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ABSTRACT

The purpose of this study was to ascertain the effects of two factors, the data base used for instructional decision making and the structure of instruction, on student achievement. The dependent data were the number of words read correctly by 117 elementary school students on three basal reading passages. Students were rank ordered in two ways: first by the degree of implementation of a technically adequate curriculum-based measurement and evaluation system, and second by the degree of structure in their instructional programs. The top 27 percent were compared to the bottom 27 percent for both variables. The t tests on the mean z scores indicated no difference in achievement due to the structure of instruction. A significant difference was found between high and low implementation groups on one reading passage; differences between scores on two other passages were not significant but were in the same direction, supporting the hypothesis that a high degree of implementation of a technically adequate data system does lead to greater achievement. The discussion addresses implications for teaching practices. (Author)

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Institute for Research on Learning Disabilities

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Abstract

The purpose of this study was to ascertain the effects of two factors, the data base used for instructional decision making and the structure of instruction, on student achievement. The dependent data were the number of words read correctly by 117 students on three basal reading passages. Students were rank ordered in two ways: first by the degree of implementation of a technically adequate curriculum-based measurement and evaluation system, and second by the degree of structure in their instructional programs. The top 27% were compared to the bottom 27% for both variables. The t tests on the mean z scores indicated no difference in achievement due to the structure of instruction. A significant difference was found between high and low implementation groups on one reading passage; differences between scores on two other passages were not significant but were in the same direction, supporting the hypothesis that a high degree of implementation of a technically adequate data system does lead to greater achievement. The discussion addresses implications for teaching practices.

The Impact of the Structure of Instruction and the Use of Technically Adequate Instructional Data on Reading Improvement

The basic teaching skill is decision making (Shavelson & Borko, 1979). "Any teaching act is a result of a decision, either conscious or unconscious" (Shavelson, 1973, p. 144). Decisions are made spontaneously as a teacher responds to the immediate demands of a situation and decisions are made in a more conscious manner as a teacher plans and prepares for lessons. The former decisions are interactive and the latter are preactive (Jackson, 1968).

Preactive decision making allows teachers to consider a wealth of information, including subjective and objective data. Teachers may consider their own informal observation, anecdotal reports of other teachers, notes from parents, school records, or standardized test scores. Given this "information overload," teachers must sift through all these data to determine which sources provide the most useful information and then make their planning decisions accordingly. Little information is available about the process teachers use to make these decisions or the quality of these decisions. The studies that address these issues are discussed below.

The Process of Teacher Decision Making

When making decisions concerning the placement of students in reading groups, teachers primarily consider student characteristics, which they transform into estimates of students' reading abilities (Shavelson & Borko, 1979). After reading groups are formed, the group becomes the focus of instruction so that the teacher's decisions concerning how to teach reading are not based on individual students

but on the group. Basically, then, teachers summarize a great deal of data into one salient piece of information, the group's ability. Based on this global assessment, the teacher decides how to instruct.

Potter and Mirkin (1982) summarized responses to a questionnaire returned by 128 teachers of learning disabled students on how teachers plan and implement instruction. The analysis revealed that teachers most often rely on informal assessment and personal observation as the information used in making planning decisions. However, Potter and Mirkin noted that there was great variability in the sources of information teachers used. These sources ranged from scores on IQ tests, achievement tests, and criterion-referenced tests, to parental input, input of other teachers, and behavioral observation.

A major problem with the myriad of data sources used by teachers is their inconsistent technical adequacy. Many of the pieces of information on which a teacher bases decisions may be unreliable and/or invalid. Use of data with such flaws may lead to erroneous decision making. Yet, teachers appear to be sensitive to the issue of technical adequacy of data, as was shown by Shavelson, Caldwell, and Izu (1977). They asked teachers to estimate the progress that would be made by a fictitious student. Some teachers received technically adequate information, such as test scores, and others received unreliable and potentially invalid information, such as a statement from a classmate. Teachers who received unreliable information revised their estimates of probability when they were given additional data. Teachers appeared to prefer making decisions based on technically adequate sources of information.

However, as Shavelson and Borko (1979) and Potter and Mirkin (1982) pointed out, teachers use a number of technically inadequate sources. The technical adequacy of the information on which teachers base their decisions is crucial if teachers are to make accurate preactive decisions. And if decision making is the basic teaching skill, then providing teachers with more technically adequate data with which to make decisions may help teachers improve the instruction they provide. If teachers are trained to routinely and frequently gather technically adequate data and use these data to make decisions about when to change their instructional procedures, then perhaps the decision-making process will be improved.

The Quality of Teacher Decision Making

The quality of educational decisions is best assessed via the primary results of those decisions, namely, student achievement. Research regarding educational practices that positively effect student achievement suggests that structure of instruction is an important factor (Stevens & Rosenshine, 1981). Structure of instruction is comprised of factors such as academic engaged time (Borg, 1980; Fisher, Berliner, Filby, Marliave, Cahen, & Dishaw, 1980), teacher-directed learning, pacing (Fisher et al., 1980), positive consequences, frequency of correct responses, correction procedures, and direct practice on the target behaviors (Borg, 1980; Starlin, 1979).

Research concerning the degree of structure of instruction in classrooms is sparse. Baker, Herman, and Yeh (1981) reported widespread use of games, puzzles, and adjunct devices, indicative of

low structure of instruction. Leinhardt, Zigmond, and Cooley (1981) concluded that teachers made poor instructional decisions. This conclusion was reached after a year long project in which learning disabled students were observed in the classroom in order to ascertain the kind of instruction they were receiving. The structure of instruction for any given student may be dependent on the curriculum materials used. As McNair and Joyce (1979) have indicated, most classroom activities are derived from the curriculum materials.

Purpose

In summary, the data teachers typically use to make instructional decisions are often technically inadequate and some teachers select less than adequate instructional procedures with regard to instruction. Therefore, it would be interesting to ascertain what the impact would be on student achievement when both of these factors, the data base and structure, are manipulated. The purpose of this research was to examine these two variables. The specific research questions were:

(1) What is the effect of teacher's use of technically adequate, curriculum-based repeated measurement and evaluation procedures on students' reading achievement?

(2) What is the effect of the degree of structure of students' instructional programs on students' reading achievement?

Method

Subjects

A total of 31 teachers participated in this study. In this group, there were 26 females and 5 males. On the average, they had 1.9 years of experience teaching regular education and 8.8 years teaching special education. The greatest percentage of teachers (39%) had no experience teaching regular education; 23% had taught special education for one to three years.

There were 117 students included in the study. Their ages ranged from 6 to 13 years, with an average age of 9.5. There were 92 males and 23 females (the sex of two subjects was uncoded) in grades 1-7. The greatest numbers of students were in grades 2-5 (20, 26, 25, and 25, respectively). In grade 1, there were five students, in grade 6, there were nine students, and in grade 7, there were two students. The students included in the study were, for the most part (111 of the 117), provided with special education in resource rooms.

Measures

Three major types of measures were employed in this study. First, a measure of the degree of implementation of the measurement and evaluation procedures was included since it was critical to know how accurate and complete teachers were in using the evaluation system. Second, measures indicating the degree of structure of the students' instructional programs were included. These measures were useful in determining how the evaluation system influences teaching practices. Both the implementation and structure measures served as independent variables. The third set of measures included student

achievement indices, which served as the dependent data.

Implementation variables. The Accuracy of Implementation Rating Scale (AIRS) is an instrument that was developed in conjunction with the manual Procedures to Develop and Monitor Progress on IEP Goals (Mirkin, Deno, Fuchs, Wesson, Tindal, Marston, & Kuehnle, 1981), which was used for teacher training in this study. The AIRS provides a format for monitoring the implementation of the procedures described in the manual. The AIRS consists of 12 items rated on a 1 to 5 scale, 1 being the lowest implementation score and 5 being complete and accurate implementation. A complete list of the items and their operational definitions can be found in Appendix A.

Items 1 and 2 of the AIRS, which require direct observation, deal with the accuracy of administration of the measurement and selection of the stimulus materials. Items 3-12 of the AIRS require inspection of various written documents. Specifically, the rater examines four documents for each student: the Individualized Educational Plan (IEP), which should specify the long-range goal and short-term objective in reading, the reading graph, the instructional plan for reading, and the record of changes made in the instructional plan in reading. Factors included in items 3-12 pertain to the establishment of (a) the appropriate measurement level; (b) an adequate baseline; (c) an accurate long-range goal and short-term objective; (d) a detailed graph; (e) a complete instructional program; (f) a correct aimline; (g) the timing of instructional changes; (h) the clarity and intensity of the changes made. (See Appendix A.) The AIRS was used to assess the degree of implementation at the beginning, mid-way, and at the

conclusion of this study.

The interjudge agreement for the AIRS ranged from .92 to .98 when percentage of agreement was based on a within-one-point rating match. The percentage of exact agreement ranged from .73 to .91.

Structure variables. The Structure of Instruction Rating Scale (SIRS) is designed to measure, through observation, the degree of structure of the instructional lesson that a student receives. In this study, the focus was on structure during reading instruction. The variables chosen for inclusion on the SIRS were gathered from current literature on instruction and student academic achievement (cf. Stevens & Rosenshine, 1981). A list of the variables and their operational definitions can be found in Appendix B. Observations were conducted at three different points in time during the study.

The SIRS consists of 12 five-point rating scales in which a rating of 1 is low for the variable and 5 is high. Observers, trained by videotape to a criterion of .80-.90 inter-rater agreement, rate all variables on the basis of strict definitions at the end of a 20-minute observation period. For the present study, nine research assistants were trained as observers; they reached an inter-rater agreement level of .92 before actually observing in classrooms. The focus of each observation period for the SIRS is on the instructional environment for one student at a time. (See Appendix B.)

The reliability of the SIRS was assessed by means of Coefficient Alpha, a measure of internal consistency. For a sample of 70 students observed in November 1981, the average inter-item correlation was .37, resulting in an alpha of .86. Thus, the SIRS seems to have a high

degree of reliability as indexed by a homogeneity measure.

Achievement measures. Three one-minute oral reading measures, consisting of randomly selected passages from the third grade level in Ginn 720, were administered to the students at the end of the study. These measures were selected based on their technical adequacy (Deno, Mirkin, & Chiang, 1982) and sensitivity to change (Marston, Lowry, Deno, & Mirkin, 1981). These simple measures are as reliable and valid as traditional standardized tests and yet are more likely to reflect small increments in improvement. The measurements were conducted by directing students to begin reading at the top of the page and continue reading for one minute, at which time the examiner would say stop. If they came to a word they did not know, the examiner would supply the word and prompt them to continue. While the student was reading, the examiner followed along on a copy of the passage and marked errors of substitution and omission. Following the reading, the numbers of words read correct and incorrect were counted and recorded, with no feedback given to the student. These three reading measures were given at the beginning of the study and immediately following the final observation (posttest). A gain score then was calculated for each subject.

Procedures

All teachers were trained to carry out a specific set of procedures, including establishing an appropriate measurement level, writing long-range goals (LRGs) and short-term objectives (STOs), collecting three oral reading scores per week for each student, plotting the scores on a graph, and using the data in making decisions

about the effectiveness of students' instructional programs.

Measurement. Reading measurement consisted of one-minute timed samples of reading from the student's curriculum. Both words correct and incorrect were scored and charted on equal interval charts. The level of stimulus material for testing, which also became the baseline, was selected as the level from which the student could read aloud between 20-29 words per minute for grades 1 and 2, and 30-39 words per minute for grades 3-6.

Writing goals. Teachers were instructed to write long-range goals for the student's IEP using both the entry level criterion and a desired year-end mastery criterion, usually 70 words correct per minute with no more than 7 errors. The format used in writing the long range goal is shown in Figure 1.

Insert Figure 1 about here

Writing objectives. Two types of short-term objectives were written, performance and mastery; both were based on the long-range goals. For performance objectives, in order to compute the short-term objective, teachers first subtracted the baseline level of performance from the criterion level listed in the LRG. Dividing this difference by the number of weeks necessary until the annual review, they arrived at the number of words per week gain necessary to meet the long-range goal criteria. In performance measurement, the measurement task is a random sample of items from a constant set of stimuli, and the goal is to improve the level of performance on that stimulus material. In

graphing performance measurement, the horizontal axis represents successive school days and the vertical axis represents the level of performance on a constant measurement task; each data point represents the level of proficiency on that constant measurement task. The line of best fit through the data points depicts the student's rate of improvement in performance on the set of stimulus material.

When writing mastery based short-term objectives, teachers backtrack through the reading curriculum to find the level at which the student reads at the mastery rate designated in the long-range goal. The pages or stories between this baseline level and the goal level are counted and divided by the number of weeks until the annual review. This number becomes the criterion used in the STO specifying the average weekly progress necessary to meet the LRG. On the graph, the horizontal axis again represents school days and the vertical axis represents successive segments, pages, or stories of the curriculum mastered. Each data point represents the number of curriculum segments mastered through a given day. The line of best fit through the data points depicts the rate of student progress through the curriculum. The purpose of repeated mastery assessment is to assess the student's rate of mastery in the curriculum, and the purpose of the graph is to display that rate of curriculum mastery. The teacher measures the student on a representative sample of material from the current instructional curriculum unit and plots that level on the graph until mastery is achieved. At that point (a) the teacher registers on the student's graph that a curriculum unit has been mastered, and (b) the set of reading stimulus material on which the

teacher measures the student progresses to the next segment in the hierarchy. The two formats used for writing short-term objectives are listed in Figure 2.

Insert Figure 2 about here

Data utilization. In addition to measuring and writing goals and objectives, the teachers were trained in the use of the measurement procedures for evaluation of the instructional program. In order to monitor student growth, the baseline reading level and the long-range goal were connected by an aimline that showed the student's desired progress. Every seven data points, the teachers were to monitor student growth by means of the split-middle or quarter-intersect method (White & Haring, 1976). An example is given in Figure 3. If the student was progressing at a rate equivalent to or greater than that indicated by the aimline, the instructional program was continued; if the projected rate of growth was less than that indicated by the aimline, teachers were directed to make a major change in the student's instructional program.

Insert Figure 3 about here

Teacher Training

Three formats were used to train teachers in these procedures. For 10 teachers in one special education cooperative, training in the use of the measurement procedures took place in a series of three

half-day workshops at the beginning of the school year. Teachers also were provided with the manual, Procedures to Develop and Monitor Progress on IEP Goals (Mirkin et al., 1981), which detailed all the activities teachers were to do. In addition, visits by observers in December, February, and May, and frequent phone contacts, provided feedback to the teachers on the accuracy of their implementation of the measures.

In two other districts, training was conducted by district personnel with the aid of the same manual. In November, individuals designated by each district as trainers participated in a one-day trainer's workshop. At this time the procedures were reviewed for the trainers and they were given trainer's manuals that specified activities for them to use when teaching the monitoring procedures to the teachers. After this trainer's workshop, the trainers set up and conducted a series of training sessions in their own districts. Questions about the procedures usually were forwarded to IRLD personnel. On-going phone contact facilitated the training process.

The last type of teacher training involved 10 teachers from a rural special education cooperative that had served as a pilot site. These teachers were trained during one week of full-day workshops prior to the 1980-81 school year and during monthly, half-day workshops throughout the year. These workshops were conducted by IRLD staff and, prior to February, their focus was on training the teachers to (a) write curriculum-based IEPs, (b) create a curriculum-based measurement procedure including mastery and performance systems, (c) measure frequently and graph student progress toward IEP goals, and

(d) develop strategies to improve the feasibility of implementing the frequent measurement systems. By February, each teacher had developed curriculum-based IEPs for at least two students and was measuring and graphing those students' reading performance at least three times each week. In February, the data-utilization systems were introduced to the teachers. The remainder of the workshops consisted of teacher presentations of their graphs and discussions of student progress and changes in instructional plans.

Data Collection

Throughout the year, specific data were compiled by each teacher and sent to an IRLD staff member who was designated as the contact person. Data collection took place on three occasions, separated by approximately two months each, and was synchronized with the SIRS and AIRS observations.

Each teacher compiled a packet for each student in the study. The packet consisted of the following forms: (a) SIRS; (b) AIRS; (c) Graph; (d) IEP (IRLD form); (e) Instructional Plan (IRLD form); (f) Changes in Instructional Plan (IRLD form); (g) Student Information Sheet; and (h) 3rd Grade Passage Scores.

To insure confidentiality, each student was assigned an ID number and names were removed before the documents left the districts. The information obtained from the teachers was gleaned by research assistants according to the implementation, structure, and achievement variables.

Observer Training

In order to collect SIRS data and rate items 1 and 2 on the AIRS, observations of each student during reading class were necessary. Staff members (lead teachers, program coordinators) from two locations involved in the research carried out the necessary observation procedures in their districts. These observers were trained during one half-day session by two IRLD staff members. A brief review of the research design was provided at the onset of the training. The primary focus of the training was on actual observation procedures required of the observers throughout the year, particularly proper use of the Structure of Instruction Rating Scale (SIRS) and the Accuracy of Implementation Rating Scale (AIRS).

Explanation of the SIRS included its history and rationale, its purpose, and its administration procedures. Each item on the scale was discussed in detail, including definitions for and examples of several ratings per item. After the SIRS was explained, two videotapes were used as a training aid to give the observers a chance to practice their skills. The tapes consisted of two resource room situations, one demonstrating a model teacher and the other more indicative of a teacher who would receive lower ratings on the SIRS. Each item on both tapes was rated by each observer and an IRLD staff member and discussed. An inter-rater agreement of .80 was required of the observers before the session ended.

The AIRS training consisted of explanations of the two items on the scale that the observers would be rating. The final portion of the training involved the organizational aspect of the data

collection. A list of documents that were to be collected at the time of each observation was drawn up and explained. Throughout the year, an IRLD staff member was in contact with the observers on a weekly basis to insure understanding and consistency of the procedures and to answer any questions.

In the other two study sites, trained IRLD staff members conducted the observations. Nine observers were used in one district and four in the other. Training of these observers was similar to the training of the district personnel. The videotape and code book were presented and ratings were practiced until the required level of interobserver agreement was reached.

Data Analysis

Data analysis was done via a series of steps. The first step was to standardize the reading passage scores by grade level in order to minimize the influence of grade on achievement. Second, the three implementation and three structure scores were averaged across the three data collections to arrive at an average implementation and an average structure score per subject. The third step was to standardize the structure and implementation scores by school district in order to minimize the measurement error introduced by using different raters at the various sites. The fourth step in the data analysis was to compile rank order distributions of the 117 students; one rank order distribution was according to standardized average implementation score, and the second rank order distribution was according to standardized average structure score.

The upper 27% and lower 27% of each distribution composed the

groups used for this analysis. The gain scores of the high implementation group were compared to the gain scores of the low implementation group and the gain scores of the high structure group were compared to the gain scores of the low structure group. T tests were employed for these comparisons; the dependent data were the gain scores from pretest to posttest.

Results

Implementation

Table 1 presents the mean z score gains for Low and High Implementation Groups, as well as the results of the t tests. The matched pairs t tests on the gain scores from the three passages yielded a significant difference between groups ($p = .004$) for passage 1: the High Implementation group showed greater gains in achievement than the Low Implementation group. The sample mean gains also were higher for the High Implementation group on passages 2 and 3; however, the t tests on the gain scores for these two passages were not significant.

Insert Table 1 about here

Structure

Table 2 presents the gain scores for Low and High Structure Groups, as well as the results of the t tests. None of the t tests between achievement gains of the High and Low Structure groups yielded significant results. In addition, no trend was apparent in the data to indicate that either the Low or High Structure group showed more

improvement than the other group.

Insert Table 2 about here

Discussion

The results lend modest support to the conclusion that teachers' use of a technically adequate, curriculum-based repeated measurement and evaluation system positively affects their instructional decisions. In this study the students of those teachers who more accurately and consistently applied this system made better progress. Apparently, the teachers made better instructional decisions using the technically adequate data and consistent rules regarding how to use that data.

In contrast, the structure of instruction, as measured in the study, appears to have no bearing on reading improvement. The students of teachers who conducted highly structured programs improved no more than the students of less structured teachers. This finding is important because in a descriptive study such as this one many rival hypotheses can be offered for relationships obtained between presumably causal variables. For example, the relationship between high implementation of measurement and evaluation and achievement might, ordinarily, be explained by offering another construct--particularly structure--as the cause of improved achievement. In such an analysis high implementation would be seen as concommitant rather than causal. Given the present results, however, structure of instruction as the "real cause" of improved reading performance cannot

be offered as a plausible rival hypothesis.

Considering the important role given to structure by other researchers, however, some speculation about the lack of findings for this variable should be offered. First, the SIRS may not be an adequate tool to assess structure. Perhaps other structure variables would be more salient than those used in this scale. The research on which the SIRS is based focuses on regular education. It is possible that those variables are not as powerful for students in special education. Other aspects of instruction may be more important with special populations. A second possible explanation for lack of effects is the sampling procedure used to collect the SIRS ratings. Students were observed for 20 minutes on three occasions. Therefore, a total of approximately 60 minutes of classroom time was used to represent instruction received over a seven-month period. It is impossible to know whether the SIRS scores accurately reflect the structure of instruction on the whole. The observers reported that some teachers made comments after the observations that their students were behaving differently than usual. Perhaps the teachers also instructed differently when observed.

The main implication for practice that can be derived from this study is that teachers should be encouraged to use a technically adequate data base for making instructional decisions. The results of the structure of instruction analysis may indicate that teachers cannot always rely on a model set of instructional procedures that generally seem to have a positive effect on achievement. No single instructional procedure will work for every student. Rather, teachers

must consider each student individually and regard each instructional procedure as a hypothesis that must be tested to determine whether it works for a particular student. The measurement procedures described in this paper meet the technical characteristics that are necessary for teachers to use the data with confidence. These data can help teachers make better instructional decisions for each student and these decisions result in improved performance.

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Table 1

T-Tests on Gain Scores for High and Low Implementation Groups

	N	Mean z score	Standard Deviation	Standard Error	T Value	P Value
Passage 1						
Low Implementation	24	-.339	.587	.120	-3.03	.004
High Implementation	18	.309	.801	.189		
Passage 2						
Low Implementation	24	-.337	.510	.104	-1.59	.127
High Implementation	16	.085	.977	.244		
Passage 3						
Low Implementation	24	-.561	1.002	.204	-1.52	.138
High Implementation	16	.016	1.407	.352		

Table 2

T-Tests on Gain Scores for High and Low Structure Groups

	N	Mean z score	Standard Deviation	Standard Error	T Value	P Value
Passage 1						
Low Structure	34	.218	.797	.137	1.51	.137
High Structure	24	-.087	.732	.146		
Passage 2						
Low Structure	34	.255	.955	.164	-.10	.923
High Structure	25	.277	.795	.152		
Passage 3						
Low Structure	34	.366	1.688	.290	.73	.470
High Structure	25	.100	1.116	.223		

	Condition	Behavior	Criteria
LRG:	In _____ (total # weeks) weeks, when presented with stories from Level _____ (#), _____ (reading series),	student will read aloud	at the rate of 50 wpm or better 5 or fewer errors.

Figure 1. Format for Long-Range Goal: Reading

Performance Charting: Reading

CONDITION	BEHAVIOR	CRITERIA
Each successive week, when presented with a random selection from_____ (level # from current instructional level - same as LRG) of_____ (reading series)	student will read aloud	at an average increase of _____ (70 or 50 wpm - actual performance) total # weeks remaining in school year.

Progress Charting: Reading

CONDITION	BEHAVIOR	CRITERIA
Each week, when presented with successive stories from _____ (Level #s from current instructional level to annual goal level)	student will progress	at the rate of _____ stories per week maintaining the mastery criteria of at least 50 wpm (gr. 1 & 2) with 5 or fewer errors and 70 wpm (gr. 3-6) with 7 or fewer errors

Figure 2. Performance and Progress Charting Short Term Objectives for Reading.

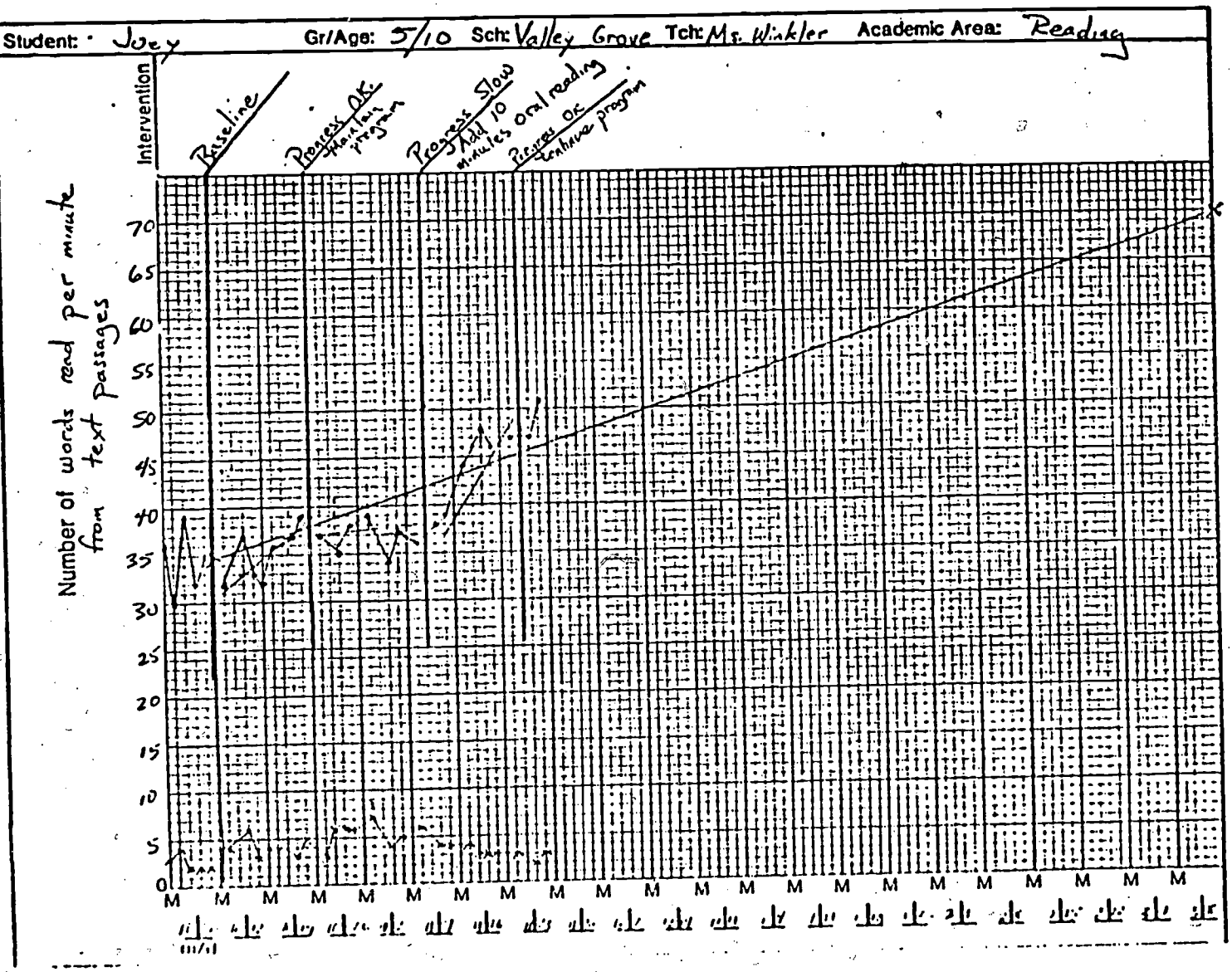


Figure 3. Using the split-middle technique to monitor student progress.

Appendix A

Accuracy of Implementation Rating Scale

School:_____ Student:_____

Date:_____ Teacher:_____

Observer (Items 1 and 2):_____

Rater (Items 3-13):_____

Number of observations prior to rating:_____

Time observation begins:_____ Time observation ends:_____

Time allocated to reading instruction per day:_____

Curriculum used for measurement: Publisher_____

Series_____ Level_____

Instructions

Circle the number that accurately reflects your rating for each variable. Only one number may be circled per variable. 1 reflects a low level of implementation and 5 means total implementation of the Procedures to Develop and Monitor Progress on IEP Goals. See Operational Definitions. Items 1 and 2 require direct observation of the measurement administration. Items 3, 4, 5, 6, and 7 require inspection of the student graph. Items 8, 9, and 10 require inspection of the student's IEP form. The Instructional Plan must be inspected to rate item 11. The Change Record must be inspected to rate items 12 and 13.

Dir. Obs.	1.	Administering the Measurement Task	1	2	3	4	5
	2.	Selecting the Stimulus Material	1	2	3	4	5
Inspect Graph	3.	Sampling for Instructional Level	1	2	3	4	5
	4.	Baseline	1	2	3	4	5
	5.	Graph Set-up	1	2	3	4	5
	6.	Aimline	1	2	3	4	5
	7.	Timing of Instructional Changes	1	2	3	4	5
Inspect IEP	8.	Long-Range Goal	1	2	3	4	5
	9.	Short-Term Objective	1	2	3	4	5
	10.	Measurement System	1	2	3	4	5
Insp. Inst. Plan	11.	Instructional Plan	1	2	3	4	5
Insp. Change Rec.	12.	Substantial Changes	1	2	3	4	5
	13.	One, Clear Change	1	2	3	4	5

AIRS

Operational Definitions

Accuracy of Implementation Rating Scale

1. Administering the Measurement Task

   5 - The measurement task is administered correctly: teacher brings stopwatch and pencil to measurement area; gives correct directions for the task; administers the measurement procedure for one minute; correctly marks the teacher copy; correctly counts words correct and incorrect; correctly counts words correct and incorrect; correctly plots the data point.

   1 - The teacher: forgets necessary materials; does not give directions; does not time the task accurately; fails to mark the teacher copy or incorrectly marks errors; miscounts correct and incorrect words; and inaccurately plots the data point.

2. Selecting the Stimulus Material

   5 - The teacher has followed these procedures: Uses passages selected from the level that represents the annual goal. Observers should record the book from which the passage was selected and later check this with the long-range goal level. At this level find the pages in these stories that do not have excessive dialogue, indentations, and/or unusual pronouns. Write these page numbers on equal size slips of paper.

   - Put the slips of paper into a drawbag and shake it.

   - Randomly pick a slip of paper.

   - The page number chosen is the page where the student begins reading. If the page chosen is a passage that was read earlier during the week, draw another page number.

   Other completely random procedures are also rated a 5. If, however, not all passages have an equal chance of being selected, a 4 rating would be indicated.

   1 - The teacher fails to randomly pick the passage or the sample is taken from a domain which is greater or smaller than the one indicated in the goal.

3. Sampling for Instructional Level

   5 - The teacher has sampled from higher or lower reading levels to find the level in which the student reads 20-29 wpm (grades 1 & 2) or 30-39 wpm (grades 3 and up).

1 - The teacher is measuring at a level which is too high or too low.

4. Baseline

5 - The student's performance has been measured at least 3 times to establish a stable baseline. A stable baseline means that all data points fall within a range of 10.

1 - The teacher has not found a level for which a stable baseline has been established or has failed to collect 3 data points during the baseline phase.

5. Graph Set-Up

5 - The graph is accurately set up: The dates filled in on the horizontal axis; the vertical axis is correctly labeled words read per minute from _____ material; the units of measurement are specified; the student's name and subject area are certified; a key identifies the symbols for correct (.) and incorrect (x); symbols are placed at the intersection of date and score; the data points are connected with straight lines; and absences are recorded on the graph as (abs.).

1 - The graph does not include many of the items mentioned above.

6. Aimline

5 - The long-range goal is marked on the graph with an X at the intersection of the desired performance level and date of attainment and a line of desired progress connects the point representing the student's median score of the last 3 data points from baseline and the LRG.

1 - The long-range goal is not marked on the graph and/or the median and LRG are not connected.

7. Timing of Instructional Changes

5 - All the adjustments in the student's program are made at the appropriate time given the rules for data utilization:

(1) Compare the actual slope based on 7 to 10 data points to the slope required to attain the Annual Goal.

(2) If the actual slope is equal to, or steeper than, the Annual Goal slope, continue the program.

(3) If the actual slope is flatter than the Annual Goal slope, change the program.

1 - None of the adjustments in the student's program are made at the appropriate time.

8. Long-Range Goal

5 - The long-range goal is accurately written; goal specifies the number of weeks until next review; stimulus materials for the goal represents the level in which the student is performing at entry level criterion; goal specifies student behavior; goal specifies mastery criterion of 50 wpm with fewer than 5 errors (grades 1 & 2) or 70 wpm with fewer than 7 errors (grades 3-5) when there are 36 weeks until the annual review. If there are fewer than 36 weeks, the criteria can be lowered proportionately.

1 - The long-range goal contains none of the above criteria.

9. Short-Term Objective

5 - The short-term objective is accurately written; stimulus material and behavior is specified; and the average increase in performance is the desired performance minus the actual performance divided by the number of weeks until the annual review.

1 - The short-term objective contains none of the above criteria.

10. Measurement System

5 - The teacher has indicated how the material is organized, the frequency of measurement, and what is to be recorded on the graph.

1 - The measurement system is not specified.

11. Instructional Plan

5 - The instructional plan includes clear and specific descriptions of the instructional procedures, the time spent in each activity, the pertinent materials, the arrangements, and the motivational strategies.

1 - The instructional plan is unclear and lacks specific descriptions of the instructional procedures, the time spent in each activity, the pertinent materials, the arrangements, and the motivational strategies.

12. Substantial Changes

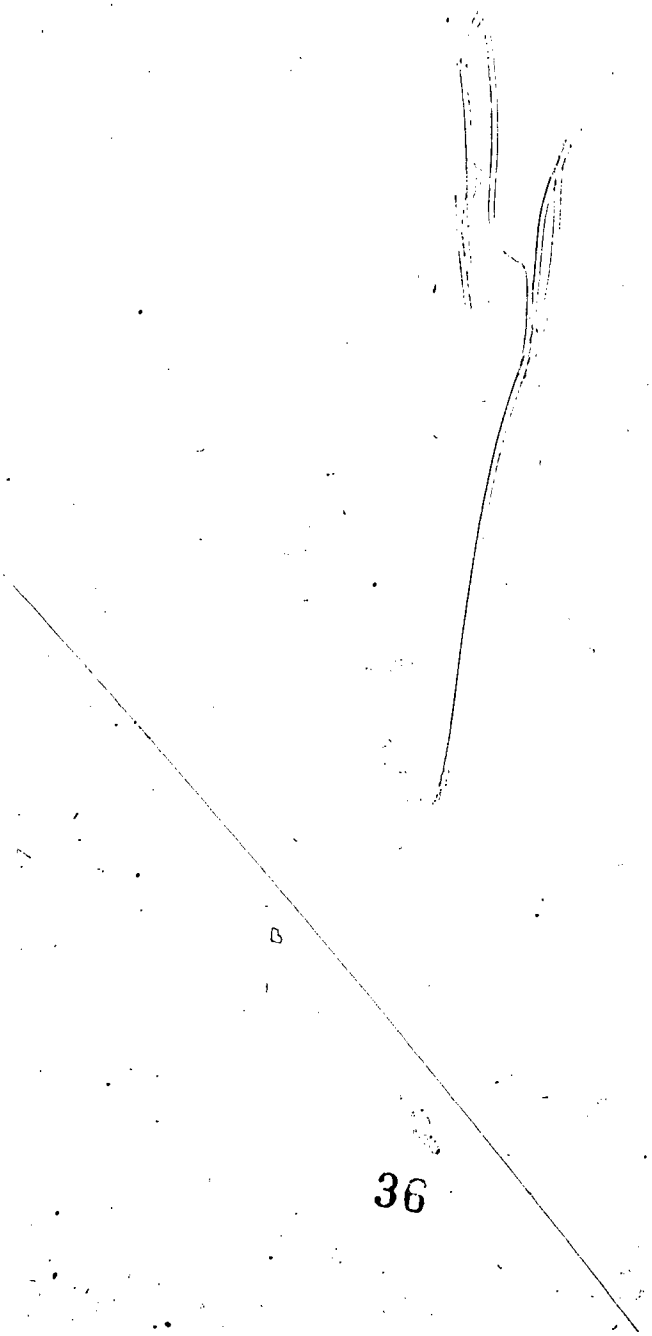
5 - The adjustments in the student's program are always substantial (have a good chance of being effective; see Unit XIV).

1 - The adjustments are never substantial.

13. Clear Change

5 - All the adjustments made introduce only one, clear program change.

1 - All the adjustments made introduce more than one change and/or the change is unclear.



Appendix B

Structure of Instruction Rating Scale (SIRS)

School:_____ Student:_____

Date:_____ Teacher:_____

Observer:_____ Number of Students in Group:_____

Number of observations prior to rating:_____

Time observation begins:_____ Time observation ends:_____

Time allocated to reading instruction per day:_____

Currirulum used for instruction: Publisher_____

Series_____ Level_____

Instructions

Circle the number that accurately reflects your rating for each variable. Only one number may be circled per variable. If you are unable to evaluate a certain variable, mark N/A (not applicable) next to the left-hand column.

1.	Instructional Grouping	1	2	3	4	5
2.	Teacher-directed Learning	1	2	3	4	5
3.	Active Academic Responding	1	2	3	4	5
4.	Demonstration/Prompting	1	2	3	4	5
5.	Controlled Practice	1	2	3	4	5
6.	Frequency of Correct Answers	1	2	3	4	5
7.	Independent Practice	1	2	3	4	5
8.	Corrections	1	2	3	4	5
9.	Positive Consequences	1	2	3	4	5
10.	Pacing	1	2	3	4	5
11.	Oral Practice on Outcome Behavior	1	2	3	4	5
12.	Silent Practice on Outcome Behavior	1	2	3	4	5

SIRS

Operational Definitions Codebook

1. Instructional Grouping

   5 - 90% or more of the instruction this student receives from the teacher is on an individual basis.

   1 - 10% or less of the instruction this student receives from the teacher is on an individual basis.

2. Teacher-Directed Learning

   5 - Student's instruction is extremely organized, businesslike, and teacher is firm in direction and control of activities. For example, student is presented with questions, student has material to cover, etc.

   1 - Student's instruction is casually organized and very spontaneous. Teacher is not committed to having the student work on a particular set of material. Instructional materials do not determine what activities student engages in and the lessons change according to problems or mood of this student.

3. Active Academic Responding

   5 - The student is actively practicing the academic skills to be learned more than 75% of the time observed. Specifically, the student is engaged in oral or written responding to teacher questions or written material, e.g., reading aloud, answering questions, writing, or computing. Student rarely is involved in non-academic conversations with teacher or other students Attending to the lesson without responding, such as sitting, looking, listening, and/or following along in a book does not apply. The student must make an active, written or oral response.

   1 - The student is actively practicing the skills to be learned less than 10% of the time observed. Instructional lessons may be interrupted or shortened to include "process" and other non-academic activities, e.g., clarifying feelings, opinions, and working on arts and crafts.

4. Demonstration and Prompting

   5 - Appropriate steps of the desired behavior to be performed are demonstrated for the student. Student is given an opportunity to practice the step(s) as teacher provides prompts for correct behavior that approximates or achives desired response.

   1 - Teacher attempts to teach the student a behavior without using demonstration and prompting techniques.

SIRS

5. Controlled Practice

5 - Student's practice of material is actively controlled by teacher who frequently asks questions to clarify that the student understands what has just been demonstrated. Questions are convergent (single factual answer) and the student's answers consistently follow the questions and are given teacher feedback.

1 - Student is rarely questioned by teacher following demonstration of new materials. Questions are more divergent (open-ended, several interpretations) than convergent (single factual answer). Student's response is not consistently followed by teacher feedback. The type of questions are such that several answers are acceptable, i.e., questions are abstract or ambiguous.

Examples:

If during an oral reading session:

a) the teacher frequently attempts to clarify the material with convergent questions ("what color hat was John wearing?"), a 5 would be recorded.

b) the teacher asks few questions, most of which are divergent ("What do you think this means?"), a 1 would be recorded.

c) the teacher asks few convergent questions or many divergent questions, the appropriate rating would be a 3.

6. Frequency of Correct Answers

5 - Academic lessons are conducted in such a way that the difficulty of the material allows the student to achieve mean accuracy of 80% or higher.

1 - Academic material is difficult for student, component steps are large or unsequenced, and mean accuracy for student is less than 55%.

(Note: If the student has no opportunity for oral or written response during the observational period, item 6 would be rated N/A - not applicable, while items 3 and 5 would most likely be rated 1.).

7. Independent Practice

5 - When engaged in independent seatwork, the student frequently is monitored by the teacher who assists, clarifies, and praises the student for academic engaged tasks.

(Note: Independent seatwork is defined here as a student working on an assigned task for at least 5 minutes. [If no such 5-minute block of time is observed, Item 7 is rated N/A].)

SIRS

1 - When student is engaged in academic seat-work activities, little attention is given by teacher who directs seat-work activities from a distance or engages in work separate from the assigned seat work. Teacher is generally not helpful or supportive to student during independent practice time.

8. Corrections

5 - The student's errors are consistently corrected by the teacher. When the student either does not respond, responds incorrectly, or does not respond in unison if the activity is group directed and requires such responding, the teacher will systematically attempt to correct the student by asking a simpler question, refocusing student's attention to elicit correct response from the student or provide general rules by which to determine the correct answer 90% or more of the time.

1 - Student's errors are rarely and inconsistently corrected by the teacher. The student responses are not systematically corrected. Student's errors are corrected 50% or less of the time.

For example: In oral reading this includes teacher correction of skips and mispronunciations, or help in sounding out hesitations.

9. Positive Consequences

5 - Positive events (tokens, points, activities, etc.) are given to the student when performing the desired behavior. When learning a new skill the student receives positive consequence for approximations of the desired behavior. Consequences are consistently received during academic training time. Praise and compliments, e.g., "good working, nice job," are not included in this definition.

1 - Student rarely receives positive consequences for academic work. When student receives consequences they usually are for social behavior, rather than for behaviors occurring under systematic academic training.

10. Pacing

5 - The pace of the lesson is rapid, providing many opportunities for response by the student. As a result, attention is high and off-task behavior is low.

1 - The pace of the lesson is slow and the student's rate of responding is low. Lesson format frequently varies, is not highly structured, and student attention may be low.

SIRS

11. Oral Practice on Outcome Behavior

5 - Student reads aloud from context nearly all the time (85-100% or 12-15 min. of a 15 min. observation).

1 - Student does not read aloud during the observation (0% of the time).

(Note: Reading aloud for measurement purposes should not be considered when rating this variable. Reading in context is defined as reading phrases, sentences, paragraphs, or story selections.)

Examples:

If the student is reading isolated words nearly the entire time, the appropriate rating is a 3.

If the student is reading aloud from a text about half the time, a 3 would be recorded.

12. Silent Practice on Outcome Behavior

5 - Student reads silently from context nearly all the time (85-100% or 12-15 min. of a 15 min. observation).

1 - Student does not read silently during the observation (0% of the time).

(Note: Reading in context is defined as the same as #11. The examples of #11 are the same for #12, with silent reading.)

PUBLICATIONS

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