How Effective Is Interaction Analysis Feedback on the Verbal Behavior of Teachers?

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Two findings grew out of this study: (a) Teachers not trained in the mechanics of interaction analysis will change their classroom verbal behavior as a result of feedback from interaction analysis; and (b) Teachers with high scores on the MTAI will make greater changes in their classroom verbal behavior than will teachers with lower scores.

WHAT a teacher says in his or her classroom should be determined by what will produce the most effective results; a result is effective if it produces a desired change in the students. What is effective verbal behavior on the part of a teacher has been and still is being researched (Withall, 1949; Anderson, 1939; Flanders, 1963b; Storlie, 1963). To conclude that certain verbal behaviors are effective at certain times to produce desired change is of questionable value if it is not possible for teachers to demonstrate these behaviors in their classrooms. The problem to be considered here is whether classroom observation and feedback are effective means to change a teacher's classroom verbal behavior, in particular whether there is reduction in supervisory cost and effort of in-service training of teachers in mechanics of a technique to be used to produce desired instructional change.

The most effective changes in method of instruction occur when teachers can compare what they wanted to accomplish with a nonthreatening, objective summarization of their spontaneous behavior. Feedback is an essential aid to teachers trying to understand and change their classroom verbal behavior. Therefore, programs designed to help teachers must provide for an effective, that is, nonthreatening, objective feedback summarization system.

Research findings indicated (a) that an objective, systematic observational system can supply feedback which will aid changing teacher verbal behavior (Bondi, 1969; Amidon, 1966; Amidon and Hunter, 1967;

Flanders, 1970); (b) that the *Minnesota Teacher Attitude Inventory* can give an indication of teacher-pupil rapport in the classroom (Medley, 1961).

These results support and permit two questions to be raised: (a) whether feedback supplied to teachers untrained in the mechanics of interaction analysis will result in changes in their verbal behavior; (b) whether the *Minnesota Teacher Attitude Inventoru* can be used to predict teacher verbal behavior changes.

The following hypotheses were tested in this study:

H1: Teachers not trained in the mechanics of interaction analysis will change their verbal behavior as a result of feedback from interaction analysis.

H2: The amount of change in teacher verbal behavior has a high positive correlation with the *Minnesota Teacher Attitude Inventory* score obtained before interaction analysis data are discussed.

Definition of Terms

For clarity of communication the following terms and symbols are defined:

1. *Indirect influence:* Actions taken by the teacher which encourage and support student participation. In reference to an interaction analysis observation system, indirect refers to the categories: accepts feelings, praises or encourages, accepts or uses ideas of students, asks questions (Flanders, 1963a).

2. *Direct influence:* Actions taken by the teacher which restrict student participation. In an interaction analysis observation system, direct refers to the categories: lecturing, giving directions, criticizing or justifying authority (Flanders, 1963a).

3. *C1-2:* A composite of observations one and two.

4. *C5-6:* A composite of observations five and six.

5. *C1-6:* A composite of observations one through six.

6. *I/D Ratio:* Teacher indirect talk—sum of interaction analysis categories one through seven—divided by total teacher talk—sum of interaction analysis categories one through ten.

Instrumentation

A 17 category modification of Flanders' interaction analysis observational system was used.

The first three categories were unchanged:

INDIRECT TEACHER TALK

1. Accepts feelings
2. Praises or encourages
3. Accepts or uses ideas of students

Category 4 was subdivided into four categories under the heading of *Asks Questions*.

4. Asks Questions
   4f. Factual

4c. Convergent
4d. Divergent
4e. Evaluation

The next three categories were unchanged.

DIRECT TEACHER TALK

5. Lecturing
6. Giving directions
7. Criticizing or justifying authority

Under the major heading *Student Talk*, categories 8 and 9 were subdivided to act as matching responses for category 4.

STUDENT TALK

8. Response
   8f. Factual
   8c. Convergent
9. Initiation
   9d. Divergent
   9e. Evaluation

Finally, category 10 was separated into three parts and labeled.

NON TALK

10s. Silence
10c. Confusion
10. Change of student speaker

The *Minnesota Teacher Attitude Inventory*, MTAI, was used to measure attitudes of teachers toward students. Cook, Leeds, and Callis (1951) determined validity of the inventory with correlations between the inventory and criterion ratings by pupils, principals, and experts; the correlations were .45, .43, .49 respectively, with a combined correlation of .59. The split-half reliability of the MTAI is .93, and retest reliabilities are near .70 (Cronbach, 1953).

Procedure

Ten graduate students at Purdue University were the subjects. Each taught a class of mathematics for elementary education majors and had from zero to nine years of teaching experience at elementary, secondary, and/or college levels. Each class consisted of 40 to 45 freshman or sophomore students. At the beginning of the fall semester, 1970, each teacher responded to the MTAI in order to establish his or her attitude toward students.

During the first week of the semester, each teacher was observed once for 15 to 20 minutes using the Revised Flanders Interaction Analysis Category (RFIAC) system. On the basis of indirect/direct teaching ratio, I/D ratio, teachers were divided into experimental and control groups so that each group had the same total amount of indirectness. No training in the use of interaction analysis was supplied to either group at any time. In the second week and at 2½ week intervals thereafter each teacher was observed five times for 15 to 20 minutes per observation. The experimental group received written feedback after each observation. The control group received no feedback until the study was completed.

After each observation the RFIAC numbers were punched onto cards and analyzed with a computer program developed for this research.

As the intent of interaction analysis is to preserve certain aspects of interaction through observations, encoding, tabulation, and then decoding, RFIAC validity was obtained through accurate interpretation during both decoding and encoding (Flanders, 1970).

Reliability was checked by taking randomly selected audio recordings of second and fourth observations and re-analyzing them with the RFIAC. Scott's coefficient was calculated and produced values of .77 and .96 respectively. Scott's coefficient for reliability was used because "this method is unaffected by low frequencies, can be adapted to percent figures, and is more sensitive at higher levels of reliability" (Flanders, 1960).

Results

Interaction analysis data, analysis of variance, and chi-square statistical procedures used to test Hypothesis One produced data that showed (a) a 30.6 percent net gain in indirect teaching based on the difference between C1-2 and observation 6, and a net

gain of 35.6 percent based similarly between C1-2 and C5-6 (see Table 1), (b) a significant increase in the acceptance and use of student ideas, (c) an increase in the amount of questioning with significant increases in the amount of convergent questioning, (d) a significant decrease in amount of time spent lecturing, (e) significant increases in student talk, specifically, convergent and divergent responses (see Table 2). Hypothesis One was not rejected.

	Teachers		
Item	Experimental	Control	Difference
C1-2	23.0	31.0	−8.0
6	47.2	24.6	+22.6
Difference	24.2	−6.4	30.6
C1-2	23.0	31.0	−8.0
C5-6	48.4	20.8	27.6
Difference	25.4	−10.2	35.6

Table 1. Comparisons of Averages of Indirect Teaching

	Observation				
Category	C1-2	3	4	5	6
Student ideas	2.93	3.93	7.92	10.38	7.92
Convergent questions	7.27	12.49	15.48	14.90	15.48
Lecture	58.98	48.33	35.48	31.85	32.84
Convergent response	7.24	13.78	13.31	15.01	14.72
Divergent response	3.75	5.75	7.86	7.04	10.79

Table 2. Percent of Time Spent in Five Categories

Pearson r correlations between MTAI scores and the difference in I/D ratio between observations C1-2 and 6, and between the MTAI scores and the difference in I/D ratio between C1-2 and an average of observations 5 and 6 were .72 and .64, respectively. Because of these correlations Hypothesis Two was not rejected. Categories correlating $\pm .50$ or above with MTAI scores indicated that teachers who like their students, as measured by the higher MTAI scores, (a) spend more time accepting student feelings, (b) ask more factual and evaluative questions, (c) get more divergent responses from students, and (d) use less criticism, than those teachers who scored lower on the MTAI (see Table 3).

Categories	Correlation
Accepts feelings	.61
Factual questions	.56
Evaluative questions	.66
Criticism	−.55
Divergent response	.59

Table 3. Categories Correlating $\pm .50$ or Above with MTAI Scores

Discussion

As a result of these findings the following conclusions as presented: (a) Teachers not trained in the mechanics of interaction analysis will change their classroom verbal behavior as a result of feedback from interaction analysis; (b) Teachers with high scores on the *Minnesota Teacher Attitude Inventory* will make greater changes in their classroom verbal behavior than will teachers with lower scores.

The major emphasis of this discussion is that classroom data obtained and analyzed objectively may be used to change classroom verbal behavior. Since each subject in this study had up to nine years of teaching experience at elementary, secondary, and/or college levels of instruction, it is the opinion of the researchers that neither the research procedure nor its results are unique to college instruction, nor are they peculiar to mathematics teachers. Thus, it is held that the implications are generalizable to all levels and areas of instruction.

As demonstrated and implied in this study, eliminating the necessity of training teachers in the mechanics of interaction analysis will facilitate greatly the work of a supervisor. The possibility of eliminating the need for extensive in-service time and money for training of a school system's teachers in interaction analysis is apparent.

Based upon the results of this research, it is not necessary for a practitioner other than the supervisor to know the intricacies of this supervisory technique to receive its benefits. Teachers do not have to be trained in this observational analysis technique to effectively use the feedback data gathered in their classrooms by the trained observer/supervisor.

Since teachers are more likely to be receptive to a program that does not require in-service time than they would be to one

that demands extensive in-school effort, the supervisor could anticipate greater possibility of success in their using this technique.

Instructional improvements important for quality instruction can be brought about at a minimal financial cost, a few hundred dollars, to schools and at a minimal time consumption for already overworked teachers by means of interaction analysis feedback. A trained observer with data-processing facilities, even a mini-computer, can supply a teacher with effective feedback in 24 hours at most. Without data-processing a little more time or a little less complete, but still effective, feedback are alternatives to the supervisor responsible for supplying such feedback.

The MTAI provides a supervisor with an effective means of determining which teachers should require the most work to bring about verbal instructional change. A supervisor would have to spend more time with a teacher who has a low MTAI score than with one who has a high score.

Incidental observations, made during the course of the research, suggested if one were to correlate not only amount of change in teaching technique, but also interest in a program to bring about change, as well as response to the research with attitude measured by the MTAI, these factors probably would correlate highly. Such MTAI information would increase greatly the potential of the inventory by helping in supervisory/administrative decisions concerning prospective teacher employment and additionally, would indicate the ease or difficulty to be encountered with a particular teacher if that teacher's verbal behavior were to be subject for change to secure instructional improvement. Employers who want teachers receptive to change, that is, teachers who will cooperate in the analysis and improvement of instruction should seek employees with high MTAI scores. Supervisors working with teachers already employed within the system can use MTAI scores to determine which teachers will be the most likely or least likely to change their instructional behavior. Knowing this aspect, supervisors can plan better their approach for instructional improvement. Greater insight in employment situations and in techniques necessary for instructional improvement afforded by MTAI data probably will increase the level of instruction and, thereby, the level of student attainment.

Because of the findings of this research a supervisor can work confidently with five or ten teachers knowing that positive results should be forthcoming due to technique applicability. Success with one small group should increase the interest of others leading to system-wide improvements in instruction without forcing the technique upon teachers.

In all research there are some areas that are not as defensible as others. In this study due consideration must be given to the effect of using one observer rather than several. However, rigidly defined criteria and the structure of the observational system gave high reliability and objectivity to the study.

One lecture category in an interaction analysis observational system does not discriminate between various qualities of lecture presentation. A category that is used as much as the lecture category was in this research perhaps does not consider all factors that are relevant.

Oral feedback was supplied once to the teachers; four other times it was written. During those four times, feedback was limited to what was self-interpreted from the written word. Acknowledging that people do not all interpret written sentences in the same way, consideration must be given to the effect of feedback altered slightly by a particular interpretation.

Recommendations

An interaction analysis observational system provides a classroom observer with something other than an educated guess as to the effect of a teaching technique. The data obtained using this RFIAC system designed for this study indicate that distinctions made between types of questions and types of responses are important. The subdivision, Evaluation, appeared rarely for this college group of instructors and students. However, it is thought that for younger students Evaluation might be an important category.

In this RFIAC system the lecture category needs reevaluation. Two instructors can lecture for the same amount of time and, except for the time factor, appear to differ markedly. They do not give the same type of lecture; one may be clear and concise, the other wordy and circuitous. Variations in type of lecture may be important enough to call for subdivisions in the lecture category.

These additional recommendations are tendered: (a) supervisors give consideration to the types of questions asked by teachers as well as the number of questions asked; (b) supervisors have at least five observations of a teacher before making a complete evaluation; (c) consideration be given in practice to rigidly defined criteria for category selection prior to observation; and (d) the mechanics of feedback require oral as well as written communication.

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