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This study was designed to measure the results on public school teachers of training in three teaching systems. The results of the study were intended to provide evidence that might be used for designing a single system which would bring together the most effective aspects of each of the systems employed.

The three systems used were those based on the theory and practice of Dr. Hilda Taba, Dr. James J. Gallagher, and Richard J. Suchman. The sample of sixty teachers was selected from those who had undergone training in these systems. They had been selected for training by the Northwest Regional Educational Laboratory.

Following training in the system, each of the teachers had an audio tape made of a discussion in his classroom. These tapes were coded and all teacher utterances appearing on the tapes were

classified into categories defined as "Language Actions" and "Functions". This procedure was followed for all sixty tapes.

The results were tabulated in order to discover which system or systems resulted in the greatest amount of use by the teachers of each of these Language Actions and Functions. The results were compared by analysis of variance to determine whether there were significant differences among the Systems in the results obtained.

Analysis of the data revealed significant differences, $P < .01$, in three of the five Language Actions and in two of the four Functions.

No single Teaching System appeared to be significantly superior to the others in producing the Language Actions and Functions. In producing an integrated teaching system, each of the three Systems appear to contribute to teacher acquisition of the use of four of the five Language Actions and two of the four Functions.

Recommendations for the use of this study in creating an integrated system, as well as suggestions for future use of the data compiled here, were offered.

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of Training in Classroom Interaction

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COMPARISON OF TEACHER PERFORMANCE UNDER THREE CONDITIONS OF TRAINING IN CLASSROOM INTERACTION

CHAPTER I

INTRODUCTION

One of the most consistent findings of educational research is that teachers talk a great deal (French, 1970; Lashier, 1970). The steadily increasing evidence leads one to the conclusion that the how, the what and the why of teacher "talk" are worth serious consideration in analyzing what takes place in classroom learning. Reflection on any classroom experience makes apparent the importance of "talk" in most teaching situations,

Step inside a classroom and what do you hear?
The chances are better than 60 percent you will
hear someone talking . . .
If someone is talking, the chances are that it
will be the teacher more than 70 percent of the
time (Flanders, 1965, p. 1).

At the same time, it appears increasingly evident that the teacher needs to learn to stimulate active participation rather than simply to dominate the classroom, as in the past.

The language used by the teacher can be an instrument for evoking interest, curiosity and lively response. While the more traditional service supplied by language has been that of description and explanation, it would seem that the most creative function of

language in the classroom is at work when students are inspired to spontaneous and original participation, or to go beyond what Smith (1969), calls "superficial, 'first-answer' responses".

A survey of the research gathered by the Educational Resources Information Center (ERIC)*, reveals a great amount of study in the area of verbal interaction and attests to the importance which researchers attach to classroom communication. In the last three years, approximately three dozen titles have appeared, the result of research carried on in all parts of the country.

The research reported in this study follows a many-phased program devised and executed by the Northwest Regional Educational Laboratory. The selection and preparation of teachers in three teaching systems, the preparation of classroom tapes and the devising of a coding system for classifying tapes--all these preceded the research and results presented in this paper. This is essentially an analytic phase of a project which extended over many months.

It was the task of this researcher to audit, compile, analyze and report the results and possible consequences of three systems of teacher preparation designed to effect and improve the performance of 60 selected teachers.

It was also intended that the evidence resulting from this study might be used as a basis for formulating a training system

* Obtained from Oregon Board of Education Retrieval-Dissemination Center, 942 Lancaster Drive N. E., Salem, Oregon 97310.

incorporating the most effective aspects of the three different training systems employed in the program.

THE PROBLEM

The problem of this study was to determine the measurable effect, in terms of five "Language Actions" and four "Functions", on 60 teachers from elementary and high school levels, of a ten-day workshop in the Taba, Suchman or Gallagher teacher preparation system.

The questions to be answered were as follows:

1. WHICH OF THE THREE SYSTEMS CAUSED TEACHERS TO MAKE THE MOST USE OF EACH OF THE FIVE LANGUAGE ACTIONS AND FOUR FUNCTIONS?
2. WAS THERE A SIGNIFICANT DIFFERENCE, AT $P < .01$, AMONG THE THREE SYSTEMS WITH RESPECT TO EACH LANGUAGE ACTION AND EACH FUNCTION?
3. WAS THERE A SIGNIFICANT DIFFERENCE BETWEEN THOSE DESCRIBED AS "HIGH LEARNERS" AND "LOW LEARNERS" WITH RESPECT TO THEIR USE OF EACH LANGUAGE ACTION AND EACH FUNCTION?

PURPOSE OF THE STUDY

The purpose of this study was to facilitate the construction of a training system which integrates those features of Taba, Suchman and Gallagher, which have been demonstrated to be most effective in enabling the teacher to make use of certain defined "Language Actions" and "Functions".

The study subjected the method to its first test, and, with further refinement, the method will be available for measuring teacher competency in verbal interaction. The analysis will be available to each teacher for self-criticism and possible improvement in his own verbal interaction.

A comparison between the performance of the High Learners and Low Learners could provide some basis for predicting performance of the two groups in the future.

LIMITATIONS OF THE STUDY

The research reported in this study was limited to an analysis of teacher verbal behaviors which occurred in the classrooms of those teachers who were exposed to one of the three teacher-education systems developed by the Northwest Regional Educational Laboratory. The study dealt only with the verbal behaviors of the teacher and did not attempt to analyze those of the student.

This study was limited to the teachers' use of certain Language Actions and Functions. The study was not designed to test the merits of any components of the verbal interaction. No value judgments were attached to the teacher utterances.

DEFINITION OF TERMS

Categories of Verbal Interaction

Nine categories were designed to cover and include all possible types of statements, questions and directives of the teacher. Each teacher utterance was classified and recorded both as Language Action and as Function.

Language Actions

- Describing:** Information about a specific object, event, or phenomenon.
EXAMPLE: The Loyalty Building is on Alder Street.
- Directing:** Telling another (directly, indirectly) what to do. Calling on child by name.
EXAMPLE: "Close the door."
- Explaining:** Telling how something relates to something else (by function, cause-effect).
EXAMPLE: "There is rain in the U.S. and there isn't much rain in Canada."
"In what way are these two pictures alike?"
- Choosing:** Telling the preferences, appropriateness, qualities on the basis of which one has selected between two or more stated alternatives.
EXAMPLE: "I like jam better than peanut butter."
- Predicting:** Telling the (probable) consequences of actions, problems, or solutions. All references to the future.
EXAMPLE: "The faucet will leak."

Functions

- Function I: Supports the learning of group members.
The language of the leader, as well as the language of group members, can be analyzed to determine the degree to which members of the groups are attending to the interpersonal and situational forces affecting group interaction.
EXAMPLE: Describes how he feels or asks another to describe his feelings.
- Function II: Fosters clear, open communication between group members.
Language usage within the group reveals the extent to which group members encourage the expression of individual thought and seek understanding of thoughts being expressed.
EXAMPLE: Paraphrases what another has said, or asks for illustrations of what is being said.
- Function III: Asks for conceptualizations, interpretations of data and applications of knowledge.
Classroom language reveals the extent to which group members are engaged in a variety of thinking tasks such as recalling, translating, interpreting, applying and analyzing.
EXAMPLE: Asks another to summarize, or tells where he got data.
- Function IV: Insures that knowledge-producing processes are explicitly available to all group members.
The language of the classroom reveals not only the processes by which individual members of the group derive knowledge or meaning and evaluate it, but also the degree to which individuals are aware of their knowledge-producing processes.
EXAMPLE: Says he is changing or considering changing his ideas or asks another how he tested his idea.

OTHER DESCRIPTIVE DEFINITIONS PECULIAR TO THIS STUDY

AUTONOMOUS

LEARNING: The learning act in which the learner acquires data, discovers the relationships that exist within the data, generalizes or infers from the data, and applies acquired knowledge to a new situation, independent of cues from an outside authority.

COGNITIVE
MEMORY

QUESTIONS: Call for the simple reproduction of facts.
EXAMPLE: "Who was the sixteenth president of the U. S. ? "

CONCEPT: A word or phrase which denotes a category of information. Level of abstraction may vary from relatively concrete to highly abstract. For the individual, concepts are in a continuous state of modification.

CONVERGENT

THINKING: Thought patterns which follow a logical sequence to an acceptable, conventional, or predetermined conclusion.

DIVERGENT

QUESTIONS: Call for generating data independently and to take a new perspective on a topic.
EXAMPLE: "Suppose Spain had conquered England in 1588. What are some effects which would be with us today? "

EVALUATION: Reaching decisions or making judgments concerning the goodness, correctness, suitability, adequacies, or desirability of information.

FACTUAL

DATA: Knowledge consisting of what is widely accepted as objectively true. Nonsubjective knowledge, which can be verified by observation, experimentation, or reliable testimony.

GENERALI-
ZATION:

A statement of relationships among concepts, usually qualified by condition, which can be supported by evidence.

- INQUIRY:** The process of solving problems with a conscious knowledge of the parts and processes of reasoning.
- INTEGRATED SYSTEM:** A teacher training plan being developed by NWREL which will help teachers gain competencies equal to those conveyed by the combined Suchman, Gallagher and Taba Systems.
- LEVELS OF THINKING:** Manipulation of ideas from simple to complex, from concrete to abstract.
- PRINCIPLE:** An abstract idea supported by concepts and generalizations which have been tested over a period of time.
- QUESTIONING STRATEGY:** A planned series of questions leading toward a specific goal.

THE THREE TEACHER EDUCATION SYSTEMS USED IN THIS STUDY

The three systems and the training manuals to which this study are related were developed by the Northwest Regional Educational Laboratory in Portland, Oregon. They are designed to help teachers gain knowledge and develop certain skills in interacting verbally with students.

Facilitating Inquiry in the Classroom (Suchman)

The Suchman teacher-education system assists the teacher in learning the procedure of presenting a demonstration in which an event unfamiliar to his students occurs. The teacher does not reveal the cause(s) of the event, but supplies only data, or sources

of data. He encourages his students to inquire and search out the cause(s) of the happening (Suchman, 1962, pp. 29-42).

The workshop is planned so that teachers learn to establish classroom conditions which allow inquiry. Teachers learn how to help students grow as self-directed learners. Teachers learn how to tune into the thinking and actions of students (Suchman, 1959, p. 207).

Teachers learn specific skills. Most of these are verbal interaction skills, ways of talking with and responding to students. It is believed that student's inquiry behavior can be facilitated through the verbal behavior of the teacher. Once more, "talk" makes it possible for thoughts to be exposed and shared.

The workshop is planned so that, at the end of 50 hours, teachers:

- (1) show that they can classify inquirer behavior accurately,
- (2) show that they can use those verbal interaction skills (called tactical moves in the workshop) to establish inquiry-facilitating conditions,
- (3) show that they can use those verbal interaction skills to help students be more independent (called "autonomy" in the workshop), and
- (4) show that they can use those verbal interaction skills to tune into the thoughts, feelings, and actions of students.

Teachers show that they can do these things by making tape recordings of their practice efforts. Teachers learn to measure their own efforts (NWREL, 1969).

Questioning Strategies (Gallagher)

Questioning Strategies is a teacher-education system patterned after a model developed by James J. Gallagher. It is designed to

help teacher participants gain an understanding of the various kinds of questions that teachers may use. They are made aware of the possible effects each kind of question may have on students (Gallagher, 1966).

The Questioning Strategies system is based on the assumption that understandings and skills discovered by the student have greater personal meaning and are more likely to be retained (Gallagher, 1967, p. 46).

The system has two main levels: (1) an understanding level which helps the teacher to identify, to define, and to order examples; and (2) an application level which aids the teacher in designing questions for the lesson to be taught, to plan questioning strategy, and to teach from his own plan.

Traditionally, teachers have asked predominately memory-recall types of questions. This would limit student responses to one style of thinking. In order for students to respond in a variety of ways, the teacher must ask questions which provide that opportunity. A teacher may ask students to explain, to evaluate, to predict, to diverge, and to recall (Miller, 1969, a).

The model developed by the Gallagher system builders has three dimensions:

1. Data, Concept, Generalizations - This dimension describes the levels of abstraction.
2. Description, Explanation, Evaluation Justification, Evaluation Matching and Expansion - This is the styles dimension.
3. Content-Skill - This dimension distinguishes between questions about content and questions about skills.

Development of Higher Level Thinking Abilities (Taba)

The Taba training system is designed to develop understanding and skill in relating to a "structure of process" to a "structure of knowledge". Structure of knowledge refers to a hierarchy starting with:

- (1) factual data, proceeding to the organization and categorization of factual data according to
- (2) concepts, then to the analysis of relationships between concepts and the discovery and expression of
- (3) generalizations which can be logically supported by the data.

The structure of learning processes related to the hierarchy of knowledge proceeds from

- (1) the recall of previously learned or memorized data, to
- (2) the translation or organization of specific data according to concepts, to
- (3) the interpretation and statement of relationships, generalizations, inferences and principles, and finally to
- (4) the application of discovered knowledge to new or different situations (Waller, 1969, pp. 17-21). The end goal is the creating of autonomous learners, able to function independently in the process of inquiry and proof.

Taba's research centered on the examination of those teaching strategies which promote the thinking abilities of children (Taba, 1967, p. 8). The Northwest Regional Educational Laboratory writers

incorporated Taba's work in the creation of this teacher-education system (Taba, 1955, pp. 1-17).

Relationship to Other Work

In order to obtain a clear understanding of the relationship of this study to other work in the area of "talk" or "verbal interaction", a review of related educational literature was made and is reported in Chapter II.

CHAPTER II

REVIEW OF THE LITERATURE

Teacher Talk

This chapter centers on the predominance, the importance, and the effects of teacher talk in the classroom. It draws attention to both the obvious and the subtler aspects of talk as an instrument of teaching and learning. Current widespread preoccupation with the subject of talk points up a growing awareness that talk, not simply and obviously the means for direct teacher-to-student communication, is also a complex vehicle for interaction, and is, perhaps, of first importance in fostering a healthy, creative atmosphere for learning.

French and Lashier (1970) found in their educational research, that teachers talk a great deal. If one accepts this evidence as significant he comes to the conclusion that the how, the what, and the why of teacher talk are worth consideration in analyzing what takes place in classroom learning. Looking in on any classroom experience makes apparent the importance of talk in most teaching situations. Flanders (1965, p. 1) found that someone is talking in the classroom about three-fifths of the time, and the teacher does about two-thirds of that talking.

Educators and psychologists have grown concerned about the effect on the student of the teacher's language action. Hayakawa points to the scholar as status seeker, who knows that communication is enhanced when it is made simple and unpretentious, but who seeks recognition as a scholar of the academic community by using:

. . . a language that is guaranteed by its abstractness, its prolixity, and its sheer lifelessness to discourage attention and to obscure comprehension. I think that we can state as a general rule that whenever the social functions of a learned vocabulary become more important to its users than its communicative function, communication suffers and jargon proliferates (Hayakawa, 1967, Vol. III, No. 2, p. 4).

Talk and Psychological Atmosphere

The psychological atmosphere existing between teacher and learner has become the subject of direct and continuing analysis. Carl Rogers (1961) stresses the important role played by the teacher in the creation of this atmosphere, or what he terms as "climate of safety". If so much of what the teacher does is exemplified in his speech, or verbal behavior, it would seem that a study directed toward an analysis and classification of such verbal behavior is needed.

There is an increasing awareness of the necessity on the part of the teacher to learn how to stimulate and participate in situations rather than simply dominating classroom situations, as in the past.

The 1968 publication by James C. Stone, Breakthrough in Teacher Education, is the result of three years of direct visitation, analysis of questionnaire sampling, analysis of institutional reports, and conference findings, underwritten by the Ford Foundation. While no single source can hope to summarize the current status of so complex a field as teacher education, the Stone Report appears incisive in its conclusions:

Finally, tradition in higher education is a strong force. It does not break but it can bend. The results of the breakthrough experiments even now reveal ways in which, if they are effective, traditions will bend, and, indeed, the ways in which they should bend. Some of them are:

<u>from</u>	<u>to</u>
recruiting and selecting on the assumption that anyone can and should teach	recruiting and selecting on the assumption that, like any other profession, the skills and competencies are not possessed by everyone
preparing teachers who think teaching is talking, usually from 'up front' and 'on high'	preparing teachers who listen, who emphasize inquiry, social sensitivity, and self-direction, and who are 'around and about' the classroom, guiding, probing, encouraging
preparing teachers whose learning is all finished	preparing teachers who are life-long learners
preparing teachers to be self-contained, using only themselves and books as educational resources	preparing teachers to be organizers of multiple teaching resources, both human and technological
preparing teachers for whole-class instruction and product learning (what and how)	preparing teachers for individual and small group instruction and process learning (why and for whom)

<u>from</u>	<u>to</u>
the philosophy that a student cannot possibly know something if he hasn't had a 'course' in it	flexible teaching arrangements that emphasize a sequence of experiences rather than 'course coverage', 'term papers', 'final examination', 'grades', and 'credits'
lecture-centered and campus-based professional education	laboratory-centered and school-community-based professional education
seeking <u>one</u> best teacher education program	offering multiple pathways to teaching, recognizing the diverse needs of the profession and the varying backgrounds and abilities of those who wish to teach
experimenting and innovating 'on schedule' every five or ten years	inventing strategies whereby members of the staff are continuously encouraged to innovate
These 'new' goals may be viewed as a natural extension of all our previous aims in the education of teachers (Stone, 1968, pp. 175-.76).	

Talk as Interaction

Educators seem to agree on the importance of encouraging the student to become a self-directing learner (Suchman System). The desired use of language, or talk, in the classroom would seem to be directed toward this goal. To this, psychologists add the importance of developing in the student a positive self-image.

The child not only responds to the teacher, but the teacher is constantly responding to the child. In these responses the teacher may be building the self-esteem of the child or he may be acting in a way that deteriorates the child's ideals and motives (Smith, 1969, p. 59).

In a wider context, that of the social world, we are coming to recognize the critical function of dialogue as an instrument of interaction among members of groups, organizations and institutions. Directing the attention of language teachers to the subtleties of this process, and singling out the critical role of language in dialogue, Hayakawa told English teachers in Florida,

We should work to nurture in students a sensitivity to the "metamessages" in communications . . . the subtleties of tone and implication growing out of connotative meaning, figurative language, intonation and emphasis (Hayakawa, 1967, Vol. III, No. 2, p. 4).

The teacher's use of language should be as an instrument for evoking interest, curiosity and lively response. While the more traditional service supplied by language has been that of description and explanation, it would seem that the most creative function of language in the classroom is at work when students are inspired to spontaneous and original participation, or to go beyond what Smith, (1969) calls "superficial, 'first-answer' responses".

What we know today about the interaction of teacher and learner in the classroom appears to be largely a result of research efforts in three related disciplines: sociology, psychology and education. Many of the findings of these three disciplines have been incorporated in the work of Ned A. Flanders. His "Interaction Analysis in the Classroom" (1966) provides a valuable method for observing and recording the teacher's verbal behavior, particularly in its

relationship to the interaction taking place during a class session. Flander's system proves useful in charting what takes place during a given class period. It is not designed however to be corrective to the possible shortcomings of the teacher; its function remains essentially descriptive. In the Flander's manual one finds,

Interaction analysis is an observation procedure designed to . . . permit a systematic record of spontaneous acts, and scrutinize the process of instruction by taking into account each small bit of interaction. If there is ever to be a theory of instruction, a tool such as interaction analysis will be necessary to test its principles (Flanders, 1966, p. 6).

Flander's preoccupation with interaction analysis was aimed at singling out those elements most influential in the creation of "climate" in the classroom. He describes certain aspects of performance which characterized two kinds (or "Patterns") of teacher attitudes:

The Integrative Pattern	The Dominative Pattern
a. Accepts, clarifies, and supports the ideas and feelings of pupils.	a. Expresses or lectures about own ideas or knowledge.
b. Praises and encourages.	b. Gives directions or orders.
c. Asks questions to stimulate pupil participation in decision-making.	c. Criticizes or depreciates pupil behavior with intent to change it.
d. Asks questions to orient pupils to school-work.	d. Justifies own position or authority (Flanders, 1965, p. 6).

A Scientific Method for Analyzing Verbal Behavior

Janice T. Gibson of the University of Pittsburgh, in her Educational Psychology (1968, p. 12) offers this definition of science ". . . science is the systematic investigation of phenomena". Professor Gibson makes clear distinctions in the types of investigations possible of the teaching/learning process (nomothetic, idiographic, experimental, longitudinal, cross-sectional). If one were to use the measures of the Gibson text with the most advanced of contemporary research in teacher/learner interactive systems, he might become aware of the imprecision and generalized nature of the data from which the systems determine the nomothetic laws. These observations of behavior, it must be borne in mind, would describe only "the average behavior of a group under certain conditions" even if the data from which they were derived were ideally controlled.

Under present conditions, in which the basic questions of taxonomy have not yet been settled, the researcher moves into the area of experimental investigation of interactive phenomena without the guidelines of a true science (Dyer, Ebel, 1971). His method, therefore, although it approximates the scientific method and assumes many of its attitudes, may lack the precision and scientific controls which might be desirable in a scientific research project.

Research on Classroom Interaction

Related to the research of this paper, and currently available through Educational Resources Information Center (ERIC)*, are individual titles dealing with interaction analysis, methods of teacher observation, and other closely related aspects of communication. All of these titles bear publication dates of the last three years. They are the result of research initiated in all sections of the country, and while there is variance among them, they indicate clearly how strong concern has grown for the interaction process. Central in most of the studies is the role of verbal behavior, but a study of each of them reveals how multi-faceted is the concept of verbal "interaction".

The New York State Department of Education sponsored a pilot study (1969) designed to increase teacher awareness of their own behavior and its effect on the emotions and attitudes of their students. This involved human relations techniques, sensitivity training, and feedback of classroom interactions. Although the study revealed no significant changes, the teachers themselves reported their own attempts to move in positive directions, as defined by the study. The report emphasized the need for improved instruments of measurement.

The difference in teacher interaction with boys and with girls was studied in a report by H. Felsenthal (1970). All the teachers

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in this study were female and a significant difference in verbal interaction was revealed in their exchanges with boys as compared with girls. Evidence frequently indicates that female teachers are more understanding toward girls than toward boys. The study also showed that differences in learning do exist between the sexes, and suggests that such differences should be taken into account when testing classroom learning.

A distinction between self-initiated and response-to-teacher student behavior is made in a report by J. Forbes (1970). Self-initiated student behavior tended to result from indirect teacher behavior, and response-to-teacher on the part of the student resulted from direct teacher behavior. This report is the only one found which attempts to differentiate between these two types of student behavior.

A study by R. L. French (1970) employed video-tapes of class sessions by twelve junior high teachers. The study sought to determine if data on both non-verbal and verbal behavior are more useful than on verbal behavior alone. Included among the findings of this study: (1) Non-verbal behavior cannot be ignored; (2) Use of more than one instrument in observing and analyzing the same classroom behavior is valuable.

Among the publications which seem especially concerned with the broad process of interaction, many deal with two areas which

occupy researchers, the affective and the cognitive. The evidence of the following studies points to the significant role of affect in classroom interaction: Bemis and Liberty (1970) developed a system for analyzing teacher-pupil interaction in terms of tension-reduction and need satisfaction for the student; Moravek, at Oklahoma State University (1970), studied the relationship of self-concept with teacher verbal behavior patterns; Crispin and Walker (1969), in research involving socially maladjusted children, discovered that maladjusted behavior was reduced and at times eliminated when teachers became more indirect, reduced controlling behaviors, and increased praise and questions. Response-to-teacher and self-initiated responses also increased significantly.

Any method of analysis or diagnosis which fails to acknowledge both these dimensions, the affective and the cognitive, as operative within interaction will probably be only partially successful. For the present it seems advisable that, in order to gain a comprehensive view of any classroom situation, one should attempt to apply an instrument which measures both the affective and the cognitive.

The system employed in the research of this paper bears some resemblance to all of these. Since its purpose is directed specifically to the formulation of a system which integrates three previous systems (Taba, Suchman, Gallagher), it is restricted to those language actions and functions which appear most prominently in these three.

Conclusion

This review has touched on the background and some of the literature dealing with teacher talk. It has ranged from the simple realization that "teachers are talkers", through the fact that talk is an important dimension of psychological atmosphere. Talk has been seen here as interaction, both cognitive and affective.

While the many dimensions and the complexity of talk-as-interaction make it an intriguing subject for research, these same features create difficulty in treating the subject with precision. Despite the difficulties inherent in analyzing and classifying the many aspects of verbal interaction, steadily growing research on the subject seems to indicate the importance and the potential of this area for understanding the dynamics of the productive classroom.

CHAPTER III

METHODOLOGY

Sixty teachers were chosen at random from the total population which had been trained in one of the three systems. The teachers provided tapes of classroom sessions before and after training.

The two tapes of each teacher were rated on the amount of learning in the system's content, as demonstrated by the difference in taped performance. On the basis of this rating, each teacher was classified as either High Learner or Low Learner.

Subsequently, steps were taken to devise an "Integrated System". In order to achieve this, five Language Actions and four Functions were selected for incorporation in the new system. It was then necessary to learn which of the three systems resulted in maximum use of each of these five Language Actions and four Functions.

Research Design

The present investigator identified and recorded the number of Language Actions and their functions as they appeared on each of the sixty tapes. A card showing the results was prepared for each teacher. The ratio of separate Language Actions to the total number of utterances appeared as a percentage.

An analysis of variance was made to determine whether difference among the three participating groups had been significant.

Comparison was made of two categories of the sample: (1) the three groups of twenty each: Suchman, Taba and Gallagher, and (2) the thirty High Learners and the thirty Low Learners. This is reported in context in Chapter Four. Chapter Five defines these areas of significance and relates the findings to the ongoing work of the Laboratory in its efforts to integrate the most important features of the three systems.

The Sample

Sixty certified teachers, each of whom had been trained in one of the three systems -- Suchman, Taba, and Gallaher -- were chosen by Laboratory personnel for inclusion in this present study. The following applies to each:

1. No teacher of the sixty in the total sample had taken more than one of the training systems;
2. Each of the teachers had made an audio-tape of a discussion in his or her classroom prior to the training session;
3. After the training session each teacher returned to the classroom and made a post-session tape;
4. Each teacher was rated as a High Learner or a Low Learner (i. e. , a Higher Learner show significant

improvement in use of the system's techniques between pre-tape and post-tape; a Low Learner did not show significant improvement).

From the group identified as High Learners, ten were selected from each of the three systems, making a total for purposes of the present study of thirty High Learners; the same procedure was followed with Low Learners. The sample totaled sixty teachers.

Basic Assumptions

1. The competence and effectiveness of a teacher are directly proportionate to his ability to stimulate active participation on the part of the student in classroom activity. Under present teaching conditions, most of this participation is achieved through verbal interaction.
2. Certain kinds of language actions are preferable to others because they result in a desired response from the majority of students.
3. Systems of teaching can be effectively applied to different subject areas, e. g. , Taba techniques can be applied equally in the teaching of such diverse subjects as social studies, science, and mathematics.

Hypotheses

(For descriptive definitions of FUNCTIONS AND LANGUAGE ACTIONS, see Chapter I, pp. 5-6.)

The following Null Hypotheses were developed and were tested by analysis of variance at the $P < .01$ level of confidence.

Hypothesis I:

There was no significant difference in the mean percent of Describing Language Action occurrences among the three sample groups.

Hypothesis IA:

There was no significant difference in the mean percent of Describing Language Action occurrences between the High Learners and the Low Learners.

Hypothesis II:

There was no significant difference in the mean percent of Directing Language Action occurrences among the three sample groups.

Hypothesis IIA:

There was no significant difference in the mean percent of Directing Language Action occurrences between the High Learners and the Low Learners.

Hypothesis III:

There was no significant difference in the mean percent of Explaining Language Action occurrences among the three sample groups.

Hypothesis IIIA:

There was no significant difference in the mean percent of Explaining Language Actions occurrences between the High Learners and the Low Learners.

Hypothesis IV:

There was no significant difference in the mean percent of Choosing Language Action occurrences among the three sample groups.

Hypothesis IVA:

There was no significant difference in the mean percent of Choosing Language Action occurrences between the High Learners and the Low Learners.

Hypothesis V:

There was no significant difference in the mean percent of Predicting Language Action occurrences among the three sample groups.

Hypothesis VA:

There was no significant difference in the mean percent of Predicting Language Action occurrences between the High Learners and the Low Learners.

Function I: SUPPORTS THE LEARNING OF GROUP MEMBERS.

Hypothesis VI:

There was no significant difference in the mean percent of Function I occurrences among the three sample groups.

Hypothesis VIA:

There was no significant difference in the mean percent of Function I occurrences between the High Learners and the Low Learners.

Function II: FOSTERS OPEN, CLEAR, COMMUNICATION BETWEEN GROUP MEMBERS.

Hypothesis VII:

There was no significant difference in the mean percent of Function II occurrences among the three sample groups.

Hypothesis VIIA:

There was no significant differences in the mean percent of Function II occurrences between the High Learners and the Low Learners.

Function III: ASKS FOR CONCEPTUALIZATIONS, INTERPRETATIONS OF DATA AND APPLICATIONS OF KNOWLEDGE.

Hypothesis VIII:

There was no significant difference in the mean percent of Function III occurrences among the three sample groups.

Hypothesis VIII A:

There was no significant difference in the mean percent of Function III occurrences between the High Learners and the Low Learners.

Function IV: INSURES THAT KNOWLEDGE-PRODUCING PROCESSES ARE EXPLICITLY AVAILABLE TO ALL MEMBERS OF THE GROUP.

Hypothesis IX:

There was no significant difference in the mean percent of Function IV occurrences among the three sample groups.

Hypothesis IX A:

There was no significant difference in the mean percent of Function IV occurrences between the High Learners and the Low Learners.

Summary

1. Sixty teachers chosen at random from those who had been trained in one of the three systems provided tapes of a classroom session before and after training.
2. The sixty teachers were divided into High Learners and Low Learners, according to pre-determined criteria.

3. All teacher verbal utterances appearing on the tapes were classified and totaled as one of four Functions and one of five Language Actions.
4. Separate summaries of totals were made for each of the three groups and for High and Low Learners.
5. Analyses were made by comparing the totals of each group.
6. Certain Null Hypotheses were tested against the recorded analyses.
7. An arbitrary decision was made not to test for effects of interaction among the three groups and High Learners and Low Learners.

CHAPTER IV

PRESENTATION OF EVIDENCE

This chapter presents the statistical findings for Language Actions and Functions. Each table is followed by a brief discussion of the data. The findings are summarized and interpreted in Chapter V.

Guide to Tables

DF = Degrees of Freedom F = F-ratio between variance
 SS = Sum of the Squares estimates
 MS = Mean Square "Significant" = indicates whether
 or not F is significant
 (P < .01)

TABLE I. Describing Language Action

Hypothesis: There was no significant difference in the mean percent of Describing Language Action occurrences: (I) among the three groups; (IA) between the High Learners and the Low Learners.

Source	Means	DF	SS	MS	F	Significant
Suchman	.634					
Gallagher	.577	2	.418	.209	14.801	Yes
Taba	.436					
High	.545					
		1	.0008	.0008	.057	No
Low	.553					

Among the three systems, Null Hypothesis (I) was rejected; F was significant. However, t-tests revealed that the significant DIFFERENCE was between the Suchman and Taba Systems. No significant differences were found between Suchman and Gallagher, or between Gallagher and Taba.

Null Hypothesis (IA) could not be rejected. No significant difference was found between High Learners and Low Learners.

TABLE II. Directing Language Action

Hypothesis: There was no significant difference in the mean percent of Directing Language Action Occurrences: (II) among the three groups; (IIA) between the High Learners and the Low Learners.

Source	Means	DF	SS	MS	F	Significant
Suchman	.119					
Gallagher	.170	2	.289	.145	10.026	Yes
Taba	.285					
High	.198					
		1	.003	.003	.204	No
Low	.184					

Among the three systems, Null Hypothesis (II) was rejected; F was significant. However, t-tests revealed that the significant difference was between the Taba and Suchman Systems. No significant differences were found between Suchman and Gallagher, or between Gallagher and Taba.

Null Hypothesis (IIA) could not be rejected. No significant difference was found between High Learners and Low Learners.

TABLE III. Explaining Language Action

Hypothesis: There was no significant difference in the mean percent of Explaining Language Action occurrences: (III) among the three groups; (IIIA) between the High Learners and the Low Learners.

Source	Means	DF	SS	MS	F	Significant
Suchman	.130					
Gallagher	.169	2	.032	.016	2.114	No
Taba	.114					
High	.129					
		1	.004	.004	.553	No
Low	.146					

Among the three systems and between the High Learners and the Low Learners, Null Hypotheses (III and IIIA) could not be rejected. F was not found to be significant.

TABLE IV. Choosing Language Action

Hypothesis: There was no significant difference in the mean percent of Choosing Language Action occurrences: (IV) among the three groups; (IVA) between the High Learners and the Low Learners.

Source	Means	DF	SS	MS	F	Significant
Suchman	.008					
Gallagher	.001	2	.0006	.0003	1.005	No
Taba	.002					
High	.006	1	.0004	.0004	1.236	No
Low	.001					

Among the three systems and between the High Learners and the Low Learners, Null Hypotheses (IV and IVA) could not be rejected. F was not found to be significant.

TABLE V. Predicting Language Action

Hypothesis: There was no significant difference in the mean percent of Predicting Language Action occurrences: (V) among the three groups; (VA) between the High Learners and the Low Learners.

Source	Means	DF	SS	MS	F	Significant
Suchman	.109					
Gallagher	.083	2	.069	.035	5.522	Yes
Taba	.165					
High	.121	1	.0004	.0004	.060	No
Low	.116					

Among the three systems, Null Hypothesis (V) was rejected; F was significant. However, t-tests revealed that the significant difference was between the Taba and Gallagher systems. No significant differences were found between Suchman and Gallagher, or between Suchman and Taba.

Null Hypothesis (VA) could not be rejected. No significant difference was found between High Learners and Low Learners.

TABLE VI. Function I

Hypothesis: There was no significant difference in the mean percent of Function I occurrences: (VI) among the three groups; (VIA) between the High Learners and the Low Learners.

Source	Means	DF	SS	MS	F	Significant
Suchman	.002					
Gallagher	.002	2	.004	.002	4.517	No
Taba	.018					
High	.006					
		1	.00006	.00006	.149	No
Low	.008					

Among the three systems and between the High Learners and the Low Learners, Null Hypotheses (VI and VIA) could not be rejected. F was not found to be significant.

TABLE VII. Function II

Hypothesis: There was no significant difference in the mean percent of Function II occurrences: (VII) among the three groups; (VIIA) between the High Learners and the Low Learners.

Source	Means	DF	SS	MS	F	Significant
Suchman	.357					
Gallagher	.213	2	.409	.205	7.431	Yes
Taba	.408					
High	.379					
		1	.169	.169	6.123	Yes
Low	.273					

Among the three systems, Null Hypothesis (VII) was rejected; F was significant. However, t-tests revealed that the significant difference was between the Taba and Gallagher systems. No significant differences were found between Suchman and Gallagher, or between Suchman and Taba.

Null Hypothesis (VIIA) was rejected. A significant difference was also found between the High Learners and the Low Learners.

TABLE VIII. Function III

Hypothesis: There was no significant difference in the mean percent of Function III occurrences: (VIII) among the three groups; (VIII A) between the High Learners and the Low Learners.

Source	Means	DF	SS	MS	F	Significant
Suchman	.642					
Gallagher	.785	2	.464	.232	9.046	Yes
Taba	.574					
High	.615	1	.163	.163	6.361	Yes
Low	.719					

Among the three systems, Null Hypothesis (VIII) was rejected; F was significant. However, t-tests revealed that the significant difference was between the Gallagher and Taba systems. No significant differences were found between Suchman and Gallagher, or between Suchman and Taba.

Null Hypothesis (VIII A) was rejected. A significant difference was also found between the High Learners and the Low Learners.

TABLE IX. Function IV

Hypothesis: There was no significant difference in the mean percent of Function IV occurrences: (IX) among the three groups; (IX A) between the High Learners and the Low Learners.

Source	Means	DF	SS	MS	F	Significant
Suchman	.000					
Gallagher	.001	2	.000	.000	1.000	No
Taba	.000					
High	.0003	1	.000	.000	1.000	No
Low	.000					

Among the three systems and between the High Learners and the Low Learners, Null Hypotheses (IX and IX A) could not be rejected. F was not found to be significant.

The following table summarizes in detail the results of the analyses of variance.

TABLE X. Comparison of Teacher Performance Under Three Conditions of Training in Classroom Interaction.

SUMMARY OF DATA								
(Scores are Expressed in Decimal Fractions Equivalent to Percents)								
Problem	Training System Groups						*Sig.	
	Means	DF	SS	MS	F			
Categories	Suchman	Gallagher	Taba					
Describing	.634	.577	.436	2	.418	.209	14.801	Yes
Directing	.119	.170	.285	2	.289	.145	10.026	Yes
Explaining	.130	.169	.114	2	.032	.016	2.114	No
Choosing	.008	.001	.002	2	.0006	.0003	1.005	No
Predicting	.109	.083	.165	2	.069	.035	5.522	Yes
Function I	.002	.002	.018	2	.004	.002	4.517	No
Function II	.357	.213	.408	2	.409	.205	7.431	Yes
Function III	.642	.785	.574	2	.464	.232	9.046	Yes
Function IV	.000	.001	.000	2	.000	.000	1.000	No

Problem	High - Low Groups						*Sig.
	DF	SS	MS	F			
Categories	High	Low					
Describing	.545	.553	1	.0008	.0008	.057	No
Directing	.198	.184	1	.003	.003	.204	No
Explaining	.129	.146	1	.004	.004	.553	No
Choosing	.006	.001	1	.0004	.0004	1.236	No
Predicting	.121	.116	1	.0004	.0004	.060	No
Function I	.006	.008	1	.00006	.00006	.149	No
Function II	.379	.273	1	.169	.169	6.123	Yes
Function III	.615	.719	1	.163	.163	6.361	Yes
Function IV	.0003	.000	1	.000	.000	1.000	No

*Significant when $P < .01$

CHAPTER V

SUMMARY

Sixty teachers chosen at random from those who had been trained in one of three Systems (Suchman, Gallagher, and TABA) provided tapes made during one of their classroom sessions. These teachers had been divided into High Learners and Low Learners, according to pre-determined criteria.

All teacher verbal utterances appearing on the tapes were classified and totaled as one of four Functions and one of five Language Actions. Separate summaries were made for each of the three groups and for High and Low Learners. Analyses were made by comparing the totals of each group, and certain null hypotheses (see pp. 24-25) were tested against the recorded analyses.

The purpose of this study as stated in Chapter I was

to facilitate the construction of a training system which integrates features of Taba, Suchman and Gallagher which have been demonstrated most effective in enabling the teacher to make use of certain defined "Functions" and "Language Actions" (p. 3).

In terms of the stated purpose, these are the results offered by this study:

QUESTION 1: WHICH OF THE THREE SYSTEMS CAUSES ITS TEACHERS TO MAKE THE MOST USE OF THE FIVE LANGUAGE ACTIONS AND FOUR FUNCTIONS?
(See page 3)

The systems were unsuccessful in promoting Choosing Language Actions (Table IV, p. 34), Function I (Table VI, p. 35) and Function IV (Table IX, p. 36).

The systems were only moderately successful in causing Directing (Table II, p. 33), Explaining (Table III, p. 33) and Predicting Language Actions (Table V, p. 34) and Function II (Table VII, p. 35).

The findings indicate that all three systems were effective in causing the teachers to use Describing Language Actions (Table I, p. 32) and Function III (Table VIII, p. 36).

QUESTION 2: IS THERE A SIGNIFICANT DIFFERENCE, AT $P < .01$, AMONG THE THREE SYSTEMS IN REGARD TO EACH LANGUAGE ACTION AND EACH FUNCTION? (See page 3)

Analysis-of-variance revealed significant differences in Describing, Directing and Predicting Language Actions, and in Functions II and III.

In order to learn whether significant differences were present other than between the system showing the highest means and the lowest means, t-tests were calculated for all categories where significant differences had appeared.

The t-tests did not reveal significant differences other than between the systems with the highest and lowest means.

The Three Systems

Language Actions

1. In Directing, there was a significant difference between the Taba System and the Suchman System (Taba high).
2. In Predicting, there was a significant difference between the Taba System and the Gallagher System (Taba high).
3. In Describing, there was a significant difference between the Suchman System and the Taba System (Suchman high).

In Explaining and Choosing, no significant differences were found.

Functions

1. In Function II, there was a significant difference between the Taba System and the Gallagher System (Taba high).
2. In Function III, there was a significant difference between the Gallagher System and the Taba System (Gallagher high).

In Functions I and IV, no significant differences were found.

High Learners and Low Learners

QUESTION 3: IS THERE A SIGNIFICANT DIFFERENCE BETWEEN THOSE DESCRIBED AS "HIGH LEARNERS" AND "LOW LEARNERS" AS REGARDS THEIR USE OF EACH LANGUAGE ACTION AND EACH FUNCTION? (See page 3).

Language Actions

In no Language Action was there a significant difference found between High and Low Learners. In all five of the Language Actions the means for both groups were close. The largest difference (Explaining) was only .017.

Functions

1. In Function II, there was a significant difference between the High and Low Learners (High Learners high).
2. In Function III, there was a significant difference between the Low and High Learners (Low Learners high).

No significant differences were found between the High and Low Learners in Functions I and IV. In these two, the means for both groups were almost the same (.006 - .008; .0003 - .000).

Creating An Integrated System

The preceding data (Tables I-IX, Chapter IV) indicate that for creating an Integrated System, the following data are significant:

Language Actions

DESCRIBING	The Suchman System was most efficient.
DIRECTING	The Taba System was most efficient.
EXPLAINING	<u>No</u> system proved significantly superior. (Only eleven to seventeen percent of the total utterances were classified in this category.)
CHOOSING	<u>No</u> system proved significantly superior. (Less than one percent of the total utterances were classified in this category.)

PREDICTING	The Taba System was most efficient.
Functions	
FUNCTION I	<u>No</u> system proved significantly superior. (Less than one percent of the total utterances were classified in this category.)
FUNCTION II	The Taba System was most efficient.
FUNCTION III*	The Gallagher System was most efficient.
FUNCTION IV	<u>No</u> system proved significantly superior. (Less than one percent of the total utterances were classified in this category.)

Discussion of the Findings

Suchman's insistence that the teacher supply data, but not provide theory probably accounts for the high score of Suchman teachers in Describing Language Action. If Describing is considered a desirable component for an Integrated System, the Suchman approach should be reexamined to discover how this component is promoted by Suchman's training.

It seems ironic that Taba teachers should place high in Directing Language Action. Taba places great stress on developing "autonomous learners" (see page 11). On the other hand, it is to be expected that Suchman teachers might be low in this component.

* From 57% to 78% of the teachers' utterances were classified as Function III. (On the other hand, less than 1% could be classified as Function I or IV.) More information might be made available if Function III were broken into several Functions, with Function I and IV either broadened or eliminated.

Much of the Suchman System involves demonstration which is visually oriented, rather than verbally oriented. It is the task of the student to direct questions to the teacher. The directing role of the teacher, as a result, is minimized.

None of the three systems appears to encourage explanations or choice by the teacher. The emphasis on inquiry in all three systems might explain the low percentage of Explaining Language Actions (11.4% to 16.9%) and Choosing Language Actions (less than 1%) recorded for the three groups.

Since the underlying direction of the Taba approach is to move from factual data to generalizations (see p. 11), and the "structure of learning processes" begins with recall and ends with "the application of discovered knowledge to new or different situations" (see p. 11), it seems inevitable that the Taba method would result in future-oriented ("Predicting") language action.

Neither Function I and IV resulted from any of the systems. Since all of the systems appear to be information- or concept-oriented, there seems to be little provision in any of the three for dealing with the "feeling" mentioned in "Function I" or learning "processes" in Function IV (Durkin, 1969, p. xxviii).

On the other hand, the definitions of Function II and Function III closely parallel the expressed aims of all three systems (see pp. 5-7).

Taba's high frequency (40.8%) makes this System conspicuously strong in Function II. The even greater frequency of Gallagher (78.5%) in Function III points up the stress on "conceptualizations, interpretations of data and applications of knowledge" (see p. 6) as an inherent aim of the Gallagher System.

There is frequently more than one way that one can interpret the results of research. In the case presented here, the approach one takes will follow, indirectly or directly, from how he sees the role of an effective teacher. Earlier it was suggested that "teachers talk a great deal". If this comment is seen as implicit criticism, it follows that a substantial part of the teacher's role should be that of listener.

Despite the popular picture of the listener, listening cannot be seen as a passive function; it requires skill and a lively intelligence. Thomas Gordon, in his paper "The Risks in Effective Communication", speaks of "active listening" as

a process of putting your understanding of . . . (the) message to the severest of tests - - namely, forcing yourself to put into your own words the meaning of the sender's message and 'feeding back' your words to the sender for verification or for subsequent correction. Active listening obviously requires the receiver to suspend his own thoughts, feeling, evaluations, and judgments in order to attend exclusively to the message of the sender. It forces accurate receiving inasmuch as the listener finds that if he is to understand the message in terms of the sender's meaning, he must put himself into the shoes of the sender (into his frame of reference, into his world of reality). The listener thus hears the meaning intended by the sender (1961).

If Gordon is correct, and what he says seems at least psychologically sound, every teacher could profit from an increased awareness of the importance of this aspect of his role. As a listener to large groups (thirty students in a classroom), the teacher's skill and intelligence meet their most severe test.

The categories used in this research classify the teacher's verbal behavior principally in terms of his role as the initiator of communication. The four Functions, however, are defined in terms of certain desired results. The results, in most instances, involve student response. Logically, the effectiveness of what the teacher says can probably be determined only by the responses that follow. While Functions I and II do, by implication, call upon the teacher to be an effective listener, there is no clear-cut instrument or index in the method employed here for measuring or indicating teacher success in this matter. Consequently, what is presented here could be called only half the story.

Recommendations For Using This Study to Create an Integrated System

The following logical analyses of the data should be considered for developing an Integrated System:

- a. PERHAPS THE "QUESTIONING STRATEGIES" PROMOTED BY BOTH THE SUCHMAN AND GALLAGHER SYSTEMS PRODUCED THE DESCRIBING LANGUAGE ACTION USED IN CLASSROOM VERBAL INTERACTION.

The Suchman System teaches the trainee to supply data (Describing Language Action) in response to student questions. Such data are to be used by the student to discover why a certain phenomenon took place.

While it is the teacher who poses the questions in the Gallagher format, the language of his questions tends to be "descriptive".

- b. APPARENTLY THE "TEACHING STRATEGIES WHICH PROMOTE THE THINKING ABILITIES OF CHILDREN" OF THE TABA SYSTEM PRODUCED THE DIRECTING AND PREDICTING LANGUAGE ACTIONS AND FUNCTION II USED IN CLASSROOM VERBAL INTERACTION.

The Taba System uses specific and concrete data as a means to move the student toward the forming of concepts and generalizations. Given this ideal, inherent in the system, a certain zeal for moving the student in this direction may assert itself in the performance of the teacher. This could account for the high frequency of both Directing and Predicting Language Actions, as both of these tend to be future-oriented rather than present-oriented.

- c. APPARENTLY THE GALLAGHER SYSTEM'S COMPONENT WHICH INSTRUCTS TEACHERS TO ASK THE KINDS OF QUESTIONS WHICH CAUSE STUDENTS TO "EXPLAIN" IS RESPONSIBLE FOR THE RELATIVELY HIGH NUMBER OF EXPLAINING LANGUAGE ACTIONS OF THE TEACHERS.

No significant difference was found among the three Systems in Explaining Language Actions, but approximately one seventh of all utterances were recorded in this category. The Gallagher System tended to produce more of these utterances than the other two Systems, and the probable explanation is the deliberate attempt of the Gallagher System to teach teachers to ask questions which provide opportunities for students to "explain".

- d. LOGICALLY, THE "QUESTIONING STRATEGIES AND DISCOVERY TRAINING" OF THE GALLAGHER SYSTEM PRODUCED THE HIGH FREQUENCY OF FUNCTION III UTTERANCES.

In forming any question, it seems almost inevitable that the teacher will include the areas covered by Function III (Conceptualizations, Interpretations of Data and Application of Knowledge). While the Gallagher System was significantly higher, the other two Systems were also high in this category. Each of the three groups of teachers made more use of Function III than any other Function. One might conclude either (1) that normally all teachers make much use of this Function or (2) that all three training Systems were especially effective in promoting its use.

The Gallagher System's strong emphasis on questioning Strategies may account for its teachers' frequent use of Function III.

- e. IT IS NOT APPARENT WHAT COMPONENT OF THE TABA AND SUCHMAN SYSTEMS, NOT PRESENT IN THE GALLAGHER SYSTEMS, RESULTS IN THE HIGH FREQUENCY OF FUNCTION II (FOSTERS CLEAR, OPEN COMMUNICATION AMONG GROUP MEMBERS) IN THE VERBAL INTERACTION OF TEACHERS.

A study of the three Systems does not suggest that any of the three should be superior (or deficient) in clarity or the openness of the communication resulting from use of the Systems. Possibly some other variable, not considered in this research, would tend to account for the difference.

- f. IT IS POSSIBLE TO EXPLAIN LOGICALLY THE SIGNIFICANTLY GREATER USE OF FUNCTION II BY HIGH LEARNERS AND THE SIGNIFICANTLY GREATER USE OF FUNCTION III BY LOW LEARNERS.

Function II (clear, open communication) is a basic necessity for the effective application of all three Systems. Function III (conceptualizations, Interpretations of Data and Application of Knowledge) seems inherent in the application of any traditional teaching system. Part of what these three Systems offer as "new" is additional clarity and openness in teaching approach. One could assume that the more the "new" System is assimilated, the more it will result in clarity and openness. The less the new

System is assimilated, the more the teacher will continue to employ the means of his traditional system.

2. On the assumption that an effective teaching system will produce Choosing Language Action, Function I and Function IV, it is recommended that the Integrated System incorporate features (apparently not present in Suchman, Gallagher, or Taba) which will tend to produce these Language Actions and Functions.
3. To produce the five Language Actions and four Functions, the proposed model probably should contain the following components taken from the three Systems:

<u>COMPONENT</u>	<u>TO PRODUCE</u>
The Questioning Strategies of the Suchman and Gallagher Systems	Describing Language Action
Assuming that "Directing Language Action" is to be avoided the part of the Suchman System, scored lowest in "Directing Language Action" called "Allowing Inquiry to Happen" (N. W. R. E. L. , 1969, p. 1).	Directing Language Action
The "Questioning Strategies" (Miller, 1969, p. a) component of the Gallagher System which prepares teachers to ask the kinds of questions which cause students to "explain".	Explaining Language Action

<u>COMPONENT</u>	<u>TO PRODUCE</u>
The component of the Taba System which consists of "analyzing relationships between concepts and expression of generalizations" (often expressed in Predicting Language Actions)	Predicting Language Action
Evidently no component of the three Systems produces Choosing Language Action utterances, therefore one should look elsewhere for a component	Choosing Language Action
Practically no utterances were classified under this Function, therefore, one should look elsewhere for a component.	Function I (Supports the Learning of Group Members)
The components of the Taba System, such as paraphrasing, which promote inter-communication skills, should be included.	Function II (Fosters Clear, Open Communication)
The questioning techniques and inter-communication skills promoted by each of the three Systems, especially the Gallagher System, should be included. (There was a high percentage of utterance by teachers in each of the three Systems)	Function III (Asks for Conceptualizations, Interpretations of Data and Application of Knowledge)
Practically no utterances were classified under this Function, therefore, one should look elsewhere for a component.	Function IV (Insures that Knowledge Producing Processes are Available to the Group)

Recommendations For Additional Research

1. The issues considered in the preceding pages should be considered in any future study of the evidence collected either here or by any future research.
2. To complete the information yielded by this study, the tapes might be reexamined, with attention given to the student half of the teacher-student exchange. Only then could the whole verbal-interaction picture become apparent.
3. For maximum value as an analysis of classroom interaction, it is recommended that the tapes be studied for feelings, emotions and attitudes.

Feelings are present in every classroom exchange. They serve to make communication more lively and real. When they are overlooked or ignored, something is lost. The importance of feelings in the process of communication is apparent. It is up to the teacher, as the oldest and hopefully wisest member of the classroom community, to be sensitive to the interplay of feelings within the classroom. He achieves this in most instances as sensitive listener to the wide variety of student responses.

4. Video-taping should be employed in future research to insure that non-verbal communication (gestures, body movements, and facial expressions) might be studied and considered as an integral and significant part of classroom interaction.
5. The tapes used in this research might find additional value as instruments for diagnosing and improving individual teacher performance. A skilled auditor might supply the teacher with a written analysis and critique of his recorded class session. Together, the auditor and teacher could review the tape and bring to the attention of the teacher both his strengths and weaknesses, as demonstrated on the tape.
6. Finally, teachers might be taught to code their own audio-tapes for self-criticism and improvement. While the time involved could be substantial, it should genuinely benefit the teacher.

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APPENDICES

APPENDIX A

Computer Copies of Analyses of Variance

 *ANOVA12 - ONE/TWO FACTOR ANALYSIS OF VARIANCE. OS-3 VER.3.5
 OREGON STATE UNIVERSITY COMPUTER CENTER DATE - 05/06/71

PROBLEM I-D - DE (DESCRIBING)

SOURCE	DF	SS	MS	F	P
METHOD 3 Groups	2	4.18390000E-01	2.09195000E-01	14.8019	.01
HI - LO	1	3.06666911E-04	3.06666911E-04	.0571	
*METHOD X HI - LO	2	1.62563333E-01	8.12816666E-02	5.7512	.01
ERROR	54	7.63180002E-01	1.41329630E-02		
TOTAL	59	1.34494000E 00			

SOURCE MEANS

METHOD	Suchman (S)	Gallagher (G)	Taba (T)
HI - LO	High (H)	Low (L)	
METHOD X HI - LO	(HI - LO VARIES MOST RAPIDLY.)		
	SH.69400	SL.57400	GH.51000
	TH.43200	TL.43900	GL.64500

* See number 7, page 31.

 *ANOVA12 - ONE/TWO FACTOR ANALYSIS OF VARIANCE. OS-3 VER.3.5
 OREGON STATE UNIVERSITY COMPUTER CENTER DATE - 05/06/71

PROBLEM 1-0 - DR (DIRECTING)

SOURCE	DF	SS	MS	F	P
METHOD	2	2.89213333E-01	1.44606667E-01	10.0259	.01
HI - LO	1	2.94000003E-03	2.94000003E-03	.2038	
METHOD X HI - LO	2	2.30799999E-02	1.15399999E-02	.8001	
ERROR	54	7.73860000E-01	1.44233333E-02		
TOTAL	59	1.09409333E 00			

SOURCE MEANS

METHOD

(S) (,) (T)
 .11300 .17000 .28500

HI - LO

(H) (L)
 .19333 .19433

METHOD X HI - LO

SH .09300
 TH .30100

(HI - LO VARIES MOST RAPIDLY.)

SL .13900
 TL .27000

GH .19600

GL .14400

 *ANOVA12 - ONE/TWO FACTOR ANALYSIS OF VARIANCE. OS-3 VER.3.5
 OREGON STATE UNIVERSITY COMPUTER CENTER DATE - 05/06/71

PROBLEM I-D - EX (EXPLAINING)

SOURCE	DF	SS	MS	F	P
METHOD	2	3.18633334E-02	1.59316667E-02	2.1143	
HI - LO	1	4.16666671E-03	4.16666671E-03	.5530	
METHOD X HI - LO	2	7.04333326E-03	3.52166663E-03	.4674	
ERROR	54	4.06900000E-01	7.53518519E-03		
TOTAL	59	4.49973333E-01			

SOURCE	MEANS			
METHOD	(S)	(G)	(T)	
	.13100	.16850	.11350	
HI - LO	(H)	(L)		
	.12900	.14567		
METHOD X HI - LO	(HI - LO VARIES MOST RAPIDLY.)			
	SH .10800	SL .15200	QH .17300	QL .16400
	TH .11600	TL .12100		

 *ANOVA12 - ONE/TWO FACTOR ANALYSIS OF VARIANCE. OS-3 VER.3.5
 OREGON STATE UNIVERSITY COMPUTER CENTER DATE - 05/06/71

PROBLEM I-D - CH (CHOOSING)

SOURCE	DF	SS	MS	F	P
METHOD	2	6.10000000E-04	3.05000000E-04	1.0049	
HI - LO	1	3.75000000E-04	3.75000000E-04	1.2355	
METHOD X HI - LO	2	1.90000000E-04	9.50000000E-05	.3130	
ERROR	54	1.63900000E-02	3.03518519E-04		
TOTAL	59	1.75650000E-02			

SOURCE MEANS

SOURCE	MEANS
METHOD	(S) (G) (T) .00300 .00100 .00150
HI - LO	(H) (L) .00600 .00100
METHOD X HI - LO	(HI - LO VARIES MOST RAPIDLY.) SH .01300 SL .00300 GH .00200 GL 0 TH .00300 TLO

 *ANOVA12 - ONE/TWO FACTOR ANALYSIS OF VARIANCE. OS-3 VER.3.5
 OREGON STATE UNIVERSITY COMPUTER CENTER DATE - 05/06/71

PROBLEM I-D - PRE (PREDICTING)

SOURCE	DF	SS	MS	F	P
METHOD	2	6.93233333E-02	3.46616667E-02	5.5215	.01
HI - LO	1	3.75000003E-04	3.75000003E-04	.0597	
METHOD X HI - LO	2	3.67300000E-02	1.83650000E-02	2.9255	
ERROR	54	3.38990000E-01	6.27759259E-03		
TOTAL	59	4.45418333E-01			

SOURCE MEANS

METHOD	(S)	(G)	(T)
	.13330	.08330	.16450
HI - LO	(H)	(L)	
	.12133	.11633	
METHOD X HI - LO	(HI - LO VARIES MOST RAPIDLY.)		
SH	.08500	SL.13200	GH.11900
TH	.15300	TL.17000	GL.04700

 *ANOVA12 - ONE/TWO FACTOR ANALYSIS OF VARIANCE. OS-3 VER.3.5
 OREGON STATE UNIVERSITY COMPUTER CENTER DATE - 05/06/71

PROBLEM I-0 - I (FUNCTION)

SOURCE	DF	SS	MS	F	P
METHOD	2	2.00363000000E-03	1.00181500000E-03	4.5166	.05
HI - LO	1	1.00060000000E-05	1.00060000000E-05	.1493	
METHOD X HI - LO	2	7.000000002E-05	3.500000001E-05	.0871	
ERROR	54	2.170000000E-02	4.01851852E-04		
TOTAL	59	2.546000000E-02			

SOURCE MEANS

METHOD	(S)	(G)	(T)
	.00150	.00150	.01800
HI - LO	(H)	(L)	
	.00500	.00800	
METHOD X HI - LO	(HI - LO VARIES MOST RAPIDLY.)		
SH 0	SL.00300	GH.00200	GL.00100
TH .01500	TL.02000		

 *ANOVA12 - ONE/TWO FACTOR ANALYSIS OF VARIANCE. OS-3 VER.3.5
 OREGON STATE UNIVERSITY COMPUTER CENTER DATE - 05/06/71

PROBLEM I-D - II (FUNCTION)

SOURCE	DF	SS	MS	F	P
METHOD	2	4.09380000E-01	2.04540000E-01	7.4313	.01
HI - LO	1	1.68540000E-01	1.68540000E-01	6.1234	.01
METHOD X HI - LO	2	1.04920000E-01	5.24600000E-02	1.9060	
ERROR	54	1.48630000E 00	2.75240741E-02		
TOTAL	59	2.16884000E 00			

SOURCE	MEANS		
METHOD	(S)	(G)	(T)
	.35700	.21300	.40800
HI - LO	(H)	(L)	
	.37100	.27300	
METHOD X HI - LO	(HI - LO VARIES MOST RAPIDLY.)		
	SH .46300	SL .24600	GH .17900
	TH .42200	TL .39400	

 *ANOVA12 - ONE/TWO FACTOR ANALYSIS OF VARIANCE. OS-3 VER.3.5
 OREGON STATE UNIVERSITY COMPUTER CENTER DATE - 05/06/71

PROBLEM I-D - III (FUNCTION)

SOURCE	DF	SS	MS	F	P
METHOD	2	4.64463334E-01	2.32231667E-01	9.0464	.01
HI - LO	1	1.63281667E-01	1.63281667E-01	6.3605	.01
METHOD X HI - LO	2	1.03903333E-01	5.19516664E-02	2.0237	
ERROR	54	1.38625000E 00	2.56712963E-02		
TOTAL	59	2.11789833E 00			

SOURCE MEANS

METHOD	(S)	(G)	(T)
	.64158	.78500	.57400
HI - LO	(H)	(L)	
	.61467	.71900	
METHOD X HI - LO	(HI - LO VARIES MOST RAPIDLY.)		
SH	.53000	SL .75100	GH .75000
TH	.56000	TL .58600	GL .82000

 *ANOVA12 - ONE/TWO FACTOR ANALYSIS OF VARIANCE. OS-3 VER.3.5
 OREGON STATE UNIVERSITY COMPUTER CENTER DATE - 05/06/71

PROBLEM I-D - IV (FUNCTION)

SOURCE	DF	SS	MS	F	<i>P</i>
METHOD	2	3.33333333E-06	1.66666667E-06	1.0000	
HI - LO	1	1.66666667E-06	1.66666667E-06	1.0000	
METHOD X HI - LO	2	3.33333333E-06	1.66666667E-06	1.0000	
ERROR	54	9.00000000E-05	1.66666667E-06		
TOTAL	59	9.83333333E-05			

SOURCE	MEANS		
METHOD	(S) 0	(G) .00050	(T) 0
HI - LO	(H) .00037	(L) 0	
METHOD X HI - LO	(SH) 0 TH 0	(HI - LO VARIES MOST RAPIDLY.) (SL) 0 TL 0	(T) 0 GL 0

APPENDIX B

Typescript of an Audio-Tape

Following is a typescript of an audio-tape used in this research.

- Teacher This is fifth period English Literature class.
Now, you read "An Adventurer's Viewpoint". What did you think of it. Janet?
- Janet I thought it was descriptive, and toward the end, it got kind of boring, because it was too descriptive and he kept repeating himself.
- T Alright. Lana?
- Lana I thought the author had a lot of imagination, and he just makes you feel like, you were him.
- T Feel like what?
- Lana You were 'he' inside.
- T Was he talking as he saw things or as?
- Lana Yes.
- T Not entirely, was he?
- Boy As he thought, as he saw things, as he was an animal, or maybe an ant or something.
- T Right. He was very poetic in a lot of his descriptions. Find some passages that show that, Gary.
- Gary Well on page 204, the first paragraph, "Of this vast undone, I think the part I regret most of all will be the missing of so many places, phases, fascinating and infinitely varied forms of life. Life as it is known to the ocean bird, whose home is the open sea; to the mole that has forsaken the pleasures of sun; to the snake that walks on it's ribs; to the winter springtails that skip by thousands across the fields of snow, "
- T Why did you think that was poetic?
- Gary Well, it sounds as though you can almost, you can almost put it into a phase like a poem.
- T Alright. Anybody have another one? Linda?

- Linda Page 205, the first paragraph, in the second column. "The air around me was filled with a faint sweetish perfume of it's own scent bloom, and it's lustre hardly more than in inch in diameter, we counted forty flowers. Close behind me was a wild bee alighted and grasping a small clump of bloom in its' forelegs as though holding a goblet, sticking it's long tongue into flowerlet after flowerlet. Brilliant little gold-banded flies walked up and down the green high-ways of the cattail leaves. "
- T It says, "as though holding a goblet". What a picturesque speech. What type is that? Do you know, Gary?
- Gary Simile.
- T Yes. Because it has the 'as' . It's comparing it to something else when using the 'as'. Another one?
- Girl "On all sides was the slender columns of cattails , old and new, brown and green, sunlight slanting downward was profused into soft illumination of the bottom of the swamp line, over the black and distant (not clear) criss-crossed like the cane seat of a discolored chair. "
- T Good. "Criss-crossed like the cane seat of a discolored chair. " What is that?
- Girl Another simile.
- T That's another simile, because it used what?
- Girl Like.
- T Like, in it's comparison. Another one?
- Boy "What the quick gusts struck the Cattail Island, a multitude of green, sword-like leaves waved against the sky above my head. The stiff brown cattails rolicked greatly amid the wild flutter of their leaves. The wind passed, and the flutter ebbed away and the hot moist silence that followed bits of fluff drifted down from the old stalks, dropping slowly and silently, float as they meet the water.
- T OK. Very good. Steve?
- Steve On page 204, the last paragraph, "When the quick gusts struck the Cattail Island, a multitude of green, sword-like leaves waved against the sky above my head. The stiff brown cattails rolicked greatly amid the wild flutter of their leaves. The wind passed and the flutter ebbed away, and in the hot moist that followed, bits of fluff drifted down from the other stalks, dropping slowly and silently as they descended into the water.

- T Alright. Dave?
- Dave Well, on page 206, the third paragraph.
(Cannot understand, not clear)
- T Alright. What does that mean, semi-aerial? Dick?
- Dick Partially in the air.
- T Yes, semi is what?
- Dick Partial.
- T Ok. Now for a passage that shows that the author was
extremely curious, Doug.
- Doug On page 205, second paragraph, "Single file, three ants
hurried across the bone-set creeker bridge and dis-
appeared into a tangle of cattails beyond. "
- T Alright. Diana, did you have one?
- Diana Well, one time when he was counting . . . (Not clear)
- T A little louder, please.
- Diana Well, he was counting the seeds in the cattails.
- T Yes.
- Girl On page 205, second paragraph. "To the yellowish mass,
dimly seen through the leaves, attracted my eyes. A
quick investigation revealed that it was the abandoned
nest of a long-billed marsh hen. The six inch . . . was
formed of twisted cattail leaves lined with mud. The
doorway was almost entirely closed. I probed an investiga-
ting finger inside. Instantly a stream of dark blue ants
poured from the interior. (Not too clear)
- T Yes. Good. Merlin?
- Merlin On page 204, about the middle of the last paragraph.
"I've often wondered how the swamp forest, the wide
cattail islands, and the thousands of waving sword leaves,
must appear to the dragon fly, the blackbird and the ants,
living on the dense vegetation of the marshland jungle. I
decided to find out. "
- T Good. He definitely was curious then. Dave?
- Dave Well on page 204, second column, second paragraph.
"Our only sign was the slender column of the cattails,
old and new, brown and green, sunlight slanting down . . .
(not clear-cannot understand) and cattail leaves were
criss-crossed like the cane seat of a discolored chair. "

T Alright

Boy There were other noises. "The far carrying clang of metal, the yelp of a dog and the faint drone of a high flying plane. The cry of a gull coasting across a low patch of sky way my . . . Then a quick gust struck the cattail island and a multitude of green sword-like leaves waved against the sky above my head. The stiff brown cattails nodded greatly amid the wild flutter of their leaves. "

T Ok. Very good. Then we have several passages in here that show that he had his curiosity. We have . . . it isn't as poetic . . . his very keen observation (not clear) There are several passages that show metaphors, . aside from the ones we've had. Can you find any? Metaphors or similes, Gary?

Gary On page 204, in the second column of the first paragraph, about one third of the way through, "From my orchard hillside, masses of whitish blooms of _____ had stood out on the dense sand of cattails like splashes of foam on waves of dark green water. "

APPENDIX C

Summary of an Audio-Tape

This is a sample of the cards on which data was recorded

Functions	Describing L. A.	Directing L. A.	Explaining L. A.	Choosing L. A.	Predicting L. A.	Total
I						
II	20* .29**	2 .03	4 .05		1 .01	29 .38
III	19 .25	11 .14	9 .12		8 .11	47 .62
V						
Total	41 .54	13 .17	13 .17		9 .12	76 1.00

* The first number in each cell represents the amount of utterances.

** The second number in each cell represents the decimal fraction of utterances.