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DEVELOPMENT AND USE OF A LOW INFERENCE OBSERVATION TECHNIQUE
FOR DIAGNOSIS, PLACEMENT AND EVALUATION OF TEACHERS IN
AN INDIVIDUALIZED STAFF DEVELOPMENT PROGRAM

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Education in the Graduate School
of Texas Southern University

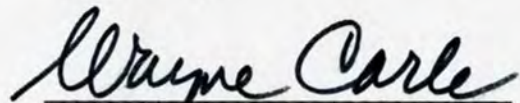
By

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1979

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V I T A

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Few people in a full lifetime make so great a contribution to their fellows as Drs. Homer and Joan Coker in their efforts to describe the effective teacher. This work is an extension of their efforts and a salute to their contributions.

Gratitude is extended to a number of other people and institutions for their contributions to the development of this project; among them are the Houston Independent School District administrators and teachers who participated in this study, the Title I facilitators who served as classroom observers, Dr. Jacqueline Mouton, Assistant Professor, Texas Southern University, and members of the Staff Development Department who provided the support and daily encouragement whenever needed.

Deepest appreciation is reserved for my family, for their patience throughout this academic pursuit.

It is my hope that educators will receive this work at a time when radical improvements in teacher training are so needed.

Dedicated in memory

of

Irma Hart Allen, my mother
Jesse A. McDavid, my husband

Special dedication to
my daughters

Hjordis Dawn and
Tyishka Fanar

Chapter 1

INTRODUCTION

Staff development programs are meeting two levels of needs: teacher needs and organizational needs. That is, activities which are designed specifically to enhance a teacher's effectiveness in the classroom, and those (usually of a group nature) which are planned to enhance the effectiveness of the school district as a functioning organization.

Traditional Programs

Traditional programs have been based on two assumptions. One was that the central administration and university departments of education knew what was best for teachers. Those who held such beliefs thought it would "be best for teachers to have 'orientation' workshops a day or two before school started and some time for working in classrooms to prepare for the coming year, as well as a workshop day or two during the school year and courses offered in the evening or during the summer taught on the university campuses." Another assumption was that to grow professionally a teacher needed basically to learn more about the subject he or she was teaching; experience would take care of the rest.

Guidelines for approval of courses usually stressed that they should be related to what a teacher was currently teaching or

intended to teach in the future, thereby emphasizing that the development of cognitive skills is what is important in education.

Another traditional assumption has been that the responsibility for professional growth was essentially the teacher's. Districts offered token workshops, and monitored a teacher's achievement of state-mandated professional growth requirements. However, it was up to the teacher to find courses to meet the requirements, and the time to take them, and the money to pay for them, and the proper form with which to register them (Davies and Armistead, 1975).

Contemporary Programs

Today's districts are taking their cues from business and industry, and are recognizing that it is in their own best interest to provide administrative support, time and money for staff development as an integral part of the educational enterprise.

New assumptions are:

1. That teachers themselves are an important source of information concerning their own professional growth needs, which can be tapped through needs assessments.
2. That self awareness is crucial to effective teaching.
3. That systematic observation of teachers in the natural setting can provide insight into the nature of effective teaching, effective patterns of classroom behavior and the effectiveness of program and procedures in teacher education.
4. That teaching behavior can be evaluated.

Decisions About Teachers

Defensible decisions concerning teachers rest on many kinds of data. It is essential that among these data appears valid information about teacher competencies. Decisions that require judgment about teachers are made by many persons--teacher educators, school personnel officers, administrators, supervisors, and teachers themselves. Wise choices about teachers are made only when adequate data are at hand for judging.

Decision-makers would profit from complete and dependable information about each teacher involved in the decision. This would be (a) a description of the teacher's particular teaching situation, (b) the reason for placing the teacher there, (c) the instructional procedures used by the teacher and why those procedures were selected, and (d) the instructional intents of the administrator and the teacher, as well as essential data evidencing the teacher's effects upon pupils. Complete data are typically not available possibly because those making the decisions have not given enough thought to what is required for making warranted decisions about a teacher, and accordingly, have not arranged for the collection of such data. A second reason that data are not available is that researchers often do not pursue their investigations with awareness of the practical decisions that must be made by those working with teachers and the scientific conclusions that would be helpful in making those complex decisions.

Purpose of Decisions

To make sense of the diverse inquiries undertaken in the name of teacher effectiveness we must make distinction in purpose. The administrator may be looking for knowledge of teacher effectiveness in order to make a better decision in situations such as firing a teacher. The instructional supervisor or teacher himself may want to know what instructional procedures are most likely to prove useful in achieving certain instructional ends with given students. The researcher's purpose may include satisfying a desire to describe accurately what teachers do.

State procedures for certifying teachers have had as their main purpose the protection of public schools from incompetent teachers. Achievement of this purpose has been hampered by a lack of valid procedures for discriminating competent teachers from incompetent ones. In recent years, a number of teacher education programs have appeared which claim to produce only teachers who have demonstrated competency; and an increasing number of state certification agencies, accepting these claims as valid, have moved to require that teacher be certified only on the basis of demonstrated competence.

Teacher Effectiveness

The theoretical literature contains plenty of advice about what makes an effective teacher, most of which comes from outside of the profession itself. Learning psychologists, psychotherapists, philosophers, curriculum developers, and others less qualified have theories to propose, but seldom are they supported by hard evidence.

Teacher wisdom appears to offer a little more promise. This alternative is to ask the teachers themselves what behaviors are needed to make a teacher effective. While most teachers cannot apply the breadth of knowledge of the researcher, they are in immediate contact with all aspects of problems as they occur and may be less likely to overlook or incorrectly weigh the importance of a single aspect. The teacher moreover has a stake in the problem of specification. Not only professional advancement but day to day satisfaction and survival depends on how successfully the problem is solved.

Large urban districts like the Houston Independent School District (HISD) are finding that the best administrative support system for staff development involves a degree of centralization. The HISD staff development program provides intensive training for teachers (1) growing out of logical analysis of the teaching process, (2) stimulated by changing social, economic and technologized conditions, (3) development of methods and instruments necessary to assess and research teaching behavior, and (4) research suggested by theoretical models of teaching drawing particularly from training psychology, cybernetic psychology and systems analysis.

Staff Development as a Process

The most important contribution that could be made to the evaluation of teaching and improvement of the teaching process would be attention on the part of school systems to the total process of staff development as applied to teacher competency evaluation and pre-

dictions of teacher effectiveness. These steps include:

1. Selection and specification of a value system (criterion framework)--the agreed upon qualities that are desired or expected of teachers in a particular community and in a particular kind of teaching situation.
2. Identification of kinds of situations in which the agreed upon "valued" teacher behaviors may occur and in which they may be observed and assessed.
3. Description in operational terms of actual behaviors of the agreed upon behaviors that are to be assessed.
4. Identification of the properties of teacher classroom behaviors that may be related to the operationally described criteria.
5. Conduct of research directed at identification of relationships between selected, operationally defined properties of teacher behaviors and selected operationally defined "valued behaviors" in selected situations.
6. Conduct of a training program that will reinforce and support these findings.

The many studies on teacher competence as teacher effectiveness, usually biased toward specific viewpoints and concerned only with segments of the whole performance, demonstrate the need for a clearer definition of the total process for developing more effective teachers. Therefore, it is the intent of this study to describe this process through the integration of prioritized teacher needs, low inference

behavioral observations, competency-based instruction founded on identified school district competencies in a comprehensive staff development program. It is anticipated the extent to which reliable relationships are present between valued behavior and observable behavior will be demonstrated and the necessary groundwork laid for appropriate scientific evaluation of teacher effectiveness.

Need for the Study

Of all the tradition-bound practices in American education, the current state of inservice teacher training is probably the most indefensible. Such training as there is seems to be guided by two mutually incompatible perspectives: (1) inservice training as relevant to the upgrading of teachers professionalism and classroom performance; (2) inservice training as a convenient way to pile up units which will move a teacher horizontally across the pay schedule. But perhaps even more ironically, the ultimate outcome of current inservice training, seems to be to move teachers out of the classroom, either by promotion or firing rather than to improve their effectiveness within it (Allen, 1974).

Relevance to Teacher Needs

What then, is needed to make inservice training a viable concern to make it relevant to the professional growth of teachers and thus to the improvement of educational opportunities for students? First, we have not, as a profession gone beyond the development of vague criteria of "good" and "bad" in evaluating teacher performance. We have not devoted sufficient thought and imagination to the delineation of

teacher tasks to identify what kinds of skills and competencies are required in the various roles that teachers assume. This study proposes to identify those skills and competencies that lend themselves to increased teacher effectiveness.

Individuality

The tragedy of our current system is that we treat all teachers as perfectly interchangeable parts--as though there were some mystical power in the designation teacher that wipes out all individual differences and makes every person so labeled equally adept at teaching all varieties of students. Given the present system, how could we even begin to differentiate the various educational roles that teachers can play, and allow them to be applied to the education of students with maximum efficiency? How do we ever find out what special educational talents he has? How do we find out what skills he should have, but does not? How do we ever decide on a rational inservice training procedure that will help him to develop his own uniquely beneficial competencies? We never get around to such crucial matters, for the system never allows us to focus on them.

Task Differentiation

What is required, then, before sensible inservice training can be developed, is a careful differentiation and task analysis of the various aspects of the teacher's role. But the current structure of education makes such analysis impossible because its monolithic nature tends to wash out and camouflage all useful distinctions among teachers.

The crucial point here is not that any such distinctions dreamed up now must be instituted. It is rather that an educational framework be required which by its very nature fosters the recognition of distinctions when they arise. At this point it might begin to develop the performance-based task delineations that provide the key to a sane inservice program. Teachers would no longer be bound to the accumulation of units to gain better pay or to move them out of the classroom. Rather, they would be enabled to help specify the criteria by which their performance was judged. At the same time they would participate in meaningful training experiences that would help them meet those criteria, thereby gaining greater rewards through their greater competence.

Program Needs

Important as they are, differentiated performance criteria are by no means a final solution to the problem of inservice training. It should be fairly obvious that an inservice program based on differentiated performance criteria lends itself admirably to a kind of research that will incorporate feedback into the program and hence make it self-adjusting to a large extent. As new roles are discovered for teachers and as old ones are discarded, the various sets of performance criteria will undergo change. More importantly, as individual teachers undergo alternative means of training toward different criteria, as substantial and useful data can be gathered to answer such questions as the following: Which training procedures are most efficient in helping teachers to meet which criteria? For teachers

with different initial competencies, might it be that different training experiences are optimal in helping them to meet the same criteria? For a given teacher with a particular set of skills, what sequence of training procedure is most appropriate if he/she is to meet a given set of criteria? Meaningful research, then, will become an integral part of inservice training programs. Then we can begin to make intelligent decisions regarding the training procedures that should be added, dropped, and modified to make them more effective for teachers of varying individual talents.

Evaluation Procedures

The final, and yet unmentioned, key to a successful teacher training program, is a systematic and relevant set of evaluation procedures. Evaluation is the pivotal point. Diagnostic procedures are continually necessary to assess the extent to which teachers in the field have met various criteria appropriate to their roles, and to new roles they might wish to assume. Second, evaluative procedures are necessary to help administrators determine which teachers have met which performance criteria, so that they can be placed in the appropriate educational role with appropriate rewards for their professional talents. Third, there is a need for a systematic means of evaluating and researching the appropriateness of those more accepted teacher performance criteria. Fourth, and most important, there is a need to develop self-regulating research models to help educators make decisions about the effectiveness of training methods in reaching those goals set for teachers.

Such research models must provide feedback to the system of alternative training procedures as a way of adding, dropping, and modifying these procedures. The models must be such that alternatives to evaluate procedures and performance criteria can be made on the basis of information arising out of training modifications. There is a need to systematically gather data on teachers going through an inservice program so that research can be generated which will tie particular sets of individual variables to optimal sequences of training experiences as a means to particular goals. Educators need to know what kinds of teachers require what kinds of experiences in what order and at what times to help them meet given performance criteria. In this area, as in other research efforts tied to a viable inservice program, it is imperative that feedback operates in both directions. That is, the findings of research must direct changes in inservice training on a general and individual scale; but at the same time, changes developed in training and its priorities must direct shifts in the focus of research (Allen, 1974).

Nowhere in the educational enterprise is there a greater need for innovation than in the provisions for teacher inservice education. Finally, there is an expressed need to develop and implement a technique for integrating and meeting the aforementioned needs as a total process.

The major question raised in this study involves the persons who participated in the competency-based teacher training program. Specifically, are the teachers who have participated in specialized

training in classroom management, i.e., management of instruction, management of the environment, and management of students, more effective as a result of these staff development processes as measured by the Georgia Assessment for Teacher Effectiveness (GATE) instrument. The GATE instrument has been directly correlated to the instructional and interpersonal skills competencies on the Houston Independent School District's Teacher Assessment Instrument.

Significance of the Study

Much of the recent research on teachers and teaching has had to do with the fundamental problem of the description of teacher behavior and conditions with which various characteristics and behaviors seem to be correlated. But relatively few investigators have attempted to study the evaluation of teaching effectiveness. This may be due to difficulties imposed by the criterion problem and the time and labor required to designate behavioral criteria which reflect expectancies, in particular teaching expectancies. It may also be due to the insistence of many that we must be able to describe teacher behavior accurately and to have methods of assessing its various components before we tackle problems of evaluation.

THE PRESENT STUDY

Statement of Problem

The problem of this study was to develop and document the change in the effectiveness of elementary teachers who participated in the competency based teacher training program in terms of the

following:

1. Select or develop a teacher (GATE) observation instrument to record pre and post selected behaviors correlated to the district's own teacher assessment instrument.
2. Determine the extent to which an individual teacher exhibited change.
3. Determine the extent to which an individual teacher exhibited change as compared to the group.
4. Determine the amount of change in teacher behavior as indicated on pre and post performance data when gathered using different observation frequencies.

Further Purpose of the Study

The further purpose of the study was to chronicle the process involved in a comprehensive staff development program. Ten components evolved:

- Identification of school district needs
- Identification of teachers prioritized needs
- Identification of an assessment instrument for teachers
- Development of a competency based training program
- Selection, adaption and correlation of a low-inference observation instrument to specifically measure teacher behaviors
- Training of observers to record reliable data
- Pre-observations of training participants

- . Planned and controlled units of study based on the identified competencies
- . Post-observations
- . Analysis of results

Questions

Answers were sought to the following questions:

- . Can district needs and teacher values become a basis for a staff development program?
- . Can teacher competencies be assessed in specific observable terms.
- . Can a standardized low inference instrument be adapted and correlated to the teacher's assessment instrument?
- . Can teachers be trained as observers to record pre and post behavioral changes in their peers?
- . Can a training program be developed to integrate teacher, prioritized needs, low inference observation, competency based instruction and school district competencies?
- . Can the results of these pre and post observations be analyzed to provide reliable relationships between valued behavior and observable behavior?
- . Can the necessary groundwork be laid for appropriate scientific evaluation of teachers?

In seeking answers the following hypotheses were generated.

GENERAL HYPOTHESIS

As a result of participation in the competency based teacher training program, there will be no change in the effectiveness of elementary teachers as measured by the Georgia Assessment for Teacher Effectiveness Instrument.

Specific Hypotheses

Instructional Competencies

- Ho₁ There will be no significant difference in the pre and post performance of teachers in the teaching of basic concepts for grade level and/or subject level as a result of the competency based teacher training program.
- Ho₂ There will be no significant difference in the pre and post performances of teachers in the demonstration of a working knowledge of subject matter as a result of the competency based teacher training program.
- Ho₃ There will be no significant difference in the pre and post performances of teachers in the planning of activities for students' individual needs as a result of the competency based teacher training program.
- Ho₄ There will be no significant difference in the pre and post performances of teachers in the preparation and/or use of various methods and techniques to present subject matter and encourage student participation as a result of the competency based teacher training program.

- Ho₅ There will be no significant difference in the pre and post performance of teachers in the giving of well-defined instructions to students as a result of the competency based teacher training program.

Interpersonal Relationships and Discipline

- Ho₆ There will be no significant difference in the pre and post performances of teachers in the development, organization and implementation of a system for classroom management as a result of the competency based teacher training program.
- Ho₇ There will be no significant difference in the pre and post performances of teachers in the encouragement of students to become self disciplined as a result of the competency based teacher training program.
- Ho₈ There will be no significant difference in the pre and post performances of teachers in the promotion of positive self-images in students as a result of the competency based teacher training program.
- Ho₉ There will be no significant difference in the pre and post performances of teachers in the consistency and empathy in students as a result of the competency based teacher training program.

Assumptions

The following assumptions provided a basis for this study:

1. That classes of teacher behaviors have distinguishing features which permit their identification.
2. That samples of teacher behavior and correlates of teacher behavior may be observed in the same manner.
3. That teacher behavior is not private, intangible, and unmeasurable.
4. That the conditions of observation of teacher behavior can be controlled, at least to a reasonable degree, making comparability of assessments.
5. That teacher behaviors are both qualitatively and quantitatively discriminable--and therefore can be assessed.
6. That teacher behavior is relative. There is nothing inherently good or bad in any given teacher behavior or set of behaviors, but that teacher behavior is good or bad, effective or ineffective, or the extent that such behavior conforms or fails to conform to a particular value system that has been agreed upon.

Limitations of the Study

The following limitations apply:

1. The study was limited to elementary teachers employed in the ESEA Title I schools in the Houston Independent School District thus determining their eligibility to participate

in the Title I Collaborative Planning Staff Development Model.

2. The study was limited to thirty-three (33) elementary teachers in the ESEA Title I schools who were eligible under the District's ESEA Title I proposal, e.g., curriculum coordinators, mathematics and reading specialists and regular classroom teachers.
3. The period of time was limited to the fall 1978 semester, October through February, 1979.
4. There was no effort made to measure the possible effects of differences in age, sex, or race among the participants and/or observers.

Organization of the Study

In the foregoing chapter we have presented an introduction, a theoretical basis, rationale for the study, the statement of the problem, questions sought, the hypothesis, basic assumptions, and the limitations of the study.

Chapter 2 examines the research and literature related to this study. Chapter 3 includes the background for the study, the design of the study, the description of the population and samples, a history and development of the instrument used, procedures for collecting data including observer selection, observer training, procedures for recording data, procedures for reporting data and the method and treatment of data. Chapter 4 provides a presentation and analysis of these data and Chapter 5 presents a summary of findings, the conclusion, implications and recommendations.

Definition of Terms

The following terms are operationally defined for the purposes of this study.

Direct observation means that the observer actually looks at the processes of classroom interaction and systematically records the behaviors observed.

Low-inference observation is defined as a collection of data that stays closer to the original behavior than a subjective rating scale, which would be regarded as "high inference" observation (Soar, 1973).

Systematic observation is a way of observing classrooms in which the observer serves as a recorder, insofar as possible, rather than an evaluator of activities and or events that took place in those classrooms observed (Medley and Mitzel, 1958).

Sign observations are made when the observer is given a list of events to watch for in the classroom and is asked to check off those events that occur during a given time period.

Observer training for purposes of this study, is training conducted in a given period of time to make certain there is agreement and understanding of the observation instrument being used among observers.

Key refers to two or more items on the observation instrument which appears to measure some distinction of teacher behavior.

ESEA - (Federal Elementary and Secondary Education Act)

Title I Schools - The legislature has authorized a state program of compensatory education for educationally disadvantaged children.

Schools funded through this grant must demonstrate that a program is designed to meet the priority educational needs of disadvantaged students in such areas as reading, mathematics, language development and/or bilingual-multi cultural development. Those children with the greatest needs in those academic areas as determined by educational needs assessment must be given first consideration.

Title I Teacher Training Collaborative Planning Staff Development Model - A competency based training program specifically designed to allow program teachers, regular teachers, and curriculum coordinators in target schools to be able to plan collaboratively. Through the staff development competency based training program these teachers are trained to provide meaningful experiences and educational opportunities specific to the needs of Title I eligible students in ways that do not fragment their learning.

Title I Facilitators - (Teacher Trainer - Content Specialist) persons employed in the staff development program to facilitate the human development activities, staff development modules, and collaborative planning experiences to carry out the objectives of the program.

Observation Measures

1. Coefficient of observer agreement is a correlation between scores based on observations made by different observers at the same time. This indicates the objectivity of an

observational technique (Medley and Mitzel, 1963).

2. Reliability coefficient is the correlation between scores based on observations made by different observers at different times. This is a measure of the accuracy of the observations (Medley and Mitzel, 1963).
3. Stability coefficient is the correlation between scores based on observations made by the same observer at different times. This is a measure of the consistency of teacher behavior across visits (Medley and Mitzel, 1963).
4. Validity is the quality possessed by an instrument when it measures those behaviors it is designed to measure (Dunkin and Biddle, 1974).

Chapter 2

REVIEW OF THE LITERATURE

This chapter provides a setting for the modification of teaching-learning transactions by pointing out those factors influencing the change process of the teacher and how effects of this behavioral change can be perceived more objectively and accurately. This process can be teacher instigated, controlled, and operationalized. It is believed that teachers have the capacity to affect substantially the caliber of the local teaching-learning milieu as well as their own satisfaction as participants.

This study recognizes that the importance and indispensability of teachers and their influence in interpersonal transactions with students places immense responsibility and pressure upon the former. Power and importance do not exist apart from responsibility. Performance expectations tend to keep pace or to exceed both potential and ability.

Because much power and influence is attributed to teaching, expectations frequently exceed both teachers' potential and their ability; pressure to perform well is great. This pressure and the introjection of traditional role stereotypes by many teachers have led to teachers' failure to gain personal satisfaction from contacts with students.

Effective teaching is an interactive process. Teachers can manage it only as they are able to deal with their own cause and effect inputs and with their responses to the inputs of students.

Because teachers must deal with self first in order to function effectively with students, schools must be concerned with teacher satisfaction and psychological fulfillment on the basic sequence of priority. Children, of course, come first in schools in order of importance.

The topics provided in the review of literature were (a) humanistic approaches to change emphasizing anthropological, sociological, psychological influences on teacher behavior, (b) teacher education, stressing a systems approach for teacher training, (c) direct observation as a procedure for describing the teaching act in a quantitative manner, and (d) teacher effectiveness and its relationship to the teacher education curriculum.

BACKGROUND

The Milieu of Change

In the sense that tomorrow is bound to be different, everyone must contend with change; and in the sense that the rate of change is accelerating constantly more than ever before, teachers must deal with greater differences between yesterday and today. This dynamic change phenomenon is intensified by the risks inherent in leaving the future to uncontrolled chance. Such problems as pollution, ghettos, riots, and overpopulation heighten the dangers of inaction. The choice is not whether or not to accept change; it is whether or not to manage it (Bernard and Huckins, 1974).

Controlling the Future

During the past decade there has been an increasing realization by scholars in several disciplines that the welfare of mankind may depend upon the ability to apply planned controls to the future.

B. F. Skinner (1966), a psychologist, has urged that the behavior of individuals be subject to planned controls. He has contended that:

- (1) Enough is known so that behavior can be managed effectively for both the benefit of the person and society;
- (2) The need is pressing to influence human actions in order to control crime, war and mental illness; and
- (3) Behavior already is modified and influenced in a haphazard and unplanned manner.

Dobzhansky (1962), a biologist, has pointed out the dangers of leaving human evaluation to chance; and Dubois (1962), also a biologist, has advocated a normative planning which is ". . . not based on forecasts of a future that is inevitable; it is concerned rather with imagining a desirable state of affairs and with acting on present conditions so as to bring about desired changes."

In the socioeconomic area, Harrington (1965) has taken a similar position. He described our era as the "Accidental Century" and maintained that techniques which functioned well for handling production in an age of scarcity no longer are suitable in an era of abundance. At the same time consumers rather than producers have become essentials for the operation of the economic system. According to Holloman (1968), "The education of people . . . will have to do less with their ability

to create wealth than with their ability to use wealth which has already been created." Both Harrington (1965) and Holloman (1968) urge social planning or engineering in order to develop attitudes and controls more appropriate to this shift in the character of society.

Actually the choice of whether or not to attempt to engineer the future may already have been made by the need to survive. Boyer (1971) points out that "a society without control over change is a society with its future out of control." Boyer predicts catastrophe whenever accidental change is maximized, and/or whenever planned, intentional change is minimized. Boyer further believes that what is needed is not so much planning for the future, but planning of the future. Such planning should not assume that people must adjust to trends but should be based upon the idea of adjusting trends to people.

Difficulties of Change

Changes which affect the beliefs and attitudes of people is not easily legislated or imposed. On the contrary, pressure to change and to be different often carries the implication of inadequacy, unacceptability or culpability. This in turn generates feelings of being attacked and put down, which then create immobilizing defensive reactions. An outward compliance can be forced but the inward enthusiasm necessary to make new ideas work rarely is gained through administrative edict. Forced conformity, even if the idea is excellent, will

not produce the necessary supporting behavior and complementary ideas from participants.

Teachers and Change - Observing Change in Teachers

This study was designed to record the observable changes in effectiveness of elementary teachers as a result of their participation in the competency based teacher training program. This fact-finding study was done to establish an empirical base of teaching behaviors displayed by this group through direct observation before and after participation in a training program. It was believed that behaviors which these teachers exhibited would be significant indicators of their effectiveness which could be acquired through planned and controlled units of study. Change is inevitable. The choice is whether or not it will be planned and deliberately managed or left to occur haphazardly. Individuals who function as change agents initiate and influence change processes. They identify promising behavior possibilities and try them; and they conduct pragmatic tests to find out what works. Persons who are affected by change either resist the new or passively let it happen. Change directs them; they do not function to direct it; they react rather than enact. The unexpected or the unwanted is more apt to limit them than their more innovative and adaptable fellows.

Changing Teaching Methodology

The focus of this study is primarily upon training teachers to interact with youngsters and upon controlling those changes which teachers can effect through the management of their own attitudes and

behavior. Helping people to improve their skills is a more rewarding and lasting achievement than manipulating equipment, materials, or schedules. Brickell's (1961) assumption that the adoption of new techniques and modification of what is taught are dependent upon fundamental changes in people. Indeed, it well may be that educational personnel in general have been so concerned about the big instructional or organizational changes that they fail to see and to develop the simpler and often more important methodological changes. A small start which deals with attainable behaviors and manageable units for short periods of time may be the necessary prelude to successful innovation on a broader scope.

There are other advantages. Methodological change is a possibility for every teacher, teaching team, or other combinations of educational personnel. Change does not, for the most part, need to be sold to, or approved by, very many others; it is pertinent to particular problems and growth. Change can be carried on with a minimum of exterior direction and intervention. One can get right at it or stop it as he/she wishes and, as far as results are concerned, he/she needs to share widely only those aspects of change which are successful.

One disadvantage, of change includes placing at least a part of the responsibility for innovation and inservice growth with teachers rather than administrators. Manifestly, a part of the "why-don't-they", syndrome is lifted from administrators and a defeating rationalization is no longer available to teachers.

Teachers as Change Agents

Just as teachers should not plan educational experiences without considering the individuality and learning styles of each student, inservice experiences for teachers should not be conducted with little or no concern for the individual teacher (Snyder and Peterson, 1970). Observation and reaction by peers on the basis of each teacher's own classroom objectives and at each teacher's own request, may well constitute the most effective inservice learning experience.

In order to promote a receptivity to change (and this must become the essence of educating and learning), it is necessary for teachers to demonstrate an attitude relative to process type learning. If correct answers are more important to them than the process of gaining these answers, that is what they will teach. If teachers feel that learning is continuous, taking place in the school and in the classroom, then they will teach this to students. Teacher change is essential for, and must precede pupil change. Degrees and/or teacher certification no longer are indicators that one has learned; they are indicators that one is qualified to continue the process with pupils as emulators and fellow learners. In this sense, teachers must plan for their own learning if they are to stimulate and structure learning for others.

Tolerance for Change

The personal characteristics which enable a person to initiate and to participate in the process of change may also furnish a terminology for describing effective teachers. Good teaching depends upon

the ability to communicate and interact with other individuals (Combs, 1962; Adams and Biddle, 1970; Flanders, 1970). Therefore, it follows that there is much similarity between the good teachers and the mentally-healthy, socially-effective individual (Waetjen and Leeper, 1966).

Erikson (1968) described the ability to stay tentative and tolerate tension as an essential for psychological well-being in times of rapid change. Hamachek (1969) has maintained that the single most repeated adjective used to describe good teachers is "flexibility". Crutchfield (1963) under the broad topics of conflict, creativity, and conformity listed cognitive process deficiencies as one of the four personality factors identified with conformity proneness. He indicated that conformists show clear tendencies toward rigidity of thought and limited ability to perceive openly and realistically. Other characteristics associated with the tendency to conform and to discourage creativity, innovation, and change were (1) a generalized incapacity to cope effectively under stress coupled with a greater vulnerability to free floating anxiety; (2) feelings of personal inferiority and inadequacy along with intense preoccupation with others and the passivity, suggestibility, and dependence which go with their feelings; and (3) a common lack of openness and freedom in emotional expression plus a lack of spontaneity and a low tolerance for ambiguity. Manifestly, the assumption appears warranted that change and innovation involve the risk of being misunderstood, of being held blameworthy, and of being made a scapegoat. "In a successful oriented culture, this is especially hazardous.

Characteristics of Persons Who Change

People who initiate change appear to differ from those who do not in certain important ways. They are what Torrance and Ziller (1957) in their studies involving stress conditions and Air Force personnel have termed "high riskers".

The personality pattern of the high riskers is characterized by self confidence, physical and social adequacy, and self expression. Individuals most willing to take risks feel secure in their own resources and are little concerned that someone may not like them. Other identifying behaviors are a sense of adequacy, a feeling of power over their environment, greater social aggressiveness, and a history of being involved in on-going activities.

Depending on what he expects, one is not surprised to find points of similarity between the high risker as described above and the self-actualized person as characterized in Maslow's research (1954), between the creative individual as depicted by MacKinnon (1964) and Torrance (1965), and the good teacher as outlined by Combs (1965). These sources list or imply the common personality characteristics of:

- (1) flexibility or the ability to fit in and to adapt.
- (2) openness to experience without distortion or shutting out because of threat and defensiveness.
- (3) a feeling of being adequate, of being competent to function acceptably and effectively.
- (4) a sense of involvement and of being an important part

of what is happening.

- (5) an awareness of influencing and of making a difference, of being internally rather than externally controlled, of being more than a pawn, and of enacting rather than reacting.

Several points need to be emphasized in this respect. The first of these is that people learn to be what they are, i.e., human behaviors are acquired. If a person is fearful, rigid and inflexible, it is because he has learned to act in this manner. Second, anything that has been learned is subject to change; different behavior can be learned as a replacement. Individuals can adapt to or alter almost any situation in which they find themselves. Third, this change or learning can be self-initiated and self-directed at least to the point of recognizing a need and taking advantage of learning opportunities. Fourth, if the capacity for learning and change is not exercised, it will tend to atrophy like other human capacities. In a sense, one must use it or lose it. Fifth, learning, even for teachers, never becomes impossible. No one as long as he is alive and conscious, ever becomes completely unable to modify his behavior and to learn. He may use age or work load as reasons for not trying and as pretexts for maintaining a comfortable niche, but these should be recognized for what they are--rationalizations and excuses. Some modification is inevitable, even if it is merely to become more rigid or more flexible; and to become more locked in or to wear the rut a little deeper.

Consequences of Forced Change

People tend to look for permanence and the sure thing. Some of them find the unsettled situation uncomfortable and threatening. There appears to be some basis for believing that, although pressure up to a certain point is perceived as a challenge and operates to generate performance increases, problem solving, experimentation, and innovative behavior, pressure beyond the point where such coping and adaptive actions are no longer successful results in a return to early and overlearned behavior (Torrance, 1965). This is in accord with the Yerkes-Dodson Law (1967) which states that, while a small amount of pressure and anxiety is insufficient to improve performance, a moderate amount will improve it (Levitt, 1967). Any further increments are likely to be disruptive. In other words, pressure which causes real doubts concerning ability and shakes self-confidence tends to decrease the ability to try new ways of doing things. It limits flexibility and the capacity to induce and assimilate change.

The Continuum of Change

Individuals and institutions manifest vast differences in their abilities to initiate and adapt to change. These may range on a continuum from welcoming alternations indiscriminately just for the sake of change to regarding anything new as threatening as shown in Figure 1. While other positions, descriptions, and refinements are possible, continuum shown in Figure 1 was conceptualized by Bernard and Huckins (1974). If teachers are to continue growing, and to develop a capacity for change in students they teach, those characteristics in the middle ground of the Bernard-Huckins continuum should be central to inservice education of teachers.

Becomes indiscriminately involved in change for the sake of variety for kicks, and to avoid boredom

Innovates, conceptualizes, and initiates change. Influences others and furnishes leadership for new ways of behaving. The administrator-management role

Tolerates and goes along with change, which usually is imposed. A float-along and let it happen approach

Attacks "new fangled ideas," advocates return to "good ole days"

Superficial enthusiasm and bandwagon adoption of most new ideas as solutions

Carries out and makes new ideas work. Follows lead of innovator. The technician consultant-worker role

Uncomfortable with new ideas and methods, resists change automatically, and rationalizes not wanting to try anything different

Figure 1. A Continuum for Change

Teachers as Focal Point for Change

Thus, a basic assumption of this study is that changing the behavior of teachers must begin and end with the individual teacher. This assumption is rooted in humanistic psychology, with its recognition of contributions from other psychological orientations and its emphasis on the centrality of the individual which puts the teacher closer to a resolution of some of the many dilemmas of creative and innovative educational processes by stressing the person who receives this education. Furthermore, humanism reconciles such academic disciplines as anthropology, sociology, and psychiatry in acknowledging the individual as an active agent in learning and behavior.

Need for Modification in Teacher Learning Transaction

There is urgency in meeting the needs of increasingly diverse school children and in knowing how to deal with rapidly accelerating rates of knowledge, so that constant study, and modification, of teaching-learning transactions are merited. Student strikes, sit-ins, youth "demands", and questions of educational relevance suggest that many schools have not made enough of the needed changes in time. It has been said that one who had been absent from this world for fifty years, would, on returning, have difficulty recognizing a bank or a hotel but that he/she would quickly recognize a third grade classroom. Population growth, knowledge increase and changing social relations and demands are such that revolution in instruction is desirable. While many would disagree with the implications of such words as explosion, catastrophe, and failure, few would oppose the need for

continuous improvement of the school or of any other human institution.

Psychological Views Regarding Change - Humanism

There are several psychological views regarding how adjustments to the rapidly changing world should be made. In some the emphasis is on teaching and conditioning; with others, on learning and being. Humanistic psychology postulates and promotes a lively, selectively perceptive, unique person who reacts and proacts (Bonner, 1965). Humanistic psychology does not repudiate the concept of drive that pervades psychoanalysis but would add love, goal-seeking, and personal choice. The humanistic view does not ignore scientific approaches but its adherent does profess that science cannot separate physical causes from the active and sentient human being. Bonner uses the term "proactive psychological" to describe the projection and propulsion of psychological events into the future. This forward and future movement is made possible by the human's ability to choose, to dream, and to act now because of intangible stimuli. Man propels himself into the future by virtue of his aspirations.

Maslow (1968) also places the human in the leading role. Reinforcement and conditioned reflexes work, he says, but they cannot be separated from human personality. Associative learning is a valuable concept if one wants to learn about habits, but man's projection of himself into the future and his attempts at self-improvement, self-fulfillment, and self-actualization are the real concerns of psychology.

Weiner (1972) might be considered a humanistic psychologist for his "attribution theory". Briefly this means that one's future actions are determined and are at least partly predictable from attributions made by the perceiver. For example, a pupil possesses achievement motivation in terms of what he thinks of himself--having or not having ability, working hard or just drifting along, facing what he perceives is an easy or difficult task. As a humanist also, Weiner perceives motivation not simply in terms of regards or threats of punishments but in terms of what those rewards, threats, or punishments mean to individual humans.

Bruce (1966) explains the nonexclusive character of humanistic psychology by examining the history of psychologies. For sixty or seventy years each new psychology started as a rebellion against deterministic and analytic trends as represented by associationism and psychoanalysis. Humanistic psychology as represented by Maslow (1959), Combs (1962) and Rogers (1965) seeks to coalesce data into comprehensive theory including not only historical psychologies but also embracing contributions from sociology, anthropology and psychiatry. Adding man's social and cultural nature to his biological and instinctual equipment constitutes an appropriate concern for humanistic psychology, says Bruce (1966).

Humanism has a philosophical as well as a psychological aspect. As a philosophy it recognizes the uniqueness and individuality of persons. This implies that creativity, spontaneity and distinctiveness of life styles and learning styles must be a conscious part of teacher-

pupil transactions. Routine and mass approaches would be suspect. It implies that the child is no simple tabula rasa upon which stimuli write their irretrievable messages. Rather, the child elicits the kind of stimuli that are presented to him by adults, who in turn may be kind and accepting and harsh and punitive.

Humanism as a philosophy attributes to man the capability of creating a peaceful, salubrious climate in which the preciousness of human beings is recognized (Aiken, 1973), or of destroying himself and others with him. In contrast, humanism stresses happiness, freedom, and growth as man's highest goals. Hence population problems, ecology, and interpersonal relations are a part of the new curricula. Thus teacher-pupil transactions should be characterized by mutual respect and acceptance and recognition of pupil's needs for safety, identity, achievement, and differential treatment. Ego-demeaning, authoritarian practices have no place in a humanistic curriculum.

With such orientation, humanism is an approach to coalescing psychological knowledge and beliefs about the nature of humans as individuals. Now, the means by which various academic disciplines shape our emphasis.

How one views and uses psychology influences his teaching methods. This is recognized in virtually all states by requiring course work in educational psychology for teacher certification. The content of such courses can be shaped by many theories and points of view, but, fitting this scope of presentation, three orientations are considered. Behavioral, psychoanalytic, and humanistic psychology

have achieved some prominence in formulating classroom theory, in contrast to the intuitive, habitual, and traditional practices which are actually obtained.

Contiguity and reinforcement are concepts considered under the behavioral orientation and are illustrated by Thorndike's (1924, 1932) laws of learning:

Law of effect: A response that produces pleasant effects tends to be repeated and consolidated.

Law of exercise: The more frequently a stimulus-response bond is exercised the stronger the bond becomes.

Law of readiness: When a stimulus response bond is ready to act the effect is pleasurable.

Much of the psychology prevails in today's schools. Drill, recitation, review and reward find justification in the Thorndikian rationale. Feedback and reward recently have been given impetus by Skinners (1971) emphasis on positive feedback, as is noted in his enforcement of programmed learning.

Freud was not primarily interested in the psychology of learning in the classroom but some basic assumptions made by him are pertinent here. He emphasized that mental events are automatically regulated by the pleasure principle (Freud, 1920). He also noted that there is a tendency toward repetition compulsion, i.e. some things are repeated even though they do not yield pleasure. Thus overlearning makes an activity resistant to extinction. The idea that anxiety creates a drive has been used as a rationale for the threat of low grades or failure to pass. Teachers should remember that hostile impulses may be displaced

on innocent objects or persons, as when they find pupils acting very aggressively with classmates or themselves.

Humanistic psychology provides an interpretation of the asking-learning transactions that was previously implicitly recognized but not openly and consistently stated i.e., the teacher and the learner, as persons, takes precedence over the lesson plan, the hardware, or the software of education. Teachers must be good examples as learners and as persons.

Psychological Influences on Attitudes

At one time it was believed that, to understand the learning process, psychology was the most appropriate academic tool. Now it is apparent that learning is interdisciplinary and that sociology, biology and anthropology and chemistry also can make solid contributions to understanding how people learn. At the same time government, the community, and religion have considerable influence on attitudes towards educational institutions. All of these are determinants of the personality of the individuals and of his attitudes towards self and others.

The family has considerable influence on the pupil as a learner, as studies of motivation, social class, and family composition clearly reveal. One sociological study of the relationship of family to children's education (Brookover and Erickson, 1969, pp. 71) demonstrated parental influence on learning patterns and levels of aspiration. Related sociological studies have dealt with "father absence", particularly in terms of the personality and school performance of boys and girls (Biller and Bohn, 1971; Hetherington, 1973).

These and other studies by sociologists--studies of parents, siblings, peers, classroom groups, and home and community values and attitudes contribute more to the understanding about the teaching-learning process. Achievement orientation, peer affiliation, non-conformity, and autonomy are related to such things as identification with parents, peers and teachers standing at the blackboard.

Change - An Anthropological Approach

Anthropology is the study of the processes by which individuals learn and transmit the particular behaviors which are characteristic in their culture. Cultural anthropology, through analysis of social class structure, has made highly pertinent contributions to our knowledge of some of the major successes, defeats, and problems of education.

Twenty years ago, when cultural anthropologists began to publish their findings on American social structure, the idea of class was repudiated by typical citizens. Such differences which exist in income and status are attributed to brains, ambition, and developed skills. One can rise to the top if he just works hard enough and some just are born with more of what it takes.

Anthropologists have rendered that ideal untenable. Today it is recognized that educational opportunity, legal justice, job availability and access to medical services are unequally distributed. Teachers who once believed that pupils stayed in school, got good grades and conformed to expectations because they had brains and good dispositions, now will accept that: Being a dropout or finishing school is closely associated with social class (Binzen, 1973; Jencks, 1968);

School grades and assessment of intelligence are frequently based on class lines (Havighurst and Newgarten; McClelland, 1972);

The behaviors, ideals, and attitudes toward education which teachers find acceptable reflect middle-class values (Stalcup, 1968);

Teachers who are mostly middle-class or upper-lower class feel most comfortable and accepting and most readily identify with middle-class children (Stalcup, 1968);

Intelligence and achievement tests are devised by middle-class experts in terms of middle-class culture with the result that lower-class children compare unfavorably with those of the middle class (Kagan, 1972);

The temptation to regard those who are different as inferior, only in status but also in ability, is widespread, (Jensen, 1969, Shockley, 1972); and children from the lower class who have comparative deficiencies in verbal and conceptual functioning may come to be regarded as slow learners and negativistic toward structured learning (Bernard, 1973).

Teachers who appreciate that there is a vast difference between cultural deprivation or cultural handicap and cultural difference increase their own stature as accepting human beings and also increase their professional ability. Anthropology, thus underscores, for the humanistic psychologist, the centrality of the person.

It is herein postulated that humanistic psychology, with its recognition of contributions from other psychological orientations and its emphasis on the centrality of the individual, puts the teacher closer to a resolution of some of the many dilemmas of creative, in-

novative educational processes, by stressing the person who receives this education. Furthermore, humanism reconciles such academic disciplines as anthropology, sociology and psychiatry in acknowledging the individual as an active agent in learning and behavior.

Humanistic Implications for Change

The implication seems to be inescapable: Teachers teach not only by what they say but what they are and do. Pupils scale their aspirations and activities to the kinds of influence which teaching exert (Robinson, 1973). Kounin and Gump (1961) reported that primitive teachers, in contrast to nonprimitive teachers, had more pupils who manifested aggression, displayed misconduct in school and cared less about learning and school-related values. Leeper (1967) concluded that pupils learn school subjects more easily when teachers are courteous, friendly and respectful.

Rogers (1969) has asserted that teaching is a vastly over-rated function because the emphasis should be on the process of learning--if there is no learning there has been no teaching. The major contribution of Rogers, which actually summarizes the findings of many investigators is a summary of the characteristics of the teaching-learning transaction that maximizes learning. He emphasizes that:

Teachers must enter the teaching-learning relationship without fear, front or facade. They must be real persons by being their real selves.

Learning is facilitated when the pupil is prozes, is valued and respected by the teacher who can care without being possessive.

Empathetic understanding, an awareness of how the pupil feels about the situation, facilitates learning. Understanding is quite different from judging and evaluating.

Trust facilitates learning processes because it permits the three foregoing characteristics to emerge.

It consists of believing that the learner need not be crammed with information that is of the teacher's choosing but that the pupil has capacities for developing his own potential.

Rogers makes it clear that this type of teaching is not a one sided transaction. It has exciting implications for the personal growth of the teacher and for the enhancement of the joy of living and being for the teacher as a person. The teacher changes by developing the characteristics that are described above and that are essential to learning.

Altered Roles for Teachers and the Teaching Act

It would be an overstatement to claim that this constitutes a trend toward a new concept of teaching. There are educational leaders, or visionaries, and a few classroom teachers who see, as Rogers, a vastly altered role for teachers; but the change can be tersely stated: the responsibility for learning is shifted from the teacher to the pupil.

Goodlad (1967) says that there is no assurance that the revolution that is tearing at the edge of the education establishment will reach to the inner core. But he hopes that by 1980's schools will abandon the "telling" procedure which is so widely extant and shift to "discovery" and "inquiry" approaches.

Tyler (1967), in accord with Goodlad, does not recommend the elimination of subject matter but he emphasizes that the new task of

the schools and teachers is that of teaching pupils how to learn and developing in them the motivation and skills required to keep alive their learning processes after formal schooling is complete.

Miller (1967) reports a shift from regarding the student as a passive learner to making him an active participant in the learning process. The teacher then may find that once-over is enough, and gain greater satisfaction by giving the pupil an experience in independence and self-reliance.

Goldhammer (1967) perceives the well-prepared teacher as a director of a team who leads trained assistants in the coordination of teaching-learning activities. He will spend no more than half of his time in the classroom, using the rest for planning, developing materials and coordinating learning activities.

Lee (1966) believes that teaching roles are changing from the diversified to the specialized counselor, supervisor, social worker, and curriculum coordinators, and secondly,

. . . the teacher is moving away from the position of being exclusively or predominately a source of data and a dispenser of information

Third, and in line with the foregoing, the conception of the teacher's role grows less didactic and more tutorial; he becomes less the source than a resource for information, which is to say that he tends to stand increasingly as a mobilizer of materials for learning

It appears that the objective of teaching activities or teacher behaviors is to facilitate pupil learning that will contribute to the acquisition and development by the pupil of a repertoire of usable behavior in the form of skills, knowledge, understanding, procedures

and "sets (including work habits, behaving styles, attitudes, value judgment, and personal adjustment)." Further, the ultimate goal of teaching is to provide the individual taught with a behavior base that will help to maximize (a) his personal satisfaction and welfare, and (b) his social productivity, that is, contributions of goods, services and attitudes of value to society.

Categories of Teaching Behaviors

Ryans (1967) assumes at least five major categories of teacher behavior to be involved in attempting to achieve the objective just stated: (1) motivating and reinforcing behavior; (2) organizing, coordinating, managing behavior; (3) presenting, explaining, demonstrating behavior; (4) evaluating behavior; and (5) counseling and advising behavior.

By "motivating" or set-establishing "teacher behavior" Ryan means activities that are intended to maximize the degrees to which the learner is appropriately oriented and ready for the intended learning. The "organizing, coordinating, planning, managing teacher behavior" relates to the arranging, programming, and integrating of information and methods available to a teacher and to the direction and maintenance of control over the conditions of learning. By "presenting, explaining, demonstrating teacher behavior" is meant making available to the learner the information intended to be learned--information that is presumed to influence attainment of the educational objective for which the teaching situation is planned. "Evaluating teacher behavior" refers to the appraisal of (a) teaching behavior and (b) the effects of teaching behavior on pupil

behavior. It involves activities which provide one source of feedback to both teacher and pupil. By "counseling, advising, and guiding teacher behavior" is meant provision of information which helps the pupil or learner plan and organize his own behavior; its goal is to make the pupil aware of his needs and objectives and ways in which he may maximize his personal satisfactions and his social worth. These categories admittedly are arbitrary and overlap, but they provide one convenient way of breaking down the complex behavior called the teacher act.

Need for Increased Teacher Effectiveness

To make sense of the diverse inquiries undertaken in the name of teacher effectiveness we must make a distinction in purpose. The administrator is looking for knowledge of teacher effectiveness in order to make better decisions in situations such as hiring or firing a teacher. The instructional supervisor or teacher himself wants to know what instructional procedures are most likely to prove useful in achieving certain instructional ends with given students. The researcher's purposes include satisfying a desire to describe accurately what teachers do, searching for associations between theoretically or empirically derived variables and learning, and demonstrating the power of a given factor or instructional operation to make a practice difference upon the outcome sought.

Judging Teacher Competence

Although recognizing that the best criterion by which to judge teacher competence is a modification in the learner, many researchers

succumbed to the difficulties associated with assessing such results and have opted to use more readily available criteria. By studying certain procedures employed by teachers and then assuming that these processes are related to pupil growth, the investigator gets at a readily accessible process criterion and hopes it reflects an outcome criterion.

An illustration of a common weakness is research investigation using process criteria appears in the work of Sprinthall and Mosher (1966). In this study a relationship was directed between teacher's response on psychological tests of cognitive flexibility and teacher classroom behavior classified as cognitively feasible. Then, because cognitive flexibility was assumed to be related to teaching proficiency, it was concluded that effective teaching and cognitive flexibility are related.

Similar criticism of those who used only process criteria have been made by Saadeh (1970). In his carefully reasoned analysis of the works of Ryan (1960) and Smith (1961), Saadeh argues that a valid criterion of effectiveness in teaching must be based upon pupil outcomes not teaching process alone.

Observation Instrument for Measuring Teacher Effectiveness

A recent two-part anthology, Mirrors for Behaviors, features a collection of 79 observation instruments for classifying the relationship between teacher-pupil roles and the dynamics of instruction (Simon and Boyer, 1970). The compilers of the systems which appear in this collection were interested in instruments which revealed

a number of different teaching behaviors, on the premise that an increased number of teaching behaviors would make a wide variety of teaching strategies possible and hence more diverse pupil outcomes. Some ideas of the focus in existing systems is gained by noting that 62 of the instruments in Mirrors for Behaviors possess affective categories while only 48 have cognitive categories.

There are, however, voices of optimism regarding the role that observational tools can play in yielding knowledge about effective instruction. Flanders and Simon (1969) stated that progress in research of teacher effectiveness is being made and that it is no longer necessary to concur with earlier summarizers who concluded that no single, specific observable teacher act has yet been found whose frequency or present state of occurrence is invariable and significantly correlated with student achievement.

Similarly, Campbell and Barnes (1969) stated that "we now give a teacher something definite, both in the form of a diagnosis and subsequent prognosis to utilize in improving his/her teaching."

Experimental Classroom Studies

Gage (1969) attempted to establish scientific laws for teaching. He and his associates employed a strategy characterized by an analytical approach to the study of the teaching act--with opportunity for examining both very specific teaching practices and specific effects of these practices. Gage and his associates are making teaching skills the basis for research on teacher effects and are also showing how an investigator can control for the ability of pupils and

difficulty of topic, thereby attributing results to the differences among teachers.

There are fewer experimental studies within classrooms, even though the results of studies within classrooms should be of great importance to the individual teacher interested in knowing the power of certain instructional variables as applied to this particular situation. Two illustrations of within classroom studies are those of Dalis (1970) and Page (1958). The Dalis study involved a single teacher who arranged for his students to receive "secret messages" prior to the commencement of instruction. The study illustrates how a teacher can control for extraneous factors, even his own bias toward method and students, to produce reliable and valid evidence about the practical importance of a particular instructional technique. The Page study, which has been widely cited, remains an exemplar of a good experimental design for the conduct of within classroom studies involving a large number of teachers and subject matters, therefore producing conclusions about instructional practice that have wide generality.

The scarcity of experimental classroom studies in which variations in instructional procedures have been manipulated and effectively measured has been documented by Rosenshine and Furst (1971), who expressed the opinion that in order to furnish conclusions which can be applied to teacher education programs, experimental studies should have: (a) the teacher as the statistical unit of analysis, (b) random assignment of teacher to classes, and to treatment, (c) observational

data on the fidelity of teacher behavior to the treatment and (d) student performance assessed by a variety of end-of-course tests. In their extensive search of the literature Rosenshine and Furst found no more than ten studies which satisfies all criteria.

Humanistic psychology as represented in this section of related literature emphasizes the uniqueness and individuality of teachers as people. Substantial behavioral changes among the teachers can, however, be instigated and controlled through systematic designs. Related literature in the sections, teacher education and direct observations, comprised an attempt toward systematic designs in teacher training. The related literature section on teacher effectiveness will point up the weaknesses between research in teacher effectiveness and the teacher education efforts to date.

TEACHER EDUCATION

Teacher Education - A Systems Approach

The available research in teacher education appears to demonstrate:

1. A systems approach to teacher education, often called instructional design" substantially improves its effectiveness. There are numerous studies illustrating that this works equally well to induce desirable teaching behavior in cognitive and in affective respects. The research clustered around three special cases of this general model will be discussed: training teachers in interaction analysis, micro-teaching and behavior modification.

2. Teacher educators should practice what they preach.

When teachers are treated in the same way they are supposed to treat their pupils, they are more likely to adopt the desired style of teaching behavior.

3. Direct involvement in the role to be learned, or such close approximations as sensitivity training laboratories or classroom simulation laboratories produced the desired teaching behavior more effectively than remote or abstract experiences such as lectures or instructional theory.

4. Using any or all of the techniques just mentioned, it is possible to induce a more self-initiated, self-directed, effective pattern of learning not only in teachers but through them, in their pupils.

The virtues of the "systems" approach consist of a series of steps which recur in cyclical fashion:

1. Precise specification of the behavior which is the objective of the learning experience.

2. Carefully planned training procedures aimed explicitly at those objectives.

3. Measurement of the results of the training in terms of the behavioral objectives.

4. Feedback to the learner and the facilitator of the observed results.

5. Reentry into the training procedure (a trial-teaching experience).

6. Measurement, again, of the results following the repeated training.

Behavioral Change Through Training

There is a cluster of studies which test the effect of precisely stating teacher-behavior objectives and training student teachers to induce an initial learning set in high school students. As compared with a traditionally instructional control group, these teachers were judged by their pupils to be significantly more effective in their instruction. (Aubertine, 1965). When Peace Corps trainees were instructed to aim at specified behavioral objectives selected to be appropriate to their individual abilities and readiness, they induced significant gain in their pupils achievement (Booker, 1969). Brest and Butts (1969) used an instructionally designed program in "Science: A Process Approach." The teacher receiving this training significantly increased in their knowledge of the process of science. They also improved in their instructional decision making behavior by comparison with control samples who did not receive the instruction. In a workshop conducted by the Northwest Regional Educational Laboratory to improve "inquiry" teaching, the use of the instructional design in conducting the workshop led to highly significant gains directly in line with stated objectives (Butman, 1970). Greif (1961) found that specifying and emphasizing the desirability of fostering creative and critical thinking in educational methods courses and in student teaching produced highly significant gains in the students' ability to think creatively, to think critically and to implement such thinking in their pupils.

Kaya (1969) trained teachers to set sharply specified cognitive pupil behavior outcomes as objectives for themselves and to modify their own instructional techniques to achieve these objectives. The children in the experimental groups gained significantly more in cognitive skills than children in control classes over the period of the school year. Kaya underlined the important observation that such gain appeared to be contingent on the teacher practicing such instruction for a full year. No significant improvement was observed when the new technique was used by the teachers for only one unit.

In the affective realm, Hoover and Schutz (1968) made a systematic effort to alter the attitudes of education students by explicitly teaching them to recognize and evaluate their own value assumptions. From pre to posttest, ten concepts showed significant change: (1) dirty, lazy students (plus - plus meaning a change to a less negative or more positive attitude); (2) being proved wrong (plus); (3) Negro (plus); (4) lower-class values (plus); (5) middle-class values (minus - minus meaning a change to a less positive attitude); (6) conformity (minus); (7) fixed absolute facts (minus); (8) competition (minus); (9) keeping up with the Joneses (minus); (10) Marxism (plus). The shifts apparently were not from a middle-of-the-road position to a radically liberal position, but rather from a quite conservative initial position to a more moderate stand.

Burge (1967) studied the effects of a classroom student-teaching experience on the classroom behavior of teachers as measured by Flanders Interaction Analysis system. The student teachers were not instructed

to try to teach in the desired style represented by Flanders' system. The consequence was that they showed no change during their student teaching on any of Flanders' behavior dimensions. In short, there is a substantial amount of evidence which supports that specifying objectives and teaching to them are effective.

Effects in Performance Feedback as a Training Device

The next cluster of studies tests the proposition that feedback to teachers about their style of performance and about the effects on pupils will tend to increase their mastery on teaching skills. MacGraw (1966) found that feedback based on 35 mm time-lapse photography could be effective in changing the behavior of student teachers, in contrast to another group which did not receive such feedback. Heinrich and McKeegan (1969) compared the effects of immediate and delayed feedback in modifying student-teaching behavior. The experimental treatment was very immediate. It consisted of having a supervisor raise color-coded cards each time a student teacher showed a desirable or undesirable kind of teaching behavior. The control group received feedback by the supervisor after the classroom teaching session was completed. It was hypothesized that, in both groups, the discrepancy should be reduced between the teachers' beliefs about how they were acting and how they were observed to act. A greater reduction in discrepancy was expected for the immediate feedback group. The result verified both hypotheses. Isler (1969) using Withalls' Social - Emotional Climate Index tested the effects of feedback versus no feedback in two comparable groups of student teachers. The teachers

who received feedback became significantly more learner-centered than did the teachers in the group who received no feedback. Joyce (1967) likewise found that feedback could be effective; but he also found that supervisors need extensive training if they are to give effectively constructed feedback. James (1970) found that a combination of supervision with self-confrontation via video-taped feedback was significantly superior to traditional supervision alone in getting student teachers to move toward indirect teaching strategies.

Steinback and Butts (1968) studied the relationships of teaching practice with peers or with children, and the presence or absence of feedback about this teaching to the achievement of specific teaching competencies. There were several differences between students who taught children and those who taught peers, suggesting that at the elementary level, at least, some skills can only be learned by teaching children. With regard to feedback, students who received it were better able to gear the lesson to pupil need. They were also better able to use their plans so that their presentations were logical and coherent.

Several studies appear to say the same thing: solitary self-confrontation with feedback information is ineffectual, or much less effectual than when a second person participates in the feedback process. Fuller, Veldman and Richik (1966) found that listening to tape recordings alone did not reduce the discrepancies between student teachers self ratings and ratings by observers of their teaching performance. There was a significant reduction in these discrepancies

by instructor and peer commentary. In a similar vein Morse, Kysilka and Davis (1970) found that audio-tape feedback, with or without a listening guide, was not effective in improving the teaching competence of students unless the feedback included a personal conference with their instructor.

Tuckman, McCall and Hyman (1969) found that merely knowing the system of interaction analysis was not sufficient, to induce change in teachers' classroom behavior. Verbal feedback from another person had to be added to the self-observation before changes were achieved. They found too, that the more a teacher's self-perception disagreed with the facts about his actual teaching behavior, the more likely the teacher was to change his self perception to match the observed facts. Tuckman and Oliver (1968) found that feedback from pupils led to improved teaching behavior, whereas feedback from the student teachers' supervisor produced no additional effect when combined with pupil feedback, and actually had a negative effect when used alone.

All in all, the research evidence looks quite consistent in confirming the utility of giving teachers objective feedback about specific aspects of their teaching behavior. Furthermore, the available evidence all indicates that teachers use such feedback to make instructive changes in their teaching style only if another person participates in the feedback session. Apparently, simply looking at one's own performance does not lend to much new insight into what one is doing, or else it does not provide adequate motivation to alter that pattern. The presence of another human being adds a potent factor which does in-

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duce positive change (when that influence is beneficially exercised).

Interaction Analysis as a Training Device

Flander's Interaction system is a concise set of dimensions for describing the way a teacher interacts with his class. The dimensions contain a strong emphasis on affective elements of the classroom atmosphere, although cognitive issues were also represented. When used as a training device to give feedback to teachers about their observable patterns of action, the system has a very explicit set of objectives. Its intent is to get teachers to maximize the frequency with which they foster more self starting self-directed, actively inquiring patterns of learning behavior in their pupils. The system is used to help teachers to achieve this objective by adopting more "indirect" methods of reacting to pupils: more questioning and less lecturing; more positive reinforcement for pupils' responses rather than critical or negative comments.

Amidon (1970) studied the effects of interaction analysis training on student teachers but also studied the effects on student teacher behavior of training the cooperating teachers in the system. Those student teachers who were taught interaction analysis were significantly more indirect at the end of their student teaching experience on nearly all of the 20 indices used than were student teachers who were not taught the system. Similarly Bondi (1970) found that student teachers who had received instruction in interaction analysis prior to student teaching were significantly more indirect in their behavior than students who had not received the training earlier in their training.

Kirk (1967) studied student teachers in the elementary grades and concluded that interaction analysis training led to a more relaxed conversational teaching style. The student teachers who were trained in this method were more indirect and were more aware of what they did in the classroom.

In a study of 18 trained and untrained experienced secondary teachers, Parrish (1969) found that the interaction-trained teachers were more indirect, more acceptant of student feelings, more given to praise, made use of pupil ideas and were less critical of these ideas. Simon (1967) found that student teachers training in interaction analysis used more praise, less criticism, and used more extended indirect influence than student teachers who were trained in learning theory but not interaction analysis.

Another set of studies takes up the effects of combining interaction analysis with other training procedures, or consider the interacting effects of teacher characteristics with the training treatment. Flanders (1963) conducted a nine week training course for fifty-one experienced teachers, designed to compare the effects of using a direct (lecture) method of instruction and an indirect method of instruction. In both cases the content of the course was instruction in interaction analysis. Observations of teaching taken prior to the course were used to identify the teachers as either direct or indirect in their overall teaching pattern. Teachers initially classified as indirect became significantly more indirect when taught by the indirect method than when taught by the lecture method. This was the

only significant difference between the two methods of teacher training. Flanders concluded that the final position of the teachers in terms of their average indirect-direct ratio "seems to be directly associated with their initial style of teaching than with the style of inservice training."

In three other studies (Hough and Amidon, 1967; Hough and Ober, 1966; Lohman, Ober and Hough, 1967) training in interaction analysis was combined with a relatively personalized examination of these students' experiences in teaching. By comparison with a group of students taking a traditional, methods-oriented perogram, these students were found to be more empathetic with students, more objective in using data about students, and more experimental in their use of methodology.

Micro-Teaching

Micro-teaching is a combination of a conceptual system for identifying precisely specified teaching skills with the use of videotaped feedback to facilitate growth in these teaching skills. It was developed in the early 1960's by Allen and others at Stanford.

At Stanford and more recently at the Far West Regional Laboratory, micro-teaching has generated a more persistent, cumulative body of research than is available in most other systems. Allen and Fortune (1967) analyzed the results of the Stanford micro-teaching clinics in 1963 and 1964. They found that students trained in this way for an eight-week period, spending less than ten hours a week at it, performed at a higher level of teaching competence than a comparable group of student teachers who spend 20 to 25 hours a week receiving

traditional instruction with an associated experiences as teacher aides. Further, they found that performance in the micro-teaching situation significantly predicted subsequent practice teaching guides. Interns trained through micro-teaching showed improvement in six specific skills of teaching.

Davis and Smoot (1969) found that eighty-five students going through a micro-teaching laboratory as compared with a control group of fifty-five, showed significantly more desirable patterns of teaching behavior. They used more divergent questions, did more probing, less information giving, and elicited more pupil questions and statements. They were supportive, more clarifying, less procedural and less non-substantive in their remarks.

Limbocher (1969) found that pupils of student teachers who had earlier participated in micro-teaching experiences and their student teachers scored significantly higher than did pupils of student teachers who had not had micro-teaching. At the same time, however, the cooperating teachers reported no significant difference between the two sets of students in their "readiness to assume full responsibility for a class." Further, contrary to expectation, the college group turned out to be more indirect than the experimental group in their teaching behavior.

Kallenbach and Gall (1969) replicated Allen and Fortune's earlier study to determine the effectiveness of micro-teaching with elementary interns. Contrary to previous findings, micro-teaching was not found to result in significantly higher ratings of teacher effectiveness, either immediately or after training, as compared with ratings of interns who did not have micro-teaching. They concluded, nonetheless that

micro-teaching is an effective training strategy since it achieves similar results when compared with conventional training methods at one-fifth the cost in time and with fewer administrative problems.

Emmer, Good and Oakland (1970) found that a teacher's preference for a particular teaching style can be significantly influenced by the kind of feedback the teacher expects to receive. When the student teachers in this study expected to receive feedback based on the appropriateness of their behavior for the style they chose to practice, they tended to abandon the discovery style of teaching and shift their preferences toward an expository style. Eighty-eight students took part in a series of micro-teaching experiences. Focus feedback conditions were arranged: (1) feedback concerning the extent to which the student teacher's behavior matched the style he chose to practice, (2) feedback about the extent to which students learned about micro-teaching lesson; (3) feedback focused on the students' interests and motivation in a lesson; and (4) no feedback at all. Students were assigned to one of the four kinds of treatment. Only those who were informed that their feedback would be of the first type made any significant change in their preference for teaching style. Apparently, they graduated toward the style which they thought they "understood better" than another style.

Training Teachers in Behavior Modification Techniques

Still another relatively recent instructional technique which stresses careful specifying of behavioral objectives, reinforcement of desirable behaviors, and rigid feedback of the effects of such reinforcements is

the system called behavior modification.

Patterson (1971) summarizes the research, finding numerous studies which have trained teachers to use the behavioral modification procedures in order to alter the classroom behavior of children.

A good many studies appear to indicate that it is possible to train teachers to use positive social reinforcers to alter the behavior of children. The problem is, how is the behavior of the teacher to be maintained over the lengthy period of time it takes to establish lasting changes in child behavior? Research by Brown, Montgomery, and Barclay (1969) suggests that unless a great deal of reinforcement is supplied to the teacher, the teacher may not maintain the desired behavior modification strategy with the child.

The whole pattern of Skinnerian reinforcement which stresses positive rewards for desirable behavior but steadily ignores all other behaviors, flies in the face of traditional "common sense". Just this one element alone, might be sufficient to account for a great deal of the difficulty in getting adults to deal with children by using predominantly positive reinforcement. Proposing this new approach may create a good deal of anxiety in a conscientious adult, thereby interfering with its adoption and maintenance.

Patterson remarks that alterations in child behavior are simply not all that reinforcing for the teachers, even when the new strategy is successful, and that many teachers probably will not maintain the strategy after the termination of training. Patterson makes a highly valid point when he notes that the problem of effec-

tive reinforcers for teachers has gone almost totally unconsidered and that it is a crucial problem in designing programs of this kind that will actually work and keep on working.

DIRECT OBSERVATION

The Use of Direct Observation

The research on teaching in the natural setting to date has tended to be chaotic, unorganized and self-serving. The purpose of this segment is to ease into the maze of instrumentation and research which has focused on teaching in natural and semi natural settings. A model for assessing the state of the art as well as some examples of paradigm research will be offered, and an attempt to clarify and classify the existing knowledge. The paradigm contains at least three elements:

1. development procedures for describing teaching in a quantitative manner;
2. correlation studies in which the descriptive variables are related to measures of student growth;
3. experimental studies in which the significant variables obtained in the correlational studies are tested in a more controlled situation.

The context within which this stepwise research takes place can vary, and different context have been proposed for this descriptive-correlational-experimental loop. These two are tentatively labeled classroom-focused research and curriculum-materials research.

Classroom-Focused-Research

One of the clearest explications of classroom-focused research using the descriptive correlational-experimental model is a description of the activities which have taken place in the Canterbury (New Zealand) Teaching Research Project (Nuthall, 1971). Nuthall described a four-stage cycle. In the first stage the investigators develop ways to categorize classroom interaction. In the second stage correlational studies are conducted to determine which kinds of behaviors are worth pursuing further and which behaviors are probably irrelevant. In the third stage the correlational results are tested in experimental studies to determine the effects which specific manipulations have on both subsequent classroom interactions. In these experimental studies instructional behavior research takes place in the regular classroom.

Nuthall proposed that the results of the correlational experimental studies be used to suggest and modify further descriptive, correlational and experimental studies in which new variables are observed in new ways in natural settings. "This theory becomes embodied in the descriptive system so that the variables which have proved significant in the correlational and experimental studies can be identified by any user of a descriptive system"(Nuthall, 1971).

The descriptive system used at Canterbury was developed from the work of Smith and Meux (1970), Kliebard, Hyman, Belback, and Smith (1966), and from the descriptive research conducted in New Zealand (Nuthall and Lawrence, 1965). This was followed by a correlational study (Wright and Nuthall, 1970) conducted in existing classes of eight-year-old children in which the instructors were both regularly

assigned teachers and student teachers. The results of this correlational study and results of previous descriptive studies were used to design two sets of experimental studies.

The first set of experimental studies (Hughes, 1971) focused upon the control of student participation. The studies were conducted for two purposes: (1) to replicate experimentally the findings by Wright and Nuthall of a significant relationship between student achievement and the procedures in which a teacher follows a student's answer by redirecting the question to another student for comment and (2) to expand upon the findings by introducing other participation variables presumably related to achievement.

The experimental studies by Church (1971) involved more complex variations than those of Hughes but illustrates one technique for controlling these variations within a classroom setting. In these studies the lessons were on the topic of electricity and the model set of lessons against which variations were compared consisted of three 50 minute lessons containing 253 episodes (an episode being a content oriented teacher question and all the verbal moves of teacher and student which are associated directly with that question).

The uniqueness of these experimental studies (Church, 1971; Hughes, 1971) is that in each study the experimenters taught almost identical lessons to existing classes, modifying the lesson only to introduce the experimental variations and monitoring the tape recording of the lesson to insure high implementation of the treatment and fidelity to the content. The lessons took place in classroom

settings and involved regular instructional material, with the experimental variables being the controlled change in teacher-student interaction. Thus, while these research settings approached the degree of control usually associated with laboratory studies, they appear to have much more generalizability for classroom instruction.

Other examples of research which proceed from descriptive to correlational to experimental studies are difficult to find. The best example is the work of Flanders. His observational system was developed and refined about 1957 which was followed by an experimental study (Amidon and Flanders, 1961). Even the work of Flanders did not loopback, and there is no clear evidence of the results of his correlational studies being used to modify the observational system (Flanders, 1969) or to lead to new experimental studies.

The Curriculum Materials Approach

Rosenshine (1971a) suggested that settings in which special curriculum programs are being used represent an area for descriptive, correlational and experimental research. Curriculum models can refer to a set of instructional materials and instructions for their use which are "packaged" for dissemination (such as the Biological Sciences Curriculum Study BCCS Programs) as to specific instructional procedures (such as the Bank Street Program, Bissell, 1971).

The curriculum-materials packaged developed about 1910 by Montessori (Evans, 1971) is a superb example. The Montessori method includes specific self-correlational material, and specific instructions for teacher interactions with the child. The instructional

materials, sequencing, provisions for corrective feedback, and specific and general instructions to teachers contained in the Montessori materials are quite different from the usual practice of providing a teacher with only a set of books, a syllabus and vague objectives. The major advantage of the Montessori program or any other curriculum-material package is that it may enable a teacher to accomplish ends which would not be accompanied without these materials.

The research loop which Rosenshine endorsed consisted of (a) training teachers to use a certain package of materials, (b) using observational systems to describe instructional activities on variables considered important for the implementation of the specific program and also on variables considered to have general educational importance, (c) studying the relationship between instructional activities and student growth within those groups of teachers who are supposed to be using the experimental treatment, (d) changing training procedures and/or materials on the basis of these studies, and (e) conducting new studies to determine the effects of the modifications and to determine the new relationship between instructional activities and student growth.

The advantage claimed for this approach is that curriculum-material packages represent potential experimental treatments and also provide a teacher with means to accomplish more than we would without the materials. Whether these materials and instructions are suitable, whether they are used properly, and whether the outcomes

are the ones which are expected are the research questions.

Instruments for the Observation of Teaching

Classroom observational instrument exist in abundance. More than one hundred category systems and sign systems can be identified easily. The anthology "Mirrors for Behavior" (Simon and Boyer, 1967, 1970a, 1970b) contains 92 observational systems. Of these 76 have been used for observation of instruction in schools or school like settings. A diligent search for the experimental, teacher training and correlational studies which uses frequency counts to assess the behavior of teachers and or students would yield considerably more systems.

Although no known anthology of training forms for observing teacher exists, a conservative estimate of the number of rating instruments would be in the hundreds. As part of the survey conducted in 1966, the American Council on Education obtained 133 rating forms used by students to evaluate college courses and instructors (Kent, 1966). The safest generalization Kent could make about these instruments was that they are diverse. To these rating forms can be added the instruments used to assess student-teaching activities in laboratories and classrooms and instruction by regular teachers in public schools. One can also add the rating forms used in research studies of student growth and those used to describe learning environments or to monitor specific programs or research projects. Thus the number of category systems is much smaller than the number of rating forms which have been developed and used for the same purposes.

Classification of Purposes and Uses of Observational Systems

Another way of viewing observational systems is to classify them according to the author's dominant purpose in developing them. Four classifications were developed to summarize the purpose of the authors of the instruments in Mirrors. These four purposes are:

1. To describe current classroom practice
2. To train teachers
3. To monitor instructional systems
4. To investigate relationships between classroom activities and student growth

Since the focus of this study is the training of teachers, only this classification will be discussed in detail.

At least 10 category systems in Mirrors appear to have been developed primarily for teacher training. In teacher training situations category systems are used in one or more of three ways: (1) to improve a teacher with feedback on his behavior, (2) to give a teacher a set of procedures by which to categorize instructional activities, and (3) to provide a teacher with behaviors and activities which he can model during instruction. A clear example of a category system planned for teacher training is the system developed by Amidon (#1). In the introduction to this system Amidon wrote:

In the four years that Interaction Analysis has been used with student teachers at Temple, the work of Hughes, Taba, and Gallacher and Aschner, among others has been introduced as well, and in this paper some aspects of these systems which have been found useful will be added to Interaction Analysis in an attempt to combine into one category system the items found particularly helpful in the training of student teachers (Simon and Boyer, 1967).

In the same view, when Hunter (1970) discussed the four modifications of the Interaction Analysis system which she helped make, most of the reasons for the modifications focused on teacher training. For example, one revision was made because "it became clear to me that certain additional categories would be useful for practicing teacher talk" (Hunter, 1970) and another revision was made to include two categories on student behavior while working with science materials "because there has been considerable stress in the training session for upon permitting children to explore materials and to talk with each other while doing so"(Hunter, 1970). In general the instruments developed primarily for teacher training have tended to be simpler than the ones developed for the description of teaching.

Several authors have attempted to develop systems which the teachers could use to monitor their behavior without depending on outside observers. The clearest example of a self-monitoring system is the one developed by the Cooperative Educational Research Laboratory, Inc., (#40) which offers the teacher simple and efficient method for recording and classifying verbal statements made in a classroom. Self-feedback also appears to be the major purpose of the systems developed by Amidon and Amidon (1969), and Ober (#61 and Roberson (#67).

It is within teacher training that the distinction between the author's stated purpose and the actual use becomes most blurred. Several systems were classified as developed to describe classroom practice

because the authors said it was their primary aim. However, in many cases the authors may have to describe teaching or to provide feedback to teachers, so these systems could have been classified under teacher training. The systems developed by Hough, (#9) Simon and Agazatian, (#18) Galloway, (#44) McDonald and Zaret (#54), Wragg (#79), and Heyer (#84) could have been classified as instruments for either teacher feedback or description and those whose purpose was teacher training is not clear because any system could be used to provide feedback to teachers.

Several writers have suggested that teachers use classroom observational systems to study their own behavior. Simon and Boyer expressed the opinion of many when they wrote:

These instruments contain a wide variety of categories which are descriptors of behavior that can be used as prescriptions for skills to be acquired by people to help them become what they want to be. And this, for us, is their greatest fascination. . . (Simon and Boyer, 1970a).

Flanders (1970) presented a variation of this idea when he suggested that the inquiry behaviors of a teacher include five steps (1) specifying the pupil behavior desired in class, (2) identifying the pattern of teaching behavior considered likely to fit such pupil behavior, (3) practicing the teacher behavior patterns, (4) designing a way to test the relationships between targeted pupil behavior and designated teacher behavior, and (5) carrying out the plan in the classroom and testing the results. The suggestion that teachers should study their behavior, that they need terms to describe their behavior, and that teachers, should attempt to obtain certain patterns

of instructional activities seem reasonable. However, if teachers "become what they want to be", or if they exhibit the desired patterns, will student learning automatically be increased?

In the last chapter of this book, Flanders suggested some limitations to his inquiry approach. He stated that there probably is a point at which higher levels of teacher responsiveness begin to erode the efficient learning of problem-solving skills and principles. A different point may exist for other measures of pupil growth such as positive attitudes, creativity, memory tasks, and other kinds of educational outcomes (Flanders, 1970).

Flanders elaborated this point with the suggestion that the use of simple bivariate relational procedures may grossly underestimate the complexity of valid functional relationships, which may be nonlinear depending upon the sample and the range of teacher behavior available in the sample. Furthermore, he argued that if there were a relatively narrow but high level of indirectness in some classrooms the relationship between indirectness and student growth might be positive for some outcomes, negative for others. This possibility has been demonstrated in one study (Soar, 1968) and strongly suggested in another study (Sprague, 1970). Although few studies exist on this question, there is the possibility that if a teacher moves to a higher level of indirectness, the behavior will enhance growth on some measures and depress student growth on others.

Although arguments exist for the importance of a teacher choosing his own classroom transaction, there is a lack of data on

the relationship between these desired transactions and transfer variables such as measures of student growth. In addition, it is possible that some modifications of teacher behavior may be negatively correlated with some outcome measures.

What then is the value of teachers studying their own behavior? It is the position of the author that such training will not be productive unless transfer outcome measures such as reading comprehension, creativity, problem-solving skill and student attitudes toward learning are included in the research.

TEACHER EFFECTIVENESS

Technical Difficulties in Teacher Effectiveness Research

According to Donald Medley, Chairman and Professor of the School of Education, University of Virginia, efforts to develop performance based programs both for educating and certifying teachers have made it painfully clear just how inadequate the base is for what we know today about the dynamics of teacher effectiveness. The efforts have also demonstrated how weak the connection is between research in teacher effectiveness and the teacher education curriculum.

There seem to be two major reasons why this is so. One has to do with the quality and quantity of research findings to date; the other has to do with access to these findings.

First, research in teacher effectiveness is much more difficult and expensive to do well than research in most other aspects of the educational process. Technical difficulties are formidable and,

until recently, were not even suspected by most researchers in the area. For this reason, many of the findings were inaccurate, and therefore, inconsistent with each other.

Recent research has been better designed and better supported; it has also greatly increased both the sheer amount of results reported in the literature and the difficulty of access by anyone unable or unwilling to work full-time on the problem.

Second, whenever teacher educators attempt to sift these findings they find the task so difficult and time consuming that they can scarcely be blamed if they abandon it. The literature of the subject is vast and inaccessible and much of it is difficult to comprehend and evaluate.

Although research on teaching is quite new, research on teacher effectiveness has been conducted for many years in this country and elsewhere. So popular has been this research field that more than 10,000 have appeared for it. In general, this research has provoked poor reviews. As the committee on criteria for Teacher Effectiveness in the American Educational Research Association (1953) commented:

The simple fact of the matter is that, after 40 years of research on teacher effectiveness during which a vast number of studies has been carried out, one can point to few outcomes that a superintendent of schools can safely employ in hiring a teacher or granting him tenure, that an agency can employ in certifying teachers, or that a teacher education faculty can employ in planning or improving teacher education programs.

Several reasons have been offered by critics for the failure of this early research effort. These include (1) failure to observe teaching activities; (2) theoretical impoverishment; (3) use of in-

adequate criteria of effectiveness; and (4) lack of concern for contextual effects.

Failure to Observe Teaching Activities

Perhaps the most significant shortcoming of these early studies is that they assiduously avoided looking at the actual processes of teaching in the classroom. In the typical study some "causative" factor, for example, classroom size, a curriculum innovation, or a new teaching "method" was studied against some criterion of teacher effectiveness, for example, a rating given to teacher subjects by school principals, without any attempt to assess what was actually going on in the classroom. As was suggested by Gage (1963) such approaches treated the classroom as a "black box" into which were fed teachers, pupils, hardware and software and out of which came various results and more or less pupil learning. The crucial events within the classroom, the point at which teachers, pupils, tasks and equipment come together and at which results must be determined, was ignored, if not denied. If teachers do vary in their effectiveness, then it must be because they vary in the behaviors they exhibit in the classroom.

Theoretical Impoverishment

Many early studies were also of the "shotgun" variety, in which teachers' scores on a battery of tests which happened to be available were correlated with teacher effectiveness. In most cases little or no rationale was provided for the inclusion of an item in the test battery, and in many cases there seemed to be no justification for even suspecting a relation between a particular item and teacher effectiveness.

These studies have approached nearly all conceivable teacher characteristics and have been examined for their relationship to effectiveness.

These studies have yielded no better than chance relations between test scores and effective criteria. In the main they were stimulated by the desire to provide objective bases for selection, training, employment and promotion of teachers. By the same token they offered minimal scope for understanding teacher effectiveness. Even had they succeeded in identifying reliable predictors, they could not have provided teacher-education programs with guidance regarding the type of experiences desirable for student teachers. In general, they told teacher educators no more than that performance on college examinations and practice teaching are apparently unrelated to subsequent teaching effectiveness.

Inadequate Criteria of Effectiveness

Raters in the early approaches to research on teacher effectiveness misused methods. Raters were either asked to rank teachers in order of their teaching "effectiveness" with no definition offered for the concept, or they were expected to differentiate among the teachers on the basis of the learnings of their pupils, or they were asked to scale teachers on qualities such as "enthusiasm" and "confidence" which were presumed to relate to pupil learnings. In the first case the raters themselves were given the very difficult problem of establishing what constitutes teacher "effectiveness". In the second case the raters were asked to display knowledge which

they did not possess. In the third case little evidence was offered suggesting that the qualities concerned were aspects of effective teaching.

Lack of Concern for Contexture Effects

Most of the earlier studies also sought universal qualities of effective teachers. It was assumed that teachers who are warm, intelligent, well organized, responsive or good disciplinarians would be more "effective" as teachers than persons who possess these characteristics to a lesser extent. Such statements sound reasonable on first reading, yet they hold for all types of subject matter, for both first and twelfth grade pupils, or for both inner city and suburban schools? Thus, what makes for effective teaching probably varies from context to context. Most early studies ignore context and lumped together all teachers of a given school or school system for purposes of analysis.

It is possible that some qualities may make for effectiveness of teaching regardless of context. But others will be context related. And if we are to evaluate the effectiveness of teachers, train teachers for their specific jobs, or assign teachers to schools and curricula where they will be most effective, it would be wise to take contextual information into account.

The Current Scene

Much of the research on teacher effectiveness took place prior to 1950. To determine whether the succeeding twenty years came closer to providing useful information concerning teaching and the effectiveness of teachers, the following studies are cited:

David May and Joseph Riley (1977) focused on the complex interaction between teacher behavior and learner outcomes and the search for associational casual relationship between them. Both the results from research conducted in this area and the methodology used to conduct the studies were examined. Answers to the following questions are reported. What links between teacher behavior and learner outcomes have been identified? Which of these links have been validated as to their efficacy in realizing instructional ends? What research methodology has been used and how effective has it been? A critical evaluation is included that looks at the generalizability of results to other populations and environments, as well as to an assessment of future research needs and possibilities in further establishing links between teacher behavior and learner outcomes.

Armento (1977) describes the construction and implication of selected high inference measures applied in a study of teacher effectiveness in the third, fourth and fifth grades. Selected independent variables served as hypotheses regarding which behaviors are likely to occur during concept instruction and which are likely to be relevant to student concept learning. Two basic assumptions guided the selection of relevant behaviors: (1) Teacher behavior should be examined in terms of intent. Intent may be derived from instructional objectives. (2) Relevant process variables should be derived from existing theoretical or empirical bases that provide support for expecting certain relationships between instructional behavior and student outcomes. For this investigation, a record of classroom communication between teacher

and students was made on audio-tape recordings. Analysis of classroom interaction between teacher and pupils included evaluation of how accurate and complete was the teacher's knowledge of the subject and how effective was the teacher in conveying concepts to the pupils. Teaching techniques were analyzed in the light of resulting student understanding and achievement.

Siegel (1976) illustrates that measures of the effectiveness of teachers' implementation of a program can be derived from the instructions given to a teacher on how to use the curriculum, that such measures can be used to improve the effectiveness of teacher training and that better teacher training can be shown to lead to better learning on the part of students. By studying the relationships between behavior of teachers within curriculum programs and student outcomes, curriculum developers, publishers and school personnel can have a significant impact on the development and assessment of teacher education programs and on modification of the curriculum materials themselves.

Based on initial planning by the California Commission for Teacher Preparation and Licensing and extensive discussions by teachers, teacher education, researchers and representatives of educational organizations in California, National Education Program Associates developed a design for the second phase of a multi-year research effort, the Beginning Teacher Evaluation Study. The research design involves the collection of pre-test and post-test data on student achievement in reading and mathematics from a sample of students in grades two and five in California public schools. In addition, data was collected about teacher and student background and characteristics, school and

district characteristics, and the teaching behaviors of the teachers within the sample. The analysis of data focuses on the identification of teacher behaviors which contribute to student academic performance. Additional goals of the data analysis include the determination of the influences of various background characteristics upon teacher behavior and upon student achievement.

In addition to data on teacher performance and student learning, the Beginning Teacher Evaluation Study, Phase II collected data on the aptitudes, attitudes, knowledges and personal characteristics of ninety-five second and fifth grade teachers and their students. This permitted the investigation of the relation of cognitive style to a number of variables relevant to how teachers teach and students learn. Results indicated that for teachers cognitive style was significantly related to aptitude, satisfaction and certain performances for specific subject matter and grade levels. It was not consistently related to those teaching performances which predicted student learning.

The Beginning Teacher Evaluation Study - Phase II was a research project on effective teaching behavior--what teachers do that significantly affects what and how pupils learn. The purposes of Phase II were to (1) develop an assessment system for measuring teacher and student behaviors and other factors which could influence each of them and their interrelationships and (2) generate hypothesis about the interrelations among teachers and pupil behaviors and related factors. Results indicate a significant and

consistent effort of teaching performances on student learning.

Significant relations were found in the study between how teachers teach and how much children learn in reading and mathematics. The general picture which emerged from the data had two features; first, a pattern of teaching practices is more likely to be related to learning than a single practice and, second, effective teaching patterns will differ by subject matter and by grade level. The conclusion implies that the goals of training teachers in the primary grades and the intermediate grades and for different subject areas will be necessarily different. Perhaps the most important general conclusion from the study is that teachers do make a difference in how well their pupils learn. In this as in other studies the skills a pupil brought to the classroom were a large determinant of how much he learned. But when the entry-level skills of pupils were "accounted for" statistically, the remaining differences in pupil learning were almost all accounted for by differences among teachers in how they taught.

Creemers (1976) identified two components of teaching as task-setting behavior and optimizing behavior. The former is the action of the teacher to achieve the goals of teaching a specific curriculum; the latter is the action of the teacher to improve or accelerate the pupils learning. The results of the investigation showed that a significant relationship exists between certain behaviors and student achievement which does appear to be different among groups of pupils with different entering behavior.

Pohlman (1976) studied the relationship between student perception of teacher behaviors and change in students' attitudes toward a course in pre-service teacher education. The course selected was "School and Society", a required course in educational foundations. Subjects included 87 students enrolled in eight sections taught by six instructors. A common syllabus and set of objectives were used by all sections. The individual student was selected as the statistical unit. The criterion variable was of student attitude change which was obtained by covarying pretest from posttest scores on a semantic differential attitude scale. Teacher behaviors were rated by students at the end of the course and correlated with student change in aptitude toward the course. Three teacher behavior dimensions (1) clarity, (2) enthusiasm, and (3) indirectness were represented by items on the teacher behavior instrument. Of these, clarity had the highest percentage of items correlating significantly with the criterion.

A status report on the study of teacher effectiveness (Berliner, 1975) discusses the fact that many educators are committed to competency based teacher education and teacher accountability systems in spite of the lack of empirical evidence linking teacher behavior to student outcomes in the classroom. Some of the difficulties associated with research in this area are identified as problems in instrumentation, methodology, and statistics. Specific problem areas include the inadequacy of standardized tests, the unknown predictive ability of tests from special teaching units, the problem of building multivariate outcome measures, the problem of

measuring the appropriateness of teacher behavior, the lack of experience in choosing an appropriate unit of analysis for teacher behaviors, and the lack of stability of many teacher behaviors.

In the current controversy over accountability in education, educators concerned with the affective aspects of education seem to be in danger of losing the battle of "behavioral objectives" on two fronts: (1) demonstrating that the affective behavior of the teacher does make a difference in educational outcomes, and (2) demonstrating how affective educational outcomes can be satisfactorily evaluated (Roebuck, 1975). The National Consortium for Humanizing Education addressed itself to the first of these questions, this document reports on three large N studies of teacher behavior. The first two studies indicate that in describing relationships with affective teacher behavior, it is necessary to move into polynomial models. The third study demonstrates that in predicting student outcomes, factors other than the linear term of the mean of the teacher's behavior add considerable to the predictive power of the model. Additionally, the fact that the teacher's stability of affective behavior is a significant predictor of student outcomes offers some implications which help explain why polynomial models of affective teacher behavior seemed to be more adequate than linear models.

What little we know about relationships between specific classroom behavior of teachers and relevant pupil outcomes has been obtained almost entirely from correlational studies (Borg, 1975). Yet, if we are ever to apply knowledge in this area to teacher

education, we must carry out experimental studies in which teachers are trained to emit specific behaviors that are found to be related to pupil outcomes. Utah State University created three sets of protocol modules employed as experimental treatments. Through these studies, it was determined that relationships between specific teacher behaviors and pupil outcomes tend to be higher in correlational studies than in experimental studies. Four variables seem to be the cause of this difference. First, general teaching competence operates more strongly in correlational studies and probably leads to spuriously high correlations between specific teacher behaviors and pupil outcomes. Second, the length of pupil exposure to teaching behaviors studied may be longer in correlational studies than in experimental studies. Third, when teachers adopt new behaviors, there is a lag in the development by pupils or appropriate responses to these behaviors. Fourth, when teachers are trained in new behaviors, time is not often allowed to incorporate the skill into teacher performance.

As one phase of a research program on teacher effectiveness, five studies were completed which sought procedures for aiding teachers in the acquisition and expression of hypothetico-deductive verbal structuring through microteaching (Gregory and Casteel, 1974). Hypothetico-deductive verbal behaviors have been found to be related to desirable pupil outcomes. The evidence collected in these studies suggests that hypothetico-deductive structuring can be measured using multidimensional observation instruments; is enhanced by reinforcements of models of the behavior; it is not dependent on subject

content areas and can be used by any teacher; and results in more student talks.

Peng (1974) investigated the relationships among teacher expectations for the class, instructional behaviors and class achievement. Involved in the study were thirty (30) teachers from randomly selected elementary schools. Their expectations were measured by three scales: nature of the class, expectations of self and comparative expectations. Their behaviors were related in terms of provision of learning opportunities, clarity of instruction, and enthusiasm in teaching. Multivariate analysis provided little evidence for the relationships; thus, it was concluded that favorable teacher expectations and behaviors are probably necessary but are not sufficient factors for this achievement of the class.

Competency-based teacher education (CBTE) cannot be defended unless a systematic large-scale research effort is directed to discovering the linkage between patterns of teacher behavior and student change (Potter, 1975). A more immediate need, however, is the development of techniques that (a) permit assessments of skills trainees possess, and (b) provide training in areas where performance is inadequate. The Teacher Behavior Research Group and the Intern Teaching Program, collaborated in a research program focusing on these two areas. The two groups jointly created a paradigm which allowed casual inferences to be drawn about (a) the effectiveness of training procedures and (b) observed relationships between criterion teacher behaviors and student achievement. Results of the study indicated

several inherent problems in measuring microteaching studies of teacher behavior when student achievement was the dependent variable. These problems are: (a) lesson content must be unfamiliar yet interesting to the students and it must incorporate intended teacher behavior; (b) objectives must be limited in scope, and clearly and precisely defined; and (c) teacher behaviors must be manipulated in order to obtain accurate experimental data.

Need for Research Base in Teacher Education

The current controversy regarding the alleged merits of competency based education remains virtually data free. Advocates from both within and outside the education profession argue that a competency-based approach is absolutely essential to provide an appropriate frame of reference within which to fix accountability; they believe that such an approach is essential to still outcries of parents, citizens, and legislators. Critics counter that despite enormous commitments of energy, time and resources, it is not possible to quantify an essentially quality-references field such as education; they believe that the serious pursuit of such a notion serves at once to delude the public and eventually to frustrate the teachers (Coker, 1976).

Despite its widespread popularity, few studies have been mounted which analytically examine the assumptions on which regulations for teacher preparation and certification are based. In point of fact, the debaters have eschewed in favor of logical argument. It seems unlikely that conclusions can be reached unless and until

exploration is conducted with a representative population of substantial numbers (Coker, 1976).

One of the more widely acclaimed consequences of the movement towards competency-based teacher education is a greater emphasis on careful specification of the objectives for programs of professional preparation. In most instances, objectives are specified in lists of performance competencies that graduates of a program were expected to acquire. The absence, however, of a research base for teacher education means that competency statements tend to represent operationalizations of the concepts of effective teaching underlying each program (Coker, 1976).

Largely as a result of other massive problems that beset the developers of competency-based programs, an empirical data base was never established. To this day, little or no empirical data shows that the competencies teachers are trained to exhibit will increase their effectiveness in the classroom.

Effectiveness Approach to Teacher Education

In 1973, a project was begun in Georgia to develop an alternate approach to the certification of teachers other than approval of transcripts submitted by individual candidates or of the programs offered by institutions engaged in teacher preparation. A description of this project is detailed in an Effectiveness Directed Approach to Teacher Education and Certification by Homer Coker.

The project serves as a basis for the development of the Georgia Assessment for Teacher Effectiveness Instrument used in this

study. The Georgia State Department of Education selected West Georgia College, a senior college of the university system of Georgia, and the Carroll County Public Schools to help develop and test this alternative approach.

The purpose of the project was to identify a set of "generic competencies" and to validate them in terms of student growth. Since the major task was to develop instrumentation and procedures to be applied to prospective teachers, these would be the basis for licensing fundamental decisions which were made to establish certain safeguards.

The first decision was to have the teachers themselves identify broad competency areas. Special task forces of classroom teachers from the school district in which the study was conducted spent a year meeting, discussing, and studying various definitions of teacher competence. They finally chose eleven competency statements. More importantly, they also listed specific teacher and student behaviors under each competency area whose presence in the classroom should indicate that the teacher possessed each competency. This was important because there is considerable evidence that we should be seeking a large number of small effects rather than a small number of large effects (Soar, 1976). Also, it appears that teacher evaluation should not be based on a global concept of teacher effectiveness, but rather on the idea that an effective teacher is one who possesses a large repertory of competencies (knowledge, skills, etc.). There is not necessarily a complete list of competencies such that when a teacher possesses them

all, he is fully competent. This is not consistent with the idea that a teacher's effectiveness can improve throughout his career (Medley, 1977).

Teacher Evaluation Based Upon Observable Indicators-- An Approach

This approach to teacher evaluation is based on the identification of a list of competencies of behaviors, performances, etc., which have been shown to correlate with pupil learning. When one talks about evaluating a teacher, one means finding out which of these competencies he possesses and which he does not.

The next decision was to try out only behavioral indicators that had been identified beforehand as promising instead of blindly testing all possible indicators. The chances that a behavior which is found to predict teacher effectiveness will stand up on cross-validation should be greater when only a limited number of promising behaviors are tested.

The competencies listed are not very different from those on other lists that have been developed by other groups as specifications of C/PBTE programs; what is unusual about this is that each competency is defined in terms of specific, observable behavioral indicators. It is these indicators that formed the basis for the development of the measures described and that will also be the basis of the performance test yet to be developed.

The third decision was not to attempt to construct an observation instrument specially designed to measure these behavioral indicators, but to select a small number of tested instruments. The

reason behind this decision was that building a valid observation system is not as easy as it looks. Too many similar projects have underestimated the time and effort such an enterprise entails; and too many have ended up with a mass of data that are largely uninterpretable. In order to avoid this particular trap, it was decided to use existing instruments of proven quality - those which were the product of 15 to 20 years of development and refinement. All had been used in more than one previous study by more than one investigator and they represented several distinct points of view about classroom behavior and about observational methodology. It seemed that almost any indicator one might care to study could be identified on one or more of these instruments (Medley, 1977).

The fourth decision was that the instruments would be low-inference rather than high-inference. The main reason for this was practical: high-inference ratings are more vulnerable to legal attacks in the courts. Sooner or later a candidate who fails on the instrument will go to court and question its validity. If the decision to fail him has been based on high-inference ratings, the defense must ultimately be based on the expertise of rater, since his judgments in the form of ratings will constitute the sole documentary evidence that the candidate was incompetent. If the decision is based on low-inference performance observations, however, an objective record of what behaviors the candidate did and did not exhibit will be in the record, together with a competency score derived from that record by the use of the same scoring key that was

used on every other candidate. Thus any charge of bias or of unreliability can be refuted, and a strong case built against any charge of invalidity (Medley, 1975).

The fifth decision was to select as consultants a group of qualified active educational researchers from the area of teacher observation. This led Dr. Homer Coker, the author, to employ a distinguished group of experts who have been and are currently involved with this effort. The authors also selected three (3) regular teachers from the school district, trained them in the several instruments and employed them as observers.

The sixth decision was to assess pupil outcomes and the presence or absence of these teachers' behaviors through observation in the natural setting over a full year. The authors recruited sixty (60) teachers for the first year of observation and forty-three (43) for the replication study. The teachers attended summer workshops where they were given the set of competencies and the complete instruments.

The final decision was to base each indicator on more than one single item whenever possible. Cronbach (1951) has shown how rapidly a score based on a set of test items with low intercorrelations increases in internal consistency as the number of items increases--a phenomenon familiar to every measurement student as the Spearman-Brown Law.

Although scores based on individual items of behavior are extremely unstable and ambiguous as to meaning, the combination of

as few as four or five into a composite can produce a dramatic increase both in stability and in internal consistency, with an accompanying reduction in ambiguity (Medley and Mitzel, 1963).

The Instruments

Among the instruments utilized to assess various aspects of teacher performance were the following:

OSCAR 5V: Observation Schedule and Record, Form 5 Verbal (Medley). This instrument is designed to analyze and record teacher-student cognitive interactions so that a clear analysis can be made of the classroom's verbal learning environment. OSCAR 5V represents more than twenty years work on the OSCAR series and has been extensively in classroom observational research since the 1950's.

STARS: Spaulding Teacher Activity Rating Schedule (Spaulding). This instrument examined twenty-five categories of teacher behaviors and nineteen categories of student behaviors - forming a 19x25 matrix including teacher listening and reinforcement patterns, concept attainment and concept checking, as well as affective and valuing behaviors.

FLACCS: Florida Climate and Control System (Soar, Soar, and Ragosta). This instrument focuses on classroom direction and control by the teacher and student response. FLACCS records positive and negative affect, non-verbal expressions of affect, non-verbal expressions of affect, classroom physical movement, and the dominance of individual or group activities.

TPOR: Teacher Practices Observation Record (Brown). This instrument provides a model by which the observer can check off methods of instruction used by the teacher. TPOR is concerned primarily with cognitive learning patterns and focuses on questions such as open-ended versus close-ended questioning, reinforcing teacher behavior, strong control by the teacher versus a strategy of following class interests, tight versus open structure of conversations, etc.

CASES: Coping Analysis Schedule for Educational Settings Spaulding). This instrument provides measurements of student personality development and socialization in structured settings. It focuses on the range of student behavior in relation to the teaching strategy. These student behaviors have been empirically refined in case studies of more than 2,000 children over several years.

Other Instruments

Among the instruments which were utilized to assess student growth were achievement and self-concept measures and a measure of student behavior in the classroom as well as an index of student socio-economic status.

Data Collection

These instruments were applied by trained observers in 103 classrooms in a single school district.

Records were made of the incidence in each classroom on over 1,300 possible behavioral indicators. In addition, 58 different

measures of outcomes were also obtained. This mass of data permits the calculation of over 80,000 process-product correlations. However, by carefully selecting fewer than 100 behavioral indicators from the 1,300 to be correlated with outcomes, the authors reduced the total number of correlations substantially.

Conclusions

Findings from this project have shown that effective teaching can be predicted from observation in natural classroom settings. The project has demonstrated that a regular classroom teacher released for the purpose of observation can be trained to use a number of observation instruments; that two or more teachers so trained can assess another teacher's performance independently and at different times, with a level of agreement high enough to provide reliable data on that teacher's performance.

There is preliminary evidence that objective scoring keys can be applied to the records of observations in a teacher's classroom that will yield scores which are valid predictors of how much his pupils are learning from him. There is evidence that scores on such records correlate with pupils' gain in reading, for example, about as well as the SAT correlates with college achievement. The important fact to note is that these scores are objectives: a teacher's scores, unlike supervisor's ratings, are in no way independent on the judgment of the observers. All an observer needs to be able to do is to record which of the events and procedures on a predetermined list occur in a classroom during a

certain period of time. He is not required to make any judgments about the appropriateness of the methods used, the quality of the questions asked, the clarity of the explanations, etc.

Computer programs have been devised which will compare the performances recorded in a teacher's classroom with those observed in the classrooms of effective teachers and print out scores which indicate how closely the teacher in question approximate the behavior of an effective teacher.

The teacher effectiveness record will be detailed enough to that any discrepancy between observers will be immediately visible. Evidence indicates that such discrepancies will be minor. When this system is used, a detailed and accurate record will exist of each behavior that affected a teacher's score. It will therefore, be possible to inform the prospective teacher who is not certifiable just how he needs to change his behavior in order to become certifiable.

There will be no risk that a prospective teacher may draw a rater who is biased, careless or one whose standards may have deteriorated by the time he visits his prospective teacher. Evidence of the reliability of this approach indicates that which observer sees a teacher (or when) has very little effect on the score. If a candidate wishes to appeal his case (or to sue the state) documentary record of his performance would be available along with the scoring key, validity data, etc. A prospective teacher who failed would receive a diagnostic profile and a prescription for self-improvement and would become eligible for reassessment after a minimum period of time.

Annual reports could be made to the institutions regarding the overall quality of the entire group of prospective teachers examined each year indicating areas of strength and weakness and areas of improvement or decline from year to year. Implementation of this system should substantially improve the quality of teachers coming from the teacher education programs (Medley, Coker, Lorentz, 1976).

The ultimate responsibility of deciding what student teachers should acquire belongs to the teacher educators--those who do the training define the competency by developing an operational definition of the behavior. The instrument must contain the variables which respond to any set of performance competencies (behaviors) which are selected as important and worthy of testing.

Coker has reduced the items from the five observation schedules into a composite instrument called Georgia Assessment of Teacher Effectiveness (GATE, 1977). Coker chose to develop a sign instrument because of its greater flexibility, higher objectivity, shorter period required for observer training, and it is more error free.

The initial analysis further suggests that the teaching-learning relationship is much more complex than most educational theorists sometime imply. Each grade level and subject matter requires a different approach. Not only does socio-economic status affect the student's behavior, there is evidence that it directly influences the teacher's behavior, as well. Finally, teaching may be like cooking in that some competencies are required in large doses while only a pinch of others may be needed. Just as proportions and preparation

times change from recipe to recipe, so also does the required competencies change from setting to setting (Coker, 1977).

Moreover, the initial data indicate that simple statements of so called generic competencies will be worse than useless. They will dangerously mislead teachers and school districts into activities that are good in some classes and counterproductive in others.

Travers presented a paper at the 1974 Annual Meeting of the American Association of College Teachers in which he urged the establishment of "Empirically Based Teacher Education". He suggested that the term, effectiveness directed, seem to contain the right substance for a name to describe a program of teacher education based on what is known about effective teaching in the classroom. His recommendation bears repeating (Travers, 1974).

SUMMARY

Chapter 2 has been organized to present that literature which reflects and contributes to the rationale for the present study. First, many changes have taken place in education but student unrest, knowledge explosion, education of the culturally different child, and the need for continuous, lifelong learning have thrust new challenges onto the schools. Psychology, sociology, and anthropology have provided substantial clues regarding better approaches to the complex problems of improved schooling.

Without ignoring the matter of materials and methods, it is a tenable thesis that teachers are at the heart of improved learning

processes. Secondly, propositions for facilitating learning are presented as criteria for assessing the merit of teaching-learning innovations and emphasizing the shift in teachers' role from instruction to orchestrating teaching-learning transactions.

Third, this chapter presented research which supported the assumption that teacher behavior is observable. This assumption is an important one if we are to engage in teacher assessment. It means we assume that classes of teacher behavior and correlates of teacher behavior may be observed in some manner, that is, that teacher behavior is not private, intangible and unmeasurable; that the conditions of observation of teacher behavior can be controlled, at least to a reasonable degree; making comparability of assessments possible, that teacher behaviors are both qualitatively and quantitatively discriminable - and therefore can be assessed. In the next chapter the design and procedures used in the present study are explained.

Chapter 3

DESIGN AND PROCEDURES

This chapter describes the design and procedures which were used in carrying out the study. It includes (a) the background for the study, (b) the design of the study, (c) a description of the population and sample, (d) a history and development of the instrument used, (e) the procedures for collecting data including observer selection, observer training, procedures for recording data, (f) procedure for reporting data, and (g) the method and treatment of data.

This study examined the effectiveness of a component of the competency based teacher training program, namely the ESEA Title I Collaborative Training Model, by recording the observable changes in teacher behaviors using the Georgia Assessment for Teacher Effectiveness instrument. The Georgia Assessment for Teacher Effectiveness (GATE), a newly developed observation instrument had not been used in this manner.

The design of the study was to observe and record pre and post behaviors exhibited by participants in the competency based teacher training program during the fall semester, 1978 and spring, 1979. These behaviors were directly related to competencies on the Districtwide Staff Development Program (DSDP) and identified as important by the teachers themselves. The design utilized the following approaches:

1. This study examined the extent to which the GATE could be adapted and used to record teaching behaviors.
2. This study examined the total process of staff development, i.e., integrating teacher prioritized needs, low inference behavioral observations, competency-based instruction, and school district competencies in a comprehensive staff development program.
3. This study examined the extent to which these behaviors changed as a result of diagnostic and prescriptive training.

The validity of measurements of behavior as the term will be used here depends on the fulfillment of three conditions: (1) A representative sample of the behaviors to be measured must be observed. (2) An accurate record of the observed behaviors must be obtained. (3) The records must be scored so as to faithfully reflect differences in behaviors.

The first condition was fulfilled by specifying those competencies on the DSDP assessment instrument with direct correlates of the GATE (See Appendix A) and finally to the module clusters used in the Competency Based Teacher Training (CBTT) Program of which the ESEA Title I Collaborative Planning Model is a component. The competencies observed relate to Classroom Management Techniques i.e., management of instruction, management of the environment, management of people. Additional competencies were related to interpersonal skills.

The second condition--accurate recording of behavior--and the third--meaningful scoring--are interdependent in the sense that how a record may be scored depends on how it is made and the use of trained observers. These were kept separate in using techniques.

The task of observers was to observe events that took place in the classroom and then record them in scorable form. The observers made no attempt to score the behavior before recording an observed event. Their crucial function was to serve as an abstractor; to select those aspects of behavior relevant to the scoring process which occurred later.

The training of observers was crucial and required great skill. The observers' judgment in coding behavior was a major part of this study and major emphasis was placed on defining categories as unambiguously as possible to make the judgment as easy as possible. For the same reason considerable pains were taken in training observers so that they could classify behaviors accurately and swiftly. For this reason, it was necessary to free observers from combining behaviors in their heads to arrive at composite ratings.

Subjects

The subjects participating in this study were elementary teachers currently employed in the Houston Independent School District. These elementary teachers were identified by their peers as "effective teachers" during a faculty presentation where a sociogram was administered (See Appendix B). The building administration, however, made the final decision insuring that the

model will be disseminated upon their return. The Staff Development competency based teacher training i.e., Title I Collaborative Planning program consisted of ESEA Title I program teachers, curriculum coordinators, and regular classroom teachers.

Specification of Competencies

Since teachers represent the most important and first line "point of contact" with the student, it is essential that their perceptions of criteria for assessment be singularized. In February, 1975, the General Superintendent initiated the process which has generated the Districtwide Staff Development Program (DSDP). An attitudinal survey was administered to 10,000 teachers, district wide, in the Houston Independent School District. The evaluation device was divided into two parts: Group A which contained 240 teacher competency statements, and Group B which contained 189 teacher competency statements. Each item was written in behavioral terms and the response categories were defined by six possible choices: "must be responsible for", "should be responsible for", "teacher aide", "should not be responsible for", "not applicable" and "no response". The teachers participating in the survey indicated their attitudes concerning obligations for particular competencies by selecting the appropriate responses category. The results of this survey were recorded in percentage figures in terms of expressed response category.

An overview of these results showed that on Group A statements (See Appendix C) more than 40% of the respondents indicated

that teachers "must be responsible for" the following competencies:

1. Writes concise and specific lesson plans
2. Plans activities for students' individual needs
3. Adjusts classroom procedures and revises lesson plans to compensate for unexpected changes
4. Prepares and/or uses various techniques to present subject matter, and encourage student participation
5. Prepares and administers tests as needed
6. Keeps evaluative records on students
7. Evaluates own teaching techniques
8. Adapts to new teaching methods and current trends in subject field(s)
9. Teaches basic concepts for grade level and/or subject level
10. Gives clear instruction to students
11. Demonstrates a working knowledge of subject matter
12. Develops and implements classroom management rules
13. Encourages self-discipline
14. Established rapport with students
15. Evaluates and records students' conduct grades
16. Has command of standard English
17. Attends faculty, grade-level and/or departmental meetings
18. Confers with parents, counselors, and administrators about student conduct

Of the defined behaviors in Group B, (See Appendix C) more than 40% of the "must be" responses were indicated for the following skills:

1. Complies with district rules and regulations
2. Complies with building rules and regulations
3. Maintains confidentiality

Therefore, teachers responding to this survey more often designated those competencies in Group A to be essential than those in Group B.

In addition to those competencies receiving over 40% of the "must be" responses, over 40% of the teachers indicated the "should be" column for the following competency in Group A: "Supplements, when necessary, basic textbook information when resources are available." More than 40% of the respondents indicated the "should be" response column for the following behavior for Group B: "Plans with other teachers, i.e., departmental, grade level, homebound, etc."

In general, it should be noted that, overall, more teachers indicated "must be" responses than "should be" responses in Group A. These "must be" responses indicated that over 40% of the teachers in HISD expressed a definite responsibility for instructional techniques, preparation, evaluation and classroom management.

As a result of funding to provide staff development in generic educational competencies for teachers in the Houston Independent School District, a Competency-Based Teacher Training program was designed. There are several underlying assumptions which are basic to the development of a teacher training package designed to assist teachers in

updating their competencies and skills.

1. That higher academic achievement among students can be facilitated by those teachers who demonstrate stability, and those who are willing to upgrade their teaching skills in major academic areas.
2. That inservice teachers are interested in developing those competencies essential in improving their personal competencies in content related areas.
3. That training packets developed in the following areas will minimize the feelings of anxiety and thereby help participants to become more susceptible to feedback.
 - . Classroom Management
 - . Diagnostic and Prescriptive Techniques
 - . Teaching Effectiveness Strategies
 - . Interdisciplinary Approaches
 - . Developing Instructional Modules
 - . Multicultural Awareness

Data referred to in Appendix C have been compiled by the investigator in an unpublished paper entitled "Perceptions of Teacher Competencies as Viewed by Teachers Themselves." These data are available at the Houston Independent School District's Staff Development Department.

The Competency Based Training Model

The Competency Based Training Model - e.g., Title I Collaborative Training Model - an integral part of the overall, long range Staff Development plan was developed in an effort to meet the specific

needs of Title I students in the Houston Independent School District. Since Title I students have so many instructional support services available to them, they may be scheduled out of their classroom and into special programs several times during the day creating a fragmented, disrupted schedule for both teachers and the pupils. Moreover, many of these students cannot envision the special program activities relating to their classroom activities. It is important, therefore, that the program and regular teachers are provided with opportunities to diagnose and prescribe as a team to avoid repetitious or conflicting instruction and to provide efficient logical learning plans for each child. In the Staff Development Model, through training in competency-based modules, team building activities, seminars, classroom observations and simulation, teachers gained necessary skills for planning collaboratively.

The major thrusts of this program are to (1) improve instruction for Title I pupils by providing a better supportive structure of their regular and compensatory instruction through improved collaborative planning, i.e., management of instruction, management of the environment and management of students; (2) increase communication between compensatory instructional personnel and regular instructional personnel in target schools; (3) continue a formal staff development training process for regular and compensatory personnel that will develop and promote closer cooperation among teachers; (4) add to teacher's satisfaction, assurance, stability, feelings of security and competency in teaching in target schools; and (5) revise training materials so that they are directly related to collaborative

planning processes to be implemented in target schools.

The training program will include but not be limited to the following Staff Development modules, human development activities, collaborative planning simulations and appropriate seminars. The participants will be involved in a program designed to develop those skills needed to plan and coordinate the instruction of Title I pupils more successfully.

Collaborative planning for the instruction of Title I pupils will include but not be limited to the application of the following competencies:

1. A knowledge of district, area, school and Title I program goals and objectives
2. The ability to identify specific instructional objectives for reading and math at appropriate levels
3. The ability to correlate instructional objectives to Individualized Criterion Reference Test or Basic Arithmetic Skills Evaluation Test objectives and to current reading or math program objectives
4. The ability to identify and correlate available materials to such objectives
5. The ability to design highly specific instructional strategies based upon specific objectives
6. The ability to identify, adapt or generate test items based upon specific objectives

7. The ability to evaluate a pupil's progress toward achieving specific objectives
8. The ability to design a record system for tracking pupil progress

The training program will proceed in the following sequence:

- . After a Title I principal ascertains those areas in which assistance is needed in developing a collaborative planning program to coordinate the school's regular and compensatory instructional programs, he requests permission from his Area Superintendent for his school to participate in the Teacher Training/Collaborative Planning Program. The Area Superintendent approves the request and forwards it to the Assistant Superintendent for Staff Development. The Assistant Superintendent for Staff Development approves the request and notifies appropriate staff development personnel to meet with the principal.
- . Staff development personnel will meet with the principal to discuss needs and/or plans for developing collaborative planning in his school. The principal indicates which collaborative planning strategies are appropriate for his school. A Pre-Training Agreement between the principal and the Staff Development specifies the respective responsibilities of the principal, the building team and Staff Development.

- . As a subject of the Pre-Training Agreement, the Dissemination Plan specifies Staff Development's period of involvement following the formal training period and the responsibility of the principal, assisted by the curriculum coordinator, to involve others of his faculty in the collaborative planning process. An overview of the Collaborative Planning Training Program is presented to the faculty. Teachers who wish to volunteer for the program submit their names to their principal who selects, from those volunteers, the teachers who will participate in the training.
- . The principal sends the names and respective assignments for only one team from his building to the Title I Program Administrator who will assign mobile teachers to replace team members. To insure that the training does, in fact, promote collaborative planning for Title I pupils, the required membership of the team must include regular and compensatory teachers who serve some of the same pupils. Therefore, the team will include one or more Title I program teachers having some pupils in common and the Title I curriculum coordinator.
- . A member of the Staff Development Department meets with the principal and the building team to design a program of study that will address their team needs and their individual role needs within the team. The Study Plan

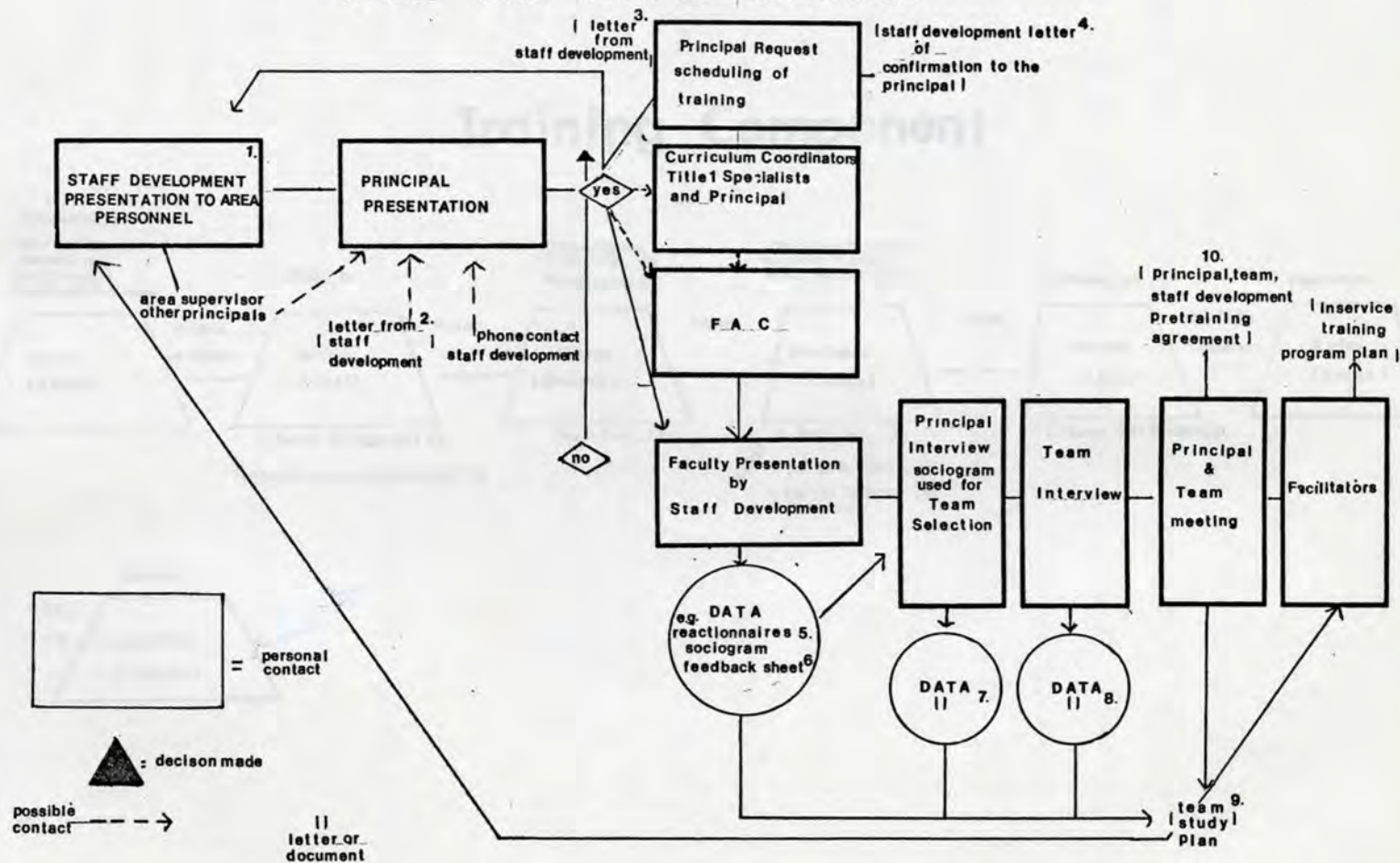
is signed by the team members and the building principal. The flow of the area and school entrance is shown in Figure 2.

- . At the Miller Staff Development Center, trainer/content specialists conduct training activities appropriate to that team's Study Plan. To provide a more in-depth study of skills addressed and to enhance materials in the modules, consultants with relevant expertise will be brought in to conduct seminars. The training component is shown in Figure 3.
- . Mobile teachers assume classroom duties for those teachers participating in the training program. Prior to assuming these responsibilities, the mobile teacher spends two days of "phase-in" with the regular teacher.
- . During the final phase of training, the team goes to Pleasants Elementary School, where they incorporate collaborative training strategies into an Implementation Plan and a Dissemination Plan for their campus.
- . The principal, who is primarily responsible for the implementation and dissemination of the collaborative planning process on his campus, participates with his team during this phase of the program. The Implementation plans must include a definitive statement of the observable collaborative planning behaviors to be implemented with a detailed Dissemination Plan included to specify the process.

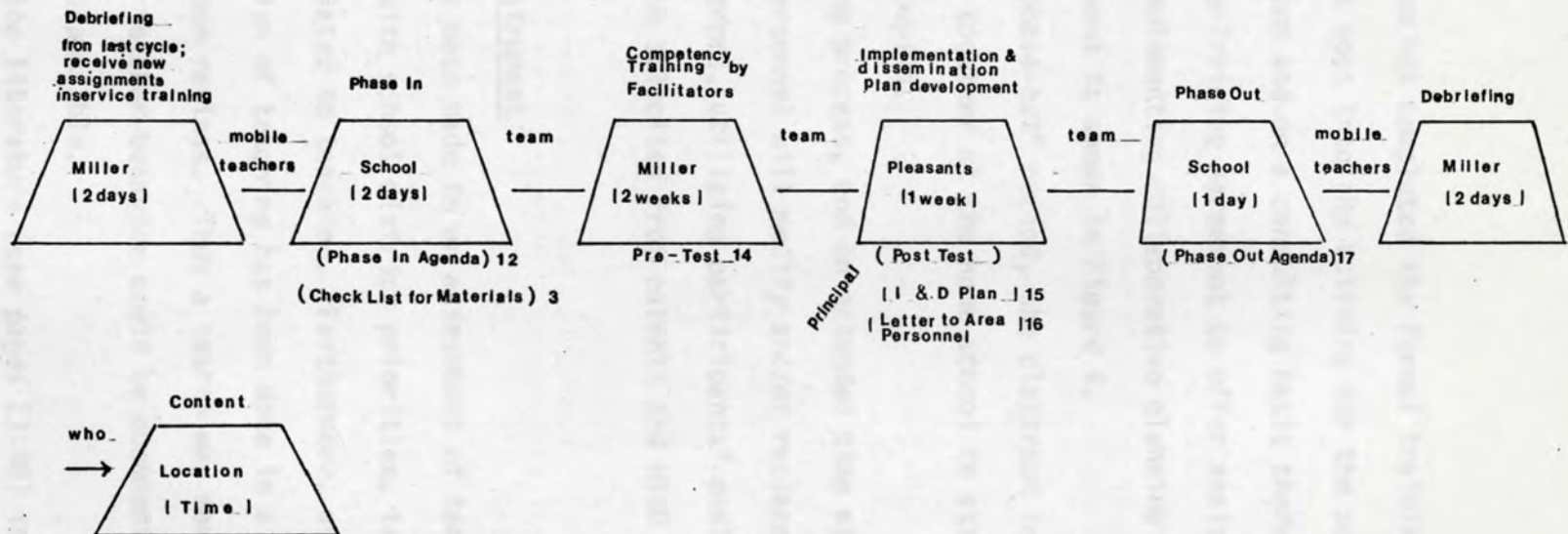
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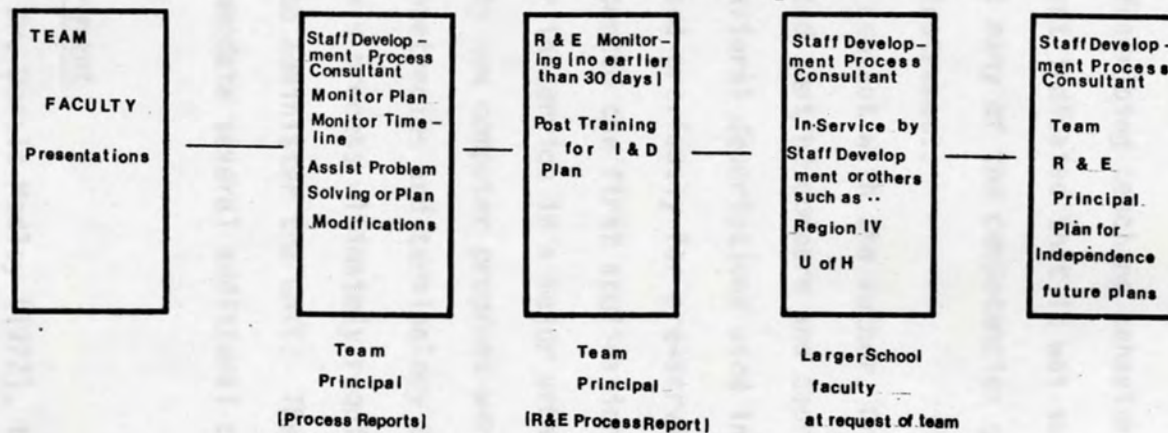
AREA AND SCHOOL ENTRANCE



Training Component



Follow-Up Component



attracted to the work of Dr. Homer Coker as represented by the Georgia Assessment for Teacher Effectiveness (GATE). Dr. Coker had drawn from several of the earlier instruments to provide an instrument broadly describing teaching behaviors. An initial survey of this instrument indicated that it was sufficiently "broad enough" to encompass many of the competencies stated in the HISD teacher assessment instrument.

After making contact with the author, Dr. Homer Coker, the investigator requested that he compare and coordinate HISD terminology with the behavioral descriptions used in the GATE. Since the GATE had been used previously for pre-service teacher education programs this represented the first application to accommodate a program designed for in-service in a major urban school district.

For this study new computer programs were designed for the grouping of HISD competencies and terminology to the words in the GATE instrument. This process ultimately required slight changes in the manual used to administer the GATE. The instrument itself was revised to accommodate several additional codes and clearer definitions of terms.

History of the Instrument

According to Dr. Donald Medley (1977), the specific purpose of the instrument that is being reported is to identify observable classroom behaviors whose presence--or absence--in a sample of the performance of a teacher can serve as an indicator of the effectiveness of that teacher. Physically, the instrument is expected to take the form of an observation schedule that contains a list of

indicators of competence (or lack of it). After a reasonable amount of training, an observer will be able to use the instrument to record which of the indicators are present and which of them are absent in a brief sample of classroom behavior. A set of such records of one's teacher behavior can then be scored to yield (1) an estimate of how effective that teacher is likely to be, and (2) a diagnostic profile indicating specific ways in which he will improve.

The Georgia Assessment for Teacher Effectiveness will, therefore, not measure effectiveness directly; rather, it will measure the degree to which a candidate possess a set of competencies known to characterize effective teachers. According to the author, Dr. Homer Coker, the search for indicators of competence began with the development by the teachers themselves of a list of competencies they perceived as important to effective teaching, with suggested indicators of the presence of each. After developing measures of each indicator, they observed behavior in a sample of classrooms to estimate the amount of each competence each teacher displayed on a variety of measures, and intercorrelated the two in order to find out which competencies did in fact characterize the effective teacher.

The author set forth a series of operational decisions or working assumptions which describes how a set of competencies quite similar to those used to specify goals of teacher education programs were operationally defined and reliably measured without the use of high-influence ratings, and using only existing and generally available low-influence systems.

The Approach

Step One was that the instrument produced would be low-inference rather than a high-inference one. The main reason for this was a practical one: the greater vulnerability of high-inference ratings to legal attacks in courts. If the decision to deem a teacher incompetent has been based on high influence ratings, the defense must be based ultimately on the expertise of the rater since his judgments in the form of ratings will constitute the sole documentary evidence that the candidate was incompetent. If the decision is based on low-inference records, however, an objective record of what the candidate did and did not do on the "examination" will be in the record by the use of the same scoring key that was used on every other candidate. The record is there; the behaviors on which the failing score was based can be examined; and it can be shown that any other candidate who had behaved in the same way would also have failed. Thus any charge of bias or of unreliability can be refuted, and a strong case can be built against any charge of invalidity.

Step Two was to try out only indicators that had been identified beforehand as promising, instead of blindly testing all possible indicators. The chances that a behavior which is found to predict teacher effectiveness will stand up on cross validation should be greater when only a limited number of promising behaviors are tested. In this instance, records were made of the incidence in each classroom on over 1300 possible behavioral indicators. Since 58 different measures of outcomes were also obtained, over 80,000 process-product correlations could have been calculated and examined. By carefully selecting fewer

than 100 behavioral indicators from the 1300 to be correlated with outcomes, they reduced the total number of correlations substantially.

Step Three was to have the teacher themselves identify these indicators of competence. Special task forces of classroom teachers in Carroll County Georgia spent a year meeting, discussing, and studying various definitions of teacher competence. They finally chose the competencies shown in Appendix D. More importantly, they also listed under each area of competency specific teacher and student behavior whose presence in the classroom should indicate that the teacher possessed each competency. It is these indicators that formed the basis for the development of the measures described below, and that will also be the basis for the performance test yet to be developed.

Step Four was not to attempt to construct an observation instrument specially designed to measure these behavioral indicators. It was decided to use existing instruments of proven quality. It was decided to adopt the Coping Analysis Schedule for Educational Settings, The Florida Classroom Climate and Control System, the Observation Schedule and Record Form 5, The Teacher Practices Observation Record and The Spaulding Teacher Activity Rating Schedule.

The Coping Analysis Schedule for Educational Settings (CASES) (Spaulding, 1970) was designed to measure pupil socialization and consists of 13 categories of "coping" behaviors which are identified by descriptive statements.

The Florida Classroom Climate and Control System (FLACCS)

(Soar, Soar and Ragosta, 1971) examined the control tactics of teachers as well as their affective behaviors. It includes items relating to the nature of classroom structure, teacher and student control strategies, and teacher and student affective behaviors, both positive and negative.

The Teacher Practices Observation Record (TPOR) (Brown, 1972) measures the congruency of observed teacher behavior in the classroom with educational practices advocated by John Dewey and consists of 62 items which describe teacher behavior. In relation to Dewey's philosophy of experimentalism, 31 of the items are positive and negative. All even-numbered items are pro-Dewey and all odd-numbered items are non-Dewey.

The Observation Schedule and Record, Form 5, Verbal (OSCAR 5V) (Medley, 1955) concentrates on the verbal behavior of teachers. It consists of 14 categories designed to measure questioning and feedback strategies, in addition to four categories for pupil-initiated utterances.

The Spaulding Teacher Activity Rating Schedule (STARS) (Spaulding, 1975) is a category system which examined the cognitive instructional strategies of teachers as well as their affective and control techniques. STARS consists of 25 categories which are subsumed under the subtitles of affective behavior, motor and social instructing, concept attainment, concept checking, and value expression.

Step Five was to base each indicator on more than one simple item whenever possible. Cronbach (1951) has shown how rapidly a score

based on a set of test items with low intercorrelations increases in internal consistency as the number of items increases (Spearman-Brown Law).

Although scores based on individual items of behavior are extremely unstable and ambiguous as to meaning, the combination of as few as four or five into a composite can produce a dramatic increase both in stability and in internal consistency, with an accompanying reduction in ambiguity (Medley and Mitzel, 1963).

Procedure

The first step in the process was to carefully scan each instrument for items related to each of the behavioral indicators. When two or more such items were found on the same instrument they were grouped to form a scale or scoring key to measure the indicator on that instrument.

Not every indicator of competence could be measured on every instrument, but most of them could be scored on at least two. There were a few instances in which a single item corresponded so closely to a competency indicator that it could function as a one item key.

The second step was to combine all of the single-instrument keys designed to measure the same indicator of competence into a single key that would yield a composite or multi-instrument measure of the behavior in question.

The third and final step was to combine all of the keys scored on competency indicators in each area of competency into a key designed to yield an overall score for each area. In this step, only keys based

on teacher behavior were used, because indicators based on student behaviors showed too much overlap between areas.

The Georgia Assessment for Teacher Effectiveness, a composite instrument, based on five low-inference observation instruments was developed in the belief that direct observation in the natural setting would provide empirical evidence of teacher performance.

GATE Procedures

When you enter the classroom, move to a position so you can clearly observe the interaction between the teacher and students. Complete the information at the top of the data sheet. Take time to get oriented to the classroom, the action, the lesson. Start your stop watch and begin coding the first 5-minute observation period in Section A. At the end of 5 minutes, stop the watch, and code Section B from memory. When you have re-oriented yourself, start the stop watch again for the second 5-minute recording period (to be coded on reverse side of data sheet). After coding Section B from memory, one visit has been completed. NOTE: If the teacher has to leave the room, stop recording (stop the watch) and continue when he/she returns.

Section A: Section A consists of a matrix of numbered cells designating specific teacher and student interactions. The matrix is designed to accommodate one five-minute observation and is printed on both sides of the recording instrument to accommodate the two observations per visit. When an interaction represented by a numbered cell occurs, the cell should be marked. For example, if a teacher is

"Explaining, discussing, telling" (12) and a student is "Listening, watching, complying" (1), code the appropriate cell (12/1). Each cell is coded only once in a given five minute observation period even though the behavior may occur many times.

Section B: Section B is designed to record specific student and/or teacher cognitive/affective behaviors which occurred during the previous five minutes. These behaviors may or may not be interactions. Code this section from memory.

Grouping: Grouping refers to the organizational plan or method used by the teacher. There are two categories which divide the student's activities: Prescribed and Non-Prescribed.

Prescribed grouping refers to those activities in which the students have no choice. All work is arranged and controlled by the teacher.

Non-Prescribed grouping allows the student to have some choice in the learning activities. It may involve choosing whether to do math first, spelling second, or in reverse; or the student choosing what area of interest to study or the approach to use in a class.

Under Prescribed and Non-Prescribed, the appropriate cell should be marked to show group size. The recorder should mark either With Teacher (WT) or Without Teacher (W/OT) in the cell opposite the appropriate group size. Without Teacher includes teacher sitting at her desk grading papers, not interacting with the students, a group working without teacher.

NOTE: Group size "1" will be marked for any number of students who are working independently and alone. It is possible that the grouping will change many times within one observation period. Do not remove a previously marked grouping, simply mark additional settings as they occur.

Casual contact by the teacher or student(s) does not constitute a group.

Subject key: Music/Art includes instruction (applied or appreciation) in music and art. Language arts includes English, Spelling, Writing, Communication Skills, etc. Science includes General Science, Biology, Chemistry, etc. Social Science includes Geography, History, etc.

Summary: Total observation time per visit is approximately ten minutes; however, total time in classroom will be approximately thirty (30 minutes).

The recorder must:

take time to look situation over, get oriented

determine classroom setting/activity

record identifying information at top of GATE

if necessary, move about room to observe clearly (BE UNOBTRUSIVE AND QUIET).

Evaluating the teaching that is observed is not the business of a recorder using a systematic observation instrument. A judgment as to whether or not a particular behavior fits an item on the instrument is appropriate, but evaluation of the behavior--a judgment as to whether it is desirable or not--is not a part of the task.

Another aspect of the role of the recorder is that of abstaining from involvement in any classroom activities. There should be little interaction with the teacher, and no interaction with the students in so far as is possible.

In summary, the recorder should meet the teacher early (before class if possible), keep a "low profile", and should not participate in activities, or interact with students.

Recruitment of Observers

Direct observation is more subjective, that is, more personal, than assessment based upon well-made examinations of knowledge and understanding of subject-matter content, but interobserver reliability of assessments can be substantially increased and the subjectivity and personal impression factors materially reduced (a) through careful development of the observation and observation recording instruments (involving an iterative process of "preparation, tryout, and revision") carried out to reduce ambiguity of language employed, and insofar as possible, to yield assessments based upon teaching (rather than abstract concepts about teaching); (b) through training the observers in the use of the instruments; and (c) by using the observation instruments and trained observers to systematically record behavior in process (rather than resorting to the use of post hoc assessments based upon "remembered" teacher behavior).

Pilot Study

During the spring of 1977, ten persons from the HISD Staff Development Department were selected to be trained in the use of the direct observation in the classroom. The investigator contacted Drs. Homer and Joan Coker, authors of the Georgia Assessment for Teacher Effectiveness, to conduct a ten-day workshop. Workshop activities included:

1. Training for approximately five hours daily in the GATE instrument. This involved memorizing categories, their codes, and accepting ground rules for the GATE as specified in the manual.
2. Collecting simultaneous data from video tapes until reaching .80 agreement with each other and the trainer before entering the classroom.
3. Collecting data in non-experimental classrooms and maintaining observer agreement by checking with each other and the trainer periodically.

After the workshop, observers were selected to enter the classrooms in this pilot study. Twenty-four teachers were involved in this pilot study.

Observer Procedures

In order to observe every teacher for ten minutes, each of the ten observers made one visit to each of the twenty-four teachers' classroom and made two GATE records in the following manner:

After entering the classroom, the observer allowed time for

orientation and establishing an understanding of the classroom activities, time for each actual observation as well as additional time for coding. The visitation period required approximately thirty minutes.

Treatment of Observer Data

When data gathering had been completed, a computer program was developed by Coker and Associates to produce a Teacher Effectiveness Profile. Data yielded inconsistencies in observer agreement, thereby producing unreliable results. It was decided by the investigator and the authors of the (GATE) that additional training was needed by the observers and that the entire study should be replicated and that certain adjustments be made in the instrument for greater clarity in light of the observers' inconsistencies in the pilot. These changes are reflected in the revised instrument shown in Appendix E.

The Present Study

In August 1978, twenty-one persons from the Teacher Development Staff were trained to use the Georgia Assessment for Teacher Effectiveness instrument to assess teacher performance independently and at different times with a high degree of consistency. These persons, through classroom video-tapes, experiences and actual field experiences, were trained to keep track of different things that happen in a classroom. The observer are required to make few subjective judgments or "inferences" about what they see. For example, to determine if a teacher was "enthusiastic" would require a highly subjective judgment and might result in very different opinions by several observers. On the other hand, observers asked to tell if the "teacher is asking a question

and the pupils are listening", could record the presence or absence of this behavior with little or no subjective judgment. Thus, the first example is a "high inference" type of question; the latter is a "low inference" question of the type found on the GATE.

It is essential that observers be trained to reach nearly perfect agreement with a criterion or an expert coder on unambiguous video-taped examples of behavioral categories. Coders should then be expected to agree on unambiguous events encountered in the field. But disagreement on unambiguous events observed in the field should also be expected, since teachers and pupils do not always exhibit behaviors that fall neatly into predefined observational system categories.

In addition to criterion-related agreement, it was suggested that measures of intraobserver agreement be obtained by showing twice to all observers a video-tape in which conditions parallel those encountered in the field. The purpose of this intraobserver agreement training measure is to demonstrate the extent to which each observer can consistently code under observational circumstances that closely approximate classroom conditions. A summary of considerations by Fricks and Semmel (1978) for determining observer agreement is presented in Table 1.

The observation visits were made into each classroom to record a true sample of the behavior of pupils and teachers over a representative period of time prior to and subsequent to the teacher's entry into the competency based teacher training program. The observers usually remained in the classroom for fifteen to twenty minutes

Table I
Summary of Considerations for Determining
Observer Agreement

	A. Criterion Related	B. Intraobserver	C. Interobserver
Purpose	Determine accuracy related to criterion	Determine consistency with oneself	Determine extent to which disagreement limits reliability
When	Before, during, actual data collection	Before, during actual data collection	After actual data collection
Medium	Video-tape test Unambiguous isolated examples	Video-tape test Representative of coding condition	Actual classroom

at a time. Post observations were made in each teacher's classroom immediately after the training had been completed.

It is important to note that each of the sixteen pre and post observations were made at the exact time of day the teacher felt she/he was at his best. Exact timing for all observations was important for observer agreement basic to the study.

Procedures for Collection of Data

Observers

Twenty-one persons were selected by the investigator to participate in a workshop directed by Homer and Joan Coker, the authors of the GATE. These persons were enrolled for ten days. The purpose of the workshop was to provide intensive training in the direct observation instrument used in this study. Each person was employed in the Teacher Development program. Four of the twenty-one collected data for this study. The investigator felt that the remaining seventeen had other duties that would not allow them the time to consistently collect data for this study.

Missing Observations

There were three ways to deal with the problem of missing observations:

1. Eliminate these data and use a reduced sample
2. Estimate the score from all the other data or use other missing data techniques
3. Substitute a fifth observer upon whom reliability had been established as an observer

Substitution was felt to be the most desirable solution and was the procedure followed.

Procedure for Reporting the Data to Teacher Participants

Upon completion of the data analysis, each participant received a profile in order that each might be aware of his/her individual strengths and weaknesses

Keying the GATE to HISD's Instrument

A committee of three professional observers, Dr. Homer Coker, Dr. Donald Medley, and Dr. Robert Spaulding were given the list of the behaviors which had been identified as important for HISD teachers to exhibit during their teaching experience. These professional observers selected clusters of items from GATE which seemed to reflect each of the competency statements used in the assessment procedure.

Appendix A represents the HISD teacher competency statements. Ten of these statements were selected from the Instructional Competencies and Interpersonal Skills areas. These are indicated with an asterisk. In the opinion of the committee of professional observers, eight (8) of the indicators could not be measured by GATE. In addition, one statement was selected from the "Personal Characteristics" area and is also indicated with an asterisk. The HISD competencies measured by GATE are also shown in Table II. Those competencies not measured by GATE are shown in Table III.

Development of Keys

The authors of two of the original instruments from which GATE was drawn were given the list of the teacher behaviors that had been

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Table II

Houston Independent School District Districtwide
Staff Development Program Teacher and Peer
Group Member's Assessment Instrument

HISD Reference Number	Competency Indicators Measured by GATE
1.1.1	Teaches Basic Concepts for Grade Level and/or Subject Level
1.1.2	Demonstrates a Working Knowledge of Subject Matter
1.1.3	Plans Activities for Students' Individual Needs
1.1.5	Prepares and/or Uses Various Methods and Techniques to Present Subject Matter and Encourage Student Participation
1.1.6	Gives Well-Defined Instructions to Students
1.2.1	Develops, Organizes, and Implements a System for Classroom Management
1.2.2	Encourages Students to Become Self-disciplined
1.2.3	Promotes Positive Self-image in Students
1.2.4	Is Consistent and Empathetic in the Treatment of Students
1.2.7	Practices Good Human Relations
1.6.1	Exhibits Overall Positive Approach

Table III

Houston Independent School District Districtwide
Staff Development Program Teacher and Peer
Group Member's Assessment Instrument

HISD Reference Number	Competency Indicators Not Measured by GATE
	<u>1.1.0 Instructional Competencies</u>
1.1.4	Implements Instructional Programs Compatible with Prepared Plans
1.1.7	Adjusts Classroom Procedures and Revises Lesson Plans to Compensate for Unexpected Changes
1.1.8	Prepares, Administers, and Utilizes Tests as an Instructional Tool
1.1.9	Adapts to New Teaching Methods and Current Trends in Subject Field(s)
1.1.10	Establishes Open Communication with Parents
1.1.11	Maintains a Physical Environment Which is Conducive to Learning
	<u>1.2.0 Interpersonal Relationships and Discipline</u>
1.2.5	Has a Functional Understanding of the Culture in Which the Student Lives
1.2.6	Assumes Responsibility for Assisting with Overall Discipline of Students Within the School
	<u>1.4.0 Clerical Duties of Teachers</u>
1.4.1	Prepares and Submits Accurate Enrollment and Attendance Cards
1.4.2	Grades and Returns Students' Papers Within a Reasonable Time

Table III (continued)

HISD Reference Number	Competency Indicators Not Measured by GATE
1.4.3	Averages and Prepares Grades for Reporting to Parents
1.4.4	Prepares Grade Book with Names of Students and all Pertinent Student Data
	1.5.0 <u>Staff Duties</u>
1.5.1	Complies with District and Building Rules and Regulations
1.5.2	Is Thoroughly Familiar with School Goals and Programs
1.5.3	Works with Appropriate Staff and Resource People for Students' Optimum Mental and Physical Development
1.5.4	Assumes Responsibility for Supervision of Students
1.5.6	Participates in Special Assessment, Recognition, and Consideration of Students
1.5.7	Assumes the Responsibility for the Care of and Accountability for School Equipment
	1.6.0 <u>Personal Characteristics</u>
1.6.2	Demonstrate Self-control
1.6.3	Demonstrates a Command of the English Language
1.6.4	Is Punctual
1.6.5	Is Well Groomed
	1.7.0 <u>Professional Growth</u>
1.7.1	Keeps Abreast of Educational Developments on the National, State and Local Levels
1.7.2	Researches for Enrichment and Completeness of Teaching Program

identified as important behaviors which teacher ought to exhibit (Medley, 1977; Spaulding, 1977; Coker, 1977). These individuals were requested to select items from GATE which seemed to reflect each of the competency statements. They then met with the other developers of GATE as a competent committee to make a final selection of clusters of items (keys) which could be used in the assessment procedure (Medley, 1977; Spaulding, 1977; Coker, 1977).

The cluster of items (keys) which reflect the eleven behavior statements were derived on a priori basis from the 314 items on the instrument by the aforementioned committee. These keys were submitted to three Georgia State University faculty members who served as a panel of experts. In their opinion the keys had face validity as measures of behavior statements.

Appendix A represents the HISD Districtwide Staff Development program competency areas with indicators. Eleven of these behavior statements were selected and are indicated with an asterisk. In the opinion of the committee, eight of these indicators could not be measured by GATE.

Data Reduction

Observers returned GATE data sheets which were scanned for any errors and then key punched. Each item marked was punched as a four digit code. All records were identified by school, teacher and observer. In this way, a record was created for each recording by each observer on each visit with a one (1) punched for every observed behavior and a zero (0) for all others. Each observer made four records per visit,

and these were combined into a single record for each observer for each class. Since the scores were averaged, there were four possible scores for each item/observer/class combination:

- 0 (no occurrence)
- 5 (one occurrence out of two records)
- 1 (two occurrences out of two records)

All of the records made by one observer for 33 classrooms (314 items on 61 records) were converted to standard (T) scores across item/class by each of the four observers using the following formula:

$$T = \frac{X - \bar{X}}{\sigma} \times 10 + 50$$

This procedure set the mean for each of the 314 items at 50 and the standard deviation of 10 for each of the observers. Values for the symbols of the formula are not shown at this point since the figures are shown on the computer printout in the Appendix.

Since all item means were equal when summed into composites, the procedure allowed for the elimination of differences between observer and between items. The 314 item scores for every teacher for each of the four observers then became the basis for the reliability analysis. The cluster of items (keys) which were selected as reflecting the behavior statements were combined into a score for each teacher. This score was the sum of all the items for all the observers for that teacher divided by the total. For example, statement A-1 Teaches Basic Concepts for Grade Level and for Subject Level, there were four items with four observers, therefore, the average for each observer was composed of 4 scores.

Table IV shows the analysis of variance design used to estimate the reliability of a cluster of items (keys) made up of K items scored on records made by observers on GATE. Items were regarded as random so that errors of measurement due to inconsistencies between scores based on different items were included in the measurement errors allowed for by their reliability coefficients as defined in Table V.

The reliability coefficient of a measure as scored may be interpreted as the correlation between a set of scores based on the total (or mean) of the \underline{S} records per classroom made on \underline{K} items on the key by the \underline{R} observers actually used, and a set of scores based on the table (or means) of \underline{S} other records per classroom made on \underline{K} other items by \underline{R} other observers visiting the same classroom at different times. This is a conservative estimate of reliability since errors due to heterogeneity of items, instability of classroom behavior, and observer error all enter into the error of measurement and can lower the reliability coefficient. Table VI indicates the estimates of reliability.

When comparing keys made up of different items, a statistic called the reliability per item was used. This coefficient estimated the correlation between a set of scores recorded on a different item by a different observer visiting the same classroom but at different times. These correlations are shown in Table VII.

The Competency Based Teacher Training Modules

The Competency Based Teacher Training modules referred to in this study are presently housed in the Houston Independent School District's Staff Development Center. These modules were developed

Table IV
Analysis of Variance
Observer Agreement

Source	Degrees of Freedom	Mean Square
Items	I - 1	a
Recorders	R - 1	b
Error	$\frac{(I-1)(R-1)}{}$	c
TOTAL	RI - 1	

$$r_{avg} = \frac{a - c}{a}$$

The r_{avg} is the average agreement of all recorders and is based on pooled data (Ebel, 1951; Coker, 1978).

Table V
Analysis of Variance
Reliability of Data

Source Variation	Degrees of Freedom	Mean Squares		
		Observed	Expected	
Between Classes	32	a	$KR \sigma_c^2$	$+ R \sigma_{ck}^2 + \sigma^2$
Interaction class x item	32 (K-1)	c		σ_{ck}^2
Residual	32 (R-1)	d		σ^2
Total variation	32S			
Fitting S Means*	<u>S</u>			
Total	32S			

33 = Number of Classrooms Estimation $(=) d \sigma^2$ $(=) d$

K = Number of Items

$$(=) \frac{c-d}{R} \sigma_{ck}^2 \quad (=) \frac{c-d}{R}$$

R = Number of Observers

$$(=) \frac{a-c}{S} (c-d)^{**} \quad c \quad (=) \frac{a-c}{S} (c > d)^{**}$$

S = KR

Reliability:

$$\frac{\sigma_{ck}^2}{\sigma_c^2 + \frac{\sigma_{ck}^2}{K} + \frac{\sigma^2}{S}}$$

Reliability per item:

$$\frac{\sigma_c^2}{\sigma_c^2 + \sigma_{ck}^2 + \sigma^2}$$

*No main effect for items is shown because the normalization of each item makes all item means the same.

**When c-d, c and d are pooled to yield an estimate \underline{e} of (with 32(S-1) degrees of freedom), and \underline{e} is submitted for c

*** (Medley, 1977; Coker, 1978; Lorentz, 1978)

Table VI
Estimates of Reliability
Eleven Behavior Statements

Competencies	Reliability Coefficient
Teaches Basic Concepts for Grade Level and/or Subject Level	0.3919
Demonstrates a Working Knowledge of Subject Matter	0.7695
Plans Activities for Students' Individual Needs	0.0222
Prepares and/or Uses Various Methods and Techniques to Present Subject Matter and Encourage Student Participation	0.5459
Gives Well-defined Instructions to Students	0.2724
Develops, Organizes, and Implements a System for Classroom Management	0.4532
Encourages Students to Become Self-Disciplined	0.2167
Promotes Positive Self-image in Students	0.2507
Is Consistent and Empathetic in the Treatment of Students	0.1497
Practices Good Human Relations	0.5427
Exhibits Overall Positive Approach	0.0936

Table VII
Correlations Across Behaviors
Among Observers

Competencies	Correlations
Teaches Basic Concepts for Grade Level and/or Subject Level	0.3919
Demonstrates a Working Knowledge of Subject Matter	0.7695
Plans Activities for Students' Individual Needs	0.0222
Prepares and/or Uses Various Methods and Techniques to Present Subject Matter and Encourage Student Participation	0.5459
Gives Well-defined Instructions to Students	0.2724
Develops, Organizes, and Implements a System for Classroom Management	0.4532
Encourages Students to Become Self-disciplined	-0.2167
Promotes Positive Self-image in Students	0.2507
Is Consistent and Empathetic in the Treatment of Students	-0.1497
Practices Good Human Relations	0.4527
Exhibits Overall Positive Approach	0.0936

and field tested as a result of a Title I funded grant. The specific modules used as a part of this study relate to Classroom Management competencies, i.e., management of instruction, management of the environment, and management of students. The specified competencies from which the modules were developed grew out of those competencies on the teacher's own assessment instrument (DSDP) which deal with instruction and interpersonal skills areas. Upon the recommendation of the author of the GATE, Dr. Homer Coker, Dr. Robert Spaulding, Dr. Donald Medley and members of the Georgia State University faculty it was decided that those competencies on the DSDP instrument, i.e., extra cocurricular activities, clerical duties of teachers, staff duties, personal characteristics, and professional growth do not yield hard evidence to scientifically judge teacher effectiveness. Therefore, the aforementioned competencies on the DSDP instruments will not be dealt with in this study.

Chapter 4

ANALYSIS OF THE DATA

The primary purpose of this study was to describe the change in the effectiveness of elementary teachers who participated in the competency based teacher training program as measured by the Georgia Assessment for Teacher Effectiveness instrument through pre and post direct observations in the classroom. These teachers (participants) were employed in Title I elementary schools in the Houston Independent School District. The observations were made by Title I Staff Development facilitators trained by Homer and Joan Coker to use the Georgia Assessment for Teacher Effectiveness (GATE). This is a low-inference, sign observation instrument.

The study was an attempt to determine whether or not the GATE could be used to record pre and post selected behaviors, once correlated to the district's own teacher assessment instrument. Additional purposes included (1) determining the extent to which an individual teacher exhibited change as a result of staff development processes as compared against himself. (2) Determining the extent to which each individual teacher exhibited change as a result of staff development processes as compared to the group of thirty.

This chapter provides a presentation and analysis of these data.

Questions

Findings with respect to the questions posed from the problem are reported first, followed by results from testing the specific hypotheses.

Can district needs and teacher values become a basis for a staff development program?

Yes. Through the process described on page 102 the investigator was able to document a process by which priorities established by the Houston Independent School District and the values identified through a survey of teacher opinions became the basis for a staff development program. These needs and values, in turn, became the basis for development of a district assessment instrument. This need and valued-based program then became the foundation for the development of the evaluation program undertaken in this study.

Can teacher competencies be assessed in specific observable terms?

Yes. From the district's assessment instrument mentioned above, the investigator successfully keyed district needs and teacher values to an instrument adapted for staff development processes. This allowed the HISD competencies to be assessed in specific observable terms as measured by a low inference instrument such as the GATE described on page 131.

Can a standardized low inference instrument be adapted and correlated to the teacher assessment instrument?

Yes. After surveying the available literature an instrument developed for pre-service of teacher education was found to be adaptable to the broad range of competencies identified in the HISD program. Selection and adaptation of this instrument is described on page 114.

Can teachers be trained as observers to record pre and post behavioral changes in their peers?

Yes. The investigator contracted the authors of the GATE instrument to train observers for purposes of this study for both a pilot program and the observations reported. These persons were teachers employed in the Staff Development Department as facilitators. A high level of observer agreement was obtained. The process of obtaining the level of agreement, .80, is described on page 128.

Can a training program be developed to integrate teacher prioritized needs, low inference observation, competency based instruction and school district competencies?

Yes. The answer to this question reflects the integrated approach taken to this study. Whereas the hypotheses reported reflect the direct observations of teachers participating in the staff development program, the study has documented how this system of evaluation is keyed specifically to school district needs, teacher values, competency based instruction and the teacher's own assessment programs. While the application of the instrument produced findings that may stand alone, the investigator believes that they derive full implications upon an integrated approach to staff development beginning with district needs,

teacher values and ending with verified changes in teacher behaviors.

Can the results of these pre and post observations be analyzed to provide reliable relationships between valued behavior and observable behaviors?

Yes. Correlations were run for each of the competencies indicating the relationships between valued behavior and observable behavior. A teacher effectiveness profile showing the pre and post observation mean scores for each teacher as compared against himself and the group is shown on page 161. An overall profile of the total group's pre and post observation mean scores is shown on page 148.

Can the necessary groundwork be laid for appropriate scientific evaluation of teacher performance?

Yes. Whereas the HISD assessment instrument required a high level of value-laden inferences, the GATE relies upon low inference observations of teaching practices. Thus, the keying of the HISD assessment instrument to the GATE combined with the high degree of observer reliability attained in the study shows that a school district's need for teacher evaluation can become rooted in a relatively objective scientific program.

Next we shall report the findings from testing the eleven specific behaviors related to the specific competencies.

After the pre and post observations of teachers participating in the staff development program, observers documented positive growth for nine of the areas of competence measured and negative correlations

for two others. The average values from the observation for each competency are shown in Figure 5. This figure represents the overall significance between group means for the total group of thirty participants. The greatest growth appears to come from those competencies dealing with classroom management which is the major thrust of the competency based teacher program. These competencies are:

1. Demonstrates a working knowledge of subject matter
2. Prepares and/or uses various methods and techniques to present subject matter and encourages student participation
3. Develops, organizes and implements a system of classroom management
4. Practices good human relations
5. Teaches basic concepts for grade level and/or subject level

As analyzed, further positive growth was shown in four others, although statistical significance was not attained. They are:

1. Gives well defined instructions to students
2. Promotes positive self images in students
3. Plans activities for students' individual needs
4. Exhibits overall positive approach

For the other two competencies "Encourages student to become self-disciplined" and "Is consistent and empathetic in the treatment of students," negative correlations were shown. One of the competencies, "Is consistent and empathetic in the treatment of students" was proven to be unreliable among the observers. For the other, "Encourages students

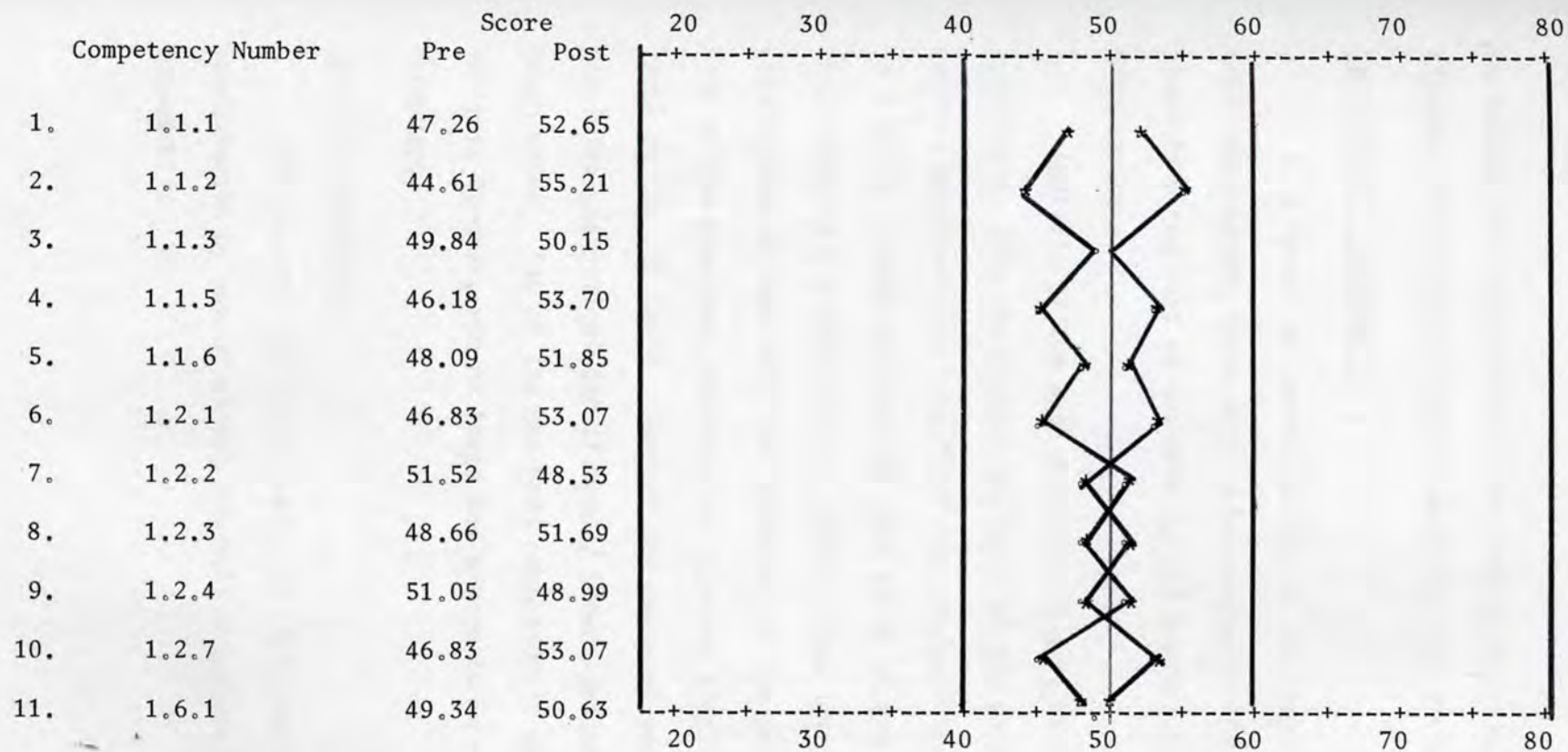


Figure 5. Teacher Effectiveness Profile Showing Overall Significance of the Competency Based Teacher Training Program as Indicated by Group Pre and Post Means

to become self-disciplined", the investigator is concerned that a clearer definition of "self-discipline: may be needed.

General Null Hypothesis

As a result of participation in the competency-based teacher training program, there will be no change in the effectiveness of elementary teachers as measured by the Georgia Assessment for Teacher Effectiveness.

Analysis of the data resulted in a rejection of the null hypothesis. The statistical analysis of the data relative to this general hypothesis by results of the pre/post observations, resulted in a Wilks' Lambda quotient of .526 using 11 and 49 degrees of freedom. This produced a probability of .0005. This level of strong statistical significance allows definite rejection of the general null hypothesis. Five of the measured competencies attained significance from the .05 level to the .01 level. Four of the measured competencies though not attaining statistical significance, showed definite shifts among the group means. Two of the measured competencies showed negative correlations; however, one of these had proven to be unreliable among the observers.

Specific Hypotheses

The general null hypothesis was stringently defined by the investigator by use of eleven sub-null hypotheses, one for each competency.

Ho₁ There will be no significant difference in the pre and post performances of teachers in the teaching of basic concepts for grade level and/or subject level as a result of the competency based teacher training program.

A pre-post correlation of 0.3919 was indicated. It was statistically significant at the .05 level. Thus, the null hypothesis was rejected. It must be reemphasized that this study dealt only with elementary teachers who are not generally considered to be subject matter specialist, but subject matter generalist. This positive shift proves that elementary teachers, given a variety of resources, time and self-confidence can become more effective in the teaching of basic concepts for grade level and/or subject level as a result of training.

Ho₂ There will be no significant difference in the pre and post performances of teachers in the demonstration of a working knowledge of subject matter as a result of the competency based teacher training program.

There was a pre-post correlation of 0.7695. This strong correlation was significant at the .001 level. Thus, the null hypothesis was rejected. This would indicate the strength of the positive impact of the training as observed in pre-post classroom behavior of this competency. This strong correlation also indicates that these teachers were able to strengthen the knowledge and skills they already possessed. They were able to make use of the many new resources, make an orderly correlation of these newly gained skills

and actually demonstrate these acquired skills in a more easily observed classroom setting.

Ho₃ There will be no significant difference in the pre and post performances of teachers in the planning of activities for students' individual needs as a result of the competency based teacher training program.

A pre-post correlation of 0.0222 was indicated. Thus, the null hypothesis was not rejected. Though not statistically significant there was a shift among group means of 49.84 to 50.15. It was expected however, that his competency could have been only slightly impacted by the competency based teacher training program since this study dealt with elementary teachers who have been trained to master this competency throughout their educational careers.

Ho₄ There will be no significant difference in the pre and post performances of teachers in the preparation and/or use of various methods and techniques to present subject matter and encourage student participation as a result of the competency based teacher training program.

A pre-post correlation of 0.5459 was indicated. This correlation was significant at the .001 level. Thus, the null hypothesis was rejected. This strong correlation supports the training results in Ho₂.

This positive shift in behavior as a result of the training addresses itself to the focus of identifying specific instructional objectives for subject matter at the appropriate levels thereby identifying, adapting, or generating test items based upon the specific objectives.

Ho₅ There will be no significant difference in the pre and post performances of teachers in the giving of well-defined instructions to students as a result of the competency based teacher training program.

A pre-post correlation of 0.2724 was indicated. This competency did not attain statistical significance. Therefore, the null hypothesis was not rejected. The data indicate there were positive shifts for pre and post observations among group means from 48.09 to 51.81. This weakened shift in behavior was not unexpected. The competency based training does not specifically focus on "giving well-defined instructions". It was expected that the college teacher training program would address this issue. There may, however, be a need to reexamine the competency based training component in light of this behavior.

Ho₆ There will no significant difference in the pre and post performances of teachers in the development, organization and implementation of a system for classroom management as a result of the competency based teacher training program.

A pre-post correlation of 0.4532 was indicated. This correlation was significant at the .05 level. This null hypothesis is rejected. This supports the basic assumption which has been made by the developers of the training program. This indicates that the training is indeed effective in training classroom teachers in a system of classroom management which positively effects their classroom behavior after training. Some of the areas addressed in training are: designing a record keeping system for tracking student progress, identifying and correlating available materials to objectives for more effective use in the grouping of students, and the ability to evaluate student progress based on identified objectives.

Ho₇ There will be no significant difference in the pre and post performances of teachers in the encouragement of students to become self-disciplined as a result of the competency based teacher training program.

A negative pre-post correlation of -0.2167 was indicated. Thus the null hypothesis was not rejected. The researcher believes that there is a need for a clearer definition of "self-discipline".

Self-discipline is an ambiguous term. A major portion of the study focused on trained observers being able to reach agreement among themselves and against an expert coder on unambiguous examples of classroom behavior. Perfect agreement is desirable, but the conditions under which this applies have not yet been specified by researchers, nor is it particularly desirable.

Ho₈ There will be no significant difference in the pre and post performances of teachers in the promotion of positive self-images in students as a result of the competency based teacher training program.

A pre-post correlation of 0.2057 was indicated. Thus, the null hypothesis was not rejected. Though not statistically significant, data indicate a positive shift in group means for pre and post observations from 49.66 to 51.69. Teachers involved in the training program are taught to believe that nothing can be achieved by relating the specific causes of a child's failure to his home background or "learning style". The first and most important step in cause finding is to discover what the child has failed to learn. This step becomes the counterpart of discovering what is needed to promote a positive self-image in students.

Ho₉ There will be no significant difference in the pre and post performances of teachers in the consistent and empathetic treatment of students as a result of the competency based teacher training program.

A negative pre-post correlation of -0.1479 was indicated on this competency. Thus, the null hypothesis was not rejected. This competency was proven to be unreliable. It is felt that a clearer definition of empathy should be made or observer bias may have been present. Since

teachers and pupils in the real world do not always exhibit behaviors that fall neatly into predefined observational system categories, observer disagreement on ambiguities reveals a more representative picture of the real world. This view is appropriate for those human behaviors that are relatively unchanging over time of measurements. For those interested in change in behavior from time to time or from goal to goal, such a view may be counterproductive and hence need modification.

Ho₁₀ There will be no significant difference in the pre and post performances of teachers in the practice of human relations as a result of the competency based teacher training program.

A pre-post correlation of 0.4527 was indicated. It was statistically significant at the .05 level. The null hypothesis was rejected. A great amount of emphasis is placed on developing strong communication skills in the competency based training program. Focus on the affective teacher is a major part of developing self-confidence and a positive attitude toward others. It is felt that by the development of appropriate problem solving skills, this will serve as a deterrent to teacher frustration and magnify the need for creating a positive learning environment.

Ho₁₁ There will be no significant difference in the pre and post performances of teachers in the exhibition of an overall positive approach as a result of the competency based teacher training program.

A pre-post correlation of 0.0936 was indicated. Though not statistically significant data indicate a shift in group means from 49.34 to 50.36 further indicating only a slight impact made by the competency based teacher training program. A major problem in trying to develop an "overall positive approach" is that there is little hope of identifying and changing lifelong attitudes and values. The competency based teacher training program tries to focus on changes that are immediately relevant to the present problems. Therefore, only a slight shift was expected in this competency.

Analysis of Observer Agreement Data

An analysis of variance procedure was used to assess the observer agreement. Data collected in non-experimental classroom were key punched and analyzed. Table I as shown in Chapter 3 represents the procedure used to determine observer agreement. Each observer had to reach .80 agreement with each other before entering the classroom.

Analysis of Data Collected Across Teachers

An analysis of variance procedure (Medley, 1977; Coker, 1979) was used to compute the reliability of each cluster of items (key) used in the assessment. Each key was made up of certain items scored

on records made by observers using GATE. The reliability of each key was computed using the following formula:

$$\text{Reliability} = \frac{\sigma^2_{ck}}{\sigma^2_c + \frac{\sigma^2_{ck}}{k} + \frac{\sigma^2}{S}}$$

A summary of this data is shown on the computer print-out in Appendix E.

The reliability per item was used to compare the keys which were made up of different items. This estimated the correlation between a set of scores recorded on a different item by a different observer visiting the same classroom but at a different time. The reliability per item was computed using the following formula:

$$\text{Reliability per item} = \frac{\sigma^2_{ck}}{\sigma^2_c + \sigma^2_{ck} + \sigma^2}$$

A summary of this data is shown on the computer print-out in Appendix E.

These reliabilities were computed as explained in the design set forth in Chapter 3. This analysis of variance produced an F statistic which was the measure of reliability. This determined if the instrument consistently measured those behaviors it purports to measure.

Summary of the Data Relative to Hypotheses

A computer program developed by Coker and Associates especially for this study presents the number of items found in each of the 11 behavior statements as well as computed reliability coefficient, stability of classroom behavior, average reliability per item and average item intercorrelation.

Summaries of the data relative to the analysis of the specific hypothesis in this study are presented in Appendix F.

Any reader who wishes to obtain the original data source from which the statistical analysis of this study have been made may contact either of the following persons: Teddy A. McDavid, Houston Independent School District, 3830 Richmond, Houston, Texas 77027 or Dr. Homer Coker, West Georgia College, Carrollton, Georgia 30118.

Individual Profile Across the Eleven Behavior Statements

The GATE observation instrument recorded selected behavior statements in a document entitled Houston Independent School District's Districtwide Staff Development Program Teacher Assessment (Exhibit A).

For purpose of this study, teachers were given identifying numbers 1001-1033. Teachers 1019, 1021, and 1033 dropped out of the study.

Records made by one observer across 314 items for 30 classrooms were converted to standard (T) scores across items/class by each of the four observers. This procedure set the mean for each of the items on GATE at 50 and the standard deviation at 10 for each of the observers.

A computer program (Coker, 1979; Lorentz, 1979) was designed in order for profiles to be generated across the 11 behavior statements. This indicated how each teacher's score ranged in relation to the mean score of the total group. For instance, Teacher 1001 had a range of 39.94 (pre-observation) on Competency 1.1.2 - Demonstrates a working knowledge of subject matter to 5337 (post observation). Teacher 1006

had a range of 51.29 (Pre-Observation) on Competency 1.2.1 - Develops, Organized, and Implements a System for Classroom Management to 56.03 (Post Observation). This exemplified the kind of specific analysis that can be made available to teachers and administrators in evaluating teacher performance or developing a staff development program. Examples of the profiles for the aforementioned teachers are shown in Figure 6 and Figure 7.

Group Profiles Across Each Behavior Statement

The GATE observation instrument recorded the extent to which teachers varied in the way they exhibited the eleven selected behaviors.

Records made by one observer were converted to standard (T) scores across item/class by each of the four observers. This procedure set the mean for each of the items on GATE at 50 and the standard deviation at 10 for each of the observers.

A computer profile (Coker, 1979; Lorentz, 1979) was designed for group profiles to be generated across each of the eleven selected behavior statements. This indicated how each teacher scored in relation to the mean score of the 30 teachers on each behavior. For instance, Competency 1.1.2 - Demonstrates a Working Knowledge of Subject Matter ranged from 31.38 for Teacher 1007 to 79.97 for Teacher 1032. Competency 1.1.5 - Prepares and/or Uses Various Methods and Techniques to Present Subject Matter and Encourages Student Participation ranged from 33.80 for Teacher 1003 to 68.43 for Teacher 1032.

These computer profiles shown in Figures 8 and 9 respectively give the reader an indication of how teachers vary in the manner in which they exhibit those competencies/behaviors thought to be important and desirable by school districts.

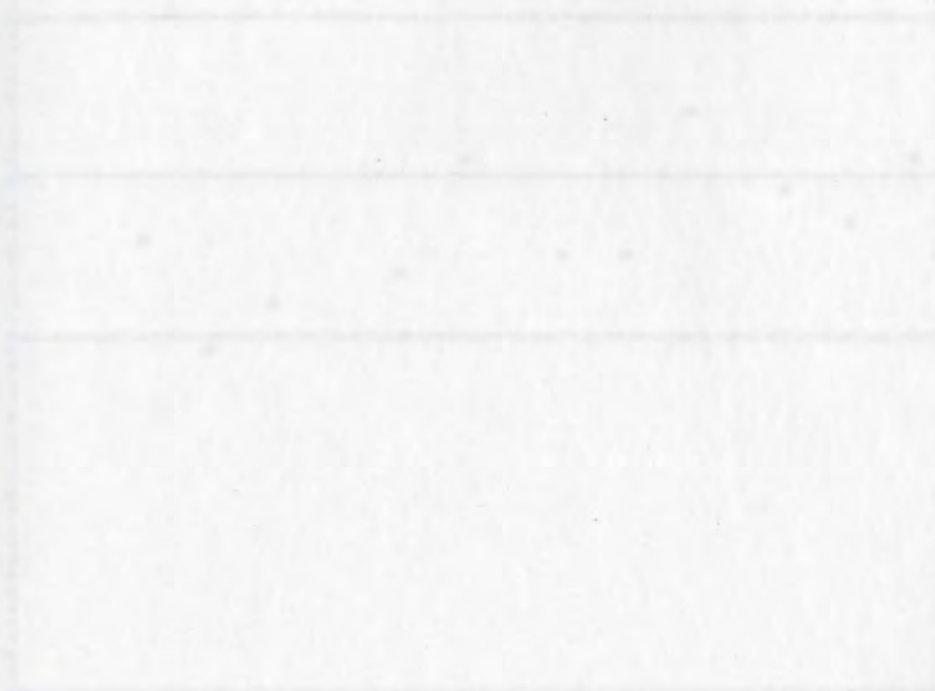


Figure 8. Teacher self-report of skills profile



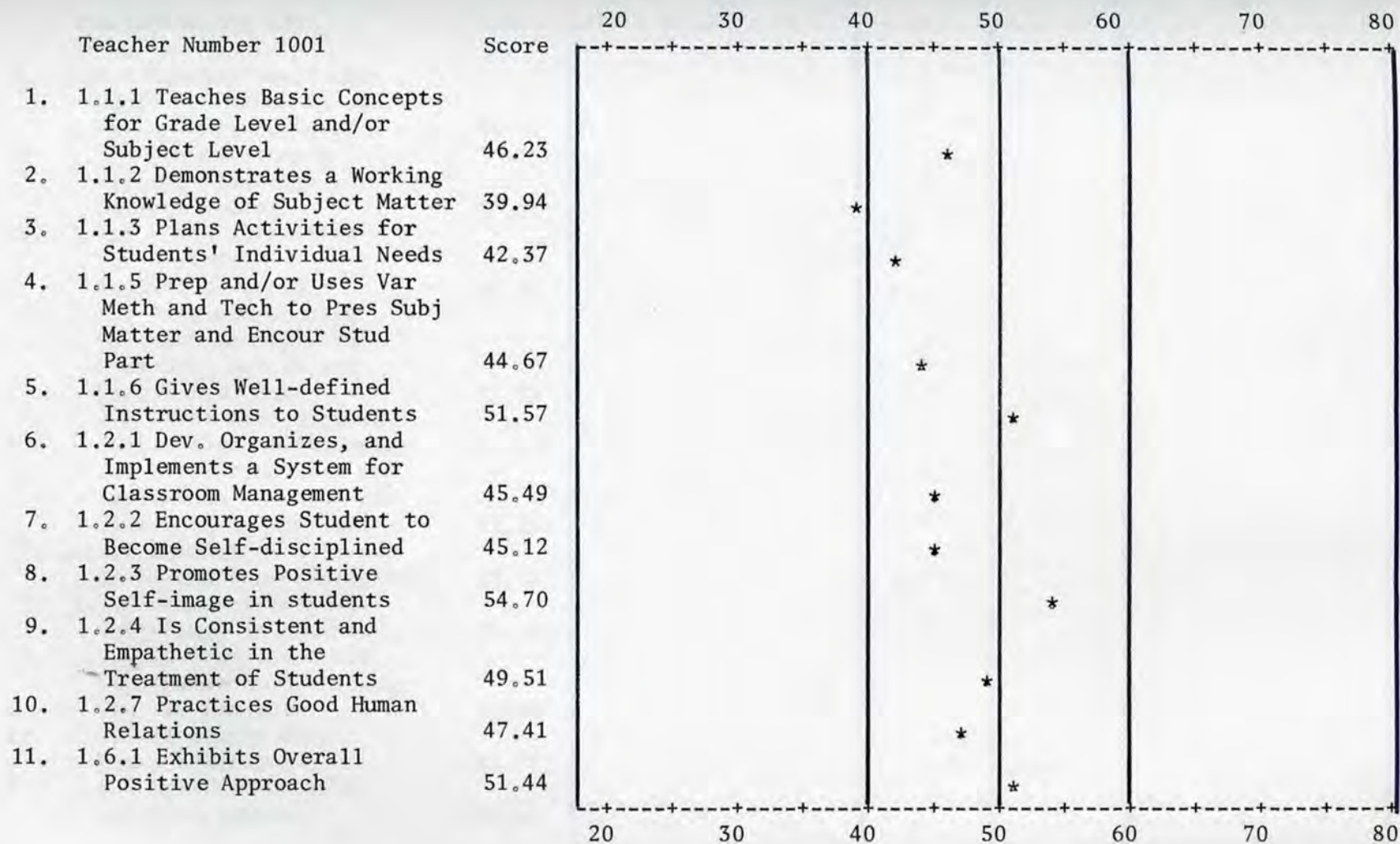


Figure 6. Teacher Effectiveness Profile

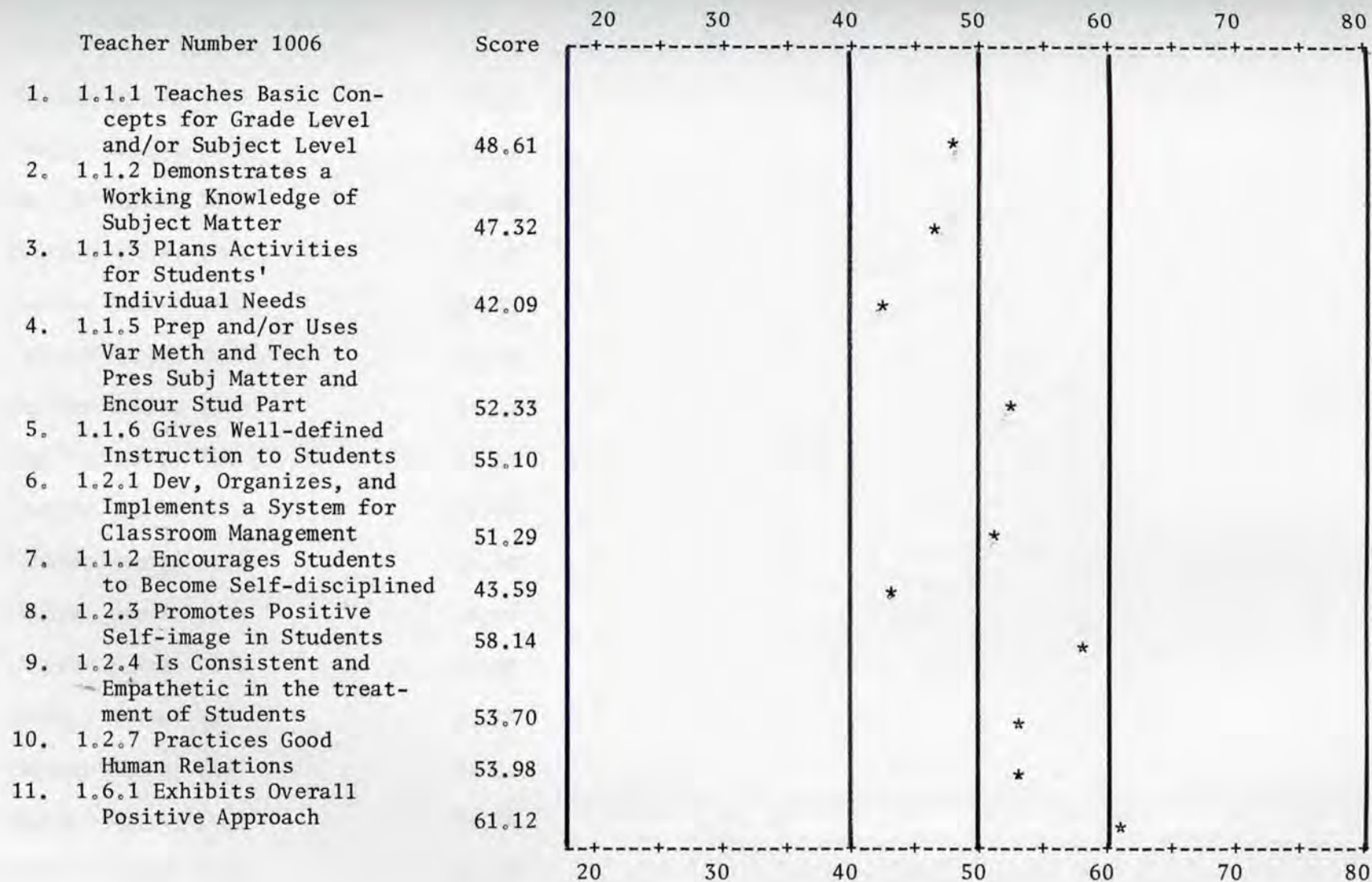
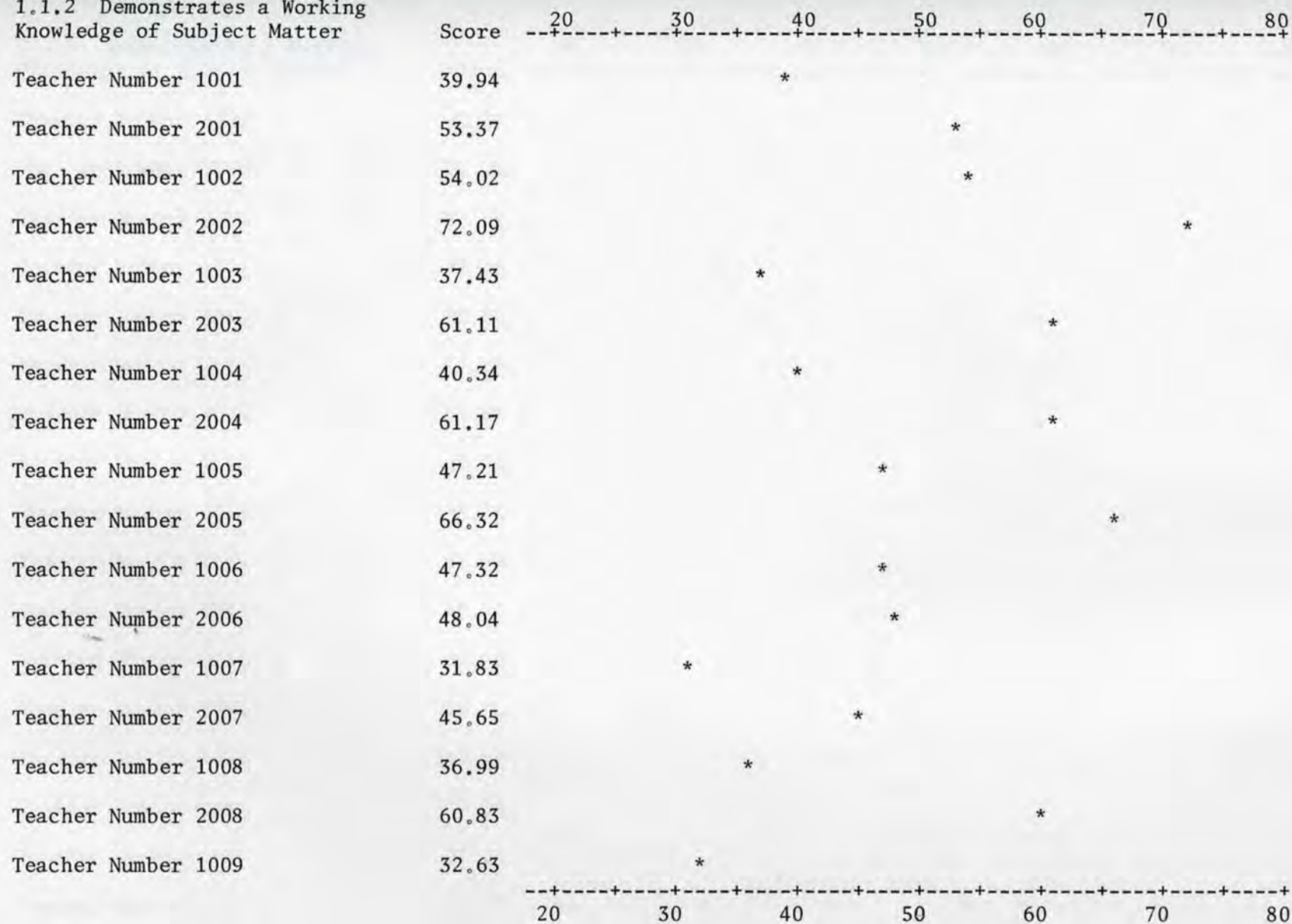
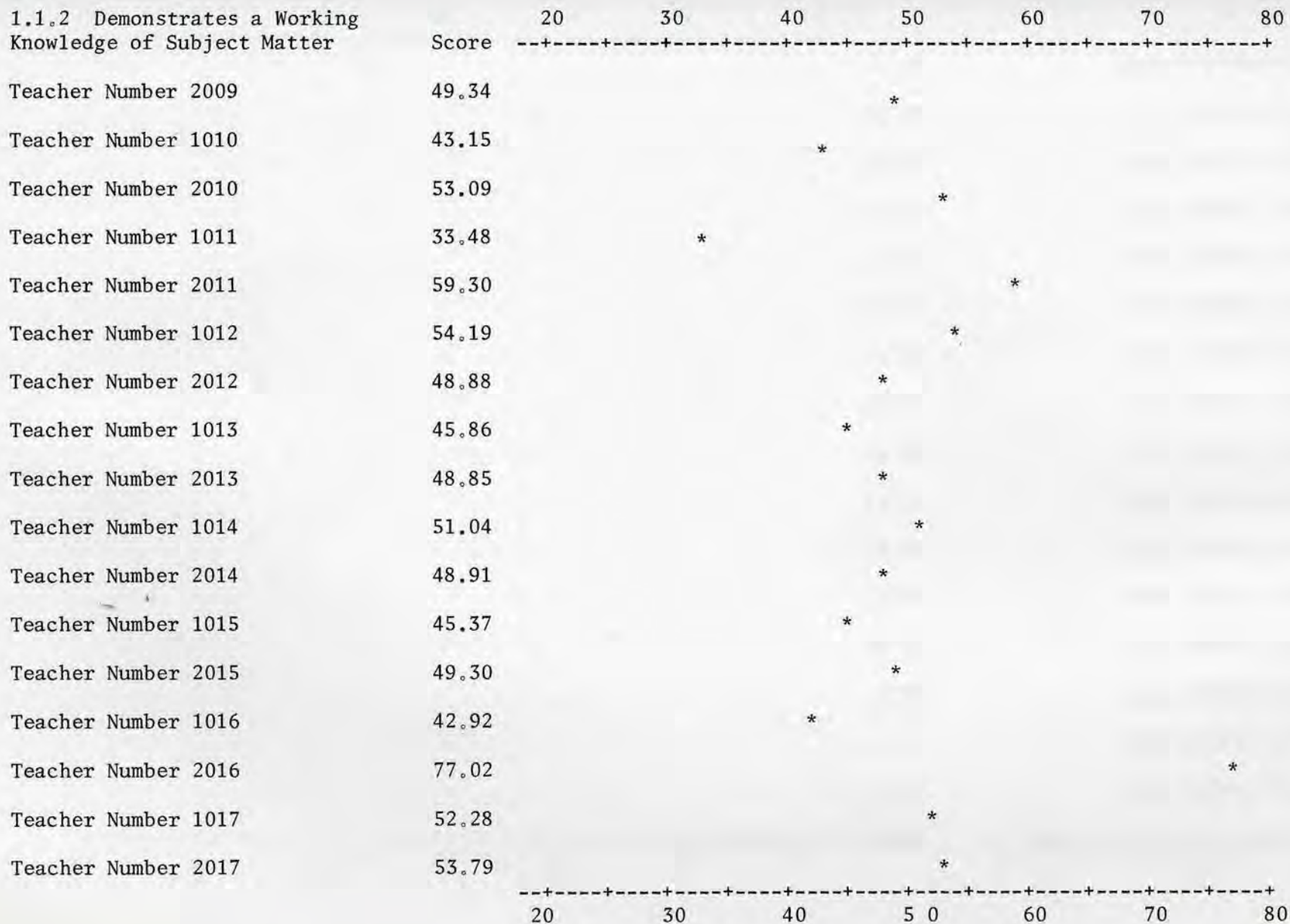


Figure 7. Teacher Effectiveness Profile

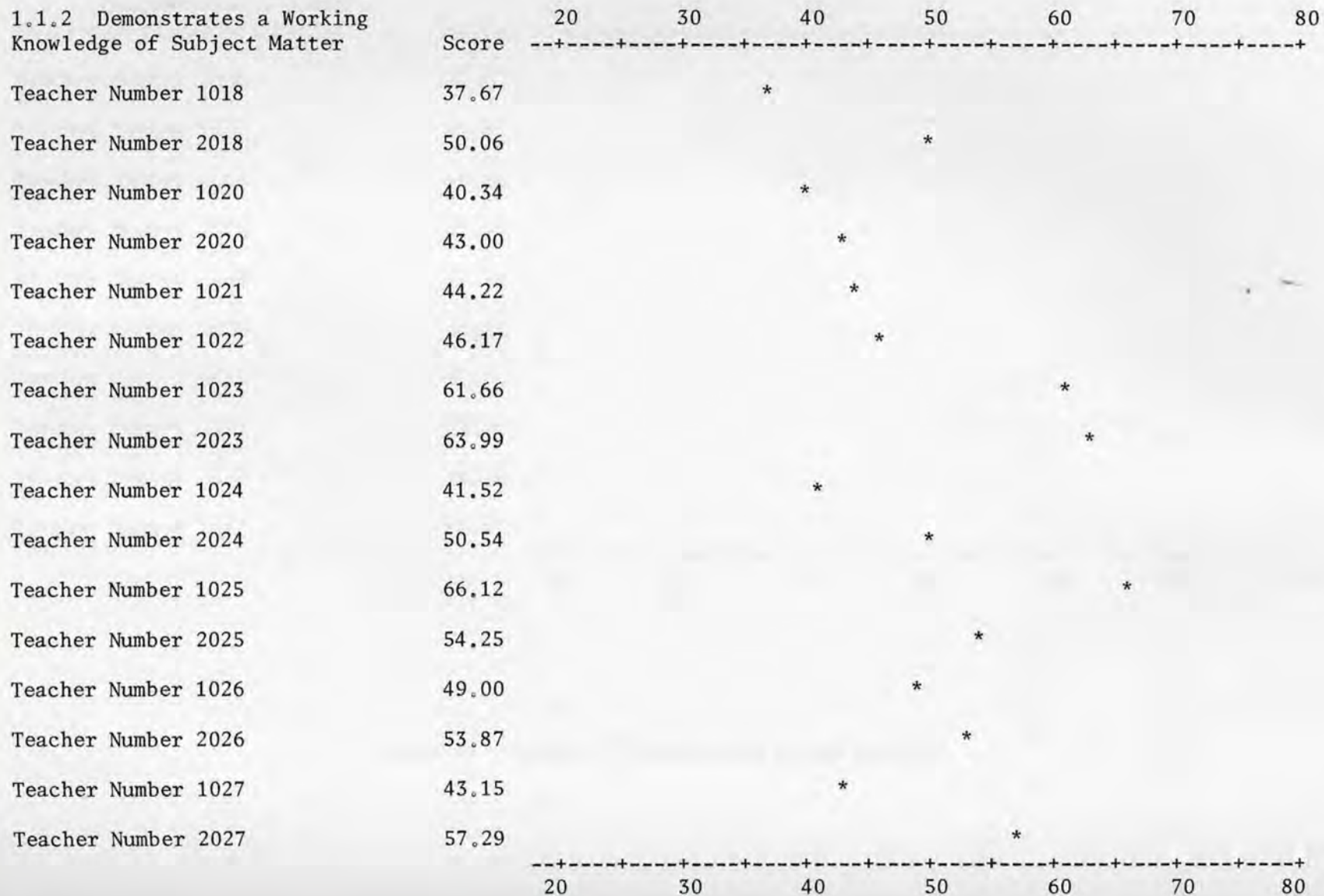
1.1.2 Demonstrates a Working Knowledge of Subject Matter



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Knowledge of Subject Matter



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Knowledge of Subject Matter



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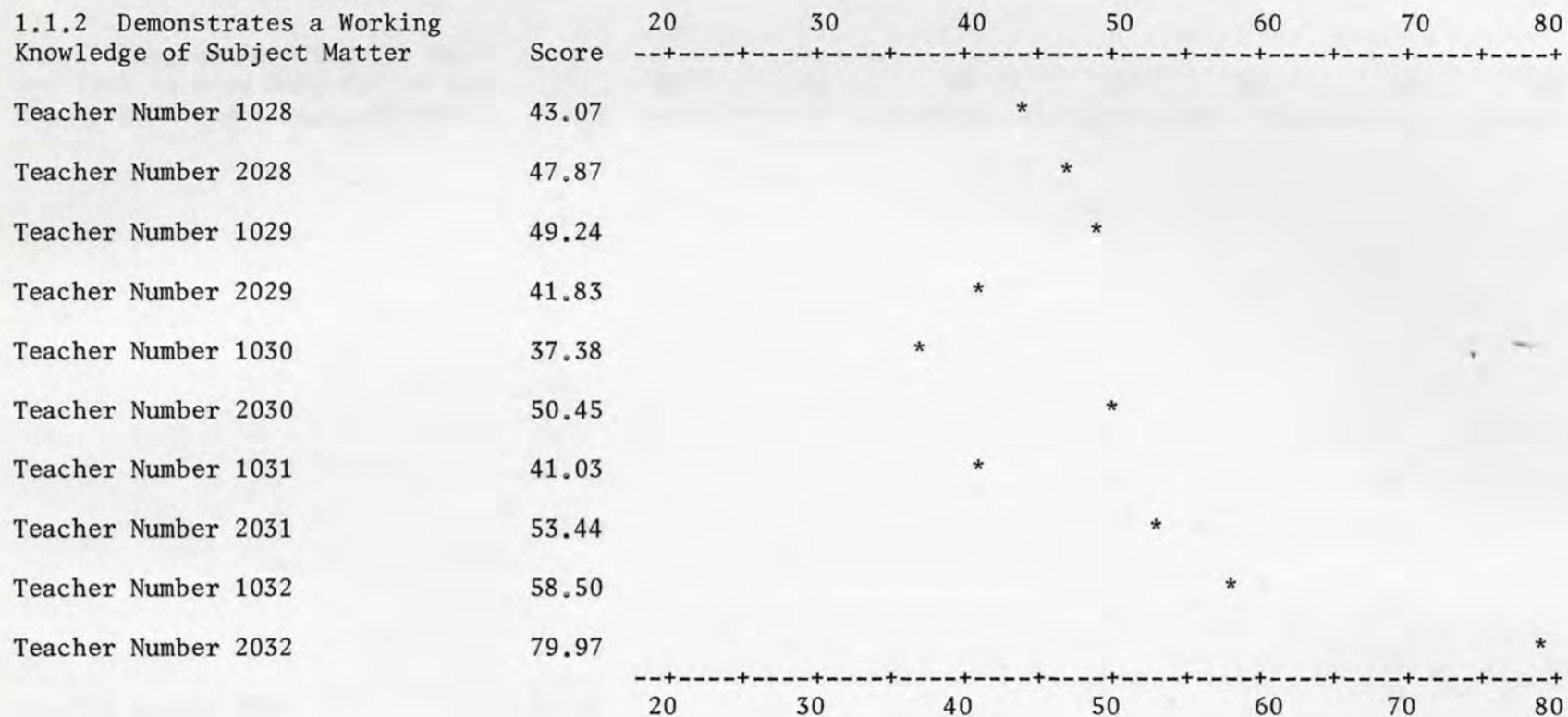
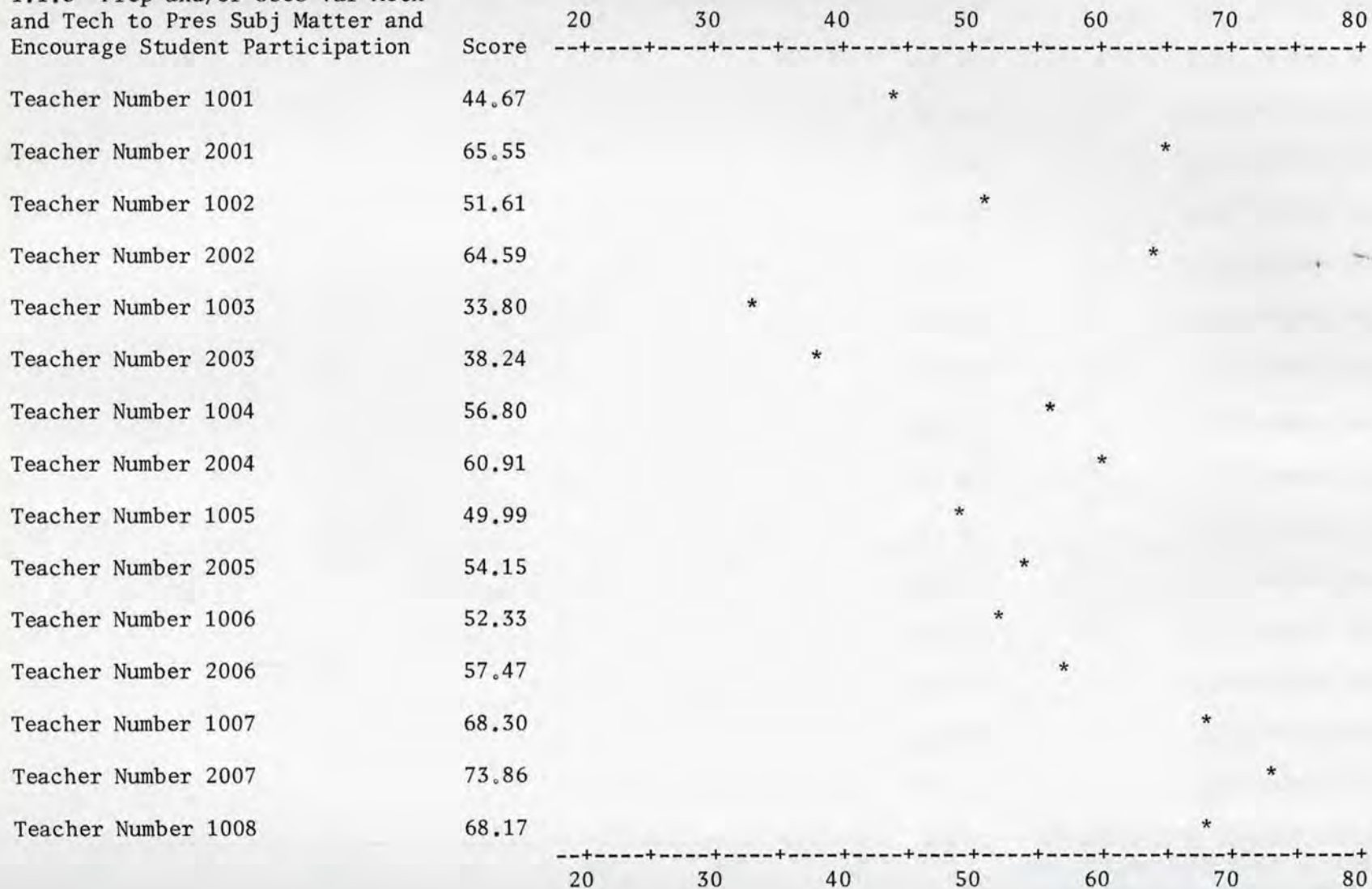
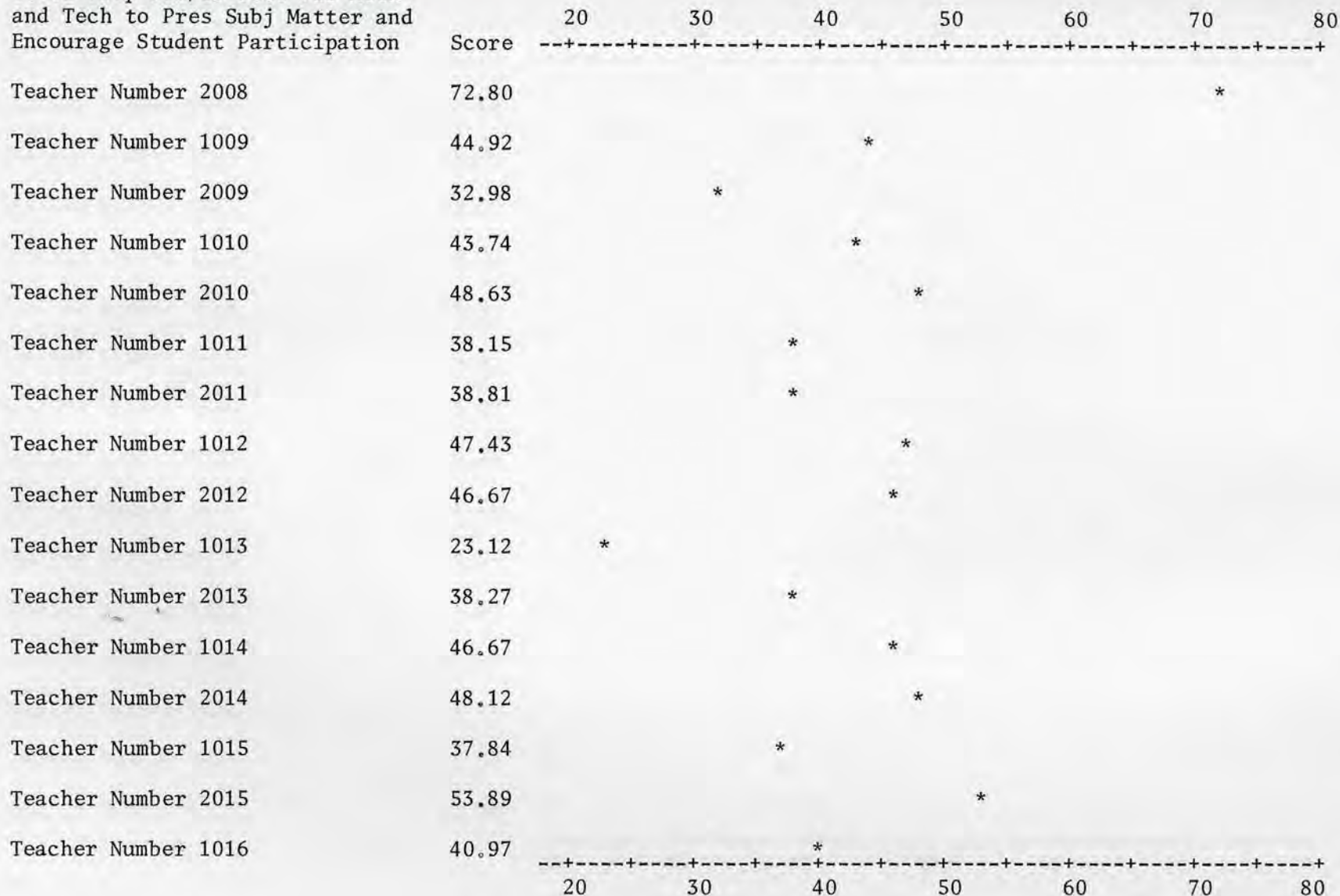


Figure 8. Teacher Effectiveness Group Profile

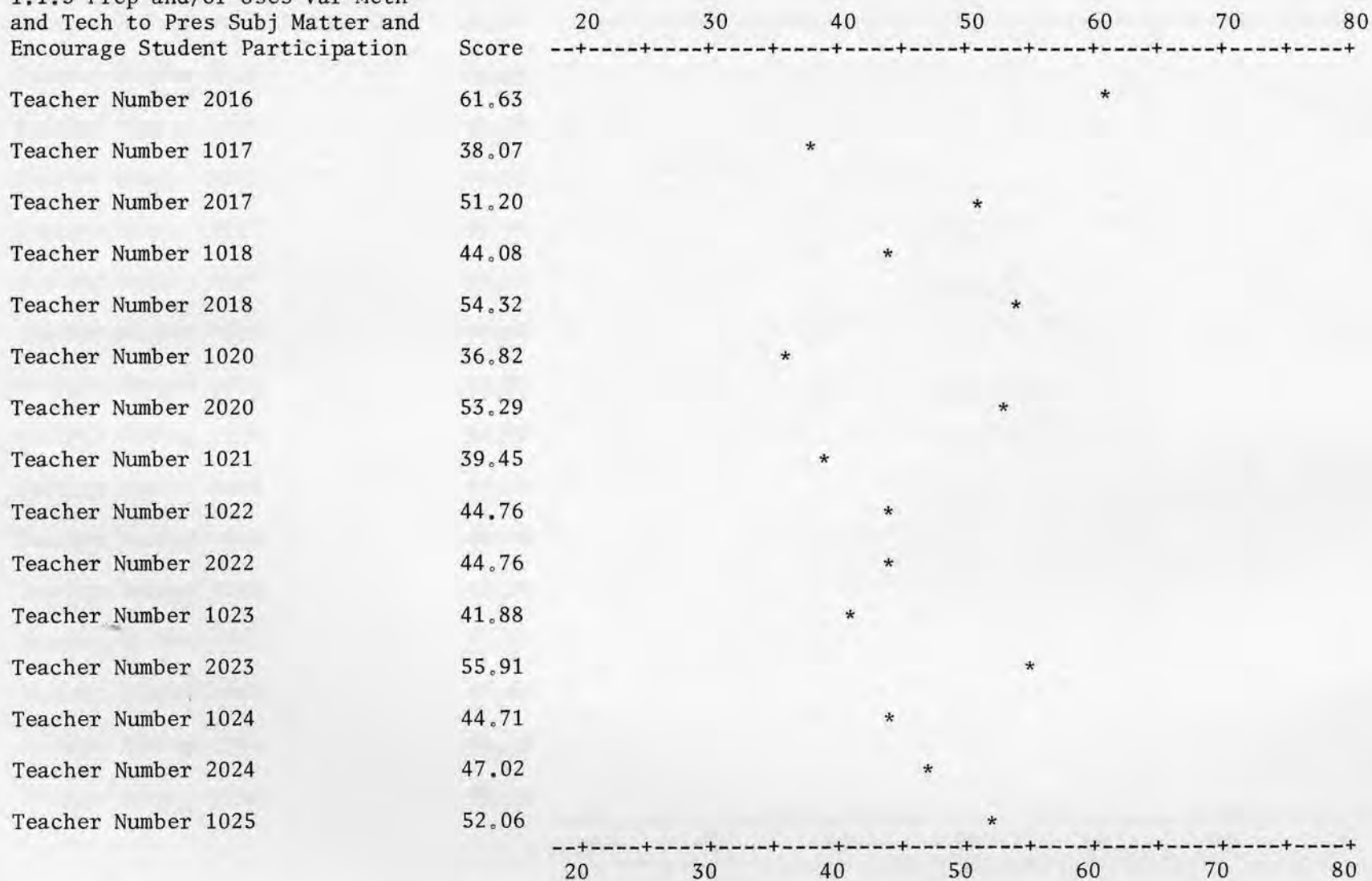
1.1.5 Prep and/or Uses Var Meth
and Tech to Pres Subj Matter and
Encourage Student Participation



1.1.5 Prep and/or Uses Var Meth
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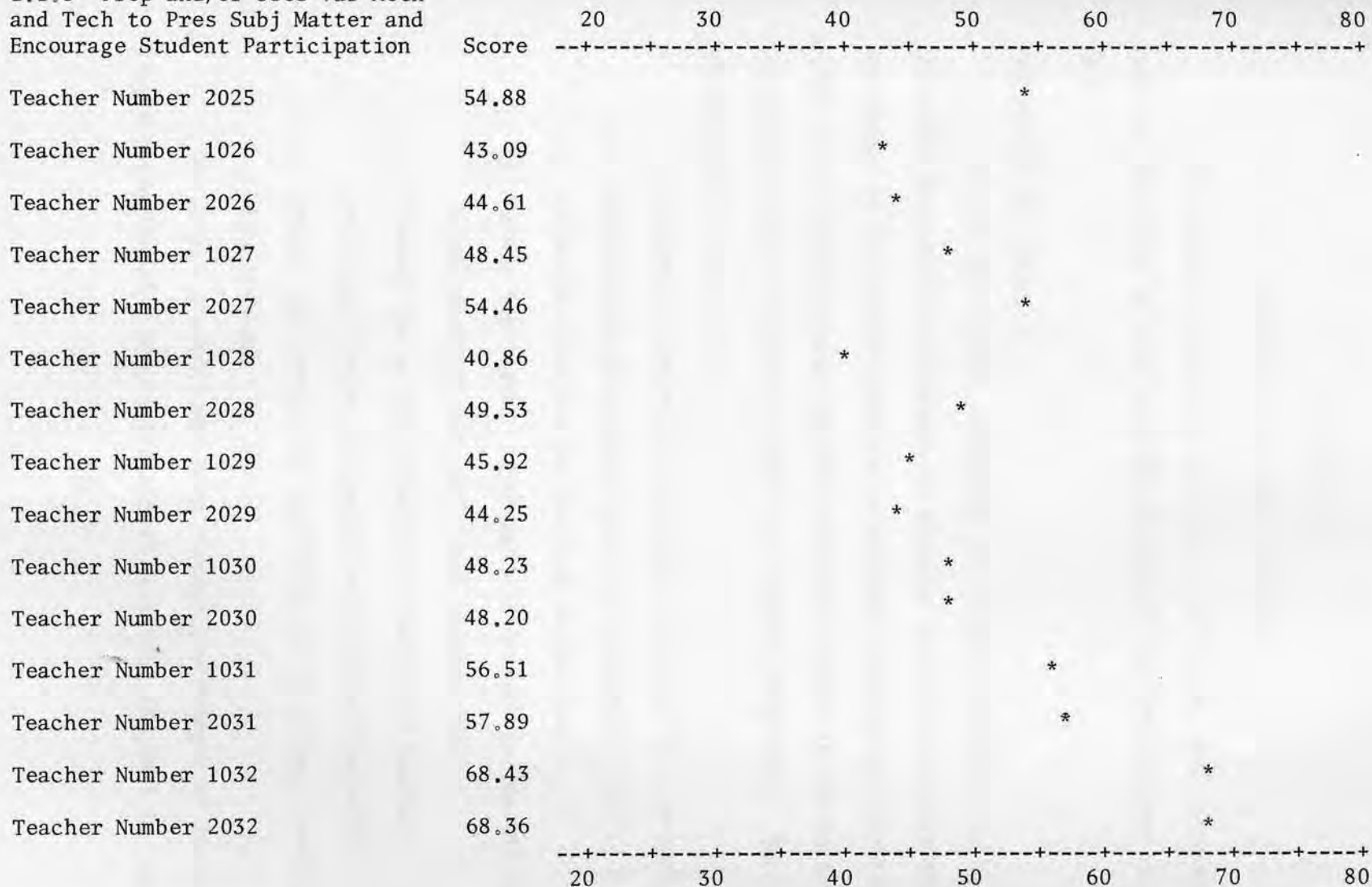


Figure 9. Teacher Effectiveness Group Profile

Chapter 5

SUMMARY AND CONCLUSIONS

This chapter presents a summary, conclusions, and recommendations of the study as well as a discussion of the implications of the data.

Summary of the Study

The purpose of this study was to select, adapt and use a low inference observation instrument to observe, describe and evaluate the change in the effectiveness of elementary teachers who participated in a competency-based teacher training program in the Houston Independent School District's Staff Development Department. More specifically it was to:

1. Determine whether an instrument designed for pre-service observation of teachers could be adapted to record selected behaviors of teachers in service.
2. Relate the teacher assessment instrument to identified school district and individual teacher needs.
3. Measure the extent to which an individual teacher exhibited change as compared with himself and with a group, as a result of participation in a staff development program.

The school district had gone through the process of identifying districtwide teaching priorities and of involving teachers in identifying

competencies they considered critical to the instructional process. Competency-based modules and professional growth programs had been developed in response to the district's and teachers' priorities. Eleven competencies considered essential to the functioning of classroom management and interpersonal relationships were selected for measurement in this study.

Selection of the Instrument

A group of thirty teachers was drawn from schools eligible to participate in the competency-based teacher training program funded through a Title I grant. Data were collected through the use of the modified Georgia Assessment for Teacher Effectiveness (GATE) which involves direct observation in the classroom.

Procedures

Twenty-one Staff Development facilitators were trained for a ten day period to gather data using the GATE observation instrument. Four of the twenty-one observers were used for this study, with a fifth observer picking up missing observations when scheduled visits were intended due to illness of an observer. Each of the observers made one visit to each teacher's classroom wherein she was responsible for two coding periods. A coding period consisted of two five-minute segments of time in which one section of the instrument was coded as the action occurred and the other section was coded immediately thereafter.

Records of the visits were then key punched and scores in a computer. Computer programs were devised which compared the perform-

ances recorded in a teacher's classroom before entry into the competency based teacher training program with those observed afterwards. The information allowed for the development of a profile for each teacher which indicated how closely each member approximated the mean of the behaviors of the total group. These behaviors had been previously identified by Houston Independent School District's teachers, and judged measurable by a competent committee consisting of Drs. Homer and Joan Coker, Dr. Donald Medley, Dr. Robert Spaulding and by the faculty of the College of Education, Georgia State University as important indicators of teacher effectiveness.

These data were analyzed by means of an analysis of variance which allowed for investigation of the reliability of the cluster of items (keys) which were descriptors of the behavior statements. With this statistical procedure, it was possible to determine whether or not the instrument was recording the important behaviors as well as determine any significant differences among the thirty teachers.

Findings with respect to the questions posed from the problem are reported.

Can district needs and teacher values become a basis for a staff development program?

Yes. Through the process described on page 102 the investigator was able to document a process by which priorities established by the Houston Independent School District and the values identified through a survey of teacher opinions became the basis for a staff development program. These needs and values, in turn, became the

basis for development of a district assessment instrument. This need and valued-based program then became the foundation for the development of the evaluation program undertaken in this study.

Can teacher competencies be assessed in specific observable terms?

Yes. From the district's assessment instrument mentioned above, the investigator successfully keyed district needs and teacher values to an instrument adapted for staff development processes. This allowed the HISD competencies to be assessed in specific observable terms as measured by a low inference instrument such as the GATE described on page 131.

Can a standardized low inference instrument be adapted and correlated to the teacher assessment instrument?

Yes. After surveying the available literature an instrument developed for pre-service of teacher education was found to be adaptable to the broad range of competencies identified in the HISD program. Selection and adaptation of this instrument is described on page 114.

Can teachers be trained as observers to record pre and post behavioral changes in their peers?

Yes. The investigator contacted the authors of the GATE instrument to train observers for purposes of this study for both a pilot program and the observations reported. These persons were teachers employed in the staff development department as facilitators. A high level of observer agreement was obtained. The process of obtaining the level of agreement, .80, is described on page 128.

Can a training program be developed to integrate teacher prioritized needs, low inference observation, competency based instruction and school district competencies?

Yes. The answer to this question reflects the integrated approach taken to this study. Whereas the hypotheses reported reflect the direct observations of teachers participating in the staff development program, the study has documented how this system of evaluation is keyed specifically to school district needs, teacher values, competency based instruction and the teacher's own assessment program. While the application of the instrument produced findings that may stand alone, the investigator believes that they derive full implications upon an integrated approach to staff development beginning with district needs, teacher values and ending with verified changes in teacher behaviors.

Can the results of these pre and post observations be analyzed to provide reliable relationships between valued behavior and observable behaviors?

Yes. Correlations were run for each of the competencies indicating the relationships between valued behavior and observable behavior. A teacher effectiveness profile showing the pre and post observation mean scores for each teacher as compared against himself and the group is shown on page 161. An overall profile of the total group's pre and post observation scores is shown on page 148.

Can the necessary groundwork be laid for appropriate scientific evaluation of teacher performance?

Yes. Whereas the HISD assessment instrument required a high

level of value-laden inferences, the GATE relies upon low inference observations of teaching practices. Thus, the keying of the HISD assessment instrument to the GATE combined with the high degree of observer reliability attained in the study shows that a school district's need for teacher evaluation can become rooted in a relatively objective scientific program.

General Null Hypothesis

As a result of participation in the competency-based teacher training program, there will be no change in the effectiveness of elementary teachers as measured by the Georgia Assessment for Teacher Effectiveness.

From the observations data were analyzed using an analysis of variance procedure. Analysis of the data resulted in a rejection of the null hypothesis. The statistical analysis of the data relative to this general hypothesis by results of the pre/post observations, resulted in a Wilks' Lambda quotient of .526 using 11 and 49 degrees of freedom. This produced a probability of .0005. This level of strong statistical significance allows definite rejection of the general null hypothesis. Five of the measured competencies attained statistical significance from the .05 level to the .01 level. Four of the measured competencies, though not attaining statistical significance, showed definite shifts among the group means. Two of the measured competencies showed negative correlations; however, one of these had proven to be unreliable among observers.

In the case of the measured competencies, teacher growth was shown between the pre and post observations and the change was statistically significant from the .05 level to the .01 level. The competencies are:

1. Demonstrates a working knowledge of subject matter
2. Prepares and/or uses various methods and techniques to present subject matter and encourages student participation
3. Develops, organizes, and implements a system for classroom management
4. Practices good human relations
5. Teaches basic concepts for grade level and/or subject level

In the case of four of the measured competencies, teacher growth was shown for each but analysis indicated that the results were not statistically significant. The competencies are:

1. Gives well defined instruction to students
2. Promotes positive self-images in students
3. Plans activities for students' individual needs
4. Exhibits overall positive approach

For the other two competencies, "Encourages students to become self-disciplined" and "Is consistent and empathetic in the treatment of students", negative correlations were shown. One of the competencies, "Is consistent and empathetic in the treatment of students" was proven to be unreliable among the observers. For the other, "Encourages students to become self-discipline", the investigator is concerned that a

clearer definition of "self-discipline" may be needed.

Implications

The results of this study imply that teacher behaviors can be recorded and that teachers vary in the way they exhibit behaviors thought to be important and desirable.

In addition, the results of this study imply that there could be a method of evaluating the staff development processes, i.e., integrating teacher prioritized needs, low-inferential observation techniques, competency-based education and evaluative feedback to verify whether or not teachers who have completed the training are equipped with the knowledges and skills which the program intended.

Another implication for education is one of program validation. This would verify that teachers who possess the behaviors specified as important and desirable are, in fact, more effective in helping pupils learn. For no changes will take place within our students unless the behaviors of teachers can be modified.

Conclusions

Within the limitations presently expressed, the following should be considered before interpreting the results of the study: (a) the sample consisted of Title I elementary teachers, i.e., curriculum coordinators, reading or math specialists, and regular classroom teachers, (b) the expense of developing a competency based teacher training program, (c) the instrument and results of the correlation of the Houston Independent School District's teacher

"values" and (d) only teachers in training from October, 1978 through February, 1979 were involved. Even though these limitations restrict the generalizability of the study, these data yielded some potentially useful and informative results regarding staff development processes.

1. The GATE observation instrument recorded 10 of the 11 clusters of items (keys) which parallel selected behaviors listed in a document (Appendix A) in a stable, reliable manner.
2. The GATE observation instrument was able to determine that the teachers who participated in the competency-based teacher training program increased their effectiveness at a statistically significant level in five of the eleven competencies.
3. Teachers involved in the Staff Development Program (Competency Based Teacher Training) do vary in the way they exhibit the pre/post behaviors thought to be important and desirable by Houston Independent School District when observed with a systematic, low-inference, direct observation instrument.
4. Staff development processes, and a low inference observation instrument such as the GATE, when keyed to the teachers' assessment instrument can yield reliable data that can be used as hard evidence to determine strengths or weaknesses of teachers.

Recommendations

Conclusions from this study seem to warrant the following recommendations:

1. That school districts employ direct observation techniques as a part of its staff development processes.
2. That school districts employ direct observation techniques using a low inference sign instrument to scientifically gather hard evidence to objectively judge a teacher's competence.
3. That Houston Independent School District initiate a long-range program to evaluate and train teachers using a direct observation system.
4. That the Houston Independent School District's Staff Development Department implement a follow-up on the sample to determine the extent to which their profiles change.
5. That school administrators be trained in direct observation techniques to be used as a part of the evaluation process.
6. That teacher training institutions begin to employ direct observation techniques to generate profiles of teacher behaviors which would have implications for staff development.
7. That a low-inference, direct observation system be taught to teachers as a part of the preparation for practice teaching in order that they will acquire an appreciation and understanding of the feedback received from the profiles.

8. That replication be conducted with secondary teachers in order to add more data to support the conclusion that teacher behaviors can be recorded in a stable, reliable manner when using a low-inference, direct observation instrument.
9. That replication be conducted with another sample of teachers in order to add more data to support the conclusion that teachers may vary in the way they exhibit behaviors thought to be important and desirable.
10. That replication be conducted with another sample of teachers in order to add more data to support the "irrelevance" of those competencies found on the teacher's assessment instrument that do not relate to instruction.

APPENDICES

APPENDIX A

Houston Independent School District

Teacher/Peer Group Member

Assessment Instrument

After the team has completed the formal training, a member of Staff Development goes into the building for the period of time previously agreed upon and on a consulting basis thereafter as specified in the Pre-Training Agreement to offer assistance to the returning team in implementing collaborative planning strategies. The follow-up component is shown in Figure 4.

During the "phase-out" period, the classroom teacher and the mobile teacher work together at the home school to assure a smooth transition for the pupils.

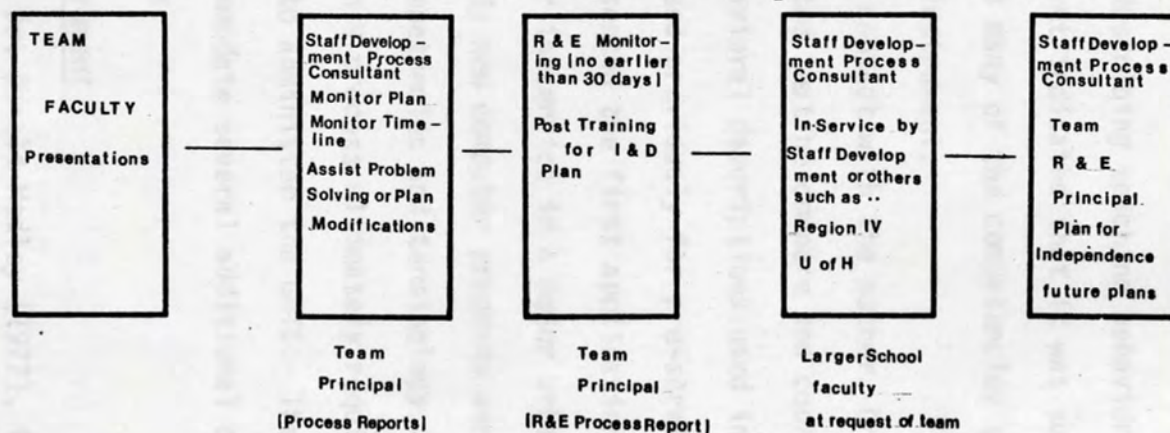
In an on-going process, and on extended time as necessary, Staff Development personnel will modify and/or replace materials for future training programs, utilizing participants' evaluations and feedback which may be solicited from parents and HISD regular compensatory personnel.

Selection of the Instrument

Reference has been made to an assessment of teacher behaviors that is consistent with school district priorities, teacher values and competencies related to teaching. Furthermore, as it was noted, much of the evaluation of teaching has been done in a setting of value-laden high inference ratings. Thus a search was made for an instrument by which teacher behavior could be documented with as little value orientation as possible.

A review of the literature (see pages 22-98) indicated that a number of investigators had developed instruments of proven quality, among them Medley, Spaulding, Soar and Brown. The investigator was

Follow-Up Component



SECTION II: ASSESSMENT

DIRECTIONS: For preassessment, place a check in one of the six columns listed under 'Preassessment' which best describes the assessee. All duties listed are the responsibility of the classroom teacher; however, the 'Not Applicable' column has been provided for a few exceptions when competencies do not apply to TPGM's with special assignments. After all competencies have been rated the assessment is to be weighted. To do this, find the average of the total points of each subsection. Example: Under 1.1.0 the assessee receives a total of 33. This is an average of 3 for the subsection 1.1.0. Multiply the 3 by .55 to receive the weighted rating of 1.65. Complete this process for each subsection and place figures in the space provided on page 3. Add all of the weighted totals to find the assessee's rating. This process should be repeated for the post assessment, using the columns provided on this sheet and page 4 of this instrument.

1.0 TEACHER/PEER GROUP*

1.1.0 INSTRUCTIONAL COMPETENCIES

- 1.1.1 Teaches basic concepts for grade level and/or subject level.
- 1.1.2 Demonstrates a working knowledge of subject matter.
- 1.1.3 Plans activities for students' individual needs.
- 1.1.4 Implements instructional programs compatible with prepared plans.
- 1.1.5 Prepares and/or uses various methods and techniques to present subject matter and encourage student participation.
- 1.1.6 Gives well-defined instructions to students.
- 1.1.7 Adjusts classroom procedures and revises lesson plans to compensate for unexpected changes.
- 1.1.8 Prepares, administers, and utilizes tests as an instructional tool.
- 1.1.9 Adapts to new teaching methods and current trends in subject field(s).
- 1.1.10 Establishes open communication with parents.
- 1.1.11 Maintains a physical environment which is conducive to learning.

Pre Assessment

1 2 3 4 5

Unacceptable Performance	Requires Improvement	Professionally Competent	High Quality Performance	Outstanding	Not Applicable

Post Assessment

1 2 3 4 5

Unacceptable Performance	Requires Improvement	Professionally Competent	High Quality Performance	Outstanding	Not Applicable

1.2.0 INTERPERSONAL RELATIONSHIPS AND DISCIPLINE

- 1.2.1 Develops, organizes, and implements a system for classroom management.
- 1.2.2 Encourages students to become self-disciplined.
- 1.2.3 Promotes positive self-image in students.
- 1.2.4 Is consistent and empathetic in the treatment of students.
- 1.2.5 Has a functional understanding of the culture in which the student lives.
- 1.2.6 Assumes responsibility for assisting with overall discipline of students within the school.
- 1.2.7 Practices good human relations.

1.3.0 EXTRA CO-CURRICULAR ACTIVITIES

- 1.3.1 Performs assigned duties as provided in Section 3 of the Teacher's Contract. (See Teacher's Contract, Appendix B, Handbook)

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1.4.0 CLERICAL DUTIES OF TEACHERS

- 1.4.1 Prepares and submits accurate enrollment and attendance cards.
- 1.4.2 Grades and returns students' papers within a reasonable time.
- 1.4.3 Averages and prepares grades for reporting to parents.
- 1.4.4 Prepares grade book with names of students and all pertinent student data.

1.5.0 STAFF DUTIES

- 1.5.1 Complies with district and building rules and regulations.
- 1.5.2 Is thoroughly familiar with school goals and programs.
- 1.5.3 Works with appropriate staff and resource people for students' optimum mental and physical development.
- 1.5.4 Assumes responsibility for supervision of students.
- 1.5.5 Evaluates textbooks and audiovisual materials.
- 1.5.6 Participates in special assessment, recognition, and consideration of students.
- 1.5.7 Assumes the responsibility for the care of and accountability for school equipment.

1.6.0 PERSONAL CHARACTERISTICS

- 1.6.1 Exhibits overall positive approach.
- 1.6.2 Demonstrates self-control.
- 1.6.3 Demonstrates a command of the English language.
- 1.6.4 Is punctual.
- 1.6.5 Is well groomed.

1.7.0 PROFESSIONAL GROWTH

- 1.7.1 Keeps abreast of educational developments on the national, state, and local levels.
- 1.7.2 Researches for enrichment and completeness of teaching program.

*1.1.1 through 1.7.2 must be completed for all Teacher/Peer Group Members. Additionally the appropriate section in 2.0.0 must be completed for appropriate support personnel.

SECTION

We have been given a difficult task in working with you. We have not only knowledge but also skill, experience and motivation. We are now going to give you the opportunity to work with you.

We must choose the faculty member to work with you as a member of the staff. We must choose the faculty member to work with you as a member of the staff.

APPENDIX B₁

Title I Collaborative Planning Sociogram

This faculty member has great potential as a group leader but has not yet been able to reach a goal.

This faculty member is a very good person but is not yet a professional educator.

SOCIOGRAM

You have been given a difficult task to accomplish demanding not only knowledge but also tact, perseverance and enthusiasm. Choose two persons from this faculty to work with you.

You must choose one faculty member to sell all others on a worthwhile but time-consuming project.

A problem requiring tact and diplomacy has developed. To whom on the faculty would you go for confidential advice?

This faculty member has great potential as a group leader but has not as yet acted in such a role.

This faculty member is quiet and unassuming but extremely competent as a professional educator.

FEEDBACK INFORMATION ON THE INVENTORY OF COLLABORATIVE PLANNING
COMPETENCIES REFLECTING THE STAFF'S IDEAL AND IDEAL RATINGS

Responses plotted on this graph represent the mean responses for
the entire staff for each item on the Inventory of Collaborative
Planning Competencies.

Ideal ratings ("A" items) are plotted in red.

Real ratings ("B" items) are plotted in blue.

APPENDIX B₂

Title I Collaborative Planning Feedback Form

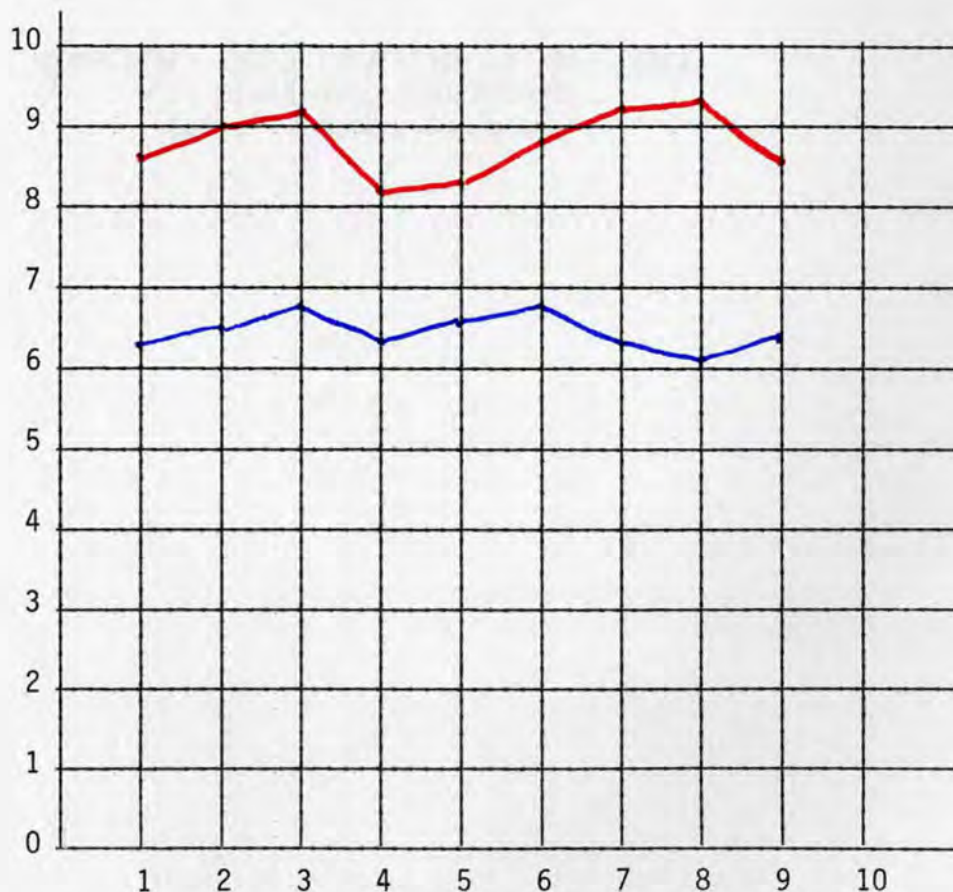


FEEDBACK INFORMATION ON THE INVENTORY OF COLLABORATIVE PLANNING COMPETENCIES REFLECTING THE STAFF'S REAL AND IDEAL RATINGS

Responses plotted on this graph represent the mean responses for the entire staff for each item on the Inventory of Collaborative Planning Competencies.

Ideal ratings ("A" items) are plotted in red.

Real ratings ("B" items) are plotted in blue.



APPENDIX C

COMPETENCY AREAS IDENTIFIED BY TASK FORCE
WITH BEHAVIORAL INDICATIONS
(Carroll County, Georgia)

COMPETENCY AREAS IDENTIFIED BY TEACHER TASK FORCE
WITH BEHAVIORAL INDICATORS

Teacher Competency Area	Teacher Behaviors (Process)	Student Outcomes
1) Gathers and uses information relating to individual differences among students	a) Maintains and uses formal/informal up-to-date records on individual students	a) working at task
	b) Consults appropriate authorities to select and administer appropriate standardized tests when information is needed on individual students and follows through with information on learning levels, interests, values, cultural and socio-economic background.	b) reduced deviant behavior
	c) Teacher recognizes limitations and seeks additional professional help	c) better physical, mental health
2) Organizes pupils, resources and materials for effective instruction	a) Selects goals and objectives appropriate to pupil need	a) enjoys class, happy, smiles
	b) Matches student with appropriate material	b)c) on task, actively involved
	c) Gathers multi-level materials	b)c) evidences academic growth
	d) Teacher involves student in organizing and planning	d) Absence of withdrawn behavior e) enthusiastically

Teacher Competency Area	Teacher Behaviors (Process)	Student Outcomes
3) Demonstrates ability to communicate effectively with students.	a) Gives clear explicit directions which are understood by students b) Pauses, elicits and responds to student questions before proceeding c) Uses a variety of methods, verbal and non-verbal, to deliver instructions	a) less confusion, less time wasted b) more relaxed, less frustration c) self-directed to move toward task
4) Assists students in using a variety of relevant communication techniques.	a) Demonstrates proper listening skills b) Respects individual's right to speak c) Utilizes non-verbal communication skills d) Utilizes written language as type of communication	a) acquires capacity to be a good listener b) students able to speak freely c) able to follow directions, on task d) discriminates acceptable or not acceptable behavior e) able to communicate through writing
5) Assists students in dealing with their misconceptions or confusions, using relevant clues and techniques	a) Utilizes student feedback, verbal and non-verbal, to modify own teaching behavior	a) Students ask questions

Teacher Competency Area	Teacher Behaviors (Process)	Student Outcomes
5) (continued)	b) Demonstrates flexibility in classroom management practices	b) students feel free to interrupt presentations
	c) Provides opportunity student-initiated questions	c) movement toward task
	d) When student not on task, teacher makes contact	
6) Responds appropriately to coping behavior of students.	a) Maintains self-control in various classroom situations and interactions with students	a) Absence of student manipulation
	b) Recognizes and treats individual student behavior	b) modifies behavior positively
	c) Seeks appropriate help from others	c) reduction of disruptive behavior
	d) Accepts necessity of dealing with individual students on an individual basis	
7) Uses a variety of methods and materials to stimulate and promote pupil learning	a) Uses more than one teaching method in a single presentation	a) attending (attentive) behavior
	b) Adapts methods and materials to instructional situation and to established goals and objectives	b) motivated
		c) actively involved

Teacher Competency Area	Teacher Behaviors (Process)	Student Outcomes
8) Promotes self-awareness and positive self-concepts in students.	a) Provides opportunity for each student to meet success daily	a) student working on individual level
	b) Provides variety of materials	b) moving toward self-direction, attending to task
	c) Evidence of a personal one-to-one relationship with each student	c) knowledge of variety of cultural and socio-economic background
	d) Provides opportunity for student to have voice in decision making	d) evidence of importance as class member--group involvement
	e) evidence of praise and/or rewards in operation	e) assumes responsibility for own success or failure
	f) Supportive classroom management	f) evidence of enthusiasm
9) Reacts with sensitivity to the needs and feelings of others.	a) Accepts and incorporates student ideas	a) expresses ideas & opinions different to those of teacher or peers
	b) Listens to students and provides feedback	b) high interest
	c) Evidence of an opportunity for one-to-one counseling and absence of evidence that students are rejected (brushed off)	c) student/teacher rapport is evident, develops sense of belonging, evidence of confidence in teacher

Teacher Competency Area	Teacher Behaviors (Process)	Student Outcomes
10) Engages in personal and professional growth	a) Reads widely and critically b) Maintains member- ship and active participation in professional organizations appropriate to the individual c) Exchanges ideas and teaching techniques with colleagues d) Continuously improves knowl- edge and skills e) Engaged in con- tinuous self- evaluation	
11) Works effectively with pupils, parents, col- leagues, community and educational administrators of school system	a) Attends school- related community activities b) Accepts responsi- bility for some community activity c) Supportive of school policies.	

APPENDIX D

GEORGIA ASSESSMENT OF TEACHER EFFECTIVENESS

APPENDIX E
STATISTICAL DATA SUMMARY

APPENDIX E

STATISTICAL DATA SUMMARIES

UNIVARIATE F-TESTS. DFB = 1. DFB = 59.

VARIABLE	F-RATIO	P
1	4.6314	0.0334
2	23.0169	0.0001
3	0.0145	0.9003
4	9.7013	0.0032
5	2.1521	0.1440
6	6.3626	0.0137
7	1.3423	0.2499
8	1.8108	0.1804
9	0.6323	0.5645
10	6.3466	0.0138
11	0.2452	0.6280

G MEANS	1	2
1	47.2576	52.6541
2	44.6146	55.2108
3	49.8449	50.1502
4	46.1796	53.0960
5	48.0936	51.8457
6	46.8282	53.0695
7	51.5165	48.5325
8	48.6696	51.6941
9	51.0469	48.9860
10	46.8322	53.0660
11	49.3445	50.6334

G ST DEV	1	2
1	11.9116	7.1681
2	8.0870	9.1129
3	10.6455	9.6826
4	8.5323	10.2100
5	12.0576	7.4506
6	11.8918	6.8442

G ST DEV	1	2
7	11.6223	8.2601
8	11.3378	5.2136
9	10.7242	9.4879
10	9.7574	9.5681
11	10.4366	9.8595

COMPARE PRE & POST GROUPS

PARAMETERS

N. VARIABLES 11
N. GROUPS 2
PRINT D WTS 0
PLOT CENT 0
DATA IN FILE 0

DATA FORMAT (5X, 15F5.2)

GROUP 1 30 SUBJECTS

1st Subj	1	2	3	4	5	6	7	8	9	10	11
	46.2000	39.8500	42.3600	44.5900	51.5500	45.5200	45.1200	54.6200	49.5000	47.4400	51.4200
NT Subj	60.6300	40.9700	42.6700	56.0900	45.4900	48.5700	45.1200	49.2000	43.1600	51.4500	67.0200

GROUP 2 31 SUBJECTS

1st Subj	1	2	3	4	5	6	7	8	9	10	11
	49.5500	58.3600	42.4000	68.4300	51.1800	55.0400	43.5900	53.6300	54.2000	65.5000	76.0300
NT Subj	1	2	3	4	5	6	7	8	9	10	11
	58.5600	79.6600	40.8700	68.3000	50.5700	54.7900	43.5900	49.9300	40.3800	65.9900	56.4500
TOT MEAN	1	2	3	4	5	6	7	8	9	10	11
	50.0001	49.9996	50.0001	49.9994	50.0004	50.0001	50.0000	50.2066	49.9996	50.0002	49.9996
TOT SD	1	2	3	4	5	6	7	8	9	10	11
	10.0830	10.0827	10.0834	10.0829	10.0831	10.0831	10.0829	8.8342	10.0835	10.0829	10.0834
COVAR	1	2	3	4	5	6	7	8	9	10	11
1	100.0010	35.9055	-44.7061	8.4189	10.4204	-13.3750	-59.1404	-9.8586	-30.0649	4.8069	-5.6304
2	35.9055	99.9951	-18.4194	33.9707	22.4958	12.2168	-34.4187	-2.2031	-35.3132	31.0884	16.2400
3	-44.7061	-18.4194	100.0081	3.2354	15.6194	20.5154	59.8789	16.5244	19.6729	12.5405	16.8049
4	8.4189	33.9707	3.2354	99.9985	42.0317	35.6843	17.1399	26.3625	-15.5905	69.8191	66.6050

COVAR

5	10.4204	22.4958	15.6194	42.0317	100.0039	44.6880	-6.4312	27.8823	-1.2347	37.7608	50.8330
6	-13.3750	12.2168	20.5154	35.6843	44.6880	100.0020	18.4250	60.9568	50.8450	56.1777	36.9055
7	-59.1404	-34.4187	59.8789	17.1399	-6.4312	18.4250	99.9976	13.5273	30.4041	12.0291	16.3652
8	-9.8586	-2.2031	16.5244	26.3625	27.8823	60.9568	13.5273	76.7646	24.3901	26.5549	31.9863
9	-30.0649	-35.3132	19.6729	-15.9905	-1.2397	50.8450	30.4041	24.3901	100.0105	8.8494	-3.6318
10	4.8069	31.3884	12.5405	69.8191	37.7808	56.1777	12.0291	26.5549	8.8984	99.9980	57.3936
11	-5.6304	16.2400	16.8049	66.6050	50.8330	36.9055	16.3652	31.9063	-3.6318	-3.6318	100.0063

PRINCIPAL AXIS ANALYSIS (A SUMMETRIC MATRIX). TRACE = 0.9009

ROOT	VALUE	PCT OF TRACE
1	0.9009	99.99

99.99 PCT. OF TRACE WAS EXTRACTED BY 1 ROOTS.

WILKS LAMBDA = 0.526

D.F. = 11. and 49

F-RATIO = 4.013 P = 0.0005

ROOT	EIGENVALUE	PCT. VARIANCE	CHI SQUARE	DF	PROB
1	0.9009	100.00	35.006	11.	0.0005

DISC WTS	1	2	3	4	5	6	7	8	9	10	11
	0.1787	0.4220	0.2943	0.5532	-0.1231	0.4286	-0.1847	-0.0317	-0.0430	-0.1460	-0.3743

CENTROID	1	2
	43.0834	54.1325

COR REL	1	2	3	4	5	6	7	8	9	10	11
	0.3919	0.7695	0.0222	0.5459	0.2724	0.4532	-0.2167	0.2507	-0.1497	0.4527	0.0936

NUMBER OF CLASSES: 61

CO/CLASS	1	2	3	4	5	6	7	8
	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000
	9	10	11	12	13	14	15	16
	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000
	17	18	19	20	21	22	23	24
	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000
	24	25	26	27	28	29	30	31
	16.0000	16.0000	16.0000	16.0000	20.0000	20.0000	20.0000	20.0000
	32	33	34	35	36	37	38	39
	20.0000	20.0000	12.0000	20.0000	20.0000	20.0000	20.0000	20.0000
	40	41	42	43	44	45	46	47
	20.0000	20.0000	16.0000	20.0000	16.0000	16.0000	16.0000	15.0000
	48	49	50	51	52	53	54	55
	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	15.0000
	56	57	58	59	60	61		
	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000		

TOTAL RECORDS (CARDS) READ: 1022

CLASS	1	2	3	4	5	6	7	8
	1001.0000	2001.0000	1002.0000	2002.0000	1003.0000	2003.0000	1004.0000	2004.0000
	9	10	11	12	13	14	15	16
	1005.0000	2005.0000	1006.0000	2006.0000	1007.0000	2007.0000	1008.0000	2008.0000

TOTAL RECORDS (CARDS) READ (continued)

17 1009.0000	18 2009.0000	19 1010.0000	20 2010.0000	21 1011.0000	22 2011.0000	23 1012.0000	24 2011.0000
25 1012.0000	26 2012.0000	26 1013.0000	28 2013.0000	29 1014.0000	30 2014.0000	31 1015.0000	32 2015.0000
33 1017.0000	34 2017.0000	35 1018.0000	36 2018.0000	37 1020.0000	38 1010.0000	39 1021.0000	40 1022.0000
41 2022.0000	42 1023.0000	43 2023.0000	44 1024.0000	45 2024.0000	46 2015.0000	47 2025.0000	48 1026.0000
49 2026.0000	50 1027.0000	51 2027.0000	52 2028.0000	54 2028.0000	55 2029.0000	56 2030.0000	57 2030.0000
58 1031.0000	59 2031.0000	60 1032.0000	61 2032.0000				

ITEM MEANS

1 0.6964	2 0.1181	3 0.1865	4 0.1296	5 0.6124	6 0.2242	7 0.0018	8 0.1098
9 0.0445	10 0.0.09	11 0.0041	12 0.0495	13 0.1090	14 0.0635	15 0.0301	16 0.0
17 0.0113	18 0.0027	19 0.0357	20 0.0101	21 0.0172	22 0.1279	23 0.0043	24 0.0113
25 0.1245	26 0.0386	27 0.0189	28 0.0202	29 0.1105	30 0.0258	31 0.0859	32 0.7221

ITEM MEANS (continued)

33	34	35	36	37	38	39	40
0.2613	0.0250	0.0859	0.2801	0.1712	0.1429	0.0119	0.0234
41	42	43	44	45	46	47	48
0.0234	0.0117	0.0775	0.0462	0.0344	0.0889	0.0084	0.0084
49	50	51	52	53	54	55	56
0.0191	0.0016	0.0031	0.0059	0.0078	0.0037	0.0234	0.3012
57	58	59	60	61	62	63	64
0.0864	0.0031	0.0191	0.0492	0.0583	0.0264	0.0456	0.0072
65	66	67	68	69	70	71	72
0.0105	0.0	0.0270	0.0139	0.0008	0.0186	0.0020	0.0041
73	74	75	76	77	78	79	80
0.0439	0.0061	0.0029	0.0	0.0349	0.0033	0.0010	0.0165
81	82	83	84	85	86	87	88
0.0	0.0	0.0	0.0010	0.0039	0.1016	0.0135	0.0020
89	90	91	92	93	94	95	96
0.0008	0.0	0.0027	0.0018	0.0029	0.0095	0.0037	0.0
97	98	99	100	101	102	103	104
0.0049	0.0010	0.0	0.0	0.0029	0.0	0.0	0.0008
105	106	107	108	109	110	111	112
0.0	0.0	0.0	0.0	0.0018	0.0184	0.0029	0.0
113	114	115	116	117	118	119	120
0.0	0.0	0.0	0.0	0.0008	0.0010	0.0	0.0

ITEM MEANS (continued)

121 0.0308	122 0.0058	123 0.0008	124 0.0020	125 0.0196	126 0.0114	127 0.0020	128 0.0680
129 0.0	130 0.0010	131 0.0020	132 0.0020	133 0.0141	134 0.0377	135 0.0031	136 0.0169
137 0.0031	138 0.0	139 0.0016	140 0.0010	141 0.0027	142 0.0258	143 0.0027	144 0.0016
145 0.0150	146 0.0043	147 0.0	148 0.0010	149 0.0039	150 0.0067	151 0.0008	152 0.0137
153 0.0010	154 0.0	155 0.0	156 0.0	157 0.0	158 0.0126	159 0.0018	160 0.0037
161 0.0	162 0.0	163 0.0	164 0.0	165 0.0	166 0.0225	167 0.0018	168 0.0082
169 0.0069	170 0.0051	171 0.0018	172 0.0	173 0.0010	174 0.0060	175 0.0055	176 0.0
177 0.0099	178 0.0010	179 0.0	180 0.0	181 0.0	182 0.0	183 0.0010	184 0.0010
185 0.0	186 0.0	187 0.0	188 0.0	189 0.0011	190 0.0010	191 0.0556	192 0.0057
193 0.0025	194 0.0064	195 0.0057	196 0.0008	197 0.0	198 0.0018	199 0.0101	200 0.0
201 0.0049	202 0.0	203 0.0	204 0.0	205 0.0	206 0.0	207 0.0010	208 0.0008

ITEM MEANS (continued)

209 0.0	210 0.0008	211 0.0	212 0.0	213 0.0	214 0.0	215 0.1001	216 0.0117
217 0.0250	218 0.1430	219 0.2576	220 0.0042	221 0.0057	222 0.0718	223 0.0281	224 0.0115
225 0.0828	226 0.0738	227 0.5460	228 0.1002	229 0.0031	230 0.0600	231 0.0154	232 0.0333
233 0.0049	234 0.0167	235 0.0899	236 0.0148	237 0.0125	238 0.0407	239 0.0162	240 0.0246
241 0.0113	242 0.0217	243 0.0037	244 0.0059	245 0.0045	246 0.0016	247 0.0	248 0.2242
249 0.0049	250 0.1882	251 0.1504	252 0.0451	253 0.0033	254 2.2443	255 0.0195	256 0.1548
257 0.8561	258 0.1122	259 0.0258	260 0.0219	261 0.9382	262 0.8477	263 0.0113	264 0.7523
265 0.1974	266 0.8059	267 0.1271	268 0.2741	269 0.0690	270 0.2254	271 0.3000	272 0.1127
273 0.2420	274 0.0045	275 0.4000	276 0.0092	277 0.0855	278 0.0010	279 0.0010	280 0.9247
281 0.0094	282 0.0858	283 0.0932	284 0.6882	285 0.3688	286 0.6223	287 0.4195	288 0.0010
289 0.0740	290 0.0145	291 0.0244	292 0.0031	293 0.1420	294 0.0294	295 0.0020	296 0.0090

ITEM MEANS (continued)

297 0.0139	298 0.0125	299 0.0027	300 0.0283	301 0.0312	302 0.1427	303 0.0	304 0.0
305 0.0035	306 0.0195	307 0.0	308 0.0	309 0.3538	310 0.0161	311 0.5052	312 0.0019
313 0.0019	314 0.0020	315 0.0068	316 0.0379	317 0.0298	318 0.0542	319 0.0139	320 0.0455
321 0.0008	322 0.0066	323 0.0	324 0.0	325 0.0	326 0.0	327 0.0	328 0.0154
329 0.0061	330 0.0092	331 0.0015	332 0.2527	333 0.0968	334 0.2174	335 0.0293	336 0.4295
337 0.2592	338 0.0316	339 0.1254	340 0.0446	341 0.0041	342 0.0	343 0.0	344 0.0
345 0.0	346 0.0	347 0.0	348 0.0	349 0.0	350 0.0	351 0.0	352 0.0
353 0.0	354 0.0	355 0.0	356 0.0	357 0.0	358 0.0	359 0.0	360 0.0
361 0.0	362 0.0	363 0.0	364 0.0	365 0.0			

ITEM - STANDARD DEVIATIONS

1	2	3	4	5	6	7	8
0.1598	0.1161	0.1473	0.1137	0.1718	0.1731	0.0101	0.1127
9	10	11	12	13	14	15	16
0.0749	0.00259	0.0155	0.0715	0.1176	0.0666	0.0609	0.0
17	18	19	20	21	22	23	24
0.0266	0.0149	0.0531	0.0255	0.0399	0.1123	0.0171	0.0360
25	26	27	28	29	30	31	32
0.0984	0.0571	0.0441	0.0350	0.1074	0.0499	0.0529	0.1715
33	34	35	36	37	38	39	40
0.1843	0.0440	0.0363	0.0730	0.2074	0.1435	0.1198	0.0311
41	42	43	44	45	46	47	48
0.0452	0.0358	0.0966	0.0631	0.0546	0.0790	0.0282	0.0306
49	50	51	52	53	54	55	56
0.0343	0.0089	0.0135	0.0181	0.0228	0.0140	0.0381	0.2109
57	58	59	60	61	62	63	64
0.0926	0.0135	0.0518	0.0635	0.0862	0.0478	0.0673	0.0199
65	66	67	68	69	70	71	72
0.0251	0.0	0.0468	0.0300	0.0295	0.0342	0.0111	0.0261
73	74	75	76	77	78	79	80
0.0640	0.0194	0.0127	0.0	0.0481	0.0153	0.0079	0.0343
81	82	83	84	85	86	87	88
0.0	0.0	0.0	0.0079	0.0148	0.0908	0.0310	0.0111

STANDARD DEVIATION (continued)

89 0.0063	90 0.0	91 0.0118	92 0.0101	93 0.0170	94 0.0219	95 0.0140	96 0.0
97 0.0165	98 0.0079	99 0.0	100 0.0	101 0.0127	102 0.0	103 0.0	104 0.0053
105 0.0	106 0.0	107 0.0	108 0.0	109 0.010	110 0.0423	111 0.0127	112 0.0
113 0.0	114 0.0	115 0.0	116 0.0	117 0.0063	118 0.0079	119 0.0	120 0.0
121 0.0557	122 0.0177	123 0.0063	124 0.0111	125 0.0397	126 0.0304	127 0.0159	128 0.0679
129 0.0	130 0.0079	131 0.0111	132 0.0159	133 0.0307	134 0.0510	135 0.0135	136 0.0319
137 0.0135	138 0.0	140 0.0089	141 0.0118	142 0.0438	143 0.0118	144 0.0127	145 0.0145
146 0.0145	147 0.0	148 0.0079	149 0.0148	150 0.0229	151 0.0068	152 0.0345	153 0.0079
154 0.0	155 0.0	156 0.0	157 0.0	158 0.0312	159 0.0101	160 0.0140	161 0.0
162 0.0	163 0.0	164 0.0	165 0.0	166 0.0502	167 0.0101	168 0.0259	169 0.1291
170 0.0260	171 0.0101	172 0.0	173 0.0079	174 0.0243	175 0.0169	176 0.0	177 0.0231

STANDARD DEVIATIONS (continued)

178 0.0079	179 0.0	180 0.0	181 0.0	182 0.0	183 0.0079	184 0.0079	185 0.0
186 0.0	187 0.0	188 0.0	189 0.0085	190 0.0079	191 0.0771	192 0.0208	193 0.0108
194 0.0247	195 0.0204	196 0.0063	197 0.0	198 0.0101	199 0.0261	200 0.0	201 0.0234
202 0.0	203 0.0	204 0.0	205 0.0	206 0.0	207 0.0079	208 0.063	209 0.0
210 0.0063	211 0.0	212 0.0	213 0.0	214 0.0	215 0.1126	216 0.0431	217 0.0666
218 0.1904	219 0.2344	220 0.0157	221 0.0208	222 0.0839	223 0.0250	224 0.0250	225 0.1100
226 0.1040	227 0.4608	228 0.1389	229 0.0176	230 0.1078	231 0.0694	232 0.1015	233 0.0200
234 0.0445	235 0.1198	236 0.0373	237 0.0314	238 0.0848	239 0.0418	240 0.0658	241 0.0332
242 0.0519	243 0.0140	245 0.0189	246 0.0089	247 0.0	248 0.2961	249 0.0831	250 0.1497
251 0.1007	252 0.0576	253 0.0254	254 0.4694	255 0.0625	256 0.1326	257 0.1591	258 0.1338
259 0.0847	260 0.0640	261 0.1032	262 0.1842	263 0.0474	264 0.2451	265 0.2219	266 0.2499

STANDARD DEVIATIONS (continued)

267 0.2283	268 0.1847	269 0.1173	270 0.1529	271 0.1580	272 0.1073	273 0.1612	274 0.0189
275 0.1701	276 0.0389	277 0.1128	278 0.0079	279 0.2198	280 0.0850	281 0.0321	282 0.1394
283 0.1057	284 0.2058	285 0.2156	286 0.2389	287 0.2392	288 0.0079	289 0.1315	290 0.0356
291 0.0453	292 0.0176	293 0.1032	294 0.0490	295 0.0159	296 0.0370	297 0.0468	298 0.0290
299 0.0118	300 0.0517	301 0.0514	302 0.1682	303 0.0	304 0.0	305 0.0160	306 0.0526
307 0.0	308 0.0	309 0.2337	310 0.0432	311 0.2263	312 0.0105	314 0.0111	315 0.0220
316 0.0783	317 0.0574	318 0.1053	319 0.0371	320 0.1059	321 0.0063	322 0.0400	323 0.0
324 0.0	325 0.0	326 0.0	327 0.0	328 0.0584	329 0.0353	330 0.0450	331 0.0127
332 0.2491	333 0.1324	334 0.2408	335 0.0740	336 0.3269	337 0.2524	338 0.0772	339 0.1744
340 0.0987	341 0.0227	342 0.0	343 0.0	344 0.0	345 0.0	346 0.0	347 0.0
348 0.0	349 0.0	350 0.0	351 0.0	352 0.0	353 0.0	354 0.0	355 0.0

STANDARD DEVIATIONS (continued)

356	357	358	359	360	361	362	363
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
364	365						
0.0	0.0						

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