRSD																
466	78.0	29	9.85	67	2.30	.51	11.98	7.81	.71	.24	1.02	5.57	.72	.80	+.08	-.02
451	32.4	29	5.61	75	2.29	00	5.19	4.92	1.07	00	1.05	2.30	.70	.91	+.21	+.08
476	0.0												.69	.81	+.12	-.02
507	86.2	26	22.31	71	8.68	00	22.70	17.86	.76	1.75	4.31	10.37	.73	.82	+.09	+.00
IGE/non-WDRSD																
372	326.2	31	17.06	73	14.15	4.71	4.70	19.41	.67	5.56	3.01	3.63	.71	.84	+.13	+.01
410	58.6	37	34.92	77	33.06	12.03	00	40.02	00	29.53	4.08	5.53	.78	.84	+.06	+.04
493	103.7	31	5.17	79	4.34	.06	2.17	6.34	00	00	.33	.95	.71	.81	+.10	-.02
non-IGE/WDRSD																
900	0.0												.68	.83	+.15	-.00
902	0.0												.68	.84	+.16	+.01
901	158.0	26	10.28	59	8.79	2.81	5.83	14.54	.06	2.68	.42	2.19	.70	.79	+.09	-.04
903	64.8	43	11.81	72	5.27	1.39	9.81	12.08	1.59	.09	2.51	5.97	.77	.77	+.00	-.04
8 Schools																
Mean	113.5	32	14.63	72	9.86	2.69	7.80	15.37	.61	4.98	2.09	4.56	.73	.82	+.10	
Standard deviation	93.6	6	9.98	6	10.18	4.13	7.14	11.27	.57	10.10	1.60	2.98	.03	.04	.06	
11 Schools																
Mean	82.5	23											.72	.82	+.11	
Standard deviation	94.5	15											.04	.04	.06	

Table 21

Data Summary for Objective 13, Word Attack, Grade 5

School	Demography	Use of WDRSD	Use of IPM	Est. hrs/wk	Allocated Hrs.	Allocated %	Engaged Hrs.	Engaged %	Grouping Indiv.	Grouping Small	Grouping Lg.	Materials P&P	Materials Manip.	Materials Print	Interactions Stud.	Interactions Tchr.	Achievement 1	Achievement 8	Achievement Ch.
IGE/WDRSD																			
466	2	4.50	75.25	2.4	40.5	43	9.48	76	5.09	.51	6.92	10.57	.00	.42	.85	3.18	.59	.55	-.04
451	4	7.25	94.75	.8	0												.48	.70	+.22
476	5	6.75	71.00	5.3	.8	00	.61	87	.27	00	.43	.52	.00	00	.16	.21	.61	.59	-.02
507	6	6.25	80.75	4.9	0												.61	.60	-.01
IGE/non-WDRSD																			
372	2	0.00	72.50	3.7	162.4	28	23.95	86	21.38	1.52	5.02	25.96	.00	9.11	.96	4.72	.47	.46	-.01
410	4	0.00	75.50	4.0	99.9	30	3.55	95	1.77	1.95	00	3.67	.00	2.80	.86	.91	.45	.57	+.12
493	5	0.00	56.00	2.3	55.9	23	1.17	95	00	00	1.23	1.16	.00	00	.30	.82	.72	.64	-.08
Non-IGE/WDRSD																			
900	2	4.25	72.00	2.4	0		2.84	66	1.13	.09	3.10	1.93	.00	1.00	.54	1.38	.59	.65	+.06
902	5	7.75	69.25	2.6	0		.07	100	00	00	.07	.07	.00	00	00	00	.59	.80	+.21
901	6	9.25	82.25	2.6	70.2	14	3.15	73	2.66	.10	1.57	2.95	.00	.59	.35	.58	.55	.64	+.09
903	6	4.00	82.50	1.5	4.0	3											.59	.62	+.03
3 Schools																			
Mean	3.9	4.06	71.72	3.2	53.7	17	5.60	85	4.04	.52	2.28	5.85	.00	1.74	.50	1.48	.57	.61	+.04
Standard deviation	1.6	3.73	7.48	1.1	57.3	16	7.97	12	7.21	.78	2.50	8.78	.00	3.12	.36	1.64	.08	.10	.10
11 Schools																			
Mean	4.2	4.55	75.61	3.0	39.4	13											.57	.62	+.05
Standard deviation	1.8	3.31	9.76	1.4	53.8	16											.08	.09	.10

Table 22

Data Summary for Objective 14, Study Skills, Grade 5

School	Allocated		Engaged		Grouping			Materials			Interactions		Achievement			
	Hrs.	%	Hrs.	%	Indiv.	Small	Lg.	P&P	Manip.	Print	Stud.	Tchr.	1	8	Ch.	Resid.
IGE/WDRSD																
466	14.2	15	1.70	85	.32	.05	1.62	1.93	00	00	.24	.90	.43	.52	+.09	-.01
451	54.7	61	17.31	74	13.56	1.11	8.61	20.07	1.23	4.26	1.50	4.60	.58	.59	+.01	-.05
476	78.3	45	16.13	87	6.97	.66	11.01	12.91	00	5.73	.63	9.67	.49	.59	+.10	+.01
507	130.1	51	24.20	78	21.17	1.89	8.49	27.31	4.56	17.10	3.34	6.85	.60	.68	+.08	+.01
IGE/non-WDRSD																
372	64.6	11	8.65	87	9.02	.24	.70	9.78	00	6.56	.36	.76	.43	.46	+.03	-.01
410	94.3	28	8.07	88	4.61	2.04	2.51	7.88	00	5.52	1.48	2.94	.54	.55	+.01	-.06
493	73.6	30	5.70	79	3.11	.29	3.78	6.75	00	1.07	1.16	1.28	.58	.66	+.08	+.01
non-IGE/WDRSD																
900	130.1	51	24.54	71	19.06	.47	14.95	29.11	3.12	4.71	1.77	9.78	.53	.67	+.14	+.06
902	18.8	47	12.89	81	9.00	00	6.86	12.77	.72	1.91	2.98	4.93	.53	.67	+.14	+.06
901	190.8	39	24.95	76	14.68	3.16	14.98	21.55	1.53	13.89	3.13	7.95	.39	.54	+.15	+.04
903	73.6	30	5.70	79	3.11	.29	3.78	6.75	00	1.07	1.16	1.28	.58	.66	+.08	+.01
Mean	83.9	37	13.62	80	9.51	.93	7.03	14.23	1.01	5.62	1.61	4.63	.51	.59	+.08	
Standard deviation	51.4	16	8.38	6	6.84	1.02	5.07	8.99	1.54	5.39	1.10	3.50	.07	.07	.05	

In Comprehension (Table 23) the achievement gain was dramatic at School 410 and large at Schools 507, 902, and 901. At School 410, the total reading period was logged and observed; perhaps the small groups were a particularly effective mechanism for improving comprehension skills at that school. Because only skills instruction was observed at other schools, where no instructional pattern emerged, we cannot draw any conclusions about the effectiveness of the basal reading groups in increasing achievement on specific comprehension skills.

Table 23

Data Summary for Objective 15, Comprehension, Grade 5

School	Allocated Hrs..	%	Engaged Hrs.	%	Grouping Indiv.	Small	Lg.	Materials P&P	Manip.	Print	Interactions Stud.	Tchr.	Achievement 1	8	Ch.	Resid.
IGE/WDRSD																
466	39.0	42	10.37	72	6.39	1.60	6.47	10.97	1.52	.35	1.19	2.96	.63	.64	+.01	-.06
451	34.6	39	17.14	75	10.47	00	12.26	21.13	.05	3.20	1.19	6.94	.69	.69	.00	-.04
476	94.0	54	14.18	91	4.34	2.45	8.84	10.26	00	4.66	.81	8.36	.68	.72	+.04	+.00
507	123.8	49	18.82	80	20.56	.16	2.84	21.56	.08	16.56	1.85	4.95	.67	.78	+.11	+.05
IGE/non-WDRSD																
372	361.9	61	36.05	79	38.13	1.23	6.36	41.26	00	26.38	.48	5.36	.62	.59	-.03	-.11
410	142.9	42	34.59	94	23.23	12.93	.44	29.97	00	14.16	5.65	7.65	.54	.74	+.20	+.06
493	116.5	47	12.62	82	6.98	.20	8.26	13.00	00	2.95	1.59	4.04	.72	.77	+.05	+.02
non-IGE/WDRSD																
900	123.8	49	1.92	64	00	00	3.00	.96	00	00	.28	1.06	.64	.72	+.08	+.00
902	216.0	53	14.76	88	6.69	1.58	8.52	8.61	3.42	3.79	2.35	6.70	.62	.78	+.16	+.07
901	226.0	46	18.00	82	12.03	2.37	7.44	16.43	00	9.67	2.80	5.06	.50	.63	+.13	-.02
903	117.7	97	30.42	74	18.43	4.79	17.91	29.55	3.00	4.46	6.28	11.10	.67	.75	+.08	+.02
Mean	145.1	53	18.99	80	13.39	2.48	7.49	18.52	.73	7.83	2.22	5.83	.63	.71	+.08	
Standard deviation	93.3	16	10.57	9	10.92	3.75	4.78	11.63	1.31	8.15	2.00	2.74	.07	.06	.07	

VIII

Summary

The data presented in this report are from one of five studies conducted as a part of Phase IV of the IGE Evaluation Study. The four primary purposes of the Phase IV Evaluation Project (page 8) reflect our attempt to describe in considerable detail the actual operating characteristics of a sample of schools that were using the curriculum materials designed to be compatible with IGE. This comparative study was designed to provide information related to the fourth purpose which was, for the reading program Wisconsin Design for Reading Skill Development (WDRSD), to contrast two situations:

--IGE schools using the program with non-IGE schools using the program

--IGE schools using the program with IGE schools using alternate programs

The contrast was made on the variables of pupil outcomes, instructional time, and means of instruction. From this contrast, we expected to be able to answer three specific questions.

1. What are the effects on reading instruction of using the WDRSD reading program in an IGE and a non-IGE school environment?
2. What are the effects on reading instruction of using WDRSD and using other reading programs in the IGE school environment?
3. What are the relationships among the variables presented in the Phase IV model? (See Figure 2, page 13.)

General Findings

Before we attempt to summarize the findings with respect to the specific questions above, an overall picture of reading instruction, both at Grade 2 and Grade 5 in this sample of schools, is warranted. The data presented in the previous chapters in some sense describe 22 quite different instructional settings (11 schools, two grades at each school). It appears that each of the 22 learning environments is unique. The demography of the school, the way in which it is organized, the degree of implementation of various components of IGE, the way in which time is used in classrooms, the way in which instruction is actually carried out, and the level of achievement on different objectives present an interesting descriptive picture about each learning environment. However, there is little common from situation to situation. For example, using the background variables, we were able to form four clusters of schools--three pairs of schools and a triplet; there were also two isolate cases. However, when we looked at how time was actually allocated and spent on various objectives in reading and the way in which instruction was carried out, the clusters did not demonstrate a consistent pattern related to instruction. Thus, the first conclusion of the study is that there is no obvious pattern by which the different learning environments at each grade level can be appropriately grouped; one cannot confidently argue that any two classrooms (or units) operated in the same way.

In spite of this first conclusion, some general statements can be made about reading instruction. At second grade, although there is considerable variation in amount of allocated time to different objectives, it is clear that all schools emphasize work on word attack skills since it comprises

the largest percentage of allocated time in 10 of the classrooms. Most of the remaining time is distributed somewhat unevenly over study skills and comprehension skills. However, at Grade 5, there is little consistent emphasis on any objectives. In fact, at both grades, while a lot of time is allocated to reading instruction, what is actually taught, time spent on specific objectives, differs vastly in each class. This might be appropriate if the differing emphasis reflected the needs of students which in turn would be reflected in improved performance. Unfortunately, the data fail to support this conjecture. In all classes, a lot of time was allocated to specific skills with little apparent gain in performance. Part of the lack of gain is due to the fact that achievement at time 1 on most objectives was fairly high. Part is due to items for a general objective which were not necessarily related to all the subskills; time possibly was spent on untested subskills. However, a more persuasive conjecture seems to be that teachers chose to base reading instruction in their classes on what they customarily covered at each grade level rather than on individual needs, and what they customarily covered was idiosyncratic.

Specific Findings

Research Question 1. What are the effects on reading instruction of using the WDRSD reading program in an IGE setting and a non-IGE school setting?

Whether a school calls itself IGE or not is not an important variable; the label difference is not a good indicator of operating differences in the schools. The instructional programming model is the key here. It is

what good teachers follow anyway. This study is not a good test of use of the instructional programming model.

Research Question 2. What are the effects on reading instruction of using WDRSD and using other reading programs in the IGE school environment?

At Grade 2, the non-WDRSD users did not allocate much time to study skills. The differences on study skill performance between WDRSD and non-WDRSD groups favor the use of that component of WDRSD. Similar differences at Grade 5 were not found. Thus, our second conclusion is that the differences between users and non-users of WDRSD are not generally apparent.

Research Question 3. What are the relationships between the variables presented in the model for the evaluation?

The overall relationship as proposed in the model cannot be statistically examined in the study. Many of the variables are highly correlated and the sample is very small. It was hoped that an overall pattern could be seen with respect to the variables; this is not the case. A lower limit on allocated time is needed to increase achievement in any area, but the relationship of allocated time to performance is not linear. For example, at Grade 2, the variability in allocated time to word attack skills is not related to achievement since all spend a lot of time. In fact, some schools are probably spending too much time for the relative pay off.

Limitations

Before concluding this chapter, let us remind the reader of four basic limitations of this study. First, these data come from a small sample of schools. No claim can be made that they are representative either of WDRSD users or of IGE schools. Second, the variables examined in this study are the variables of interest in the IGE model. The data associated with these

variables are highly correlated. For example, allocated time is highly correlated with engaged time. Analysis on small sets of related data could not be done with meaning and has not been attempted; the relationships discussed above must be considered suspect. Third, there are four different sets of data on these classrooms. The background data were provided by teachers and administrators from self-report questionnaires. These data provide information about school-wide patterns. The class log data were provided by teachers on how time was spent for one group of children in their classrooms; observations in those classrooms were often on different sets of students as regrouping took place. These two data sets provide different estimates of class variables. The achievement data came from all students, providing information about the total population. The appropriateness of the sources for predicting what the group is like has not been demonstrated. Finally, although our intent was to describe means of instruction related to reading skill development, all time spent on reading activities should have been coded in every school.

Conclusions

On reflection, it is now clear that selecting schools because they call themselves "IGE schools" or "WDRSD users" is not adequate for testing either the use of the instructional programming model, the key feature of IGE, or the use of the particular instructional materials, Wisconsin Design for Reading Skill Development. For both, a school's use of the label is no guarantee that the ideas associated with either the instructional programming model or WDRSD are being followed. In fact, what seems to be the case is that the underlying conceptual ideas which guided the developers of

IGE or WDRSD are not clearly reflected in the way in which instruction is carried out. This conclusion may be an artifact of the sample chosen or it may be more pervasive. In fact, it may be unreasonable to expect people to change as much as was expected in an IGE/WDRSD setting. For example, the teacher using WDRSD materials without testing or small groups is hardly using the program. Or, an IGE school in which teachers do not regroup students periodically according to need does not provide a good test of the instructional programming model.

It should be apparent that we have not reported all of the data gathered in this study. It would have been better to gather less data from more schools. What we have is an extensive description of 22 different learning environments, not one of which reflects in a clear way the ideas underlying IGE or WDRSD. In fact, the strongest claim that can be made is that each class has its own characteristics. This diversity is not a function of the type of community, of the way in which instruction is carried out, of whether a school calls itself IGE, or whether they use a particular reading program.

What can be said in conclusion is that one needs to spend a minimum amount of time on an objective to produce achievement; and that time should be allocated to skills where there is a need.

References

Fisher, C. W., Berliner, D. C., Filby, N. N., Marliave, R. S., Cahen, L. S., Dishaw, M. M., & Moore, J. E. Teaching and learning in the elementary school: A summary of the beginning teacher evaluation study (Technical Report VII-1, Beginning Teacher Evaulation Study). San Francisco: Far West Laboratory for Educational Research and Development, 1975.

Harnischfeger, A., & Wiley, D. E. Teaching-learning processes in elementary schools: A synoptic view (Studies in Educative Processes, Report No. 9). Chicago: University of Chicago, 1975.

Ironside, R. A., & Conaway, L. IGE evaluation, phase II--On-site evaluation and descriptive study: Final report (Technical Report No. 499). Madison: Wisconsin Research and Development Center for Individualized Schooling, 1979.

Klausmeier, H. J. Origin and overview of IGE. In H. J. Klausmeier, R. A. Rossmiller, & M. Saily (Eds.), Individually guided elementary education: Concepts and practices. New York: Academic Press, 1977.

McDonald, F. J., & Elias, P. A report on the results of phase II of the beginning teacher evaluation study. Journal of Teacher Education, 1976, 17, 315-332.

Nerenz, A. G. Reading skills achievement over eight administrations of the achievement monitoring tests--grades 2 and 5 (Project

Paper 80-10). Madison: Wisconsin Research and Development Center for Individualized Schooling, 1980.

Nerenz, A. G., Stewart, D. M., & Webb, N. L. Scaling and summary statistics for the curriculum implementation and program customizing variables (Project Paper 80-6). Madison: Wisconsin Research and Development Center for Individualized Schooling, 1980.

Nerenz, A. G., & Webb, N. L. Content aggregations for reading skills and mathematics for the comparative study of phase IV of the IGE evaluation project (Project Paper 80-3). Madison: Wisconsin Research and Development Center for Individualized Schooling, 1980. (a)

Nerenz, A. G., & Webb, N. L. Data on log allocated time for 11 reading and 8 math schools (Project Paper 80-4). Madison: Wisconsin Research and Development Center for Individualized Schooling, 1980. (b)

Nerenz, A. G., & Webb, N. L. Means of instruction variables (Project Paper 80-8). Madison: Wisconsin Research and Development Center for Individualized Schooling, 1980. (a)

Nerenz, A. G., Webb, N. L., Romberg, T. A., & Stewart, D. M. IGE evaluation phase IV: WDRSD descriptive study final report (Technical Report No. 559). Madison: Wisconsin Research and Development Center for Individualized Schooling, 1980.

Nerenz, A. G., Webb, N. L., & Stewart, D. M. School background variables (Project Paper 80-7). Madison: Wisconsin Research and Development Center for Individualized Schooling, 1980.

Otto, W. The Wisconsin design: A reading program. In H. J. Klausmeier, R. A. Rossmiller, & M. Saily (Eds.), Individually guided elementary education: Concepts and practices. New York: Academic Press, 1977.

Otto, W., & Askov, E. Wisconsin Design for Reading Skill Development: Rationale and guidelines, third edition. Minneapolis: National Computer Systems, 1974.

Popkewitz, T. S., Tabachnick, B. R., & Wehlage, G. G. Institutional life and the problem of reform: A case study of individually guided education. Madison: University of Wisconsin Press, in press.

Price, G. G., Janicki, T. C., Howard, J. A., Stewart, D. M., Buchanan, A. E., & Romberg, T. A. Overview of school and unit variables and their structural relations in phase I of the IGE evaluation (Technical Report No. 475). Madison: Wisconsin Research and Development Center for Individualized Schooling, 1978.

Price, G. G., Janicki, T. C., Howard, J. A., Stewart, D. M., Buchanan, A. E., & Romberg, T. A. Procedures used in phase I of the IGE evaluation to scale the variable school's demographic setting (Technical Report No. 482). Madison: Wisconsin Research and Development Center for Individualized Schooling, 1978.

Price, G. G., Romberg, T. A., & Janicki, T. C. IGE evaluation phase I summary report (Technical Report No. 578). Madison: Wisconsin Center for Education Research, 1981.

Romberg, T. A. IGE evaluation: Perspectives and a plan (Working Paper No. 183). Madison: Wisconsin Research and Development Center for Cognitive Learning, 1976.

Romberg, T. A. Developing mathematical processes: The elementary mathematics program for individually guided education. In H. J. Klausmeier, R. A. Rossmiller, & M. Saily (Eds.), Individually guided elementary education: Concepts and practices. New York: Academic Press, 1977.

Rosenshine, B. V. New insights and questions from recent research in elementary schools. Paper presented at the meeting of the American Educational Research Association, New York, April 1977.

Stewart, D. M., Nerenz, A. G., Webb, N. L., & Romberg, T. A. IGE evaluation phase IV: PRS descriptive study final report (Technical Report No. 568). Madison: Wisconsin Research and Development Center for Individualized Schooling, 1980.

Venezky, R. L., & Pittleman, S. P. PRS: A prereading skills program for individually guided education. In H. J. Klausmeier, R. A. Rossmiller, & M. Saily (Eds.), Individually guided elementary education: Concepts and practices. New York: Academic Press, 1977.

Webb, N. L. Interobserver agreement for the observation procedures for the DMP and WDRSD observers--descriptive study (Project Paper 79-25). Madison: Wisconsin Research and Development Center for Individualized Schooling, 1980.

Webb, N. L., & Nerenz, A. G. Information collected on nonapplied time, engaged time, nonengaged time and applied time (Project Paper 80-5). Madison: Wisconsin Research and Development Center for Individualized Schooling, 1980.

Webb, N. L., Nerenz, A. G., Romberg, T. A., & Stewart, D. M. IGE evaluation phase IV: DMP descriptive study final report (Technical Report No. 558). Madison: Wisconsin Research and Development Center for Individualized Schooling, 1980.

Webb, N. L., & Romberg, T. A. The design for the study of reading skills and mathematics curriculum products: IGE evaluation project--phase IV (Project Paper 79-42). Madison: Wisconsin Research and Development Center for Individualized Schooling, 1979.