DOCUMENT RESUME

ED 262 373 CS 008 143

AUTHOR	Weinshank, Annette B.; And Others
TITLE	Using Student Diagnostic Information to Establish an Empirical Data Base in Reading. Research Series No. 162.
INSTITUTION	Michigan State Univ., East Lansing. Inst. for Research on Teaching.
SPONS AGENCY	National Inst. of Education (ED), Washington, DC.
PUB DATE	Jun 85
CONTRACT	400-81-0014
NOTE	75p.
AVAILABLE FROM	Institute for Research on Teaching, College of Education, Michigan State University, 252 Erickson Hall, East Lansing, MI 48824 ($4.50).
PUB TYPE	Reports - Research/Technical (143)
EDRS PRICE	MF01/PC03 Plus Postage.
DESCRIPTORS	Academic Achievement; Diagnostic Teaching; Grade 5; *Information Utilization; Inservice Teacher Education; Intermediate Grades; *Reading Diagnosis; *Reading Instruction; *Reading Research; Student Behavior; *Teacher Effectiveness; *Teacher Response

ABSTRACT

Enlarging upon the scope and agenda of earlier diagnostic research, a study was conducted to examine (1) teacher responses to receiving diagnostic information about some of their students, (2) effects on student achievement of teachers receiving both diagnostic information and diagnostic training, (3) diagnostic classifications that emerged from student performance, and (4) differential teacher effectiveness and instructional practices. Subjects included 10 experienced fifth-grade classroom teachers. A reading diagnostic battery, developed for the previous studies, was individually administered as a pretest to 186 of the 192 students in the teachers' classrooms. An experimental group of five teachers, randomly assigned, received four hours of training in diagnostic reliability. Before and after the training, all 10 teachers diagnosed one of four randomly assigned simulated cases of reading difficulty at two different times. Teachers were also interviewed three times. Results showed that teachers responded positively to the receipt of specific diagnostic information about their students, seeing it as useful for thinking about and making changes in their instructional practices. Students for whom teachers received diagnostic information did not show significantly improved achievement over students for whom no information was provided. (Appendixes include the reading diagnostic battery and the interview questions.) (HOD)

Research Series No. 162

USING STUDENT DIAGNOSTIC INFORMATION TO ESTABLISH AN EMPIRICAL DATA BASE IN READING

Annette B. Weinshank, Ruth M. Polin,
and Christian C. Wagner

Published By

The Institute for Research on Teaching
252 Erickson Hall
Michigan State University
East Lansing, Michigan 48824

June 1985

This work is sponsored in part by the Institute for Research on Teaching, College of Education, Michigan State University. The Institute for Research on Teaching is funded primarily by the Program for Teaching and Instruction of the National Institute of Education, United States Department of Education. The opinions expressed in this publication do not necessarily reflect the position, policy, or endorsement of the National Institute of Education. (Contract No. 400-81-0014)

Institute for Research on Teaching

The **Institute for Research on Teaching** was founded at Michigan State University in 1976 by the National Institute of Education. Following a nationwide competition in 1981, the NIE awarded a second contract to the IRT, extending work through 1984. Funding is also received from other agencies and foundations for individual research projects.

The IRT conducts major research projects aimed at improving classroom teaching, including studies of classroom management strategies, student socialization, the diagnosis and remediation of reading difficulties, and teacher education. IRT researchers are also examining the teaching of specific school subjects such as reading, writing, general mathematics, and science, and are seeking to understand how factors outside the classroom affect teacher decision making.

Researchers from such diverse disciplines as educational psychology, anthropology, sociology, and philosophy cooperate in conducting IRT research. They join forces with public school teachers, who work at the IRT as half-time collaborators in research, helping to design and plan studies, collect data, analyze and interpret results, and disseminate findings.

The IRT publishes research reports, occasional papers, conference proceedings, a newsletter for practitioners, and lists and catalogs of IRT publications. For more information, to receive a list or catalog, and/or to be placed on the IRT mailing list to receive the newsletter, please write to the IRT Editor, Institute for Research on Teaching, 252 Erickson Hall, Michigan State University, East Lansing, Michigan 48824-1034.

Abstract

This study is the last in a programmatic series of research studies that began by investigating diagnostic reliability in reading, continued by developing a training program for improving diagnostic reliability, and concluded by investigating how diagnostic information might be used to improve student achievement in reading. Results show that 9 of the 10 teachers in the final study felt that receipt of diagnostic information sharpened their observations of student reading behavior and had potential for directing their thinking about instructional changes in their respective reading programs.

Students for whom teachers received diagnostic information did not show significantly improved achievement over students for whom no information was provided. Eighteen diagnostic classifications emerged from student performance on reading diagnostic tests; five classifications accounted for 60% of the students in the study. The characteristics of these five classifications together with their instructional implications are presented. Teachers were found to be differentially effective (p less than .05) for word recognition, oral reading, listening comprehension, and silent reading comprehension outcomes. Available interview and observation data were not sufficient for specifying instructional practices associated with varying levels of student achievement. The system documented by the study is a means of establishing an empirical basis for improving instruction and outcomes in reading.

USING STUDENT DIAGNOSTIC INFORMATION TO ESTABLISH AN EMPIRICAL DATA BASE IN READING

Annette B. Weinshank, Ruth M. Polin, and Christian C. Wagner[1]

In the teaching of reading, the absence of specific information linking student outcomes back to reliable diagnosis and instruction has presented a major obstacle to practitioners' learning systematically from their own experience. Improving student outcomes in reading requires that the teacher receive information that reliably classifies student performance into appropriate diagnostic categories. If the diagnostic categorizations are unreliable, it is not possible to determine, when outcomes are poor, whether instruction was inadequate for the student's problem or whether student performance was incorrectly diagnosed and good instruction was wasted on the wrong problem.

Unfortunately, diagnostic unreliability has been shown to be a pervasive problem in the field of reading. Only recently has it become possible to remedy the situation and to provide teachers with reliable diagnostic information. A series of studies on the diagnostic reliability of educational practitioners (Weinshank, 1982; Vinsonhaler, Weinshank, Wagner, & Polin, 1983; Weinshank & Vinsonhaler, 1983) showed that reading and learning disability specialists and classroom teachers did not agree with themselves or with one another in their diagnostic judgments about simulated cases of children with reading problems.

---

[1]Annette B. Weinshank is an IRT teacher collaborator and coordinator of the just completed Outcomes in Reading Project. Ruth M. Polin is a research associate with the same project. Christian C. Wagner, who teaches in the College of Engineering at Oakland University, served as the project's consultant.

The authors would like to acknowledge, with thanks, Lynn Wilhelm's contributions during the data-collection phase of this research.

A second series of studies (Vinsonhaler, Weinshank, Polin, & Wagner, 1983) showed that the reliability of diagnostic decision making could be improved dramatically through the use of a specific type of training program. Two important products of the training studies were (1) a reading diagnostic battery based primarily on a model of reading that focuses on performance in work recognition, oral reading, silent reading comprehension, and listening comprehension and (2) a computer program for generating reliable diagnoses given the data from student performance on the battery. Thus it became possible to provide teachers with reliable diagnostic information about their students' reading performances.

In a final set of studies (Wagner, 1982; Weinshank, Polin, & Wagner, 1985), one junior high school remedial reading teacher was provided with reliable diagnostic information about her students' reading performance. The studies were designed to test the methods needed to move from diagnostic reliability to issues of diagnostic validity: verifying linkages that exist between diagnosis, instruction, and student achievement. That is, given reliable diagnostic information, what instructional plans would be carried out and with what effect on students? These studies were limited in two ways: They involved only one teacher and they dealt with a restricted range of student abilities.

The study reported here enlarged the scope and agenda of the earlier work in order to answer four major research questions.

1. What do teachers report about the utility of receiving reliable diagnostic and performance information about their students?

2. What are the main effects on student achievement of whether or not a teacher receives (a) reliable diagnostic and performance information about a particular student and (b) diagnostic training that uses this information?

3. What are the diagnostic classifications that emerge from student performance on the test batteries?

4. Are teachers differentially effective for students in different diagnostic classifications? What teacher practices are associated with gains in achievement in particular diagnostic classifications?

Procedures

The study was conducted in an urban school district in mid-Michigan. All fifth-grade teachers in the district were invited to participate; those who volunteered were paid a small honorarium. Ten experienced classroom teachers ultimately joined the study. Eight of the 10 classes were heterogeneous in composition, with 19 to 28 students per class. The 9th class (with 6 students) was a remedial one; the 10th (with 7 students) an enriched one.

The reading diagnostic battery (Appendix A), developed for the previous studies, was individually administered as a pretest to 186 of the 192 students in the teachers' classrooms. Trained testers (interrater reliability = 92 to 99%) administered the battery and recorded (1) student responses to a set of interview questions and (2) student performance on four diagnostic reading behaviors: word recognition (correct, incorrect, and evidence of decoding strategies), oral reading (errors, rate, fluency, and inflection), silent reading comprehension (rate and percent of paragraph recalled), and listening comprehension (percent of paragraph recalled).

Teachers were interviewed three times. During the first interview (Appendix B), data was obtained about their teaching practices during the daily formal reading session (instructional practices and materials, classroom organization, criteria for grouping, nature of feedback, etc.). Teachers were then observed once during the formal reading period in order to verify whether the interview data did, in fact, reflect their classroom practices.

After the first interview, pretest information was returned to each teacher. The information consisted of individual scores and reading group mean scores for each of the four diagnostic reading behaviors. Tables 1 and 2 show the information that one teacher received about her students' performance on word recognition. The individual data were provided for two-thirds of the students in each class, randomly selected. Pretest information was given to the teachers together with a letter explaining how to read the data; no interpretation of data was made. The remaining one-third of the students served as an internal control group for the hypothesis that teachers' receipt of diagnostic information has an effect on student achievement. The data for these students were not given to the teacher.

Table 1

Pretest Word Recognition Scores by Individuals--Teacher C

Grade Level	Percent of words decoded 0 - 3		3.1 - 6
8.5 - 9.0	5C02[a]		
8.0 - 8.4	5C04	5C08	
	5C09	5C14	
7.5 - 7.9	5C01		
7.0 - 7.4	5C06	5C11	5C12
6.5 - 6.9	5C15		
6.0 - 6.4	5C05		
5.5 - 5.9			
5.0 - 5.4			
4.5 - 4.9	5C03		
4.0 - 4.4	5C17		

Control students not included: 5C04, 5C13, 5C19, 5C07, 5C16, 5C10

[a]This is the code for a student's name.

Table 2

Pretest Word Identification Scores by Reading Group--Teacher C

	Weavers(n=5) (H/M)	*Gateways*(n=5) (H/M)	*Banners*(n=7) (H/M)
Word recognition and analysis			
Slosson Oral Reading Test (SORT)			
$\bar{x}$ grade equivalent & range	6.7 (4.6-8.0)	6.7 (4.3-8.1)	7.7 (6.9-8.5)
$\bar{x}$ percent decoding & range	5.0 (1 - 11)	2.0 (0 - 5)	4.0 (0 - 9)

$\bar{x}$ = mean (average)

H/M = Houghton-Mifflin Reading Series

Weavers, *Gateways*, and *Banners* are basal texts for grades, 3, 4, and 5, respectively.

An experimental group of five teachers, randomly assigned, received four hours of training in diagnostic reliability. We thought that such training would enable them to better interpret their students' performance scores, ultimately resulting in changes in instruction and improved achievement. Before and after the training, all 10 teachers diagnosed one of four randomly assigned simulated cases of reading difficulty at two different times. Each case presented a commonly encountered problem of reading difficulty. Case material included completed test booklets, test scores, background information, and the like (Lee & Weinshank, 1978). The second diagnosis was done on an alternate version of the case used for the first diagnosis. The purpose of the diagnoses was to control for non-experimental sources of gain.

Teachers were interviewed a second time (Appendix C) to determine, among other things, (a) how they evaluated the pretest information they received and (b) what influences the simulated case diagnoses (and training program, where applicable) had on their interpretation of their students' pretest results.

Of the 186 students who had been pretested, 169 remained by the end of the school year. These students were given the diagnostic battery again as a posttest. Data for posttest and achievement were analyzed for both individuals and reading groups and the resulting information was returned to each teacher shortly after the 1983-84 school year ended. Scores for all the students in the class, including control students, were provided. Tables 3 and 4 exemplify the information returned to the teachers.

Table 3

Word Recognition Achievement by Individuals--Teacher C

	Grade Level Changes	More than 15%	Changes in Percent of Decoding: Decreases 11-15%	Decreases 6-10%	Decreases 0-5%	Increases 0-5%	Increases 6-10%
Increases	1.6-2.0						
	1.1-1.5				5C05	5C17	
	.6-1.0				5C11 5C13 5C18	5C01	
	0-.5			5C07	5C09 5C14 5C10 5C16 5C12 5C19	5C03 5C08	
Decreases	.1-.5			5C06			
	.6-1.0						

Table 4

Achievement by Reading Group--Teacher C

	Weavers(n=5) (H/M)	*Gateways*(n=5) (H/M)	*Banners*(n=6) (H/M)
Word recognition and analysis			
Slosson Oral Reading Test (SORT)			
$\bar{x}$ grade equivalent changes & range	+.3 (0 to .5)	+.8 (.2 to 1.3)	+.4 (-.2 to .6)
$\bar{x}$ percent decoding changes& range	-2.5 (-8 to 3.5)	-1.3 (-5 to +2)	-2.8 (-7 to +2)

$\bar{x}$ = mean (average)

H/M = Houghton-Mifflin Reading Series

The final teacher interview (Appendix D) focused on whether the posttest and achievement scores for 1983-84 had any effect on the participating teachers' instructional decisions and actions for the 1984-85 school year.

Results

What do teachers report about the utility of receiving reliable diagnostic and performance information about their students?

After receiving the pretest diagnostic information, teachers were asked about its usefulness to them. During this second interview, 7 of the 10 teachers reported that the information was useful in sharpening their observations of student reading behavior in a variety of ways. The information (1) caused them to expect more from the students who scored well, (2) prompted them to recheck student group placement, (3) directed their attention to student shortcomings, and (4) verified their intuition about student group placement. The remaining three teachers felt the data were not applicable for use in their classrooms.

Teacher responses about the usefulness of the posttest and achievement information were recorded in the third interview, which was conducted at the beginning of the following school year. This time, 9 of the 10 teachers reported that the information had potential for directing their thinking about instructional changes in the reading program. However, they cited a number of limitations that would have to be corrected before the information could be put to direct use.

They wanted to (1) receive the information before the school year ended, (2) discuss their students' test results with the research staff and/or the other participating teachers, and (3) receive instructional strategies targeted to the diagnostic test results.

What are the main effects on student achievement of whether or not a teacher receives (a) reliable diagnostic and performance information about a particular student and (b) diagnostic training that uses this type of information?

There were no statistically significant differences in achievement for the four major diagnostic categories (word recognition, oral reading, silent reading comprehension, and listening comprehension) for experimental students whose diagnostic test results were returned to the teachers versus those for whom no diagnostic information was provided. It may be that teachers need to go through an entire year of receiving and using diagnostic information before they are able to incorporate use of it into their daily practice.

Similarly, there were no statistically significant differences in achievement for the students of teachers who received four hours of diagnostic training versus the students of the untrained teachers. Additionally, the training did not measurably improve the diagnostic reliability of the teachers on the simulated cases. While the four-hour training program was apparently too brief to alter teacher reliability, it was useful to the teachers in their

made was whether performance on one factor was above or below performance on the other.

Dividing a dimension into only two parts is probably too coarse a distinction. It may be the case that students separated by quarter of a year or even less require differing instruction. It is not known, a priori, how fine the performance distinctions should be. Choosing fewer distinctions rather than more can be justified on the grounds of practical as well as research constraints. As a practical matter, teachers cannot accommodate a differentiating scheme that results in an excessive number of instructional groups. As a research issue, making very fine distinctions among students would require a large sample to insure that there would be enough students falling into any one diagnostic category under study. Therefore, both the limited sample size of this study as well as the necessity that the diagnostic information be useful to the teachers dictated that fewer rather than more distinctions be used with each dimension.

Given the dimensions of interest, six diagnostic possibilities were formulated:

1. Word recognition below 4.5 grade equivalent (indicates problem) or above 4.5 grade equivalent (indicates no problem).

2. Oral reading below 4.5 grade equivalent (problem) or above 4.5 or above 4.5 grade equivalent (no problem).

3. Oral reading in relation to word recognition: word recognition grade equivalent is either above or below oral reading grade equivalent. Consider the following example.

    a. Oral reading and word recognition performance are both at grade placement. In this case, better oral reading performance is no being limited by word recognition ability.

    b. Oral reading is at grade placement but word recognition performance is below grade placement. This diagnostic classification represents a potential problem in oral reading for the student.

c. Oral reading is below grade placement but word recognition is adequate. The teacher must look to other limiting causes for the lag in oral reading.

d. Oral reading and word recognition are both inadequate. Oral reading is limited, at the least, by word recognition deficits.

4. Silent reading comprehension is below 4.5 grade equivalent (problem) or above 4.5 grade equivalent (no problem).

5. Silent reading comprehension in relation to word recognition: Word recognition is either above or below silent reading comprehension.

6. Silent reading comprehension in relation to listening comprehension: Listening comprehension is either above or below silent reading comprehension. (Note that listening comprehension is not included as a separate dimension. Its primary relevance is as an indicator of silent reading comprehension potential.)

Given these six dimensions together with the two values per dimension, a total of 64 or 2^6 diagnostic classifications, were generated. All the students in the study fell into only 18 of the 64 classifications. Of these 18, 5 accounted for 60% of the students. No students fell into any of the remaining 46 classifications. Following are the 5 major classifications.

Classification 1: N = 16
Diagnosis:
word recognition: no problem
oral reading: problem
oral reading below word recognition
silent reading comprehension: problem
silent reading comprehension below word recognition
silent reading comprehension below listening comprehension

One could speculate that students in this classification have learned the mechanics of decoding but have not generalized those skills to extended text reading, either orally or silently. Given the relationship between silent reading comprehension and listening comprehension, these students would seem to have the potential for satisfactory reading performance.

Classification 2: N = 25
Diagnosis:
word recognition: no problem
oral reading: no problem
oral reading below word recognition

silent reading comprehension: problem
silent reading comprehension below word recognition
silent reading comprehension below listening comprehension

This classification is the same as Classification 1 except that oral reading is not a problem. These students may be reading orally on a superficially satisfactory basis but have not developed the monitoring and tracking strategies required for comprehension.

Classification 3: N = 24
Diagnosis:
word recognition: no problem
oral reading: no problem
oral reading below word recognition
silent reading comprehension: no problem
silent reading comprehension below word recognition
silent reading comprehension at or above listening comprehension

These students are adequate fifth-grade readers. Since both their oral reading and silent reading comprehension are below their word recognition performance, these students might be expected to perform orally and silently at a higher level. These students may need instruction that enlarges their vocabulary, conceptual base, and the like.

Classification 4: N = 19
Diagnosis:
word recognition: no problem
oral reading: no problem
oral reading at or above word recognition
silent reading comprehension: problem
silent reading comprehension below word recognition
silent reading comprehension below listening comprehension

These students' word recognition and oral reading performances are similar. Therefore, as word recognition improves, oral reading ability could be expected to rise correspondingly. Because silent reading comprehension is below word recognition and listening comprehension performance, other factors must be found to explain the silent reading comprehension problem.

Classification 5: N = 16

Diagnosis:
word recognition: no problem
oral reading: no problem
oral reading at or above word recognition
silent reading comprehension: no problem
silent reading comprehension below word recognition
silent reading comprehension at or above listening comprehension

These students appear to be performing up to their current limits.

Diagnostic classifications and grouping practices. The teachers' grouping practices were examined in relation to the diagnostic classifications generated for their students. Table 5 shows the profiles for the students in a classroom representative of the six who had two or more reading groups.

Table 5

Teachers' Groups in Relation to Student Diagnostic Classifications

Low Group			Mid Group			High Group		
WR	OR	SRC	WR	OR	SRC	WR	OR	SRC
NP	NP	NP	NP	NP	P	NP	NP	NP
NP	NP	NP	NP	NP	NP	NP	NP	NP
NP	P	P	NP	NP	NP	NP	NP	NP
NP	NP	P	NP	NP	P	NP	NP	P
NP	NP	P	P	P	P	NP	NP	NP
						NP	NP	NP
						NP	NP	P

WR = Word Recognition
OR = Oral Reading
SRC = Silent Reading Comprehension

P = Problem: below 4.5 grade level
NP = No Problem: at 4.5 or above

As can be seen, the diagnostic testing showed that most students had adequate pretest performance; the three groups were virtually indistinguishable from one another. To the extent that the groups differed noticeably, they did so on the comprehension dimension. Even here, not all students in the low group were deficient and not all students in the high group were proficient. Overall, only two students were deficient in more than one classification. The lack of clear-cut differences among reading groups was observed in all classes where there were two or more groups. This leads to questions about whether the differences that did exist warranted multiple groupings and the resulting use of different levels of the basal text.

Are teachers differentially effective for students in different diagnostic classifications? What teacher practices are associated with gains in achievement in particular diagnostic classifications?

Table 6 summarizes the performance and outcomes for word recognition, oral reading, silent reading comprehension, and listening comprehension for all the students in the study.

Table 6

Mean Performance and Achievement Scores Across All Students

	Pretest (GE)	Posttest (GE)	Outcomes (in years)
WR	6.4 (2.4 - 9.4)	7.0 (2.6 - 9.6)	.51 (-0.5 to 1.7)
OR	5.7 (1.0 - 9.0)	6.3 (1.0 - 9.0)	.56 (-2.0 to 4.0)
SRC	4.3 (3.0 - 8.0)	4.7 (3.0 - 8.0)	.38 (-2.0 to 4.0)
LC	4.9 (2.0 - 8.0)	5.2 (3.0 - 8.0)	.28 (-3.0 to 4.0)

GE = Grade Equivalent
WR = Word Recognition
OR = Oral Reading
SRC = Silent Reading Comprehension
LC = Listening Comprehension

As the table shows, these students entered fifth grade, on the average, above grade level in word recognition and oral reading, at grade level in listening comprehension, and below grade level in silent reading comprehension. While the mean gains in word recognition and oral reading were only half a year for one year in school, the students still entered sixth grade, on the average, with those skills intact. However, for students at the lower reaches of the class range, this gain would not be sufficient to bring their performance up to grade level. Even for students in the middle of the range, silent reading comprehension and listening scores are inadequate.

Outcome results based on the pretest classifications indicate that students in two of the classifications had significantly different achievement depending on the teacher they had.

a. In Diagnostic Classification 2 (N = 25) there was a significant teacher effect (p <.05) for word recognition outcomes. Across the seven teachers who had students from that classification mean student gain was .60 years with a range of .18 to 1.17 years. For this same entering classification there was an additional teacher effect approaching significance (p <.10) for silent reading comprehension outcomes as well. Mean gain was .71 years; the range was 0 to 1.67 years.

b. In Diagnostic Classification 3 (N = 24) there was a statistically significant teacher effect (p <.05) for listening comprehension outcomes. The mean gain was .68 with a range across the seven teachers who had students from this classification of 0 to 2.0 years.

Thus the teachers in this study were differentially effective for students with identical entering diagnostic classifications who could have been expected to show comparable achievement by year's end.

Differential effectiveness for whole-class outcomes for all 10 teachers was also documented for word recognition (p <.05) and silent reading comprehension (p <.01). Mean gain for word recognition was .49 years; the range was .22 to .80 years. Mean gain for silent reading comprehension was .37; the

range was -.16 to +1.25 years. Thus, regardless of the diagnostic characteristics of individual students, some teachers were more effective than others in improving student achievement on certain reading skills.

In sum, the analysis procedure differentiated among students and teachers. It allowed for the reliable diagnostic classification of students based on their performance on specified reading tasks and for tracking precisely achievement within those classifications. The procedure also was capable of documenting differential teacher effects on (a) achievement of students grouped within the same pretest classification and (b) achievement across students regardless of their individual diagnostic classifications.

An effort was made to see whether special practices could be identified for those teachers whose students made above average gains in achievement. The accuracy of the data from the first interview was verified via classroom observations made by the research staff. Within the constraints of observing each teacher once, researchers concluded that an overall match existed between interview and observational data. The interview and observational data collected were insufficient as a basis for differentiating among the teachers. The overall similarity of responses during the first interview masked any differences that undoubtedly existed among the various classrooms. However, the analysis of achievement data did permit us to show that specific teacher effects on achievement can be documented and that teachers can be rank ordered from highest to lowest according to the level of their students' achievement in specific reading skill areas. Thus the analytic procedures provide a basis upon which to select teachers for further observation and interview.

Below are the responses to 10 questions about classroom practice asked during the first interview. They point to the presence of a small, shared,

repertoire of instructional practices in reading promoted, perhaps, by the district having recently imposed a uniform set of district-wide basal materials together with their associated objectives.

1. Texts and materials used. Nine of the 10 teachers used the Houghton-Mifflin basal series mandated by the school district for grades 1-5. The accelerated class used the basal mandated for grades 6-8. Most teachers made periodic use of supplementary materials, such as library books and commercially published skills exercises.

2. Students requiring the most instructional time. Teachers perceived themselves as giving more time and attention to low students than to other student groups.

3. Feedback to students. The most commonly mentioned methods of feedback were written and verbal comments and sharing and displaying good work.

4. Types of motivational activities. Most of the teachers reported the use of verbal praise, tangible rewards, and communicating their personal enthusiasm about reading.

5. Overall choreography of the reading lesson. Seven of the teachers reported that they grouped their students. They either rotated the groups through a fixed series of daily activities or through a series of weekly activities, with each activity assigned to a different day. Whole-group instruction was also used in conjunction with the grouping.

6. Criteria for grouping. Most of the teachers reported using some combination of the following criteria to determine group membership: students' placement at the end of the preceding year, basal placement test results, teacher judgment, reading teacher recommendations, and standardized test scores.

Teachers were asked to describe how th y typically conducted instruction in oral reading, word recognition, comprehension skills, and listening skills.

7. Oral reading. Most teachers dealt with miscues by providing the student with the correct word; a few directed students to reread or to attempt to decode the word. Problems with inflection and fluency were typically addressed by teacher modeling.

8. Word recognition skills. The three instructional strategies mentioned most often were using context to determine an unknown word, using the basal skill exercises, and teaching decoding via direct instruction.

9. Comprehension skills. The most commonly used strategies were questioning and group discussion.

10. Listening skills. Three types of favored activities were use of commercially prepared tapes and kits, practice in listening to directions, and use of teacher-designed games.

Student Interview Results

Student responses to the interview questions posed on the pre- and posttest diagnostic batteries were analyzed to see if they could provide additional predictive data about student diagnostic classifications. A number of items were found to be significantly correlated with performance ($p < .01$) on one or more of the four diagnostic reading behaviors listed below. However, the usefulness of student interview data in contributing to the quality of diagnostic classification is uncertain.

Student interview responses which correlated with test performance (* = significant both for pre and posttests, WR = Word Recognition, OR = Oral Reading, SRC = Silent Reading Comprehension, and LC = Listening Comprehension):

Performance (in specified diagnostic categories) was positively correlated with:

* a) fewer retentions (WR, OR, LC);
b) understanding science texts (WR);
* c) using the dictionary for word meanings (WR);
* d) characterizing good oral reading by inflection (LC);
e) understanding the English text (WR);
f) "figuring out" meaning of unknown word (SRC, LC); and
g) having a plan for decoding words (LC).

Performance (in specified diagnostic categories) was negatively correlated with:

* a) seeing oneself as being a good reader (WR, OR, LC);
* b) not wearing prescribed glasses (WR, OR);
c) not reporting any strategy for decoding (LC);
* d) not being able to characterize good oral reading (LC); and
e) frequent absence in second grade (LC).

Summary and Discussion

This study was the last in a programmatic series of research studies which began by investigating diagnostic reliability in reading, continued by developing a training program for improving reliability, and concluded by investigating how diagnostic information could be used to improve student achievement in reading. We examined (1) teacher responses to receiving diagnostic information about some of their students; (2) effects on student achievement of teachers receiving both diagnostic information and diagnostic training; (3) diagnostic classifications that emerged from student performance; and (4) differential teacher effectiveness and instructional practices.

The fifth-grade teachers responded positively to the receipt of specific diagnostic information about their students, seeing in the information potential for thinking about their own practice and for making changes in their reading instruction.

There were no apparent effects on student achievement either for teachers receiving diagnostic information or for teachers receiving diagnostic training in addition to diagnostic information.

Eighteen diagnostic classifications accounted for the test performance of all 169 students in the study; five classifications accounted for 60% of the students. The characteristics of the classifications together with their instructional implications were presented. Teachers' grouping practices did not correspond to the diagnostic characteristics we found for their students.

Teachers were found to be differentially effective for students in three of the five major diagnostic classifications. In two diagnostic classifications, teacher effects for the entire class were also documented. Available interview and observational data were not sufficient for specifying instructional practices associated with varying levels of achievement.

The system for capturing and interpreting reading-related data documented by the study has importance for different educational communities. For educational researchers, the system provides a means of establishing, over time, an empirical basis for improving instruction and achievement in reading by (1) identifying instructionally meaningful diagnostic classifications based on student performance and (2) identifying teachers who appear to be especially effective in promoting student achievement in specified reading areas.

For participating teachers, the system makes more accessible already existing student information. Individual teachers can use diagnostic and performance information to evaluate specific instructional decisions and strategies in the light of student achievement.

The project findings suggest that developing this empirical body of information will require a large sample of students and teachers in order to establish the most common diagnostic classifications for particular grade levels together with the expected outcomes for students in those classifications. Further, teachers shown to be effective in promoting student achievement in specified areas at the various grade levels must be interviewed and observed intensively so that those instructional practices associated with higher levels of student achievement can be made explicit. A data base that verifies instructional techniques of choice for students in specific diagnostic classifications would serve to enlarge teachers' repertoires of relevant instructional activities, act as a clearinghouse for disseminating existing exemplary practice, and provide a common basis for discussion and exchange among teachers and between teachers and the research community.

The strength of the system described in this study is that it, too, learns from experience. The data base that allows teachers to learn from

their own and their colleagues' experience would itself be altered by the continuous addition of teacher actions and their consequences. It is a system that would ultimately prescribe treatments of choice, but that would simultaneously, because of its grounding in the observation of practice, be responsive to variations of practice and associated outcomes. It is a system capable of both learning and teaching.

References

Lee, A., & Weinshank, A. (1978). CLIPIR pilot observational study of reading diagnosticians (Research Series No. 14). East Lansing: Michigan State University, Institute for Research on Teaching.

Vinsonhaler, J.F., Weinshank, A.B., Wagner, C.C., & Polin, R.M. (1983). Diagnosing children with educational problems: Characteristics of reading and learning disabilities specialists and classroom teachers. Reading Research Quarterly 18(2), 134-164. (Also available as Research Series No. 117, East Lansing: Michigan State University, Institute for Research on Teaching.

Vinsonhaler, J.F., Weinshank, A.B., Polin, R.M., & Wagner, C.C. (1983). Improving diagnostic reliability in reading through training. (Research Series No. 126). East Lansing: Michigan State University, Institute for Research on Teaching.

Wagner, C. (1982). Learning from experience: Applying the clinical and epidemiological research paradigms to the study of diagnosis and treatment in reading. Unpublished doctoral dissertation, Michigan State University, East Lansing, MI.

Weinshank, A. (1982). The reliability of diagnostic and remedial decisions of reading specialists. Journal of Reading Behavior, 14(1), 33-50. (Also available as Research Series No. 72, East Lansing: Michigan State University, Institute for Research on Teaching.)

Weinshank, A., & Vinsonhaler, J.F. (1983). On diagnostic reliability in reading: What's wrong and what can be done? Topics in Learning and Learning Disabilities, 2(4), 43-51.

Weinshank, A., Polin, R., & Wagner, C. (1985). Learning from experience to improve outcomes in reading: A case study. Reading Horizons, Summer, 1985. (Also available as Research Series No. 149, East Lansing: Michigan State University, Institute for Research on Teaching.

Appendix A:

Reading Diagnostic Battery

Name of school:_____

Name of teacher:_____

Name of student:_____

Name of tester:_____

THIS SHEET MUST BE REMOVED BEFORE DATA IS PROCESSED!

Instructions to Test Administrator for Total Test

1. Please record today's date and the time:
   Date:_____ Time:_____

2. When the cover sheet identifying the school, teacher, student and tester names is destroyed, the codes for this information should be inserted here.

   School code:_____

   Teacher code:_____

   Student code:_____

   Tester code:_____

3. The following materials should be present for the testing session:

   a. The 'Test Materials Notebook'

   b. A stop watch for timing various parts of the testing session.

   c. A wristwatch or clock.

   d. One sheet of opaque 8.5 X 11 inch paper.

   e. Two # 2 2/4 pencils with eraser.

4. DO NOT GIVE THE STUDENT HIS/HER TEST MATERIALS AT THIS TIME.

Introduction to Student

After greeting the student and introducing yourself, orient the student to the session. Be sure to cover the following points:

1. that all the students in this class as well as in a number of other classes are being tested;
2. that the purpose of the testing is to collect information on how students read;
3. that we hope the information will be useful to teachers as they help students read better;
4. that the session will last about half an hour. During most of that time the student will be reading either out loud or to him/herself;
5. that during the session you will be jotting things down and using the stopwatch from time to time;
6. let the student ask you any questions s/he might have.

Standard Interview Form

1. Please record the clock time. Time:_____
   Read the following to the student:

   "I'M GOING TO ASK YOU SOME QUESTIONS. YOUR ANSWERS WILL HELP US BETTER UNDERSTAND HOW STUDENTS READ.

   Unless otherwise directed, check only one answer per question. If the student doesn't respond, prompt with the listed options.

   FOR PRETEST, ASK QUESTIONS IN SECTIONS 2 AND 4. IF THIS IS NOT AN INITIAL TESTING, ASK QUESTIONS IN SECTIONS 3 AND 4.

2. FOR PRETEST SESSION

   a. What kind of reader do you think you are?
      __very good (1)
      __good (O.K.) (2)
      __not very good (3)
      __bad (4)
      __no response or didn't know (-1)
      __other (-2) _____

   b. (Ask only if student indicates "not very good" or "bad".)
      What grade level were you in when you first noticed that reading was a problem?
      __1st grade (1)
      __2nd grade (2)
      __3rd grade (3)
      __4th grade (4)
      __5th grade (5)
      __no response or didn't know (-1)
      __other (-2) _____

   c. Have you been absent from school a lot in past years?
      __yes (1)
      __no (2)
      __some grades (3)
      __no response or didn't know (-1)
      __other (-2) _____

   d. (Ask only if student indicated absences.)
      In what grade(a) were you absent a lot? (check all that apply)
      __1st grade (yes=1 no=0)
      __2nd grade (yes=1 no=0)
      __3rd grade (yes=1 no=0)
      __4th grade (yes=1 no=0)
      __5th grade (yes=1 no=0)

e. Have you ever repeated a grade?
__yes (1)
__no (2)
__no response or didn't know (-1)
__other (-2) _____

GO TO SECTION 4 NOW!

3. FOR POSTTEST SESSIONS.

a. How often have you been absent from school this year?
__less than 1 week (1)
__1 week - 3 weeks (2)
__more than 3 weeks (3)
__no response or didn't know (-1)
__other (-2) _____

b. How would you say your reading now compares with your reading at the beginning of the year?
__better (1)
__the same (2)
__worse (3)
__no response or didn't know (-1)
__other (-2) _____

GO ON TO SECTION 4 NOW!

4. COMPLETE THE QUESTIONS IN THIS SECTION FOR ALL ADMINISTRATIONS OF THE TEST BATTERY.

a. When you read your school books, do you know most of the words right away?
__yes (1)
__no (2)
__no response or didn't know (-1)
__other (-2) _____

b. What do you do when you come to a word you can't read right away? (check all that apply)
__skip it (yes=1 no=0)
__ask for help (yes=1 no=0)
__use sound symbol association (e.g., sound it out) (yes=1 no=0)
__use unspecified strategy (e.g., figure it out) (yes=1 no=0)
__no response or didn't know (yes=1 no=0)
__other (yes=1 no=0)

c. When you listen to people read out loud, how can you tell if they're doing a good job? (check all that apply)
__accurate (e.g., they know all the words) (yes=1 no=0)
__inflection (e.g., they read smoothly) (yes=1 no=0)
__speed (e.g., they read fast) (yes=1 no=0)
__no response or didn't know (yes=1 no=0)
__other (yes=1 no=0)

d. Do you have any trouble seeing things clearly?
__yes (1)
__no (2)
__no response or didn't know (-1)
__other (-2) _____

e. Do you have glasses for reading?
__yes (1)
__no (2)
__no response or didn't know (-1)
__other (-2) _____

f. (Ask only if the student has glasses.)
Do you wear the glasses when you read?
__yes (1)
__sometimes (2)
__no (3)
__no response or didn't know (-1)
__other (-2) _____

g. Do your eyes bother you after you've been reading for 15 or 20 minutes?
__yes (1)
__sometimes (2)
__no (3)
__no response or didn't know (-1)
__other (-2) _____

h. Do you have trouble hearing your teachers while you're trying to listen to them?
__yes (1)
__sometimes (2)
__no (3)
__no response or didn't know (-1)
__other (-2) _____

Do you have any trouble understanding what you read in your:

i. science books?
__yes (1)
__sometimes (2)
__no (3)
__no response or didn't know (-1)
__other (-2) _____

j. English books?
__yes (1)
__sometimes (2)
__no (3)
__no response or didn't know (-1)
__other (-2) _____

k. social studies books?
__yes (1)
__sometimes (2)
__no (3)
__no response or didn't know (-1)
__other (-2) _____

l. math books?
__yes (1)
__sometimes (2)
__no (3)
__no response or didn't know (-1)
__other (-2) _____

m. If your teacher asked you to sound out a word, how would you do it? (check all that apply)
__divide it up (syllabicate) (yes=1 no=0)
__sound it out (yes=1 no=0)
__put it all together (blend/adjust) (yes=1 no=0)
__other (yes=1 no=0)
__no response or didn't know (yes=1 no=0)

n. What do you do when you come to a word you can read but don't know its meaning? (check all that apply)
__skip it (yes=1 no=0)
__ask someone (yes=1 no=0)
__look in the dictionary (yes=1 no=0)
__try to figure it out (yes=1 no=0)
__no response or didn't know (yes=1 no=0)
__other (yes=1 no=0)

Word Recognition Measure

1. Please record the clock time. Time:_____

2. Give the student his/her "Test Materials Booklet". Turn to the SORT.

3. Read the following directions to the child:

   "HERE ARE SOME LISTS OF WORDS. I'LL ASK YOU TO READ SOME OF THESE LISTS. IF YOU DON'T KNOW A WORD RIGHT AWAY, TRY AND SOUND IT OUT. WE'RE GOING TO START WITH THE VERY FIRST LIST."

4. For each word, record student performance as follows:

   a. If the student reads the word correctly with no hesitation, check the 'Correct' column.

   b. If the student does not correctly call the word within a slow count of five, check the 'Incorrect' column. An incorrectly accented word is considered incorrect. If the student does not respond, check the 'Incorrect' column.

   c. If you see or hear a student attempting to decode a word, check the 'Mediated' column irrespective of whether the word is pronounced correctly or incorrectly.

   d. After a slow count of five, ask the student to continue with the next word.

5. Let the student proceed through the lists in order as long as six or more words are marked as 'Correct'.

REMEMBER: THE CRITERION FOR CONTINUING IS 6 OR MORE WORDS READ CORRECTLY - INSTANT OR MEDIATED.

Word	Correct	Incorrect	Mediated
1. jump	___	___	___
2. want	___	___	___
3. look	___	___	___
4. play	___	___	___
5. come	___	___	___
6. is	___	___	___
7. can	___	___	___
8. one	___	___	___
9. see	___	___	___
10. ball	___	___	___
11. little	___	___	___
12. three	___	___	___
13. baby	___	___	___
14. run	___	___	___
15. down	___	___	___
16. mother	___	___	___
17. here	___	___	___
18. up	___	___	___
19. help	___	___	___
20. make	___	___	___
TOTALS	___	___	___

Word	Correct	Incorrect	Mediated
21. very	___	___	___
22. under	___	___	___
23. hill	___	___	___
24. road	___	___	___
25. dark	___	___	___
26. horse	___	___	___
27. came	___	___	___
28. puppy	___	___	___
29. was	___	___	___
30. bump	___	___	___
31. with	___	___	___
32. ride	___	___	___
33. along	___	___	___
34. friends	___	___	___
35. first	___	___	___
36. food	___	___	___
37. wish	___	___	___
38. what	___	___	___
39. basket	___	___	___
40. live	___	___	___
TOTALS	___	___	___

Word	Correct	Incorrect	Mediated
41. better	___	___	___
42. hide	___	___	___
43. large	___	___	___
44. field	___	___	___
45. around	___	___	___
46. suddenly	___	___	___
47. forest	___	___	___
48. river	___	___	___
49. sheep	___	___	___
50. station	___	___	___
51. breakfast	___	___	___
52. across	___	___	___
53. heavy	___	___	___
54. lunch	___	___	___
55. happen	___	___	___
56. grass	___	___	___
57. game	___	___	___
58. farmer	___	___	___
59. stars	___	___	___
60. hope	___	___	___
TOTALS	___	___	___

Word Recognition Measure

Word	Correct	Incorrect	Mediated
61. hunger	___	___	___
62. evening	___	___	___
63. bench	___	___	___
64. excuse	___	___	___
65. grove	___	___	___
66. desire	___	___	___
67. perform	___	___	___
68. destroy	___	___	___
69. delicious	___	___	___
70. understood	___	___	___
71. safe	___	___	___
72. against	___	___	___
73. timid	___	___	___
74. ocean	___	___	___
75. damp	___	___	___
76. stream	___	___	___
77. empty	___	___	___
78. smash	___	___	___
79. stone	___	___	___
80. reward	___	___	___
TOTALS	___	___	___

Word Recognition Measure

Word	Correct	Incorrect	Mediated
81. claimed	___	___	___
82. forehead	___	___	___
83. serious	___	___	___
84. speechless	___	___	___
85. distant	___	___	___
86. dainty	___	___	___
87. anger	___	___	___
88. courage	___	___	___
89. slumber	___	___	___
90. cotton	___	___	___
91. harness	___	___	___
92. flakes	___	___	___
93. develop	___	___	___
94. vacant	___	___	___
95. price	___	___	___
96. future	___	___	___
97. appearance	___	___	___
98. promptly	___	___	___
99. region	___	___	___
100. silence	___	___	___
TOTALS	___	___	___

Word	Correct	Incorrect	Mediated
101. dignity	___	___	___
102. generally	___	___	___
103. gracious	___	___	___
104. applause	___	___	___
105. define	___	___	___
106. cushion	___	___	___
107. jungle	___	___	___
108. haze	___	___	___
109. profitable	___	___	___
110. tailor	___	___	___
111. fragrant	___	___	___
112. obedient	___	___	___
113. marriage	___	___	___
114. presence	___	___	___
115. terrace	___	___	___
116. interfere	___	___	___
117. ambition	___	___	___
118. merchant	___	___	___
119. custom	___	___	___
120. extended	___	___	___
TOTALS	___	___	___

Word	Correct	Incorrect	Mediated
121. tremendous	___	___	___
122. dungeon	___	___	___
123. customary	___	___	___
124. abundant	___	___	___
125. malicious	___	___	___
126. imaginary	___	___	___
127. excellence	___	___	___
128. consequently	___	___	___
129. installed	___	___	___
130. responsible	___	___	___
131. yearning	___	___	___
132. liquid	___	___	___
133. medicine	___	___	___
134. spectacular	___	___	___
135. rebellion	___	___	___
136. compliments	___	___	___
137. infected	___	___	___
138. inventory	___	___	___
139. importance	___	___	___
140. detained	___	___	___
TOTALS	___	___	___

Word Recognition Measure

Word	Correct	Incorrect	Mediated
141. reminiscence	___	___	___
142. architecture	___	___	___
143. environment	___	___	___
144. counterfeit	___	___	___
145. pensive	___	___	___
146. tremor	___	___	___
147. intricate	___	___	___
148. administer	___	___	___
149. continuously	___	___	___
150. attentively	___	___	___
151. industrious	___	___	___
152. contemporary	___	___	___
153. approximate	___	___	___
154. standardize	___	___	___
155. complexion	___	___	___
156. exhausted	___	___	___
157. malignant	___	___	___
158. compassionate	___	___	___
159. crisis	___	___	___
160. society	___	___	___
TOTALS	___	___	___

Word Recognition Measure

Word	Correct	Incorrect	Mediated
161. nucleus	___	___	___
162. proportional	___	___	___
163. articulate	___	___	___
164. remarkably	___	___	___
165. nonchalant	___	___	___
166. memorandum	___	___	___
167. deprecate	___	___	___
168. contrasting	___	___	___
169. whimsical	___	___	___
170. evident	___	___	___
171. prairies	___	___	___
172. twilight	___	___	___
173. intangible	___	___	___
174. supplement	___	___	___
175. formulated	___	___	___
176. exuberant	___	___	___
177. antique	___	___	___
178. inducement	___	___	___
179. irrelevance	___	___	___
180. grotesque	___	___	___
TOTALS	___	___	___

Word	Correct	Incorrect	Mediated
181. sojourn	___	___	___
182. affable	___	___	___
183. auspicious	___	___	___
184. enamoured	___	___	___
185. futility	___	___	___
186. primordial	___	___	___
187. inadequacy	___	___	___
188. chastisement	___	___	___
189. envisage	___	___	___
190. pandemonium	___	___	___
191. panorama	___	___	___
192. compressible	___	___	___
193. gustatory	___	___	___
194. traverse	___	___	___
195. simultaneous	___	___	___
196. excruciating	___	___	___
197. contraband	___	___	___
198. decipher	___	___	___
199. scrupulous	___	___	___
200. facsimile	___	___	___
TOTALS	___	___	___

G4

Airplane pilots have many important jobs. They fly passengers, freight, and mail from one city to another. Sometimes they make dangerous rescues in land and sea accidents, and drop food where people or herds are starving. They bring strange animals from dense jungles to our zoos. They also serve as traffic police and spot speeding cars on highways.
Stopwatch time:_____ Inflection YES NO
Fluency YES NO

G5

Hundreds of years ago, most of Europe was a very poor region. But China, a large country in eastern Asia, had many of the comforts of a rich, civilized nation. Only a few people from Europe had visited this distant region. One was the famous Marco Polo. He learned some of the languages that were spoken in China and served its great ruler for many years.
Stopwatch time:_____ Inflection YES NO
Fluency YES NO

G6

The eager spectators who had cheered the plucky Warriors through eight hard-fought innings were silent. Only a run was required to defeat the much feared champions, who had previously defeated all opponents. The spectators had earlier criticized the umpire severely. Now their faces were tense with excitement as the players took their positions.
Stopwatch time:_____ Inflection YES NO
Fluency YES NO

G8

The oil industry has been greatly increased by recent advances in science. Geologists have discovered new ways of locating veins of oil-producing rock. Problems of gusher control have been solved. Very effective also are newer methods of refining crude oil which have resulted in a higher ratio of quality fuel oil from a given volume of crude oil.
Stopwatch time:_____ Inflection YES NO
Fluency YES NO

G10

In response to the impulse of habit Joseph rose and spoke as in former days. He spoke vigorously, continuously, and persuasively while the others listered attentively but in grim and contemptuous silence. Finally exhausted, Joseph hesitated for a moment; as often happens in such circumstances he became confused and was unable to resume speaking.
Stopwatch time:_____ Inflection YES NO
Fluency YES NO

G12

Many of the hypotheses about physical phenomena formulated by early philosophers were inconsistent and in most cases could not be universally applied. In order to develop accurate principles very capable physicists, mathematicians, and statisticians had to cooperate wholeheartedly over long periods of time to verify numerous basic facts and assumptions.
Stopwatch time:_____ Inflection YES NO
Fluency YES NO

G4

Airplane pilots have many important jobs. They fly passengers, freight, and mail from one city to another. Sometimes they make dangerous rescues in land and sea accidents, and drop food where people or herds are starving. They bring strange animals from dense jungles to our zoos. They also serve as traffic police and spot speeding cars on highways.
Stopwatch time:_____ Inflection YES NO
Fluency YES NO

G5

Hundreds of years ago, most of Europe was a very poor region. But China, a large country in eastern Asia, had many of the comforts of a rich, civilized nation. Only a few people from Europe had visited this distant region. One was the famous Marco Polo. He learned some of the languages that were spoken in China and served its great ruler for many years.
Stopwatch time:_____ Inflection YES NO
Fluency YES NO

G6

The eager spectators who had cheered the plucky Warriors through eight hard-fought innings were silent. Only a run was required to defeat the much feared champions, who had previously defeated all opponents. The spectators had earlier criticized the umpire severely. Now their faces were tense with excitement as the players took their positions.
Stopwatch time:_____ Inflection YES NO
Fluency YES NO

G8

The oil industry has been greatly increased by recent advances in science. Geologists have discovered new ways of locating veins of oil-producing rock. Problems of gusher control have been solved. Very effective also are newer methods of refining crude oil which have resulted in a higher ratio of quality fuel oil from a given volume of crude oil.
Stopwatch time:_____ Inflection YES NO
Fluency YES NO

G10

In response to the impulse of habit Joseph rose and spoke as in former days. He spoke vigorously, continuously, and persuasively while the others listered attentively but in grim and contemptuous silence. Finally exhausted, Joseph hesitated for a moment; as often happens in such circumstances he became confused and was unable to resume speaking.
Stopwatch time:_____ Inflection YES NO
Fluency YES NO

G12

Many of the hypotheses about physical phenomena formulated by early philosophers were inconsistent and in most cases could not be universally applied. In order to develop accurate principles very capable physicists, mathematicians, and statisticians had to cooperate wholeheartedly over long periods of time to verify numerous basic facts and assumptions.
Stopwatch time:_____ Inflection YES NO
Fluency YES NO

Silent Reading Measure

1. Please record the clock time. Time:_____

2. Turn to the Silent Reading Paragraphs.

3. Read the following instructions to the student:

   "YOU ARE GOING TO BE READING SOME SELECTIONS SILENTLY ONE AT A TIME. I'LL BE ASKING YOU ABOUT EACH SELECTION AFTER YOU READ IT. I'LL TELL YOU WHEN TO START. PLEASE TELL ME WHEN YOU HAVE FINISHED READING."

4. For each selection do the following:

   a. RESET THE STOPWATCH TO ZERO.

   b. Tell the student to begin. Then, START THE STOPWATCH.

   c. When the student has finished the selection, stop the stopwatch, record the time and cover the selection with the 8.5 x 11 opaque paper.

5. For each selection conduct the comprehension procedure as follows:

   a. Say to the student, "TELL ME WHAT WAS IN THE SELECTION, STARTING AT THE BEGINNING." Number all memories in order of recall. Ignore unrelated responses.

   b. The criterion for stopping is when the student remembers fewer than 40% of the memories. The number of recalls required to continue to the next paragraph are given with each selection.

   c. Start the student at paragraph 3. If the student is stopped at paragraph 3, then try 2, etc. If the student is not stopped at paragraph 3, go on to 4, etc.

   REMEMBER: THE CRITERION FOR CONTINUING IS WHEN RECALL REACHES OR EXCEEDS THE NUMBER OF MEMORIES GIVEN WITH EACH SELECTION.

1. 1: Criterion is: 6 memories. Time:_____ COVER SELECTION!

2. Tell me what the story was about, starting at the beginning.
   __A hen had
   __six yellow chicks.
   __One morning
   __she took them for a walk.
   __They looked for
   __something to eat.
   __They found some seeds
   __and sand.
   __A dog came
   __to play with them.
   __The hen
   __did not like the dog.
   __She flew at the dog
   __and made him run away.

1. 2: Criterion is: 8 memories. Time:_____ COVER SELECTION!

2. Tell me what the story was about, starting at the beginning.
   __Two children
   __got off the bus.
   __There was nobody
   __at the bus stop
   __to meet them.
   __So they sat down
   __to wait.
   __A few minutes later
   __an old blue car
   __came around the corner.
   __The children's mother
   __was in it.
   __She got out and
   __said she was late because
   __she couldn't get the car started
   __and she had to fix it.
   __They all
   __got into the car
   __and drove home.

1. 3: Criterion is: 10 memories. Time:_____ COVER SELECTION!

2. Tell me what the story was about, starting at the beginning.
__Last week
__a boy and girl from our school
__had a real adventure.
__They were going past the bank
__on their way home
__for lunch
__when two men ran out
__with a bag of money.
__The men had a car waiting for them
__and drove away
__very fast.
__When the police came,
__the children told them
__what color the car was
__and how big it was.
__They could even tell the police
__that one man was short and
__the other one was tall.
__Because the children were
__in the right place
__that day,
__the men were soon caught and
__the money was returned.

1. 4: Criterion is: 11 memories. Time:_____ COVER SELECTION!

2. Tell me what the story was about, starting at the beginning.
__Nearly two hundred
__years ago
__in France,
__the first man
__went up in a balloon.
__The balloon was made of
__paper
__covered with strips of cloth
__to make it strong.
__A huge basket
__was attached underneath
__to carry people,
__and a long rope
__anchored it
__to the ground.
__On this first trip,
__the man was in the air
__alone for several minutes.
__Later he took a friend
__up in the balloon with him.
__That time, they rose
__more than five hundred feet
__and stayed up
__for half an hour.
__They came down
__several miles
__from where they started.

1. 5: Criterion is: 12 memories. Time:_____ COVER SELECTION!

2. Tell me what the story was about, starting at the beginning.
__At one time, immense herds of buffalo
__roamed the Great Central Plains
__of North America.
__Indian tribes
__like the Blackfoot and the Cree
__called themselves "People of the Buffalo"
__and followed these huge animals,
__killing them with bows and arrows
__for the food and skins they needed.
__They hunted on horseback
__and moved their shelters
__with the herds.
__About one hundred years ago,
__this source of food
__was lost to the Plains Indians.
__The buffalo began to be killed
__in large numbers,
__not just for needed food,
__but for buffalo robes.
__The robes brought such high prices
__that some hunters pursued the animals
__with rifles,
__traveling by train
__to where they grazed.
__In a short time
__the buffalo had all been killed,
__and the Indians were left
__without a basic source of food.

1. 6: Criterion is: 14 memories. Time:_____ COVER SELECTION!

2. Tell me what the story was about, starting at the beginning.
__No one knows
__exactly how or where ice hockey started.
__However, field hockey was played
__in England
__more than one hundred fifty years ago,
__and some pucks and sticks
__have been found
__that show
__that ice hockey
__was played
__in Canada
__by British soldiers
__during the 1850's.
__By 1890,
__a hockey association had been formed
__in Canada
__to administer
__and develop the game.
__Shortly after, hockey was introduced
__into the United States
__at two universities
__and the game was soon very popular.
__At first
__the game was played
__only for fun,
__but people were willing
__to pay
__to watch exciting games.
__So professional teams were set up,
__and the National Hockey Association formed.
__That association later became
__the National Hockey League (NHL).
__By the end of the 1970's,
__there were nearly twenty teams
__playing in that league.

1. 7: Criterion is: 12 memories. Time:_____ COVER SELECTION!

2. Tell me what the story was about, starting at the beginning.
__Every four years
__athletes
__from all over the world
__compete
__in a festival of sports.
__These great contests
__are called the Olympic Games,
__since they were first conducted
__at Mount Olympus
__by the ancient Greeks.
__They were part of a religious celebration
__in honor of Zeus,
__father of the Greek gods.
__They were discontinued long ago
__and were revived
__only in 1896
__by men
__interested in continuing the custom.
__The first
__of the modern games
__were staged appropriately
__in Athens.
__Since that time
__they have been held
__in various countries.
__They stimulate world friendship
__and help to maintain interest
__in physical perfection.

1. 8: Criterion is: 13 memories. Time:_____ COVER SELECTION!

2. Tell me what the story was about, starting at the beginning.
__One of the most difficult
__political
__and economic
__problems
__of our Federal government
__is to prevent
__the development
__throughout the country,
__of certain commercial interests
__at the expense of others.
__One very persistent attack
__has been against
__the development
__of large corporations.
__DeWitt
__in his study of the history
__of this struggle
__states
__that it has three distinct objectives.
__First, to find some satisfactory means
__to control
__and regulate
__the activities of large business corporations;
__second, to resist
__the tendency
__of corporations
__to exploit
__natural resources
__for their own benefit;
__third, to control tariffs
__which favor trusts
__and monopolies.

Listening Comprehension Measure

1. Please record the clock time. Time:_____

2. Take the test booklet away from the student. You will be reading the Listening Comprehension Paragraphs to the student.

3. Read the following instructions to the student:

   "YOU ARE GOING TO BE LISTENING TO SOME SELECTIONS. I'LL BE ASKING YOU ABOUT EACH SELECTION AFTER YOU'VE LISTENED TO IT.

4. Read at a moderate pace using normal inflection.

5. For each selection conduct the comprehension procedure as follows:

   a. Say to the student, "TELL ME WHAT WAS IN THE SELECTION, STARTING AT THE BEGINNING." Number all memories in order of recall. Ignore unrelated responses.

   b. The criterion for stopping is when the student remembers fewer than 40% of the memories. The number of recalls required to continue to the next paragraph are given with each selection.

   c. Start the student at paragraph 3. If the student is stopped at paragraph 3, then try 2, etc. If the student is not stopped at paragraph 3, go on to 4, etc.

   REMEMBER: THE CRITERION FOR CONTINUING IS WHEN RECALL REACHES OR EXCEEDS THE NUMBER OF MEMORIES GIVEN WITH EACH SELECTION. SPECIFIC NUMBERS ARE GIVEN WITH EACH SELECTION.

1. LC1: Criterion is 7 memories

2. Tell me what the story was about, starting at the beginning.
   __A boy
   __had a big gray cat.
   __He was going to give her
   __some milk.
   __The cat
   __did not come
   __when he called.
   __He saw her
   __up in a tree.
   __She was looking down
   __at a big dog.
   __The boy
   __sent the dog away.
   __Then the cat
   __jumped down.
   __She came
   __for some milk.

1. LC2: Criterion is 7 memories

2. Tell me what the story was about, starting at the beginning.
   __Jan woke up
   __and ran down
   __to breakfast.
   __It was her birthday.
   __She saw
   __a big basket
   __on her chair.
   __Something was moving
   __in the basket.
   __She took off the cover
   __and a little brown dog
   __jumped out.
   __The dog
   __started to bark
   __because it was glad
   __to get out.

1. LC3: Criterion is 8 memories

2. Tell me what the story was about, starting at the beginning.
__A boy
__was hurt
__on our street
__yesterday.
__He had been playing ball.
__He was riding
__his bicycle
__away from the ball field
__when a car
__came down the road.
__He did not see the car coming
__because he was looking back
__at the children
__who were still playing ball.
__The car was going slowly.
__It hit the boy
__but did not run over him.
__His arm was hurt
__and his bicycle was bent.

1. LC4: Criterion is 11 memories

2. Tell me what the story was about, starting at the beginning.
__The first railroad engines
__were pulled
__by horses
__along rails.
__Later
__steam engines were employed
__to pull trains,
__but these first engines
__could not travel very rapidly
__and often broke down.
__Once some people
__had a contest
__between a train
__drawn by a horse
__and a train
__powered by an engine.
__At first the horse was ahead
__because the engine started slowly.
__Then the engine
__passed the horse
__and stayed ahead for a while.
__However, before the end of the race,
__the engine broke down
__and the horse won.
__People who loved horses
__were pleased about the results
__of the contest.

1. LC5: Criterion is 14 memories

2. Tell me what the story was about, starting at the beginning.
__Sometimes we have the idea
__from television
__that the only heroes
__in the "Wild West"
__were the cowboys
__and Indians.
__Really, the heroes of the West
__were the men and women
__who came from far away
__crossing the endless prairie
__in covered wagons
__and floating their belongings
__across rivers.
__Many settlers
__traveled hundreds of miles
__before they reached land
__that looked promising to them
__and they could build
__some kind of shelter.
__They could claim
__only as much land
__as they could work
__for a certain number of years.
__Many died
__of cold, hunger, and overwork,
__but others survived
__and opened the broad western plains.
__These people
__came with nothing
__but what they could carry,
__and a willingness to work.
__We should be grateful
__that they opened the West
__for us.

1. LC6: Criterion is 13 memories

2. Tell me what the story was about, starting at the beginning.
__Baseball has often been called
__the national sport of the United States.
__It developed from games
__known in England
__as "rounders"
__and "town ball"
__and was played
__in U.S. colleges
__as early as 1825.
__Baseball's popularity
__has constantly increased
__because the rules are easily understood
__and the players require
__only simple equipment.
__War, as it happens,
__has been responsible
__for the growth of the pastime.
__Many men
__learned it first in camps
__during the American Civil War
__and started teams
__after they returned home.
__Both World Wars
__extended it further,
__for wherever U.S. soldiers were stationed
__in foreign countries,
__they created
__an interest in baseball
__that remained after they left.
__In Japan, for example,
__baseball may now be as popular
__as it is in the United States.

1. LC7: Criterion is 14 memories.

2. Tell me what the story was about, starting at the beginning.
----Failure to plan
----for suitable defense
----under irregular conditions
----of warfare
----accounted for defeat
----in the first war
----waged by the United States.
----An army
----of two thousand men
----under General Arthur St. Clair
----marched northward
----from Cincinnati
----to punish Indians
----who had broken treaty provisions.
----They neglected
----to guard against
----unexpected assault
----and found themselves defenseless
----when hostile Indians
----suddenly attacked them
----in the forest.
----Firearms
----gave little protection
----against an enemy
----in ambush.
----After a futile attempt
----at defense,
----St. Clair ordered his men
----to retreat.
----Only fifty escaped
----uninjured.
----President Washington
----felt very bitter
----about St. Clair's carelessness
----in the country's first military campaign.

1. LC8: Criterion is 12 memories

2. Tell me what the story is about, starting at the beginning.
----Railroad communication
----developed rapidly
----just after the civil war.
----Between 1865 and 1873,
----thirty-five thousand
----miles of track were laid.
----This doubled the distance
----people could travel
----by railroad.
----Some of the new roads
----connected important cities
----and some extended westward beyond populated regions.
----Congress
----favored this sudden
----development
----by granting land to companies
----interested in furthering
----the expansion.
----Grants included territory
----lying within twenty miles
----of the proposed roadbed.
----Alternate sections
----were allotted to the railroad.
----Those in between were
----reserved for homesteaders.
----The sale of sections of land
----owned by the railroad
----was made easier
----through this checkerboard
----arrangement.

Test Administrator Debriefing Form

1. **********
   DO NOT DISMISS THE STUDENT YET.
   ****
   Examine the entire test booklet to make sure that all tests are completed. Check them off.
   ____Interview
   ____Word Recognition (SORT)
   ____Oral Reading (Gray)
   ____Silent Reading (Durrell)
   ____Listening Comprehension (Durrell)
   If all are done, DISMISS the student.

2. PLEASE RECORD THE CLOCK TIME! Time:_____
   Please answer the following questions concerning the just completed testing session.

3. What was the student's overall affect? (Check all that apply.)
   ____Animated
   ____Flat
   ____Sullen
   ____Hostile
   ____Passive
   ____Attentive
   ____Fidgety
   ____Nervous

4. What was the student's mean length of utterance? (Check all that apply.)
   ____Multiple Sentences
   ____Sentence
   ____Phrase
   ____One word

5. What was the student's general sophistication of language? (Check all that apply.)
   ____High
   ____Average
   ____Low

6. What was the student's sex?
   ____Male
   ____Female

7. While reading silently and independently, what were the student's characteristics? (Check all that apply.)
   ____Squirmed
   ____Was attentive
   ____Gave up
   ____Asked for assistance
   ____Subvocalized

   ____Tracked sentences with finger
   ____Raced through material
   ____Other. Specify:_____

8. Did the student appear to have any difficulty hearing?
   ____No
   ____Yes. Specify:_____

9. Did the student appear to have any difficulty with the visual aspects of reading?
   ____Yes (Rubbing eyes, watery eyes, keeping text close to eyes)
   ____No

10. Enter any other comments about the session that have not been recorded elsewhere.

_____

_____

_____

_____

_____

Appendix B:

Interview 1

Appendix B: Interview 1

Interview #1

Teacher _____

Date _____

Interview # _____

School _____

Grade _____

1. How is the reading program set up in your school (self contained, joplin, reading specialist, etc.)?

2. What time of the day do you schedule formal reading instruction?

3. How much time do you allocate for formal reading instruction each day?

4. What reading tests and associated materials do you use?

5. Is any portion of your reading program mandated? If so, please describe.

6. Do you operate under any other constraints which you feel affect your reading program?

7. Overall, what kind of year are you having in reading? (What leads you to feel that way?)

8. Describe the characteristics of the most common types of readers among your students. (This does not refer to your existing reading groups.)

   a) Considering the types of readers you've just described, which type of student do you think you are most successful with?

   b) Considering the types of readers you've described, which type of student do you think you are least successful with?

   c) Which kinds of students require the most planning/preparation time?

Appendix B: Interview 1

d) Which kinds of students require the most instructional time?

e) How do you let your students know about the quality of their work in reading?

f) How do you try to motivate your students in reading?

g) How do you bring a student up to date in reading when s/he has missed:

1) one or two days of school?

2) more than a week of school?

h) In general, how would you rate the reading ability of your typical incoming students in September?

9. Describe the choreography of a typical reading session.

a) How many reading groups do you have and what criteria do you use to form the groups?

b) How big is each group and what considerations determine its size?

c) About how many minutes a day do you typically schedule to spend with each group personally? (How close do you actually come?)

d) How do you reevaluate group membership?

e) Do you alter your instruction according to the group?

f) Do you alter your instruction according to the time of year?

g) Do you use your materials/resources differentially for each group? (How do you use them?)

h) What is your major goal in reading for each of your groups?

Appendix B: Interview 1

10. How much of the textbook do you try to cover per week for each group? Per semester? Per year? (Additional materials beyond completion of text?)

11. Describe how you conduct a typical oral reading session for each group. (How do you deal with miscalls and inflection?)

12. How do you deal with acquisition of word recognition and analysis skills for each group?

13. How do you deal with acquisition of comprehension skills for each group?

14. How do you deal with acquisition of listening skills in general?

Appendix C:

Interview 2

Appendix C: Interview 2

Interview #2

Teacher _____

Date _____

Interviewer _____

School _____

Grade _____

1. When we last talked together you explained your instructional practices in a number of areas (give laminated card with categories listed on it):

   Grouping (if any)

   Feedback and motivation

   Time allotted for the reading period

   Time allotted for each of the groups

   Materials used

   Instructional practices in: oral reading, word recognition and analysis, reading comprehension and listening comprehension

   Has anything changed since then in these areas?

   Have there been any other changes that have affected your reading program apart from these areas?

(Take transcript of Interview One along. Prompt only if they say they can't remember what they said in Interview One.)

2. Overall, what kind of year have you had in reading?

3. You remember that you received information about how your students performed on the diagnostic battery for the pretest. Here are the charts we used. (Quickly go through each blank laminated chart and point out how each axis is labeled.) Each student was placed in a cell depending on how s/he did on the pretest. Later on, we sent you the pretest results expressed as average performance for your whole class as well as for each reading group (assuming you had groups). Please give me your thoughts about this pretest information. Free response. Prompt if following not covered in the response:

Appendix C: Interview 2

Useful, how? / not useful, why?

Interesting?

Format preference?

Hard to understand?

What was missing?

4. Please give me your thoughts about the two sessions in which you diagnosed a simulated case of reading difficulty. Prompt if following not covered:

   Useful? / not useful, why?

   Interesting?

   Did it influence the way you interpreted the pretest information?

After the posttesting is completed we will be sending you (at home) two sets of information. The first set will be formatted identically to that of the pretest (i.e., charts and class/group averages). The second set will show changes in performance from pretest to posttest. Would you be willing to let us arrange one last interview after you have had a chance to react to these results? You will of course receive a modest honorarium for your time.

Appendix D:

Interview 3

Appendix D: Interview 3

INTERVIEW #3: SEPT-OCT. 1984

During this past summer you received posttest and achievement scores for last years' students in four reading diagnostic areas: word recognition, oral reading, silent reading comprehension and listening comprehension.

1. Did the results support your own observations and judgments about your students achievement? Explain.

2. Did the results contradict your observations/judgments in any way? Explain.

3. Did you use the information in any way when planning for this year?

4. What is your opinion of the usefulness of the posttest and achievement information you received?

5. Did diagnosing the simulated cases twice have any influence on how you interpreted or used the posttest/outcome scores? Explain.

*6. Did the two diagnostic training sessions have any influence on how you interpreted or used the posttest/outcome information? Explain.

7. Could we have provided you with anything else that you feel would have had an influence on your instructional decisions and actions?

---

* This question was asked only of those five teachers who received diagnostic training.