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PERCEPTUAL ORGANIZATION AND ITS RELATIONSHIP TO INSTRUCTIONAL ARRANGEMENTS IN CONTRIBUTING TO THE EFFECTIVE INSTRUCTION OF A DISTINGUISHED UNIVERSITY TEACHER

Schmid, Harriet M.

The Ohio State University

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PERCEPTUAL ORGANIZATION AND ITS RELATIONSHIP TO INSTRUCTIONAL ARRANGEMENTS IN CONTRIBUTING TO THE EFFECTIVE INSTRUCTION OF A DISTINGUISHED UNIVERSITY TEACHER

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By

Harriet M. Schmid, B.S., M.A.

* * * * *

The Ohio State University

1979

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Faculty of Educational Foundations and Research
In Memory of Alois and Margaret Schmid
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It is a commonly held belief of many who have experienced teaching that they could define a "good" teacher or "effective" teaching. A study of teaching focused on individual perspectives could provide valid information about the complex activity of teaching. Information gained through research on teaching has implications for teacher educators in developing and implementing curricula, school administrators in selecting and retaining teachers, teachers in interpreting classroom conditions and designing instructional arrangements, and researchers in guiding future research. Over 10,000 studies of teacher effectiveness and teaching have been conducted. These studies have been descriptive, explanatory, and, to a limited degree, predictive in purpose. In spite of the large number of studies undertaken and the scope of purposes, less reliable knowledge, than we would have expected, exists about the process of effective teaching.

Overview

The purpose of this chapter is to identify and present a rationale for the study of a classroom instructional experience through the perspectives of the participants--teacher and students. The chapter begins with an overview of the research trends in the study of
teaching during the past sixty years. The relatively recent trend toward a more holistic approach to the study of teaching together with the continuing need for information to assist those concerned with the development of teachers provide the background and rationale for the research questions which guided this study. The researcher's personal paradigm, grounded in perceptual psychology, provided a perspective for this study of teaching. The chapter concludes with the delineation of the research questions, delimitation and limitations of the study, definition of terms, and an overview of the research report.

Trends in the Study of Teaching

Studies of teacher effectiveness which occurred at the beginning of this century and those which followed in subsequent decades until the 1950's and even into the 1960's described the relationships between teacher characteristics or traits and effectiveness [Reported in reviews by Barr, 1961; Domas and Tiedeman, 1959; Morsh and Wilder, 1954]. Although certain characteristics or traits of effective teachers could be identified [Ryans, 1960], this course essentially led researchers to a dead-end in their attempts to discover an explanation for effective teaching [Getzels and Jackson, 1963].

The development of direct observation instruments and increased computer capabilities in the late 50's and early 60's ushered in a new era in research on teaching as researchers moved into classrooms to observe directly the process of teaching, that is, what the teacher did in the classroom [Flanders, 1969]. Specific process variables were related to student outcomes or product variables. Out of this period
grew a proliferation of direct observation instruments as well as the isolation of what some considered to be promising high and low inference process variables. Reviews and commentaries [Dunkin and Biddle, 1974; McKeachie and Kulik, 1975; Medley and Mitzel, 1963; Rosenshine, 1971; Rosenshine and Furst, 1973] on research arising out of this tradition reflected the caution of their authors as few consistent and significant relationships between teacher variables and student performance were identified. These reviews were also critical of research designs, inappropriate analysis and interpretation of data, and the seeming lack of concern on the part of researchers for conceptual or theoretical models to guide research [Berliner, 1976; Heath and Nielson, 1974; Flanders, 1973].

A more recent trend has been toward long-term investigations which attempted to correlate process, product, and context variables, i.e., Brophy and Evertson, 1976, Soar, 1973, and Stallings, 1976. The convergence of results from some of these studies has caused a movement from emphasis on specific teacher behaviors to clusters or patterns of teacher behaviors which were related to student behavior and, in turn, student achievement [Good, 1979; Medley, 1977; Powell, 1978; Rosenshine, 1978].

During the late 1960's and early 1970's, descriptive studies of classrooms using a field study approach emerged [Berliner and Tikunoff, 1976; Cusick, 1973; Rist, 1974; Sevigny, 1977; Smith and Geoffrey, 1968]. This approach, growing out of an anthropological and sociological tradition, uses a holistic framework in observing, describing, and attempting to understand the dynamics of the classroom.
Adapted to classroom settings, this approach has potential for providing a complementary contribution to learning about the nature of teaching for the purpose of generating explanatory hypotheses.

The results of research on teaching over the past sixty years at various times have been described as disappointing, frustrating, and contradictory. Disappointing results may be due, in part, to an inadequate descriptive base to support explanatory or predictive studies of teaching. It would appear that, more recently, there has been a tendency on the part of researchers to move in the direction of designing studies that more nearly reflect the multi-faceted nature of teaching. An emphasis on the generation of rich descriptive data is reflected in the principles suggested by the National Institute of Education "Report of the Learning Task Force," 1977, reported by Koehler [1978]. These principles included the following:

1. With regard to descriptive classroom research, the purpose is to describe the teaching/learning process in the social/cultural setting of classrooms. This approach is characterized by a more holistic approach, with attention paid to the ecology or environment of the classroom.

2. Small sample, in depth, longitudinal, naturalistic observations can appropriately be carried out using ethnographic methodology.

3. Disciplines such as sociolinguistics, sociology, anthropology, and economics, as well as psychology, can contribute to the research on teaching providing an inter-disciplinary approach.

4. Rather than studying alternative systems, classrooms in the existing school system should be emphasized.

5. While traditionally, teachers have been subjects of research, they can play an important collaborative role in research efforts.
In summary, results of the study of teaching have provided less useful information than we would have expected to assist teacher educators, school administrators, teachers, and/or researchers in accomplishing their goals. It would appear that there is a trend toward contextual classroom descriptive studies using field study as a complement to existing methodology.

**Purposes of the Study**

The focus of this study was on classroom description. The specific purposes of the investigation were to:

1. study one classroom context from the perspectives of the participants with the intention of providing an in-depth description of its characteristics
2. generate explanatory propositions to guide future research on teaching.

**Conceptual Frame of Reference**

The researcher's personal paradigm for this study was based on the fundamental premises posited by Combs and other perceptual psychologists, i.e.:

1. that behavior is a function of an individual's perceptions or the meaning that he personally places on these perceptions at the moment of behaving.
2. "the closer the perceived relationship of an experience to the phenomenal self, the greater will be the effect of the experience upon the behavior and function" [Combs, et al., 1976, p. 202].

Drawing on the work of Combs, these premises can be elaborated in the following manner. The use of the term individual refers to the self,
the perceptual self, or the phenomenal self. The self is that aspect of the perceptual field that we refer to when we say "I" or "me". The concept self is inferred and cannot be observed. Perceptions or personal meanings, whether they be perceptions of the senses or feelings or conceiving— or knowing or understanding, can be viewed as the individual's or self's differentiation of meaning from a whole field of available meanings or perceptions. Perceptual field refers to the stable, yet fluid, organization of all perceptions available to the individual. Perceptual organization becomes a lens through which the individual differentiates meanings at any given instant. It is that differentiation of meaning arising out of perceptual organization that determines an individual's behavior or function.

This conceptual frame of reference led the researcher to use the construct teacher's perceptual organization to study teaching. In the role of teacher, an individual brings a unique organization of an entire field of perceptions from which perceptions of himself as a teacher, perceptions of his students, and the activity of teaching are differentiated, and out of which his behavior as a teacher arises [Combs, et al., 1974].

In this study the term "teacher perceptual organization" is defined as a framework for perceiving which is a function of the interaction of how the teacher perceives himself as a teacher, perceives students, and perceives the purpose of teaching and what is necessary to teach. These perceptions include perceptions of feeling or conceiving and knowing or understanding. This organization is an inferred construct and was limited to the interactions of these perceptions as related to the specific class studied.
Earlier in this chapter, teaching was said to be a complex activity. Congruent with the researcher's frame of reference is a definition of teaching by Hough and Duncan [1976] which reflects this complexity.

Teaching is an activity—a unique professional, rational and humane activity in which one creatively and imaginatively uses himself and his knowledge to promote the learning and welfare of others [p. 2].

While this definition is consistent with the intent of this study, emphasis in this study has been placed on that part of the definition, "using himself and knowledge to promote learning," which is directly related to the aspect of teaching activity identified as instruction. Instruction, for the purpose of this study, was defined as

...the process of arranging human, material and temporal resources with the intent of facilitating one's own learning or the learning of other's [Hough, 1978, p. 1].

Specifically, emphasis is placed on the teacher's intent in this process.

Research Questions

This study of teaching was organized around the following research question, which was delineated into four further questions to reflect the researcher's conceptual frame of reference which was drawn from perceptual psychology.

1. What are the characteristics of and contributing to the instructional experience of a university professor and his students during a selected university course?

   a. What are the characteristics of the managerial and substantive aspects of instruction in this course?
b. How do students perceive and react to the instructional arrangements in this course?

c. What is the teacher's perceptual organization in relation to this course?

d. What is the relationship between the teacher's perceptual organization and the instructional arrangements in this course?

Delimitation and Limitation of the Study

The investigation was restricted to the study of one university professor who had received a university-wide award for distinguished teaching and the graduate students enrolled in one of his courses. The period of study was one academic quarter beginning several weeks prior to the first class session and ending several weeks following the end of the quarter. Student involvement in the study was voluntary, however, all students enrolled in the course for academic credit were involved. The intent of this study was description; it was not appropriate, therefore, to test hypotheses or to generalize the results beyond the class studied.

Significance of the Study

The significance of this study resided in the fact that it was guided by a theoretical formulation, and recognized the multi-faceted nature of teaching and the importance of contextual classroom factors. Many previous studies have been criticized for ignoring these issues. By studying one class in depth, using field study methodology, it was anticipated that rich descriptive information on teaching would emerge
and that this information would provide a basis for the generation of explanatory propositions which could serve to guide future research on teaching.

**Definition of Terms**

**Instruction** is the process of arranging human, material and temporal resources with the intent of facilitating one's own learning or the learning of others [Hough, 1978, p. 1].

**Perspective** is an angle of observation, an interpretive frame of reference from which the individual makes sense of and acts on his environment.

**Teacher's perceptual organization** is a framework for perceiving which is a function of the interaction of how the teacher perceives himself as a teacher, perceives students, and perceives the purpose of teaching and what is necessary to teach. These perceptions include perceptions of feeling or conceiving and knowing and understanding [Modified from Combs, et al., 1974].

**Dissertation Overview**

This report is divided into six chapters. In the next chapter a chronology of the study of teacher effectiveness and teaching is presented. Emphasized are research trends, interpretation and criticism of results of research conducted, and recommendations for research. A brief description of the nature of field study and the Observational System for Instructional Analysis, and a detailed description of the methodology used in this study comprise Chapter III. The descriptive results of the study are presented in Chapter IV, while a model and explanatory propositions based on the descriptive results are presented in Chapter V. The report concludes with Chapter VI in which the findings, conclusions, and their implications are discussed.
CHAPTER II

A REVIEW OF THE LITERATURE ON

THE STUDY OF TEACHING

The legacy of the past for today's researchers in teacher effectiveness is, at the same time, impressive and disappointing. It is impressive in terms of the numbers of studies conducted and what has been learned about methodology and technology; it is disappointing in that while we have learned that some previous commitments about teaching cannot be supported, little reliable knowledge has been generated concerning what does constitute effective teaching. More pointedly, work has consistently been criticized and interpretations of findings have often been controversial. Enough has been learned to suggest that the process-product paradigm, though useful, does not provide the only legitimate frame of reference for use in the study of teaching. Some have already begun to seek answers to questions about the complexity of the teaching process without regard to the product. In order to answer questions of this order, new research designs which more appropriately address the broad dimensions of classroom teaching and learning as it is experienced by teachers and students have begun to emerge.
Overview

Chapter II traces the chronology of the study of teacher effectiveness and teaching from approximately 1950 until the present time. Presented are research trends, interpretation and criticism of the results of research conducted, and recommendations for future research. Reflected in this review will be both consistency and inconsistency of results as well as controversy. The chapter ends with the development of alternative approaches to the study of teaching.

Studies of Teacher Personality and Characteristics

The study of teacher effectiveness and teaching as it is known today had its beginning in the 1940's and 1950's when research centered on the study of teacher personality and characteristics later to become known as teacher pressage variables. One of the most extensive and ambitious research efforts was The Teacher Characteristics Study conducted over a six year period by Ryans [1960]. This study consisted of over 100 separate but integrated studies involving over 6,000 teachers, 1,700 schools, and 450 school districts. The primary purposes were to identify teacher classroom behavior patterns, develop measures to estimate certain teacher characteristics and qualities, and relate behavior patterns to various groups of teachers. Through factor analysis, three patterns considered to represent the principal clusters of teacher behavior contributing to teacher-pupil classroom relations were identified. These included:
Pattern X₀ — teacher behavior that was warm, understanding, and friendly rather than aloof, egocentric and restricted

Pattern Y₀ — teacher behavior that was responsible, business-like, and systematic rather than evading, unplanned, and slipshod

Pattern Z₀ — teacher behavior that was stimulating, imaginative, and surgent rather than dull and routine.

Some of these constructs were to continue to appear in commentaries on teacher effectiveness research in ensuing years.

Probably the most comprehensive review of research on teacher personality and characteristics was conducted by Getzels and Jackson [1963]. Their review included studies involving attitudes, values, interests, favored activities, adjustments, needs, projective techniques, characteristics, and cognitive abilities. They concluded their review by stating that in spite of the immense research effort on a problem of critical importance, "very little is known for certain about the nature and measurement of teacher personality or about the relation between teacher personality and teaching effectiveness" [Getzels and Jackson, 1963, p. 574]. They cited, as did Remmers [1952] before them, three major obstacles that faced researchers who worked in this area. The first class of these was the problem of personality definition, that is, distinguishing between various dimensions of the construct. Second, instrumentation of the period presented problems of incompatibility of constructs obtained when using the various available measures, e.g., self report, rating scales, and projective techniques. The third problem involved the use of highly unreliable rating scales as criteria of teacher effectiveness. These basic problems of construct
validity, instrumentation, criteria of teacher effectiveness, together with the lack of a theoretical frame of reference to guide research continued, in one form or another, to plague researchers during the 1960's and even today.

The Advent of Direct Classroom Observation

Most contemporary research has been guided by what has become known as the process-product paradigm which arose out of the work begun in the late 1950's and 1960's when the focus of research moved to direct observation of teacher classroom behavior or the process of teaching. This was made possible by the development of direct observation systems [Medley and Mitzel, 1963; Rosenshine and Furst, 1973]. Central to the work of this period was that of Flanders who developed one of the early systems. The Flanders' Interaction Analysis System (FIAS) was a procedure for using trained observers to code continuously at three second intervals or less, classroom behaviors into ten mutually exclusive categories of verbal behavior between teacher and student and among students [Flanders, 1970]. Not only was FIAS one of the more sophisticated systems of its time [Medley and Mitzel, 1963], but it also had a significant impact on the research of that period and the development and use of other systems [Flanders, 1979].

In referring to the work of Flanders, reviewers have consistently interpreted his findings in terms of a positive relationship between teacher indirectness and desirable educational outcomes [Dunkin and Biddle, 1974; Rosenshine, 1971; Rosenshine and Furst, 1973]. It is puzzling that his work was interpreted in this way, as the
primary focus of Flanders' work was an investigation of teacher variation (flexibility). Flanders himself described the findings of his work as follows:

...the conclusion that needs to be emphasized is that the students who achieved the most and who had significantly higher scores on our revised classroom attitude instrument were in classes which were exposed to flexible patterns of teacher influence. This flexible pattern included periods of predominantly direct influence as well as periods of predominantly indirect influence. This characteristic flexibility was associated with a higher i/d average...deviations (from the overall i/d ratio) we have called flexibility [Flanders, 1965, p. 110].

Flanders also noted that evidence supported a predicted pattern for flexible teachers. Flexible teachers followed a pattern that consisted of greater indirectness while goals were being clarified and new material was being introduced. More directness was utilized after goals had been clarified and work was in progress. The construct indirectness refers to the teacher accepting feelings, praising or encouraging, accepting or using ideas of the student, and asking questions. Directness referred to the teacher lecturing, giving direction, criticizing, and justifying authority. Together these formed an indirect/direct (i/d) ratio of teacher behavior. It was also Flanders who identified the "law of 2/3's", that is, on the average two-thirds of class time is spent in talk and of that two-thirds, two-thirds was characterized by teacher talk [Flanders, 1965].

Out of the development of and research with Flanders' Interaction Analysis System and other related observational instruments came the following variables: teacher praise, warmth, acceptance of pupils ideas, criticism, and the inclusive categories of direct and
Indirect teaching. Although, in retrospect, these variables have been thought to lack conceptual clarity and need to be considered in a contextual framework, they have continued to be used as variables in the study of teaching.

**Emphasis on Process-Product**

**Guided Research**

With the increasing number of studies conducted during the 1960's, persons in the field began to ask the questions: What have we learned about the process of and effect of teaching? Where do we go from here? In an attempt to address these questions, various persons took upon themselves the task of reviewing and synthesizing the results of the increasing numbers of studies. Included among the reviewers and synthesizers were Biddle, Dunkin, Gage, Good, Flanders, Furst, and Rosenshine. Two of the most widely recognized efforts are those of Rosenshine and Furst and of Dunkin and Biddle.

**The Work of Rosenshine and Furst**

Rosenshine [1971] reviewed approximately fifty correlational studies in which observed teacher behaviors were related to student achievement. In each study teacher behaviors were observed using rating and category observation systems. The generated list of promising variables was not intended to be mutually exclusive, but rather, reflected Rosenshine's attempt to group variables that appeared to him to be related. He cautioned against generating a checklist of do's and don't's for educators and supervisors, as his purpose was not
to study teacher effectiveness, but to stimulate ideas for future research. The general clusters of behaviors studied were teacher approval and disapproval, teacher cognitive behaviors, flexibility and variability, enthusiasm, amount of teacher-student interaction, general ratings of teacher behavior, time and antecedent, and demographic variables.

In a subsequent publication, Rosenshine and Furst [1971] rank ordered what they considered to be the most promising variables for future research. The list included: clarity, variability, enthusiasm, task oriented/business-like behavior, opportunities to learn criterion material, use of student ideas and/or teacher indirectness, lack of use of criticism, structuring comments, multiple levels of discourse, probing, and perceived difficulty of the course. Further, they identified the following as not having shown significant or consistent results: nonverbal approval, praise, warmth, ratio of all indirect to all direct behaviors (i/d), flexibility, questions or interchanges classified into two types, teacher talk, student talk, student participation, teacher experience, and teacher knowledge of subject area. Rosenshine and Furst concluded their report with suggestions for future research, including recommendations for methods of variable selection, coding of classroom events, designs for studies, and statistical procedures to be used in data analysis.

While many considered the work of Rosenshine to be a significant contribution to the field, it has not been without criticism. Particularly critical have been Flanders [1973] and Heath and Nielson [1974]. Generally, their criticisms involved difficulties in
interpretation which arise when (1) construct definitions grow out of combining variables with different operational definitions, (2) studies where widely varying samples and settings as well as inconsistent units of measurement are combined, and (3) statistical assumptions are violated across studies.

The Work of Dunkin and Biddle

Dunkin and Biddle reviewed close to 500 studies involving systematic observation of classroom teaching in search of those studies sufficiently well conducted to be worth citing. Their review was organized around the following topics: classroom climate, management and control, classroom as a social system, knowledge and intellect, logic and linguistics, and sequential patterns of classroom behavior. Generally, climate and indirectness were rejected as variables on the basis of evidence which reviewers felt was insufficient to support the likelihood that teaching and student achievement could be improved in classrooms with a warm or democratic climate. The research in this area was considered to have weak methodology; observation systems reflected categories which were not logically exclusive; and, the conceptual posture was considered simplistic.

The work of Kounin on discipline and group management which generated variables such as withitness, overlappingness, smoothness, momentum, and group alerting was considered limited because studies were field surveys, concepts were exploratory, and while validated against process criteria, product criteria were not used, and it was unknown whether teachers could be taught to use these concepts. While
the preceding limitations were acknowledged, Dunkin and Biddle were impressed with Kounin's results and urged further exploration in this area. Studies involving behavior modification were considered to be impractical for classroom situations, although it was recognized that behavior modification techniques can be effective with target pupils.

Dunkin and Biddle considered the studies involving the view of the classroom as a social system to be lacking in concern for product variables and in clarity regarding which social processes of the classroom are under the direct control of the teacher. Findings suggested that it may be fruitful to view the classroom as a social system, especially in interpreting findings from studies where the teacher is considered to be in control. Studies involving intellect and knowledge did not reveal significant relationships with student achievement, however, they did support the proposition that teachers could be trained in this intellectual realm. Although there were limited findings available in the area of logic, Dunkin and Biddle felt that the area had face validity and would, no doubt, be a necessary part of an empirically based theory of teaching. Linguistic concepts were reflected in field surveys which the reviewers felt provided limited information or contribution to process-product oriented research. Finally, sequence units, as reflected in early work, appeared to have surface validity, and the reviewers suggested further work in the area.

The development of concepts was cited by Dunkin and Biddle as the strongest contribution of the body of research they reviewed. They also considered a major contribution to be the "debunking" of several simplistic models for improving classroom teaching. In addition to
making suggestions regarding the development of a theoretical model of teaching, they concluded their review with a discussion of problems unearthed and made recommendations concerning them. The problems and subsequent recommendations were organized into five categories:

1. the larger cultural context of educational research, including lack of support, short-term programmatic support, the place of teaching research in programs of educational innovation, publication of research on teaching

2. problems of theory, including reification of instruments, the impact of commitments on interpretation of data

3. measurement problems involving recording and encoding

4. interpretation problems, including statistical problems and problems concerning the interpretation of statistical data in verbal form

5. designs for research likely to produce innovative information concerning teaching process designs, including process designs, context designs, pressage designs, product designs, experimental designs, innovative designs.

Their final remarks pointed out the need for competent, classroom research.

While recognizing the work of Dunkin and Biddle to be especially thorough and clear in organizing the field, Gage is particularly critical. He charges

...basing their clinical judgment primarily on the statistical significance or nonattributability to chance, of the results of single studies, they risk committing to a large degree an error of Type II—that is, an error of considering a relationship or difference to be nonexistent when it does in fact exist [Gage, 1978, p. 230].

Gage based his charge on the following argument: Because of the multiplexity of teaching, it would be safe to assume that any one dimension
of teacher behavior might account for only a very small degree of variance in student outcomes, i.e., +.1 to +.4. In the studies conducted, generally, small teacher samples were used—a mean of approximately 15. Consequently, with such a sample size, it would be necessary to achieve +.51 and +.64 for a significance of .05 and .01 respectively. Using examples from the Dunkin and Biddle review, Gage demonstrates how, by using a method to test for the significance of combined results, the correlation could be significantly higher and perhaps more realistically account for variance in student performance.

Problems Confronting Researchers

The early years of the 1970's reflected a continuing overriding pessimism regarding the research on teaching and teacher effectiveness. The many reviews of previous research were characterized by statements such as the one Rosenshine and Furst used to begin their review.

This review is an admission that we know very little about the relationship between classroom behavior and student gain [Rosenshine and Furst, 1971, p. 37].

Perhaps one of the most cogent explications of the problems impeding the study of teachers and teaching was that of Berliner [1976]. He grouped problems into three general areas: those concerned with instrumentation, those concerned with methodology, and those concerned with statistics used in studying how teachers affect student achievement.
The instrumentation problems involved both dependent and independent variables. Most studies which attempted to relate teacher classroom behavior with student achievement used standardized tests to measure student outcomes. Although these were usually highly reliable instruments, they may not have reflected what was taught, and, further, because they require group administration, the young, bilingual, or lower socioeconomic status child might have been disadvantaged with regard to appropriate testing. Berliner suggested circumventing the problem by developing tests for specific teaching units. While these tests more nearly reflect classroom teaching, they usually test short-term gains and long-term gains remain unknown. Another instrumentation problem involved the reliance on achievement tests without concern for the learner's feelings toward the instructional experience. He summarized this point with the statement

...if researchers...do not consider what is learned and what is felt about learning, simultaneously, they will continue to fractionate school learning into pieces that do not resemble the student's view of reality [Berliner, 1976, p. 6].

Concerns associated with independent variables involved appropriateness of teacher behavior, unit of analysis, and stability of teacher behavior. The counting of specific teacher behaviors has led to the re-evaluation of the behavioristic stance in the study of teaching and has had a strong influence on the qualitative dimensions that must be considered in the observation of teaching. The unit of analysis has been repeatedly challenged in the study of teaching, the question being whether the teacher, instructional element, or instructional time best identifies the independent variable. A final factor
in the area of independent variables was that of teacher stability of behavior. He concludes that studies of teaching will remain limited until more is known about which behaviors fluctuate and how and why they fluctuate over time, settings, curriculum, and populations.

Methodological problems included the consideration of student background in relation to teacher effectiveness, subject matter and teacher effectiveness, issues of normative, standard and volunteer samples in the study of effectiveness, individual differences among students and teacher effectiveness, student behavior influence on teacher effectiveness, construct validation and teacher effectiveness, and generalizability of measures of effectiveness.

Finally, statistical problems often revolved about the fact that procedures did not meet the requirements of classroom situations under study. Berliner concluded that unless we are willing to deal with these problems, issues, and concerns, we cannot begin the scientific study of teaching.

New Directions Emerge

Process-Product-Context Studies

On a more optimistic note, the results of several process-product-context studies involving elementary school children converged to alter the way in which teacher behaviors were conceptualized [e.g., Brophy and Evertson, 1976; Stallings, 1976; Soar, 1973]. It no longer seemed justified to view teacher behaviors in terms of single behaviors such as clarity and enthusiasm, but rather, in these studies it became apparent that patterns or clusters of teacher behaviors were positively
and significantly related to pupil achievement in reading and mathematics. These studies have had extensive reviews by, among others, Good [1979], Medley [1977], Powell [1978], and Rosenshine [1976; 1978].

Findings from these and other studies have been organized around:

1. student variables such as content covered and student attention to relevant academic activities which together have become known as "academic engaged time"

2. teacher variables which cluster and have become known as "direct instruction."

Although the variables included in the construct academic engaged time began with the work of Carroll [1963] and Bloom [1976], Berliner has been credited with the construct definition as it applies to recent research studies. Rosenshine [1978] reported that the two variables comprising academic time had had the highest and most consistent correlations with student achievement of any studied. The concept academic engaged time leads one to the question: "What does the teacher do to promote student task engagement?"

The construct "direct instruction" begins to address the question under what conditions children are task engaged. So as not to confuse the term "direct instruction" with the construct identified by Flanders, the term is defined here as it relates to recent research:

...high levels of student engagement within teacher directed classrooms using sequenced, structured materials...it refers to teaching activities focused on academic matters where goals are clear to students, time allocated for instruction is sufficient and continuous, content coverage is extensive, student performance is monitored, questions are at a low cognitive level and produce many correct responses, and feedback to students
is immediate and academically oriented...the teacher controls instructional goals, chooses material appropriate for the student's ability level, and paces the instructional episode [Rosenshine, 1978, p. 46].

In this context, it is important to remember that when discussing direct instruction, it is related to elementary school children in the areas of reading and mathematics. Central to this approach are the ideas of academic focus and affective focus. Academic focus refers to teachers involving students in reading and mathematics activities rather than typical readiness activities which have not had a positive relationship to student achievement in academic areas. It was demonstrated that in classrooms where children were academically engaged and direct instruction was used, the classroom affect (climate) was characterized as warm, convivial, cooperative, democratic, and lacked personal negative judgments of students. The research has not identified how much time a child needs to learn, how instruction should be arranged to engage children, or how teachers should behave to facilitate goals involving creativity or problem solving.

Powell [1978] stressed that direct instruction can occur with differing patterns of classroom organization, use of materials, and teaching methods or instruction. Medley [1977], while reviewing the same findings, discussed those aspects of direct teaching that related positively and significantly to academic achievement of children of low socioeconomic status. An additional contribution by Medley [1977] is found in his concluding remarks where the beginnings of an alternative approach to the study of teaching can be found. In suggesting that the process-product model may no longer be an
appropriate paradigm to guide research, he posed the consideration of two additional variables, namely, the intent of teachers and the behavior of the individual pupil.

A dimension of the recent research discussed by Good [1979] related to teacher expectation regarding student achievement. He cited a study of teacher beliefs and expectations about a variety of teaching issues where it was found that the

...only belief that consistently separated high and low effective teaching was the extent to which teachers believed that they could make an important contribution to students' mastery of academic materials [Good, 1979, p. 12].

While consideration of the perceptual world of teachers and students has been controversial, with little substantive progress made in this area of investigation, Good proposes the necessity of integrating process information with teacher thinking, student perceptions, and teacher and student expectations and interests.

The optimism of the late seventies appears to center, first, on the recognition of patterns and clusters of teacher behavior and student mediating activity as promising areas of investigation. Second, it would appear that the suggestions of Medley and Good provide the basis for an expanded or alternative approach to the study of teaching—-one that takes into account teacher intent and teacher and student perceptions of their classroom experience.

Teacher's Perceptual Organization Studies

The Medley and Mitzel [1963] review of teacher personality and characteristics, while indicating that research in that area had
not been a productive avenue in the study of teaching, reported an interesting relationship between effective teachers and their world view or perceptions. At the time they recognized the idea worthy of further pursuit. This was not to occur until the late 1960's with the development of the construct teacher's perceptual frame of reference [Combs, et al., 1974].

In the late 1950's Combs and Soper became interested in differentiating between good and poor counselors. The initial concept "instantaneous response" evolved into the concept "use of self as an instrument." In a study of good and poor counselors, nurses, teachers, and Episcopal priests, it was generally supported that effective performance of persons in the helping professions could be differentiated on the basis of perceptual organization [Combs, 1969]. This led, in the ensuing years, to a series of studies on the identification of a perceptual organization specific to effective teachers [Brown, 1970; Choy, 1969; Gooding, 1964; Koffman, 1975; Usher, 1966]. These studies of inferred teacher perceptual organization using trained classroom observers, interviews, and questionnaires and teacher effectiveness, as determined by awards or ratings by administrators, colleagues, students, and self, differentiated an effective teacher from an ineffective teacher in five major areas. These were:

1. rich, extensive, and available perceptions about his subject field
2. accurate perceptions about what people are like
3. perceptions of self leading to adequacy
4. accurate perceptions about the purpose and process of learning
5. personal perceptions about appropriate methods for carrying out his purposes [Combs, et al., 1974, p. 22].

Combs and others have not reported studies of the teacher perceptual organization in the total context of the classroom or as it might be related to the nature or characteristics of instructional arrangements implemented by the teacher and perceived by students. Pursuing these relationships would be a response to the directions suggested by Medley and Good.

New Paradigms for the Study of Teaching

The limitation of the process-product paradigm of research has become one of the central issues involved in the study of teaching. It is becoming increasingly clear that this paradigm has outgrown its usefulness in guiding the nature of the research questions raised, the acceptable approaches to research design and interpretation of data, and, in short, the standards for the research community committed to the study of teaching and teacher effectiveness. The paradigm follows a scientific philosophy which assumes that one discovers the teacher behaviors that influence student achievement, seeks why these behaviors influence student achievement, and, consequently, arrives at a point that one has discovered the rules required to teach teachers what is necessary to enable students to achieve. It further assumes that teachers and teaching are rule-governed. Rules are determined by the descriptive-correlational-experimental research loop. Although not necessarily intended by researchers, in process-product research the why questions tend to be assumed on the basis of correlational study.
rather than determined by experimental study. On this assumption, so-called rules originate from relationships between teacher behavior and student achievement without answering why these relationships have been effective.

A Philosophical Approach

Fenstermacher [1979] raises an interesting point. Aside from the faulty assumption that

...knowing what accounts for effective teaching constitutes knowledge of how to produce more effective teaching...

he poses the question:

If teachers know that a certain behavior influences student outcomes, why might they choose an alternative behavior? [p. 169]

Fenstermacher suggests a social or mind philosophy to answer questions of this order and to guide the study of teaching. He draws on Thomas Green's constructs of subjective reasonable beliefs, i.e., those which seem plausible to the individual based on his experience and objective reasonable beliefs, i.e., those which are the result of established evidence brought to bear on subjective reasonable beliefs. The transformation of subjective beliefs into objective reasonable beliefs is what Green calls education. In answer to the question why a teacher behaves in a way contrary to what is known to influence student achievement, Fenstermacher suggests that the teacher is acting on what, to him, is a subjective reasonable belief. The reasonable belief of the teacher, in this case, is related to what the teacher knows of the entire phenomenon.
The question concerning why a teacher behaves as he does has not been addressed in teacher effectiveness research. Fenstermacher poses two reasons why researchers have ignored this question. The first is a subjective reasonable belief about what is an appropriate domain for educational inquiry. In the tradition of process-product research, it is what the teacher does that is the focus of study, and what the teacher does can be observed. Second, is the view that behavior is influenced by external factors. These views are inconsistent with the view of education which involves the transformation of objective to subjective reasonable knowledge. Fenstermacher points to a view of the study of teaching that holds, as central in identifying teacher behaviors, teacher intentionality. Given the determination of relevant teacher behaviors based on the teacher's intentionality regarding instruction, he hypothesizes a greater probability of transforming objective to subjective reasonable knowledge obtained through research in the education of teachers.

This alternative philosophical approach, although nascent, is congruent with several issues raised in this and the previous chapter. In the review of literature presented in this chapter, it becomes apparent that we have come to a transition period in the study of teaching as indicated in new directions, as for example, those posed by Good and Medley in directing researchers to consider the intent of teachers, mediating activities of students, and perceptions of the teacher and student as they experience teaching and learning.

Doyle [1978], critical of the limitations of the process-product paradigm, poses the alternatives of a student mediating and an
ecological paradigm. While each of these persons has suggested alternatives, Gage [1978] considers them only as ways to extend the process-product approach. Already, individuals such as Combs have looked, although in a limited way, to an alternative and/or expanded view of teaching, while others, namely, Smith and Geoffrey, Cusick, and Rist, in their studies have paved the way toward a more holistic methodology appropriate in considering broad research questions. In line with these views were the recommendations of the NIE Task Force on Learning cited earlier. It appears that a new paradigm may be emerging to set the standards for the study of teaching.

In Chapter I, for example, the researcher viewed behaviors through the perspective of a perceptual psychology frame of reference, that is, a person's behavior is determined at any given time by the entire field of perceptions available to him at the instant of action. This holds for both the teacher and the student. Reported research on the perceptual organization of teachers suggests a particular perceptual frame of reference associated with effective teachers. Could not the teacher's behavior in the classroom be viewed as what is subjectively and objectively reasonable in light of his perceptual field? Given a particular field of perceptions, the teacher then acts to arrange resources for the intent of facilitating learning of others. It follows that the student's engagement response to instruction will be determined by his perception of reasonableness at the time of his interaction with the instructional arrangements.
Summary

This chapter provided an overview of the study of teaching. Trends were identified, interpretations of results were presented, as were criticisms and recommendations for the future. It would appear that a major shift in the approach to the study of teaching is taking place. The shift is characterized by research approaches that use multiple perspectives and methods to study the multi-faceted activity of teaching.

Chapter III presents a description of field research, the Observational System for Instructional Analysis, and the specific field study approach used in this investigation.
CHAPTER III
A MULTIPLE METHOD RESEARCH STRATEGY

To understand reality, the meaning of human relationships, it is appropriate to consider how one arrives at an understanding of the reality of such relationships in everyday life. The common expressions "seeing is believing" and "did you see that?" suggest that people rely on their own direct experience and the confirming or disconfirming independent experience of others to make sense of their world. The degree to which the experience of others is accepted will ultimately rest on the extent to which one is willing to believe that another is telling the truth. To determine the reliability of another's experience, one measures it against his own experience and what is known about the experience of the other. One's own experience and the reported experience of another interact with logic and common sense to form reality for the individual.

Douglas [1976] suggested that social scientists discover truth in much the same way when he stated:

If we want the most reliable truth we can get about the social world, which is what is commonly meant by scientific truth or data, then we want as much direct experience as possible through direct experience of field research followed by checking it against the independent direct experience of others, and tested out and checked out by us as being true within certain limits in terms of our direct experience and our reasonably reliable, vastly complex ideas of truth-telling in this society [p. 7].
The degree to which individuals and social scientists are willing to relax their tests of truth is influenced by time and resources and/or practical constraints which influence the pursuit of truth. It is the nature of the problem and practical constraints in relation to the willingness to accept something as true that guide the selection of field study strategies.

Overview

This study was undertaken with the intention of providing an analytic description of the instructional experience of a teacher and his students during a particular course. While describing the manifest behavior of the teacher and students was considered important in gaining an understanding of the instructional experience, it was not considered to be sufficient to reflect the complexity of this experience. The context, instructional organization, instructional materials, intent of the teacher, and meanings of the experience were all thought to contribute to understanding the complexity. It was reasoned that understanding of the complexity of the instructional experience would be best approached by a research methodology that provided both direct and indirect experience with the class, together with the opportunity to check and recheck the reasonableness of the information obtained. This was accomplished using a field study approach which provided a framework for the multiple strategies that were necessary to carry out the purpose of this study.

This chapter is organized in three parts. Part I provides an overview of the nature of field study. It begins by differentiating
approaches such as ethnography, participant observation, and qualitative research and moves to describe more fully the specific characteristics of generic field study methodology. Part 2 introduces and describes the Observational System for Instructional Analysis, an instrument used to describe instructional arrangements which was found to be compatible with a field study approach. Finally, Part 3 outlines in detail the field study research strategies that were utilized in this study.

PART 1

The Nature of Field Study

The anthropological and sociological tradition of field study has been found to be of value and is being advocated for the study of educational problems [Hamilton, et al., 1977; Iannaccone, 1975; Lutz and Ramsey, 1974; Smith, 1979; Spindler, 1974; Wilson, 1977; Wolcott, 1975]. Clarification of the terms ethnography, participant observation, and qualitative research, which have often been used synonymously with field research in education literature, would provide assistance in clarifying the nature of field study.

In the anthropological tradition, ethnography is a generic term referring to the anthropologist's picture of a people, a description of the way of life of a people. Wolcott [1975] asserted than an ethnographic approach can be taken to study any aspect of human life, however, he also indicated that many contributions that are labeled ethnography "...are really contributions toward the ethnography of some culture-sharing group" [p. 112]. Often the primary
thrust of investigations outside the field of anthropology is not anthropology but that of a research design which is characteristic of an ethnographic field study approach.

Participant observation, in the generic sense, is part of the research tradition associated with sociology. Denzin [1970] defined participant observation as

...a commitment to adopt the perspective of those studied by sharing in their day-to-day experiences... the intent is to record the ongoing experiences of those observed, through their symbolic world, and such a strategy implies a commitment--either conscious or unconscious--by the observer to basic principles of symbolic interactionism [p. 185].

That participant observation is one of several strategies used in field study is an alternative view. It is this view that will be used in describing participant observation later in this chapter.

Qualitative research methodology involves the study of the empirical world from the perspective of subjects under investigation. As such, this approach includes strategies which allow the researcher to obtain firsthand knowledge of the world in question, e.g., participant observation, in-depth interviewing, total participation in the world being studied, field work [Filstead, 1970].

Field study is an overarching term involving face-to-face interaction of the researcher with the observed in the environment of the observed in an attempt to participate with them in their setting. It is inclusive of natural, that is, relatively uncontrolled social interaction as well as some forms of controlled social interaction. Given these descriptions of ethnography, participant observation, qualitative research methodology, and field study, it becomes apparent
that the terms are not entirely synonymous. The remaining portion of this section will pertain to field study as a generic approach to research.

Purpose and Assumptions

The use of field study, as indicated by Iannaccone [1970], is a useful focus for the ensuing description.

[Field study is used]...to expand conceptual frameworks and to develop models which may lead to theory and eventually to hypothesis testing [p. 226]. Similarly, findings of field work can be considered necessary for the discovery of grounded theory, theory generated from data [Glasser and Strauss, 1967]. Its purpose is not to verify existing theory.

The research design is said to be "temporarily developing," that is, although the researcher is knowledgeable about the problem and has a theoretical frame of reference for guiding his study, he does not enter the field with an a priori hypothesis or necessarily with a highly structured design. While a theoretical framework may guide the research, it does not govern it.

Two basic assumptions underlie this approach [Wilson, 1977]. First, human behavior is influenced by the physical and psychological context in which it occurs. Second, the meaning of human behavior lies beyond that which can be observed; it lies in the perspectives and meanings held by the individuals in that context. This second assumption is amplified in the distinction between "inner" and "outer" perspectives influencing research. The "inner" perspective assumes that understanding is dependent upon active participation in the life
observed while gaining insight through introspection. The "outer" perspective assumes that knowledge about social life is obtained through study of man's behavior. Knowledge of man is achieved through both the "outer" and "inner" perspectives, that is, an understanding arises both from observation of man's behavior and information about his perspective of the world. The "inner" perspective which is emphasized in field research is known as verstehen or subjective understanding [Weber, 1962].

Information and Strategies

The use of field study provides a variety of primary strategies or approaches to gathering various types of information. Zelditch [1962] identified three broad categories of information:

1. incidents and histories, e.g., logs of events, actions observed, explanations as data

2. distributions and frequencies, e.g., quantification of possessions, times, systematic reports of repeated observations with constant coding categories

3. generally known rules and statuses, e.g., lists of statuses, persons occupying them, informants' accounts of rules.

This information reflects only that which is directly available from reports and observations; it does not include inferred information. Zelditch further classified three primary field work methods to obtain information. These included participant observation, informant interviewing, and enumerations and samples. In field research a large variety of methods are available to the researcher. Pelto and Pelto [1978] provided an extensive descriptive list, including participant
observation, key informant interviewing, surveys, and unobtrusive measures. The foremost is participant observation.

Participant Observation

In sharing the world of the observed for the purpose of gaining verstehen, the field worker can assume a variety of social roles. Gold [1958] described four roles on a continuum from complete participant to complete observer. These included:

1. complete observer -- identity and purpose of the observer is concealed from the observed
2. observer-as-participant -- both observer and observed are aware of the field relationship
3. participant-as-observer -- observation is limited to one time or very short visits
4. complete observer -- observer does not interact with informants.

Much has been written concerning the advantages and disadvantages of each role. [See Gold, 1958, Bruyn, 1966, and McCall and Simmons, 1969.] The role of the observer requires both detachment and personal involvement. His interests are independent of the cultural life of the observed [Bruyn, 1976]. The role assumed by the field worker will be one that is deemed plausible within the context of the observed. It will be determined by the research design and the framework of the culture of the observed. Critical to the participant observer role is recognition that the researcher, himself, is the key instrument in observing a setting, and collecting and analyzing the data. Douglas [1976] emphasized that central to collecting valid data is the building and using of friendly and trusting relationships.
Martin [1968] discussed the relationship between understanding and being understood, empathy, and participant observation. He distinguished between the goal of obtaining scientific understanding—propositional knowledge, and being understood—the ethical appropriateness of being sympathetic toward those observed. While no logical connection exists between the two, the participant observer is concerned with the prior and realizes that the latter, while it may be facilitating, does not contribute to scientific understanding. Empathy is presented in the adoption and assimilation senses. In the adoption sense, empathy values putting oneself in the place of others, e.g., adopting attitudes, views, emotions, and thought patterns of the observed. It is not relevant to scientific understanding. Empathy, in the assimilation sense, is related to the attainment of understanding, such that the observer behaves as a member of the community—moves around easily, speaks the language, and is able to joke with the observed. This ability to behave as a member of the community increases the amount of potential information available to him. In concluding, Martin suggested that participant observation, as a research method, is not sufficient to gain understanding nor is it necessary in understanding all cultures. It may be useful, however, in collecting certain kinds of information (events and histories) to help gain a subjective understanding of the community of observed.

Multiple Strategies

For several reasons the field researcher, in addition to his direct observation, must rely on indirect observation. First, the
phenomenon being observed usually occurs in several places which prevents the researcher from observing more than one scene at a time. Second, the researcher usually studies a phenomenon which has had a previous history, one with which the researcher would be unfamiliar and that would not be available to him through direct observation. Finally, many perceptions are not adequately inferable by direct observation. The field worker, consequently, adds to his information indirect observation from informants and respondents. Informant information takes the form of documents or records and reports of persons present in the scene. Both serve the purpose of providing information to the observer about scenes in which he could not be present. Respondent information results frequently from interviewing members of the setting concerning their motives, intents, and interpretation of events. In the former, the person or document substitutes for the observer's presence, while in the latter, the person acts for and as himself.

The use of various methods to collect information or data in an attempt to rule out rival interpretations is known as triangulation. Denzin [1970], in The Research Act, emphasized the need for triangulation in terms of types of data, including time, space, and person, as well as the person levels of aggregate, interaction, and collective. Further evidence of triangulation is seen in the use of multiple versus single (1) investigators, and (2) theoretical perspectives on the phenomenon. Finally, triangulation is evident in methodology when data are viewed between and within methods. Each of these contribute to overcoming "intrinsic bias that comes from single method, single observer, single studies" [p. 313].
The Research Process

While a field study design is described as temporarily developing and there is a certain fluidity in decision making by the researcher, several dimensions or stages of the research process have been identified. The views of Strauss, McCall, and Becker are useful in providing an overall perspective on the research process. Strauss [1964] described essentially three phases. During the initial phase, the specific problems or foci have not been identified and emphasis is placed on observation. Temporary hypotheses begin to emerge from the data as the researcher begins to make sense of his accumulating information. These hypotheses, which may even be conjectures, are tested for relevance as continuing observations are made. Classes of information are developed and the researcher returns to observation and data to look for disconfirmation, qualification, or confirmation. The process is reiterated until hypotheses are confirmed.

McCall [1969] described the process and the end result of field study as analytic description which he indicated:

1. employs the concepts, propositions, and empirical generalization of a body of scientific theory as the guides in analysis and reporting
2. employs thorough and systematic collection, classification, and reporting of facts
3. generates new empirical generalization (and perhaps concepts and propositions as well) on these data [p. 3].

Finally, a similar description of process is cited by Becker [1970] where he considered stages of field work analysis to be:

1. selection and designation of problems, concepts, and indices
2. the check on frequencies and distribution of phenomenon

3. the incorporation of individual findings into a model or organization under study. The final stage of field analysis involves problems of presentation and proof [p. 27].

Characteristic of each approach to identifying process is the relationship between description and the reiterative cycle involved in inductive generation of hypotheses.

Part 1 presented an overview of field study, describing briefly its characteristics. The purpose of field study, the generation of analytic description resulting in the generation of hypotheses, the assumptions regarding the importance of context, and the "inner" and "outer" perspective approach, together with a multiple strategy research approach, demonstrate its compatibility with the intent of this study to describe the complexity of a teaching-learning experience of a teacher and students. Part 2 presents a description of a direct observation system designed to describe instruction. Its compatibility with field study methodology will be demonstrated.

PART 2

An Observation System for Interaction Analysis

Of the numerous observation instruments available to the researcher, few have the potential of the Observation System for Instructional Analysis (O.S.I.A.) for collecting, processing, and analyzing descriptive and inferential information about complex instructional arrangements. The instrument originally developed by
Hough [1967], as an extension of the Flanders Interaction Analysis System, has undergone several revisions [Hough and Duncan, 1975], culminating in O.S.I.A. IV, an instrument which provides the researcher with a conceptual organizer involving both ethnographic and interaction event forms.

Broadwater [1972] investigated the representative validity of O.S.I.A. II and found that substantive events could be coded with a higher inter-observer agreement than appraisal events. Minor revisions were made to improve the validity of appraisal behaviors. Although validity was not tested with the original instrument and the third revision, the current capacity of O.S.I.A. IV, in its expanded form, to validly and reliably describe both quantitative and qualitative aspects of a highly complex instructional setting has been the focus of an in-process study by Hough [1975, 1979].

During its development period, O.S.I.A., in its various forms, has been used successfully in eight supported research, evaluation, and/or staff development efforts and approximately twenty doctoral dissertations at The Ohio State University. In addition, the system is supported by a highly sophisticated computer data analysis system.

Specifically, O.S.I.A. was designed to

...collect information about instruction where instruction is defined as the process of arranging human, material, and temporal resources with the intention of facilitating one's own learning and/or the learning of others [Hough and Duncan, 1976; Hough, 1978].

It is a combination sign and category system in which the temporal aspects of instructional events are continuously coded at time intervals of five seconds, or less, if an event occurs for a period
of time shorter than five seconds. In addition to the classification of temporal dimensions of instructional events, nine dimensions of instructional events can be described.

Dimensions of Instructional Events

This description is adapted from descriptions of O.S.I.A. by Hough and Duncan [1976], and Hough and Duncan with Belland [1975]. Definitions are reprinted with permission of the authors.

One of the unique features of O.S.I.A. IV is that nine dimensions, or foci, can be recorded simultaneously. Figure 1 illustrates these dimensions.

Dimension one permits the observer to focus on the teacher, student, instructional setting, or other. The availability of the other designation allows the observer to define alternative focus, e.g., some other person or artifact. Recording continues with the foci chosen, excluding all other events until a purposive change in focus is made.

The second dimension of instructional events is the instructional setting described by the observer. In choosing a setting, numbers of persons involved and the social-instructional interaction which comprise the setting can be designated as class, group, dyad or tutorial, independent, or other. Although the focus can change frequently to provide multiple perspectives, in some settings such as lecture, the focus might remain on the teacher for the entire period.

The third dimension indicates the source of the instructional events, the options being teacher, student, and other. Again, the
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<th>Code</th>
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<tr>
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<td>Senses</td>
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<td>2</td>
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<td>Manipulating Artifacts</td>
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<td>Initiates</td>
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<td>Responds</td>
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<td>Solicits Clarification</td>
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<tr>
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<td>12</td>
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<tr>
<td>Instructionally Non-Functional Behavior</td>
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</table>

**KEY**

A = Appraisal
M = Managerial
S = Substantive

Figure 1. Nine Dimensions of Instructional Events Coded by OSIA IV
Figure 1. Nine Dimensions of Instructional Events Coded by OSIA JY
other category provides flexibility for indicating such sources as mediated instruction, a team teacher, student teacher, or even a simultaneous group response.

Dimension four is comprised of thirteen basic generic categories of instructional events which can be combined with up to fifteen subscripts at one level and twenty at another level. It is assumed that these basic categories represent fundamental descriptions of instructional events, while the multiple combination of subscripts with categories provide opportunities to make finer discriminations.

It is the subscript provision that provides the researcher opportunities to record inductive or ethnographic elements of the instructional arrangements. Basic categories are defined as follows:

1. **Thinking** -- Any nonappraisal behavior in which a person is apparently reflecting on (thinking about) some substantive or managerial aspect of classroom instruction. The behavior is essentially one of being consciously in communication with one's self.

2. **Sensing** -- Any nonappraisal behavior in which a person uses one's senses (seeing, hearing, feeling, tasting, smelling) to take in information from an external source. The behavior is essentially one of being in sensory contact with one's environment.

3. **Manipulating Artifacts** -- Any nonappraisal behavior in which one manipulates (works with) instructional artifacts (curricular-instructional materials).

4. **Initiating** -- Any spoken, unspoken or mediated non-appraisal behavior that presents substantive or managerial information to another or others. The initiating behavior may be an expression of knowledge and/or an expression of feeling states or value preferences.

5. **Responding** -- Any spoken, unspoken or mediated non-appraisal behavior that responds substantively or managerially to an element in the instructional situation, [i.e., the antecedent behavior of another or an instructional artifact(s)]. The responding
behavior may be an expression of knowledge, demonstration of a skill and/or an expression of a feeling state or value preference.

6. Soliciting Clarification -- Any manifest nonappraisal behavior (spoken, unspoken or mediated) that evokes or is intended to evoke from another person the fuller meaning of an antecedent behavior of that other person or a product of his behavior. The antecedent behavior may have involved expressions of knowledge, expressions of feeling states or value preferences, and/or expressions through motor behavior. The behavior intended to evoke the fuller meaning may be in the form of a question, direction, or suggestion.

7. Soliciting -- Any manifest (spoken, unspoken or mediated) nonappraisal behavior that evokes or is clearly intended to evoke substantive and/or managerial behavior from another person in the instructional situation. Specifically excluded here are those behaviors which fall in the category of soliciting clarification. The soliciting behaviors may ask for expressions of knowledge, expressions of feeling states or value preferences, or expressions through motor behavior.

8. Judging Correctness -- Any manifest (spoken, unspoken or mediated) behavior that responds or reacts to an antecedent behavior of the self or another or to a product of such behavior appearing in the instructional situation by judging the behavior or the product of the behavior to have been logically, empirically or normatively correct in some degree. Publicly accepted criteria are invoked or could be invoked to support the judgment.

9. Personal Positive Judging -- Any manifest behavior (spoken, unspoken or mediated) that responds or reacts to a person (self or another), an antecedent behavior of the self or another, or to a product of such a behavior appearing in the instructional situation by expressing a personal, positive judgment about the person, behavior or product of behavior. The criteria for making the judgment are personal and arise from the feeling states or value preferences of the person doing the judging.

10. Acknowledging -- A manifest (spoken, unspoken, or mediated) behavior that responds or reacts to a person (self or other), an antecedent behavior of
the self, or of another, or to a product of such behavior appearing in the instructional situation by acknowledging the person, behavior, or product in ways that indicate that the person, behavior or product has been perceived. No judgment is explicitly expressed.

11. **Judging Incorrectness** — Any manifest (spoken, unspoken or mediated) behavior that responds or reacts to an antecedent behavior of the self or another or to a product of such behavior appearing in the instructional situation by judging the behavior or the product of the behavior to have been logically, empirically, or normatively incorrect in some degree. Publicly accepted criteria are invoked or could be invoked to support the judgment.

12. **Personal Negative Judging** — Any manifest behavior (spoken, unspoken or mediated) that responds or reacts to a person (self or other), an antecedent behavior of the self or another, or to a product of such behavior by expressing a personal, negative judgment about the person, behavior or product of behavior. The criteria for making the judgment are personal and arise from the feeling states or value preferences of the person doing the judging.

13. **Instructionally Nonfunctional Behavior** — Behavior that clearly or apparently interferes with the creation of the nonsubstantive conditions for learning or with the achievement of learning outcomes, and/or serve no apparent substantive, managerial or appraisal instructional function.

Dimension five indicates the particular instructional function served by the instructional event. These functions are classified as substantive, managerial, appraisal, and other. They are defined as follows:

**Substantive Behavior** — Behavior that is directly associated with achieving learning outcomes considered by those in the instructional situation to be a legitimate part of the subject matter of the field under study.
Managerial Behavior -- Behavior that is directly associated with creating the nonsubstantive conditions that are considered by those in the instructional situation to help influence the achievement of learning outcomes.

Appraisal Behaviors -- Behavior that judges or acknowledges a person, a behavior, or a product of a person's behavior who is a member of the instructional situation.

The designation other refers to category thirteen, instructional nonfunctional behavior. Substantive and managerial functions can be used with the following categories: thinking, sensing, manipulating artifacts, initiating, responding, soliciting clarification, and soliciting. The categories judging correctness, personal positive judging, acknowledgment, judging incorrectness, and personal negative judgment serve appraisal functions.

Dimension six classifies instructional functions further into substantive explicate or arrange, managerial structure or admonish, and appraisal express or accentuate. These examples of six subfunctions or subcategories are defined here.

Explicate -- Instructing in such a way that others or the self may, by means of the techniques employed, create conditions supportive of or directly promote learning. This may be accomplished by telling others, questioning others, answering the questions of others, seeking clarification of the meaning of others or engaging in independent study that performs similar functions in an individualized setting.

Arrange -- Instructing in such a way that, in part at least, others or the self may do things that are related to the subject matter under study. But, that which is done is primarily characterized by structuring conditions in such a way as to facilitate, sustain or extinguish substantive learnings without engaging in substantive explication.
**Structure** -- Instruction that makes use of non-substantive and non-appraisal behaviors with the intent of creating non-substantive conditions that are supportive of or directly promote learning.

**Admonish** -- A particular type of managerial instructional behavior intended to cause, inhibit or redirect the behavior of self or others for the purpose of gaining or regaining non-substantive conditions that are intended to support or directly promote learning.

**Express** -- Appraisal behaviors expressed through spoken, unspoken behavior and through mediated instructional devices.

**Accentuate** -- The relative strength or intensity with which appraisal behaviors are expressed.

Although the instructional function has been classified into six subcategories, the researcher has the option of inductively defining up to sixteen subcategories of his own. Herein exists the first opportunity to combine information gained from ethnographic observation and designated generic categories.

The seventh dimension is designated as communication mode, which essentially provides opportunity to indicate whether an event is communicated verbally, nonverbally, or through the use of an instructional medium.

Communication is further classified in focus seven by primary strategy behaviors. Strategies may be direct (expository), interactive (reciprocal), or independent (private). Direct is used with the category initiates, while interactive is used with responding, solicits clarification, and solicits. Private behaviors involve the categories thinking, sensing, and manipulating artifacts. Appraisal behaviors may be expressed using each of the communication strategies.
Dimension nine provides the observer with the second subscript level of up to an additional twenty descriptors which may be used with any of the basic thirteen basic categories. Combinations of these twenty, together with the sixteen level one subscripts using various dimensions described, provide the observer literally thousands of category combinations.

In the previous discussion of field study, three types of information were described: events and histories, frequencies and distributions, and statuses and rules. The combination of participant observation and the use of a direct observation system such as O.S.I.A. IV is a realistic method for obtaining information about events, frequencies, and distributions of classroom instructional events. This, together with its deductive and inductive qualities, make the use of O.S.I.A. IV an appropriate field study strategy in an instructional setting.

Computer Processing of Information

The present computer program for analysis of O.S.I.A. IV encoded data has been expanded to include the following analyses: four strategy analyses, subscripts, subfunction, timeline, ratio, matrix, chain and pool, standard variable, and variable calculation [Hough, 1979].

Part 2 of this chapter introduced O.S.I.A. IV, defined terms, and discussed nine foci for processing information about instructional events. Its capacity to describe instruction using both ethnographic and interaction categories was demonstrated and its appropriate use as
a complementary strategy in field study conducted in an instructional setting was advocated. In the next section of this chapter, the specific methodology used in this study will be explicated.

PART 3

The Research Strategy Developed for this Study

The focus of this study was the description of an instructional experience from the perspective of a teacher and students as it occurred during the course of an academic quarter. Embedded in this description was the influence of the construct of teacher's perceptual organization and its relationship to instruction. In an attempt to gain an understanding of this classroom instructional experience, the researcher determined that direct observation was necessary but not sufficient to describe this experience. With this recognition, the researcher chose to develop a research strategy involving direct observation as well as indirect observation which was reflected in a field study approach to the problem.

Overview

Part 3 of this chapter outlines in detail the field study research strategy utilized in this study. In retrospect, it became apparent that this study was conducted in three distinct phases which appropriately serve as an outline for this portion of Chapter III. Phase one involved entry, design, and preparation. Phase two primarily involved data collection, although as is characteristic of field study,
the design continued to develop during data collection. Concurrently, preliminary analysis was begun. Phase three emphasized analysis, model development, and report writing.

Phase One: Research Activity

Phase one involved research activity occurring during the six month period immediately preceding the quarter in which the course under study was scheduled to be taught (Table 1). This period between April and the third week of September was spent in gaining entry to the setting, planning data collection strategies, developing data collecting schedules and instruments, seeking and obtaining approval from the Human Subjects Review Committee, and making arrangements.

Gaining Entry

Entry activities involved developing a rationale for selecting the professor and obtaining his cooperation in the research effort. The decision to study Dr. James (pseudonym) and his course, Research 975 (fictitious), was influenced by several factors. It was reasoned that an attempt to describe those aspects of an effective teacher's instruction that may have contributed to his effectiveness would provide insight into the nature of the teaching process. Having received a university-wide award for distinguished teaching, Dr. James was considered for the purpose of this study to be an effective teacher. A second factor contributing to the decision was the researcher's previous experience as a graduate student in three courses taught by the instructor. Although three courses had been taken with this instructor, the researcher did not know him well. These courses
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provided little opportunity for direct interaction, since they were conducted using a lecture format and each involved fifty to seventy-five students. While enrolled in these courses, interaction with Dr. James outside of class had been limited to two brief instruction-related conferences. While familiarity with the class could serve to restrict the researcher's scope of observation, that is, could cause the researcher to "overlook the obvious," familiarity with the teaching style and language patterns could contribute to the validity of observations, interpretations, and inferences. A willing participant was a final factor influencing the selection decision.

The second aspect of entry involved soliciting the instructor's cooperation in the research effort. In April, three months after the completion of the final course with the instructor, and six months prior to the proposed study beginning, an initial appointment was made to enlist his cooperation. It should be noted that at the time of the initial meeting details of the study had not yet been developed. The researcher's interest in studying teaching, specifically instruction, and using a field study approach in an attempt to understand the teaching-learning experience from the perspective of the teacher and students, were discussed. Dr. James was informed of the effectiveness criterion for selection and it was emphasized that his identity would not be revealed nor his teaching evaluated. Dr. James expressed interest and willingness to participate in the study, even though specific details were not yet available.

Two further contacts were made prior to the beginning of the study. In late June it was announced that Dr. James would be assuming
major administrative responsibilities. Recognizing that this could interfere with the plans for the study, he was contacted by telephone for the purpose of confirming his participation in the study. Although he was provided an opportunity to withdraw from the study, he chose not to do so. During July an appointment was made in which further details of the study were discussed. It was anticipated that the study would formally begin two weeks prior to the beginning of the quarter, at which time a formal interview would be scheduled with the instructor and details of student orientation would be discussed and arranged. At no time preceding or during the data collection phases of the study was Dr. James apprised of the research questions, construct, teacher's perceptual organization, or specific research methodology.

Planning and Developing Data Collection Strategies

Understanding the instruction-related experiences of a teacher and students suggests the necessity of multiple perspectives on the events that occur. While these perspectives are important in developing an understanding of the phenomenon, the use of the construct, teacher's perceptual organization, to guide the study implies that the primary perspective in the study is that of the instructor. The additional perspectives of students and an objective observer not only provide information regarding the totality of the experience, but act to confirm or disconfirm the perspective of the teacher. The following strategies were planned: direct observation through participant observation and indirect observation through interviewing, using questionnaires and documents, and establishing a cohort student group.
Participant Observation

In order to witness the instructional events as they occurred and to share in the experiences of the teacher and students, participant observation was chosen as one strategy for collecting information. Specifically, the role was to be most nearly that of participant-as-observer. Prior to data collection, the following decisions were made. The researcher would not enroll in the course or complete assignments for a grade, but would attend all class sessions and participate in during-class instructional activities. The researcher would not become involved in specific instruction-related interaction, such as asking questions in class or responding to student requests for assistance. All class sessions would be audio tape recorded with a Sony cassette tape recorder with attached microphone, Model No. TC-110A, to provide documentation of instruction for future analysis, using O.S.I.A. IV with field developed constructs. During the session, information on contextual instructional arrangements and events involving interaction among and between the teacher, students, and observer would be documented in field notes. The researcher would make use of opportunities before class, during the break, and after class, as feasible, to interact informally with students. Time would be scheduled directly after the class period to add to field notations.

For several reasons, it was thought that the researcher would be thought of as unobtrusive, thereby, reducing reactive effects. First, the anticipated class size of sixty-five and a lecture format would limit interaction with and observation of the observer. Second, the class was intended as a graduate level course and as the
researcher, herself, was a graduate student, her appearance would not be unlike that of other students in the class. Finally, the researcher's activity during the class session would not be unlike the activity of students in the class. Students could be anticipated to listen, take notes, collect and use instructional materials, and perhaps record the lecture using a cassette recorder. The researcher's activity would easily appear to parallel student activity.

Interviews and Questionnaires

Recognizing that direct observation is limited both by the type of information obtained and the impossibility of being in more than one place at a time or interacting with sixty-five students at one time, the decision was made to obtain indirect information through informants and respondents. It will be recalled that informants provide factual information regarding events which occurred in the researcher's absence, while respondents provide information about their own perceptions of events. It was anticipated that the teacher and some students could function in both roles.

Interviews were planned with the teacher and selected students. Prior to the beginning of the course, a structured open-ended interview was planned with the instructor for the purpose of exploring his beliefs about teaching and students, intentions regarding the course, and his career history. This interview schedule was developed and piloted with another university professor during August. No revisions were deemed necessary and a two-hour block of time was planned to conduct the interview. It was reasoned that conducting the interview prior to the beginning of the course would provide a tentative frame
of reference for initial observations and for exploration of the rela-
tionship between intentionality and actual instructional arrangements.
Periodic meetings with the instructor were planned throughout the
quarter for the purpose of clarification, elaboration and/or verifica-
tion of data being collected. Generally, these meetings would be less
formal than the initial interview. A debriefing interview was planned
for the earliest convenient date following the end of the quarter.
Meetings would be audio tape recorded unless the instructor objected
or the researcher sensed recording caused reactive effects. In the
informant role, the instructor could provide course history, as well
as information regarding events that occurred in the absence of the
researcher, while in the respondent role, information could be pro-
vided regarding the teacher's intentions, perceptions, and reactions
concerning the course. Additionally, meetings would be scheduled
during the analysis phase for the purpose of host identification as a
means of validating information [Schatzman and Strauss, 1973]. Host
identification refers to submitting observations or propositions to
subjects to be validated against their understanding of the experience.

Because of anticipated class size and the lecture format, it
was not considered feasible to establish and maintain an on-going
dialogue with each student. Emphasis was placed on gaining an in-depth
perspective from a small group of students, as well as a general
respondent perspective of the student group as a whole. An
in-depth interview was planned with a small group of students during
the latter half of the course. Selection of students would be based
on the establishment of a rapport that would counteract some types of
possible reactive responses. Other traditional strategies to counteract reactive effects in both teacher and student interviews would be employed [Dean and Whyte, 1958; Vidich, 1955].

In order to solicit information, as well as student perspectives and reactions to the instructional arrangements and/or class experiences, three questionnaires would be given to all students. The initial questionnaire, developed and piloted in August, would be distributed during the first class session and would focus on students' motives for enrolling in the course, their instructional preferences, and their expectations regarding the course.

An interim questionnaire, concerned with students' perspectives of their accumulating experience with course instruction, would be developed during the first half of the quarter and distribution arrangements would be made in consultation with the instructor. Specific focus would be determined by the emerging data from field observation and teacher interviews during the first half of the quarter.

A final questionnaire would be distributed to all participating students at the time of the final course examination. It would be developed during the latter half of the course and would be summary in nature, focusing on the students' overall perspective of their instructional experience. Because both questionnaires would be specific to a developing context, conventional field testing and revision would be inappropriate. Provisions would be made for an alternative trial run (See Cohort Student Group).
Cohort Student Group

Because the researcher would be unable to interact with all students, it was planned to establish a cohort student group of approximately six students for the purpose of:

1. contributing their in-depth perspectives relative to their class experience
2. contributing to the on-going research design especially in the area of their identifying and sharing with the researcher the perspectives of the larger student group regarding their instructional experiences
3. reviewing and contributing to the development of the second and third questionnaires.

Selection of these students would be based on their differing profiles on the initial questionnaires and on their willingness to be involved in this activity. It was intended that the group serve in both informant and respondent roles.

Documents

An additional source of indirect information would be the planned use of documents. It was anticipated that the following documents would be available to the researcher: course description, course "handouts," participating student information cards solicited by the instructor, the instructor's daily appointment calendar, and instructor solicited student evaluation forms. These documents would provide information on the course description, student characteristics, student-instructor conference time, and students' evaluation of the course.
Arrangements

Arrangements prior to the beginning of the study involved both substantive and managerial activities. The substantive matters involved preparing a proposal for submission to the Human Subjects Review Committee and developing an orientation to be used with students the first day of class. The proposal was prepared and submitted to the Committee in late August. The study was approved with the provision that questionnaires developed during the quarter be submitted to the Committee for review. Aside from time constraints, this action did not pose a problem to the researcher.

A student orientation outline was developed in late August and reviewed with the instructor. Included were the researcher's interest in conducting the study, the instructor's willingness to participate, the significance of the study, data collection and student involvement, voluntary nature of student participation, confidentiality, opportunity to raise questions, and distribution of the Human Subjects Consent Forms.

Activities that were primarily managerial involved making provisions for tape recording and arranging for the transcription of audio tapes on a weekly basis. These arrangements were completed prior to the beginning of the quarter.

Phase Two: Research Activity

Phase two research activities occurred during the period beginning two weeks prior to the beginning of the quarter and ending one week following final examinations (Table 2). Activities included
### TABLE 2
RESEARCH ACTIVITIES BY WEEK DURING PHASE TWO

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<tr>
<th>Research Activity</th>
<th>9-10</th>
<th>9-17</th>
<th>9-25&lt;sup&gt;a&lt;/sup&gt;</th>
<th>10-2&lt;sup&gt;b&lt;/sup&gt;</th>
<th>10-9&lt;sup&gt;c&lt;/sup&gt;</th>
<th>10-16&lt;sup&gt;c&lt;/sup&gt;</th>
<th>10-23&lt;sup&gt;b&lt;/sup&gt;</th>
<th>10-30&lt;sup&gt;b&lt;/sup&gt;</th>
<th>11-6&lt;sup&gt;d&lt;/sup&gt;</th>
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<td>Solicit Additional Students for Interview</td>
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<td>Review Evidence Submitted by Students</td>
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<td>Review Information Gained</td>
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<sup>a</sup> Classes in session.  
<sup>b</sup> No class--tape reviewed.  
<sup>c</sup> Final examination week.
gaining entry, collecting information, developing instruments and schedules, reviewing information collected, modifying strategies, and making arrangements. Although activities can be categorized in this way, they do not necessarily occur independently. The developing nature of the field study is reflected in the merging of activities.

Gaining Entry

The final gaining entry activity involved orienting students to the purpose of the study and gaining their consent to participate in the study. Time was planned for this purpose at the beginning of the first class session prior to the presentation of the instructor's course overview. The researcher was introduced as a researcher, the instructor endorsed the study, and emphasized that the students' decision to participate in the study was not a requirement of the course and in no way would influence their final grade. Students were oriented using the outline developed for this purpose (Appendix A). Consent forms were distributed, signed, and returned prior to the administration of the initial student questionnaire (Appendix B). As was planned, approximately thirty minutes of class time were utilized. All students enrolled for credit eventually signed consent forms. Delayed signatures resulted from class absence.

Participant Observation, Collecting Information, Developing Instruments

The researcher attended all scheduled class sessions for the entire duration of the quarter, two-and-one-half hours weekly. Because it became necessary for the instructor to cancel the final
class session, he made available at the Learning Resources Center, an audio tape with supplementary instructional materials. The researcher availed herself of the opportunity to listen to the tape. During class sessions field notes were written which described the context, and routine and unusual instructional and non-instructional events and incidents among and between the teacher, students, and researcher. All class sessions were audio tape recorded as planned. Taping all class sessions eliminated the possible reactive effects of selective tape recording.

Other opportunities for direct observation occurred. The developing nature of the research study permitted the researcher to take advantage of other opportunities to obtain information that became available. One such opportunity occurred when the instructor scheduled one hour, small group sessions most weeks for the purpose of providing students an opportunity to clarify unanswered questions. The researcher attended seven of nine sessions as her schedule permitted. Together with the classroom observation, this resulted in the researcher being present thirty-two of thirty-four possible hours during instructor-student instructional interaction. The informal sessions usually involved the instructor and less than twelve students, consequently, it was decided not to audio tape these sessions as a recorder would be obtrusive in the setting. Field notes were usually written during the session as it was not uncommon for students to take notes.

A second opportunity for direct observation presented itself when the instructor solicited the researcher's assistance in monitoring
the final examination which was scheduled for two consecutive days from 8:00 a.m. until 4:30 p.m. Students were able to take the examination at a time of their choosing during that schedule. The researcher chose to monitor the examination, thereby having control over the administration of the final questionnaire. It further provided many opportunities to speak informally with students, especially those with whom the researcher had had little opportunity for direct contact. Field notes were kept on the events occurring those two days.

Cohort Student Group

There were two basic criteria for establishing a cohort student group. These were diversity of experience and student willingness to serve in that capacity. Diversity of experience was determined on the basis of the responses to the initial questionnaire and to the student information sheets circulated by the instructor. Although diversity was a criterion, no attempt was made to establish a strictly representative group. Six full-time Ph.D. students were selected on the basis of these characteristics: program area, sex, employment, total number of courses in which enrolled, total number of previous statistics courses taken, and previous course experience with the instructor (Table 3). Each student, except one holding a part-time faculty position, was employed 50 percent of the time as a graduate teaching or research associate. The students represented six different program areas and were enrolled in from three to four courses. The previous number of statistics courses in which they had been enrolled ranged from zero to two, while previous course experience with the instructor ranged from zero to three. Two students (numbers 3 and 4)
<table>
<thead>
<tr>
<th>Students</th>
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<th>Courses in Which Enrolled</th>
<th>Statistics Courses Completed</th>
<th>Previous Courses with Instructor</th>
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<td>4</td>
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</table>
dropped the course late in the quarter because of withdrawal from school and serious illness.

The purpose of the group continued as planned, that is, to serve in both informant and respondent roles and to assist in limited piloting of the second and third questionnaire. They met for one hour during the third, fourth, sixth, and ninth week of class. The first meeting was primarily one in which introductions were made and the purpose of the group explained. Students suggested and collectively agreed to keep and submit to the researcher weekly logs of their experiences. Four students regularly submitted logs, while one student submitted one and one student submitted none. Limited time and illness appeared to be the reason influencing students who did not submit logs. Discussion of their and peer reactions to the instructional experience provided the agenda for the second meeting, while the third meeting was spent in reviewing and offering suggestions for revision of the interim questionnaire. Revisions made in the questionnaire did not reflect their individual comments, but were responsive to the implications of their suggestions. It was agreed that the questionnaire should be administered during class, preferably following the break, thus providing control measures. The fourth session of the cohort group was spent piloting the final questionnaire and reviewing reactions to the course to that point. It was not necessary to revise this questionnaire. Administration time was estimated to be fifteen minutes.

Interviews

During this period, the researcher and the instructor met on six occasions for the purpose of formal and informal open-ended
interviews. The first formal interview was initially scheduled for a two-hour session prior to the beginning of the quarter (Appendix C). However, it was conducted on two different days, as the instructor had been running behind in his scheduled appointments on the date originally scheduled. This presented no difficulty as both interview sessions were scheduled prior to the beginning of the quarter. The third and fourth meetings were less formal and scheduled as planned to clarify and verify observations, while the fifth meeting occurred prior to a class session for the purpose of making arrangements for the administration of the final questionnaire and for gaining access to various documents. It was mutually agreed to administer the final questionnaire on the occasion of the final examination. It was to be completed prior to the receipt of the examination in order to control for the possible influence of test fatigue on responses. The final meeting, a more structured, yet open-ended interview, was summary in nature, soliciting reflections on the course as a whole.

At no time did the instructor balk at suggested arrangements, hesitate to answer questions, or to make available to the researcher all materials requested. With the exception of the fifth meeting which was held in an adjacent classroom and not audio tape recorded, all other meetings were held in the instructor's office and were recorded. Tape recording did not appear to influence responses to questions.

Although the researcher had opportunities to speak informally with students, an in-depth interview was planned to solicit student perspectives on their class experience and to confirm or disconfirm observations concerning the instructor's perspective (Appendix D).
It was felt that more valid information would be obtained if students had had opportunities for interaction with the researcher and rapport had been established. The six members of the cohort student group were selected to be interviewed, as well as four other students; three, who attended small group sessions and a fourth, who had expressed opinions during informal discussions that were at variance with those of other students. Ten interviews of approximately one-and-one-half hour's length were conducted during the last three weeks of the quarter. All were tape recorded and conducted in the researcher's or a colleague's office, with the exception of one interview conducted in the student's home. All students who were approached consented to be interviewed in spite of very busy end-of-quarter schedules.

Questionnaires

The interim questionnaire completed by students was administered in class the sixth week of the quarter. It focused on verifying the instructor's beliefs about teaching and learning obtained through review of instructor's interviews and class transcripts, and on obtaining students' initial and current feelings about course instruction (Appendix E). The first part was designed so that students could indicate a "yes" or "no" response. Each question in this section was followed by a request to cite examples of the events as they were observed or experienced in class. Two sentence completion questions concerning feelings about instruction comprised the second section of the questionnaire.
The final questionnaire completed by students involved several open-ended questions concerning suggestions for improving the course and the degree to which their objectives had been met (Appendix F). Rating scales were used for observed teaching behaviors, teacher characteristics, and specific instructional arrangements. A provision was made for additional comments. Review of transcripts and field notes was necessary to develop this questionnaire which was administered just prior to the final examination.

Documents

A number of anticipated and unanticipated documents became available to the researcher. One type included all instructional materials distributed in class. These included computer printouts and mimeographed sheets. A second type made available by the instructor included:

1. copies of student objectives and evidence sheets submitted to the instructor at the beginning and end of the quarter
2. student information sheets
3. student submitted evidence with the instructor's feedback comments and grade
4. mastery tests, answers, and performance by question and student
5. copies of teacher initiated student evaluations with computerized analysis and additional typed comments
6. the instructor's computerized record of all evidence submitted for a grade, the weight it carried, the grade achieved, and final course grade.
Original handouts distributed in class were retained, while copies of all other documents were made and retained, except student evidence. With student evidence, which involved major projects which were impractical to copy, the researcher took notes citing examples of the types of feedback provided by the instructor. Generally, these documents provided indirect information in the informant role and formed part of the triangulation of methods.

Reviewing Information

All incoming information was cataloged and filed so that it was easily retrievable. Each week new information was read and re-read relating it to previously gathered information in order to identify inconsistencies, implausibilities, need for clarification, elaboration, and verification of information. However, formalized analysis did not occur during this phase.

Arrangements

A number of arrangements continued from week-to-week, while others were time specific. Included among on-going items were scheduling, e.g., cohort meetings, interview and questionnaire administration, and weekly transmission of tapes for transcription. Time specific arrangements related to printing questionnaires, collecting documents, and submitting questionnaires to the Human Subjects Review Committee for approval.
Phase Three: Research Activity

The time frame for phase three research activities was a seven month period from January, immediately following the end of the course, through July. Activities included data collection, data analysis, comparative analysis, and host verification and report writing (Table 4).

Data Collection

Data collection during this phase was limited to brief telephone or in-person contacts with six of the ten interviewed students who were available in early January. The purpose of this contact was to obtain student reactions to the final examination and the course after completing it.

Data Analysis

This section will include the analysis of information obtained through primary data sources: questionnaires, taped instruction, and teacher and student interviews.

Questionnaires

Included in the analysis of questionnaires were student information sheets which provided the instructor with descriptive information about such student characteristics as degree sought, status in degree program, current employment, program area, number of previous research courses, and number of courses in which currently enrolled. Included in the analysis of this information was a question from the initial questionnaire regarding "previous courses taken with
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this instructor." Analysis of this information was limited to frequency distributions, thus providing a general characteristics profile of the student population enrolled in the course.

The initial questionnaire was comprised of questions requiring open-ended, yes-no, and numeration responses. Examples of the former are "What factors motivated you to enroll in this course?" or "What would you like to accomplish in this course?" An example of the latter is, "Have you taken another course with this professor? ___yes, ___no. If yes, number of courses? ___" Open-ended questions were analyzed by content analysis with guidelines derived from Holsti [1969]. The following steps describe the analysis procedures that were utilized:

1. All responses for a particular question were recorded on 8½ by 11 inch sheets of paper.

2. Each person was coded for identification purposes so that original questionnaires would be easily retrievable.

3. Responses were read and re-read several times until preliminary themes emerged. The inductive nature of the research approach precluded the use of preconceived classification categories.

4. Each response was classified by theme and coded in the left margin according to the theme it represented.

5. Responses in each theme area were again read and revisions in themes and response classifications were made. This process continued until themes were exhaustive and mutually exclusive.

6. Responses for each theme were enumerated.

7. This process (Steps 1-6) was repeated for each question.

Yes-No and enumeration questions were analyzed in terms of frequency distributions.
The interim questionnaire involved the use of two types of questions. The most predominant question asked the reader to indicate a yes-no response, provide examples, and indicate value. The following is a sample of this question type.

Have you observed or experienced opportunities for students in this class to demonstrate their abilities in different ways? ___yes ___no

Cite several examples of what you have observed or experienced. Star (*) those examples, if any, which have facilitated your learning.

These questions were analyzed in several ways. Yes-no responses were tallied and simple percentages were calculated. For example, in the sample question, 98 percent of all respondents either experienced or observed "opportunities to demonstrate their abilities in different ways." Second, of all examples cited, a percentage of starred examples was calculated. Continuing with the sample question, 65 percent of those examples cited were considered by students to facilitate their learning. Third, frequencies and percentages calculated for each example were given in rank order of the top five examples cited in terms of value in facilitating learning. In the sample question, rank order by percentage of examples cited as facilitating learning was: "mastery tests" (73 percent), "computer runs" (72 percent), "questions in class" (71 percent), "exercises" (64 percent), and "evidence for grade" (63 percent).

The two open-ended questions were of the sentence completion type, e.g., "Following the first few class periods, my initial reactions to this class, both the instruction and assignments were:....." Content analysis was utilized with these questions.
The final questionnaire was comprised of rating and open-ended response questions. Three types of rating questions were used. Samples of these types follow:

1. **Instruction:** For each item, place a check mark in the space on the continuum that best describes your recollection of your instructor's teaching.

   **Question:** Clarity—Ideas were expressed in ways that were clearly understood; questions were asked by the teacher in a way that the intent of the questions was clearly related to larger concepts, and examples were used to illustrate concepts.

<table>
<thead>
<tr>
<th>Teaching lacked clarity to the point of being inadequate</th>
<th>Teaching was extremely clear to the point of being outstanding</th>
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</table>

2. **Instruction:** Place a check in the space on the continuum that most nearly describes this teacher.

   **Question:** This teacher considers student to be:

   unable ___ ___ ___ ___ ___ able

3. **Instruction:** On a continuum from 1 to 5 where 1 represents little value and 5 represents great value to you in meeting your course objectives, rate the following items by placing a 1, 2, 3, 4, 5 on the space provided. If the item is clearly not applicable in your case, indicate with the letters NA.

   ___ reading assignments
   ___ during course mastery tests
   ___ special projects
   ___ computer runs
   ___ instruction--use of examples
   ___ having had a statistics course

   **NOTE:** Seventeen items were included in this list.

   Analysis of these questions was by calculation of mean scores. Visual inspection suggested that little could be gained from further analysis, e.g., standard deviation. It should be noted that in the sample question number three, the NA responses were excluded in the calculation of means.
Sample open-ended response questions included "What suggestions do you have for improving this course?" or "To what degree did you meet your course objectives? Explain." Content analysis, as described earlier in this section, was used to analyze responses to such questions.

It will be remembered that the use of questionnaires was a means of providing the observer with "indirect observation," therefore, analysis of each of these in and of itself contributes in a very limited way to the understanding of the teaching-learning experience of class members. The significant contribution of questionnaire responses to understanding in this study was the way in which information gained provided another perspective from which to interpret information gained through multiple perspectives.

Taped Instruction

The Observation System for Instructional Analysis (O.S.I.A. IV) was used to analyze samples of instruction. Instruction, as defined earlier, is the process of arranging human, material, and temporal resources with the intent of facilitating one's own learning or the learning of others. Using O.S.I.A. IV provided a conceptual framework for analyzing these arrangements. Specifically, it provided the deductive overlay of generic categories and opportunity to develop constructs inductively from observation of instruction. These constructs are expressed in O.S.I.A. IV through two subscript levels.

One of the early decisions in encoding instruction involved sampling. All class sessions had been audio tape recorded and transcribed, resulting in approximately twenty-three recorded hours,
or 270 transcribed pages. While it was possible to encode and analyze all instruction, this was highly impractical and deemed unnecessary to describe the salient aspects or characteristics of instruction. Field notes and tape documented instruction suggested that the instruction was highly organized, patterned, and consistent over time. It was reasoned that random selection of short segments over time would not reflect the characteristics of organization, pattern, and consistency. The use of a purposive sample of three of the nine available class sessions provided a representative sample. The second, fifth, and eighth sessions were chosen to be encoded and analyzed, as they represented instruction near the beginning, middle, and end of the quarter. The first and last sessions were excluded because they were characterized by features unique to beginning and ending a course. It should be noted that the second class session was one-and-one-half hours in length, contrasted to the typical length of two-and-one-half hours exemplified in the fifth and eighth sessions.

In addition to generating a general description of instruction with O.S.I.A. IV, one of the purposes of analyzing instruction was to determine whether the instruction reflected the instructor's beliefs about teaching and intentions regarding instruction. It was this purpose that led to the modification of function and the development of subscripts at the subfunction and subscript level. The following criteria were used to develop subscripts. To be used as a subscript, the construct had to relate directly to:

1. the definition of instruction as the process of arranging human, material, and temporal resources for the intent of facilitating one's own learning or the learning of others
2. the construct teacher's perceptual organization defined as the organization of the interaction of perceptions of the individual as a teacher, perceptions of his students, and perceptions of teaching and the subject matter.

In addition to the above, the construct must have been identified or confirmed by the teacher, students, or the observer. It was not necessary that each construct relate to both instruction and overtly to teacher's perceptual organization or to be identified by teacher, student, and observer.

Modification involved designating managerial behavior, defined by O.S.I.A. IV, as a subfunction and redefining the function identified as managerial. These new definitions are indicated as follows:

O.S.I.A. IV: Managerial Behavior -- behavior that is directly associated with creating the non-substantive conditions that are considered by those in the instructional situation to help influence the achievement of learning outcomes [Hough, et al., 1975].

Modified Function: Managerial Behavior -- behavior that involves structuring opportunities to learn outside of class or arrangements for demonstration of evidence that learning has occurred. Opportunities for learning outside of class may include, but are not limited to, use of computer, small group sessions, announcements of workshops or lectures, availability of the teacher or graduate associate to assist students, or use of the learning resources center. Evidence may include, but is not limited to, during-course mastery tests, Part I and Part II exercises, dissertation proposals, or analysis and interpretation of own data.

Further, the O.S.I.A. IV behavior designated as arranging was expanded as indicated below.
O.S.I.A. IV: Arranging -- behavior that is directly associated with achieving learning outcomes considered by those in the instructional situation to be a legitimate part of the subject matter of the field under study.

Modified Function: Arranging Behavior -- in addition to the above, it includes any manifest behavior, spoken or unspoken, that involves arrangements of materials associated with the lecture during a class session. Materials may include computer printouts, mimeographed handouts, or statistics books.

An additional eleven subfunctions or subscripts were defined for this study using the criteria identified earlier. These eleven included:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Construct</th>
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<tbody>
<tr>
<td>V</td>
<td>Example -- involves any manifest, spoken behavior which illustrates ideas or concepts by word or symbol, the intent of which is to help make ideas or concepts concrete or real to the student. Such illustrations may include computer printouts, drawings and problems presented on the overhead projector, or verbal illustrations.</td>
</tr>
<tr>
<td>M</td>
<td>Material -- involves class and/or teacher use of material associated with lecture presentation. This may include computer printouts, mimeographed handouts, or books.</td>
</tr>
<tr>
<td>U</td>
<td>Unspoken -- is a communication mode used to designate students' laughter response to the instructor's humor and the students' response to the teacher's solicitation to take out or turn to specific materials. (The latter is designated for use with material.)</td>
</tr>
<tr>
<td>UA</td>
<td>Emphasis -- involves the instructor's identification for students of those ideas, information, or concepts which the instructor considers to be important. This may include, but is not limited to, the following phrases: &quot;remember this,&quot; &quot;this is important,&quot; &quot;a mastery test item,&quot; &quot;a big idea,&quot; or &quot;keep this in your head.&quot;</td>
</tr>
<tr>
<td>Symbol</td>
<td>Construct</td>
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<td>-----------</td>
</tr>
<tr>
<td>B</td>
<td>Bridging -- involves events which refer to nonsubstantive information, materials, and/or arrangements which have been addressed during a previous session or will be addressed in a future session. This construct allows one to place information, materials, and/or arrangements within the perspective of time outside the context of a specific class being observed.</td>
</tr>
<tr>
<td>O</td>
<td>Orienting -- involves events which place substantive events within the perspective of time during a specific class session. This may involve, but is not limited to, behaviors which indicate &quot;where we are,&quot; &quot;what will be covered,&quot; and &quot;how it fits to what we are about.&quot;</td>
</tr>
<tr>
<td>L</td>
<td>Looping -- involves events in which ideas are related to previously addressed ideas or transition is made from one idea to another. Included are summaries and substantive transitions.</td>
</tr>
<tr>
<td>C</td>
<td>Clarifying -- involves explicit opportunities provided by the instructor for students to raise questions, e.g., &quot;any questions?&quot;</td>
</tr>
<tr>
<td>H</td>
<td>Humor -- involves teacher humor which results in student laughter.</td>
</tr>
<tr>
<td>N</td>
<td>Name -- involves the instructor's acknowledgement of a student by identifying him by name.</td>
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</table>

The flexibility of O.S.I.A. IV permitted the designation "Q" for source behavior originating as a "class response." Another feature, the use of interaction designators "x," "y," and "z," facilitated the appearance of subscripts not ordinarily programmed to appear on the time line analysis. This was accomplished by bracketing selected subscripted behavior with either an "x," "y," or "z." Bridging was designated on the time line with a "y," orienting with an "x," and looping with a "z." To extend the number of subscripts
appearing on the time line, "emphasis" was considered a subfunction for encoding and analysis and a subscript for interpretation of analysis.

Prior to encoding the selected instruction samples, the researcher's reliability as a coder of basic categories was established against a criterion coder. Two twenty minute randomly selected segments of instruction of Dr. James, the teacher being studied, were encoded independently by the criterion coder and the researcher from a combination of audio tape and transcript. Using the Scott coefficient, which assumes a criterion coder, inter-observer agreements were calculated. Coefficients of .65 and .85, respectively, for segment one and two were obtained. Interpretation standards suggest .50 as moderate agreement and .75 as high agreement. A coefficient of .80 or higher is considered a research standard. It should be noted that for segment one, the low coefficient was a probable function of the violation of the distribution assumption underlying the use of Scott coefficient. The frequencies for segment one were 299, 14, 14, with only three categories of thirteen being represented. The simple percentage of agreement, 93, perhaps more accurately described the inter-observer agreement on segment one, even though this measure does not correct for chance (Figure 2).

During the encoding process, one of the segments used for inter-observer agreement was encoded three times to determine intra-observer agreement or the researcher's coding stability over time. These stability checks occurred prior to encoding the second and third samples, both occurring the same day, and one occurred one week post
Figure 7. Inter-Observers Agreement Between Criterion and Research Coder for Segment One.
encoding. Comparisons were made between reliability checks one and two, two and three, and one and three on basic categories, subfunctions, and subscripts using the Cohen's K Coefficient which assumes no criterion coder. As reflected in Table 5, all coefficients achieved were within research standards.

Representative validity for subfunctions and subscripts developed for this study was established using inter-observer agreement with another non-criterion coder using Cohen's K Coefficient. The second coder was presented with construct definitions and requested to review a representative sample of researcher encoded events. The purpose of this review was to determine whether the researcher's encoded events were reasonable decisions based on the defined constructs. Coefficients of .93 for subfunctions and .97 for subscripts were obtained. The second coder agreed with all encoded events, but did identify four instances of researcher coding omissions which are reflected in the coefficients.

Following the encoding of the three sample class sessions, codes were transferred to Fortran sheets to facilitate punching cards for computer analysis. Of twelve possible computer analyses, six were run: strategy context, subscript, subfunction, timeline, matrix two, and chain and pool analyses. The following descriptions, modified from Hough [1979], are relevant to this study.

**Context Strategy Analysis** -- This analysis provides a summary of the proportional use of instructional strategies distributed across instructional functions, instructional settings, and instructional agents (defined by strategy, focus, and context signs). In this study all encoding was done in the expository strategy; focus was teacher; and context was class.
# Table 5

Comparison Coefficients for Intra-Observable Reliability for Basic Categories, Subfunctions, and Subscripts

<table>
<thead>
<tr>
<th>Comparisons</th>
<th>Basic Categories</th>
<th>Subfunctions</th>
<th>Subscripts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 with 2</td>
<td>.94</td>
<td>.94</td>
<td>.93</td>
</tr>
<tr>
<td>2 with 3</td>
<td>.85</td>
<td>.82</td>
<td>.96</td>
</tr>
<tr>
<td>3 with 1</td>
<td>.81</td>
<td>.82</td>
<td>.91</td>
</tr>
</tbody>
</table>
Subfunction Analysis -- A summary of subfunctions used by category frequencies and percentages. Subfunctions in this study were example, material, unspoken, emphasis, arrange, and their combinations.

Subscript Analysis -- Like subfunctions, subscripts are displayed by category frequencies and percentages. Bridging, orienting, looping, clarifying, humor, name, and managerial were designated as subscripts.

Time Line Analysis -- This analysis provides a display of instructional behaviors by interactional agents in the order in which the behaviors occurred in the instructional episode. A regular part of this display includes subfunctions. Three subscripts—bridging, orienting, and looping—were identified on the time line in this study by using interaction indicators "x," "y," and "z."

Matrix Two -- This is a matrix analysis of the instructional behaviors of the teacher, students, and, in this study, students in a group response. Managerial and substantive behaviors are displayed separately in the matrix. The managerial behaviors occurring in this study were the modified managerial behaviors.

Chain and Pool Analysis -- Pools of variables (sums of behaviors) and chains of events (up to eight element chains) can be identified. Of particular interest were the chains involving teacher questioning, students' response, and teacher response.

The analysis of instruction using O.S.I.A. IV generated description from a number of dimensions: time, organization, communication strategy and mode, source, function, category of events, and levels of qualifiers. Of particular advantage was O.S.I.A. IV's provision for inclusion of qualitative data. In this study qualitative data included in the analysis provided a confirmation or disconfirmation of the relationship between teacher beliefs and intentions, and teacher instructional behavior.
Teacher and Student Interviews

All taped interviews were transcribed to facilitate analysis. Information derived from six interviews with Dr. James and ten student interviews were used in raw form and/or analyzed using content analysis. Excerpts from interviews with Dr. James are found in Appendix G; with students, in Appendix H. An example of information used both ways was the response to a request made of Dr. James to discuss his intentions for the course. In its raw form this information provided the researcher with an initial observation focus. It also contributed to the development of themes such as "teacher's beliefs about students" or "teacher's recognition of context variables." Similarly, student responses such as those to a question regarding their perceptions of Dr. James' attitudes toward students was used in raw form, for example, to confirm observations made by the researcher, and contributed to the development of themes such as "teacher's beliefs about students." Additionally, student responses were analyzed by frequency of response.

Context analysis of interview information was conducted on individual questions, as well as the interviews as a whole, and in the case of Dr. James, across interviews. The analysis procedure was modified slightly from that described earlier in this chapter. While some themes emerged from the information without influence of pre-conceived categories or classifications, others were influenced by the construct teacher's perceptual organization. When the construct was used to analyze information, it was used in broad terms. For example, while "teacher beliefs about students," as part of the construct
teacher's perceptual organization, was used as a classification category, the nature of the beliefs was not predetermined but emerged from the data.

**Comparative Analysis**

The analysis of the data as a whole involved a comparative process similar to that described by Strauss [1964] and described in Section 1 of this chapter. The researcher reviewed the data identifying major foci or themes. As sense was made of the data, classes of information and, finally, constructs were developed. Relationships between these constructs, in the form of conjectures and/or temporary hypotheses, were suggested by the data. These temporary hypotheses were repeatedly tested against the data for the purpose of disconfirmation, qualification, or confirmation. The process continued until a set of constructs (elements) and relationships, which were felt necessary to explain the descriptive information generated about the instructional experience of Dr. James and his students, were identified and supported by the data.

The multiple method and perspective nature of the research methodology provided a triangulated approach to the refinement of constructs and relationships, thus reducing the bias of rival hypotheses inherent in single method or perspective approaches. Sources of information for this study were:

1. teacher interviews
2. student interviews
3. student questionnaires
4. documents
The following is an example of the origin of one theme and the influence of multiple data sources on the development of the construct.

From the initial interview with Dr. James, the theme teacher knowledge about learning theory emerged. Dr. James reported that he believed that to be an effective teacher, one should be able to apply various principles from the psychology of learning. Among those identified were use of structure, organization, example, feedback, and individualization. While discussing intentions for the course, these principles were evident. From taped transcripts of each class session and analysis of the O.S.I.A. encoded instructional behavior for three class sessions, it was substantiated that Dr. James' instruction was characterized by these principles. Student responses to questions on the interim questionnaire reflected that they had observed or experienced these principles in the instructional arrangements. Students supported their responses by citing examples. Volunteered information in student interviews characterized the instructional arrangements in terms of structure, organization, example, feedback, and individualization. Instructional materials reflected organization, structure, and sequencing. From these various sources of information, the researcher

1. inferred that as part of Dr. James' perceptual organization as a teacher, he believed that application of principles from psychology of learning was important to effective teaching

2. substantiated that Dr. James applied principles from psychology of learning to his teaching
3. hypothesized that principles from psychology of learning influenced the teacher's instructional decision making (intent)

4. hypothesized that his instructional decision making influenced his instructional arrangements.

These hypotheses were tested against the data until they were confirmed or when qualified, an explanation was provided by another confirmed hypothesis. The process described reflects only one theme and two hypotheses developed from multiple sources, however, the process was typical of that used to analyze the data as a whole until a model was developed and confirmed to explain the instructional experience of Dr. James and his students.

**Host Verification and Report Writing**

Host verification refers to submitting observations, inferences or conclusions made by the researcher to the persons directly involved in the setting observed for their verification. This process was used several times during the analysis and report writing phase of this study. The analysis of instructional events using O.S.I.A. IV was shared with Dr. James. The O.S.I.A. IV was briefly described, as was the process for developing subscripts. He was interested that the results substantiated the degree to which he was actually able to carry out his intentions. "It's good to know that you are actually able to do what you set out to do."

In the early stages of model development Dr. James was introduced to the construct teacher's perceptual organization. He was not familiar with the construct, however, believed it to be a reasonable one in terms of the data. When a definition for effective instruction
was developed, Dr. James was asked for his reaction to it. He indicated that he felt it was an appropriate definition reflecting accurately his views. Finally, Dr. James was requested to read the drafts of Chapter IV, "The Instructional Experience," and Chapter V, "A Model for Explaining Effective Instruction," of this report for the purpose of determining the degree to which they reflected his perspective of the instructional experience that was the focus of this study. His judgment, having read these preliminary drafts which were not substantively revised in their final form, was that, from his perspective, they "quite accurately" depicted the experience.

The early months of phase three involved analysis of individual data sources, while analysis of the whole, writing the report, and verification of findings with Dr. James involved the latter four of seven months, with considerable overlap of activity.

Part 3 of this chapter described the research methodology in terms of three phases of activity which occurred over a period of sixteen months. Phase one involved entry, design, and preparation, while phase two consisted primarily of data collection and preliminary analysis. Phase three involved data analysis, model development, host verification, and report writing.

Chapter IV presents the characteristics of the instructional experiences of Dr. James and sixty-two students enrolled in the course, Research 975. The experience is presented from the perspectives of the instructor, students, and researcher and includes information about the participants, the instruction, and their reactions to the instruction.
CHAPTER IV

THE INSTRUCTIONAL EXPERIENCE

Overview

The characteristics of the instructional experiences of Dr. James and sixty-two students enrolled for credit in the course, Research 975, are described in this chapter. It begins with an overview of Dr. James' career, his beliefs about teaching and learning, and his intentions for the course. The students are described and their expectations and objectives for the course are presented. The setting is defined. The major portion of the chapter is devoted to a detailed description of how Dr. James arranged human, material, and temporal resources to facilitate learning about the analysis and interpretation of data. Student and instructor reactions to the arrangements follow. Students' reactions toward the instructor are discussed, as are the instructor's beliefs about students. The chapter concludes with a view of the course outcomes from the perspectives of students and Dr. James. Sources of information are many and varied. They include instructor and student interviews, instructor's vita, materials distributed in class, field notes, taped class sessions, responses to student questionnaires, student data sheets submitted to the instructor, student statements of objectives and evidence, and the record of grades.
This chapter is intended to describe the instructional experiences from the perspectives of Dr. James, the students, and the researcher. While three perspectives were presented, readers are encouraged to adopt the perspective of the instructor, as the researcher considered instruction to be a function of the intent of the instructor and analyzed information from the perspective of the instructor. Student and researcher perspectives provide additional sources of information from which to interpret the instructor's perspective.

The Instructor

Background, Beliefs, and Intentions

Background

Events surrounding Dr. James' decision to pursue college teaching as a career choice and his early teaching experiences suggest that he received personal and professional recognition early in his career.

His decision to attend college and to pursue an area of study in education had long been assumed, while his decision to become a high school teacher occurred during his junior year in undergraduate school. Upon completing his baccalaureate program and recognizing his obligation for military service, he enrolled in a master's degree program at the same university so that he might avail himself of an advanced ROTC program. An event occurred during this time that had a significant influence on his decision to become a university teacher. He recounted the event in the following way:
(the chairman)...was in many ways very creative ...(and) worked well with students who had a little initiative and who performed well. He found out about...(my looking for graduate school options)... and in his own subtle way one day when I was talking to him about something else, said "really what you ought to do is teach a couple of years of high school and then you ought to get an advanced degree and come back and be a member of my faculty." Well for a fairly immature person of 21 or 22, that sounded pretty good. So that, in effect, helped me to see that...(teaching)...at the university level was my future [interview, 9-12].

Even prior to completing his military service and obtaining an advanced degree, Dr. James was offered and accepted a faculty position at this same university. He completed military service, taught one year at the university, and recognizing the need for public school teaching experience, resigned to accept a position as a high school teacher for two years. At that time, he felt that he was prepared to teach. In his words:

I knew how to teach. I was knowledgeable in the content. In some of these things, I don't know that you learn them, but I had no problems getting along with the kids. I taught boys...never had any problems with discipline or anything. We had a top notch group of young kids and things went very well [interview, 9-12].

Following this teaching experience, he received a fellowship to what he considered to be one of the outstanding programs in the country. One of the major experiences that Dr. James stated influenced the way he teaches occurred near the end of his graduate program. It involved an on-going study of a professor's teaching of an undergraduate methods course. Dr. James attended the class and met regularly with the professor following each class for the purpose of an in-depth criticism of that day's class. Among other things, he was
to discern the professor's intentions for a given class session. A very thorough analysis of the class was conducted. He was also required to teach several units in the course. The criticism process was then reversed—the professor criticized his teaching. Additional readings were assigned and students were followed into their field experience. The meaning that that experience held for him was expressed in this way:

That...experience...probably had, if any one single thing had, as much to do with my teaching as anything else. It was a valuable experience [interview, 9-12].

Upon receipt of his Ed.D., he was offered a position at the same university, which he related "...didn't take me about a millionth of a second to accept." He remained with that faculty for five years before accepting his current position.

As a faculty member in his current position for eleven years, Dr. James has distinguished himself in the areas of teaching, research, and service. During his professional career he has held a number of top offices in various national professional organizations; has been the recipient of research grants or involved in funded research projects; served nationally as a consultant and lecturer; edited a journal, authored some forty books, research reports, or journal articles; served on numerous university committees; and received a number of awards, including one for distinguished teaching. His primary responsibilities, until recently when he assumed additional administrative responsibilities, involved teaching four research courses over the academic year and a "heavy" involvement in graduate advising—primarily Ph.D. students.
Beliefs About Teaching and Learning

"Advocate" is the word Dr. James used in interviews with the researcher to describe his role as a teacher. "I'm an advocate of students' maximum achievement or of maximizing their learning." He observed that some teachers pair students against teachers, creating a situation in which the teacher and students try to see who can out-smart whom rather than being on the same side for the purpose of maximizing student learning. Perhaps the following statement best summarizes his beliefs about his role as a teacher.

If I cannot make it easier, more clear for the students to learn, then I'm not doing what I ought to do...because I think there are a lot of things that we can do to help students...make sense out of what is going on [interview, 9-12].

Given this purpose and the belief that a great deal is known about how people learn, what is effective and what is ineffective, Dr. James was very explicit in stating the conditions that he felt contributed to effective teaching. These conditions involved, first, a knowledgeable teacher who applied principles from the psychology of learning. Knowledge of the content to be taught involves knowing the content sufficiently to recognize it as a closely integrated body of knowledge with a logical structure. He used the analogy of the teacher as an expert, standing on a mountain top.

...like standing on the mountain top looking and seeing a beautiful picture, everything fits together but the poor kid standing down in the valley some place is probably looking at one tree and he doesn't see how that fits into the picture...the big ideas to me are these things of organization and structure [interview, 9-12].
Second, he considered psychology of learning to include logical and psychological organization of subject matter, organizational structure, transfer of learning involving the use of concrete examples, feedback, and individualization. Because students organize subject matter psychologically and teachers organize it logically, teachers should seriously consider the students' perspective of subject matter as "psychological organization...could...evolve into logical organization." He expressed this yet another way when he indicated that teachers should try to see the course from the students' perspective. He was convinced that students learn best and transfer learning when they have an opportunity to apply ideas using concrete situations. Related to this is the use of feedback, that is, "...we have to know how we are doing (to learn)." He recognized that students learn by means of different styles and strategies and believes that feedback serves an important function in recognizing individual learning styles.

In addition to knowledge about the subject matter and psychology of learning, Dr. James expressed the belief that the presentation of content should be organized in such a way that students know "where we are, where we are going, how it fits, and what will be done today." The presentation should be clear, accurate, organized, and made interesting to the student. These beliefs can be summarized as follows: the teacher should (1) be knowledgeable regarding content and learning, (2) intentionally organize instruction with these factors in mind, and (3) view the learning situation from the perspective of the student. These beliefs about teaching and learning were complemented by Dr. James' belief that teachers should be willing to accept student ideas and be open and available to students.
Intentions for the Course

Dr. James designed the course, Research 975, for persons who have had one course in statistics or a minimum background in statistics and data analysis. The course is organized around four objectives: becoming knowledgeable about (1) selecting appropriate data analysis techniques, (2) using the computer for computing statistics, (3) interpreting analysis, and (4) communicating the analysis in a written report. Content begins with descriptive statistics and evolves logically into inferential statistics using confidence intervals, hypothesis testing, correlation coefficients, chi square, ANOVA, and ANCOVA.

With an enrollment of typically sixty to seventy students, a lecture format, supplemented by the use of an overhead projector and "handouts," is his choice of instructional method. The overhead projector is used to communicate major ideas. Instructions for using the computer, summary statements, and other reference material are duplicated and distributed to students. These are intended to provide a readily available reference, but also to present ideas in written form so that students can attend to the presentation rather than to excessive note-taking. Other instructional materials include computer printouts generated from a data file to provide students with concrete examples of the application of each major topic covered. Exercises, to be used with the data file, are available for students to use as evidence for a grade should they choose to do so. Student involvement during the lecture includes the use of computer printouts as examples of specific content and involve teacher or student initiated questioning.
While a final examination is required of all students, they have the option of submitting additional evidence for grade determination. Early in the quarter students are required to submit a statement of their course objectives and the proposed evidence, if any, that they intend to submit for a grade. Dr. James reads and approves suggested alternative evidence for a grade. All evidence is to be directly related to course content. For example, if a student chose to submit a dissertation proposal, only that portion pertaining to data analysis is considered relevant evidence. Students are requested to re-submit objective and evidence statements prior to the end of the quarter in order to have an opportunity to make revisions in their intentions.

One hour small group sessions are scheduled weekly at different times for the purpose of providing students an opportunity to ask questions or to clarify information presented in class. Dr. James does not preplan these sessions as the agenda is determined by students present.

**Student Characteristics**

Seventy-six graduate students, representing thirteen program areas, enrolled in the course, Research 975. Sixty-five registered for credit and eleven for audit. Following the drop and add period, the enrollment stabilized at sixty-two students enrolled for credit, eight for audit, with approximately the same number of males and females in each category. Information sheets distributed by Dr. James provided a description of students on various academic and employment
characteristics. Specifically, information about major and minor program areas, advisor's name, and previous position was available. Additionally, information was provided concerning the following characteristics described in this section: degree sought, enrollment status, employment status, statistics courses completed, and course in which enrolled (Table 6). Ninety-two percent of the students enrolled for credit were in Ph.D. programs, while the remaining 8 percent were in master's degree programs. Most, 88 percent, were full-time students; 12 percent were part-time students. Almost two-thirds, or sixty-three students, were employed part-time as graduate associates. Of the remaining one-third, twenty-six were unemployed and eleven were employed full-time.

The number of courses in which students were enrolled ranged from one to six. Approximately one-fourth were enrolled in one or two courses; one-fourth in three courses; one-half in four to six courses. Six percent, four students, had not completed a statistics course, while approximately 75 percent, or fifty students, had completed one or two courses. The almost 19 percent remaining had completed from three to six or more courses.

A comparison of the employment status of full-time and part-time students shows that most part-time students, seven of eight, were employed full-time and one part-time. More than two-thirds, or forty-one students, were employed part-time and one-third were unemployed (Table 7). Full-time unemployed students enrolled in two to six courses, while slightly more than 75 percent enrolled in two to four courses. The remainder were enrolled in five or six courses (Table 8).
<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
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<tr>
<td>Degree Sought</td>
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<tr>
<td>Master's</td>
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<tr>
<td>Ph.D.</td>
<td>59</td>
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<tr>
<td>Total</td>
<td>65</td>
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<tr>
<td>Enrollment Status</td>
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<tr>
<td>Part-Time</td>
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<tr>
<td>Full-Time</td>
<td>57</td>
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<td>Total</td>
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<tr>
<td>Employment Status</td>
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<tr>
<td>Unemployed</td>
<td>17</td>
</tr>
<tr>
<td>Employed--Part-Time/Graduate Associate</td>
<td>41</td>
</tr>
<tr>
<td>Employed--Full-Time</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
</tr>
<tr>
<td>Number of Courses in Which Enrolled</td>
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<td>1</td>
<td>8</td>
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<tr>
<td>2</td>
<td>7</td>
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<td>3</td>
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<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Unknown</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
</tr>
<tr>
<td>Number of Statistics Courses Completed</td>
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<td>2</td>
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<td>3</td>
<td>6</td>
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<tr>
<td>4</td>
<td>1</td>
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<tr>
<td>Unknown</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
</tr>
</tbody>
</table>
### TABLE 7
EMPLOYMENT STATUS OF PART-TIME AND FULL-TIME STUDENTS
N = 65

<table>
<thead>
<tr>
<th>Employment Status</th>
<th>Part-Time</th>
<th></th>
<th>Full-Time</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Percent</td>
<td>N</td>
<td>Percent</td>
<td>N</td>
<td>Percent</td>
</tr>
<tr>
<td>Unemployed</td>
<td>0</td>
<td>0</td>
<td>16</td>
<td>25</td>
<td>17</td>
<td>26</td>
</tr>
<tr>
<td>Employed Part-Time</td>
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<td>1</td>
<td>41</td>
<td>63</td>
<td>41</td>
<td>63</td>
</tr>
<tr>
<td>Employed Full-Time</td>
<td>7</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
<td>12</td>
<td>57</td>
<td>88</td>
<td>65</td>
<td>100</td>
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</tbody>
</table>
### TABLE 8

**COURSES IN WHICH FULL-TIME UNEMPLOYED STUDENTS ARE ENROLLED**

*N = 16*

<table>
<thead>
<tr>
<th>Courses in Which Enrolled N</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
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<tr>
<td>1</td>
<td>0</td>
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<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>
The full-time employed students were enrolled in one to six courses, with nearly 80 percent enrolled in three to five courses. The remaining 20 percent were divided between one, two, and six courses (Table 9). Of eight part-time employed students, six were enrolled in one course; one, in two courses. One student, employed full-time, was taking one course (Table 10).

In summary, 92 percent of those enrolled in the course were Ph.D. students; 8 percent were master's degree students. Most, 88 percent, were full-time, while 12 percent were part-time. It should be noted that forty-one of sixty-five students, or two-thirds of the students enrolled in Research 975, were full-time students who were employed part-time as graduate associates and thirty-five, approximately half the students in the class, were enrolled in three to five courses.

**Student Expectations and Objectives**

Although it is not unreasonable to suggest that all students approach a course with certain expectations, most students, fifty-five of sixty-three, came to this course with expectations based, at least in part, on previous experience in courses with Dr. James. While eight students had no previous class experience with Dr. James, an equal number had had one course and forty-seven students had two to three courses (Table 11). Recognizing course content and the research requirement of graduate programs as major factors cited as motivating influences for enrolling in this course, half of the students that cited these factors (course content and research requirement) also cited the teacher or experience with the teacher as a motivating determinant for enrolling in the course.
### TABLE 9

**COURSES IN WHICH FULL-TIME EMPLOYED STUDENTS ARE ENROLLED**

**N = 41**

<table>
<thead>
<tr>
<th>Courses in Which Enrolled N</th>
<th>Students</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Percent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>5</td>
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</tr>
<tr>
<td>2</td>
<td>2</td>
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<td>3</td>
<td>14</td>
<td>34</td>
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<td>4</td>
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<tr>
<td>6</td>
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<td>2</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>41</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>
TABLE 10
COURSES IN WHICH PART-TIME EMPLOYED STUDENTS ARE ENROLLED

N = 8

<table>
<thead>
<tr>
<th>Courses in Which Enrolled</th>
<th>Employment</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Part-Time</td>
<td>N</td>
<td>Full-Time</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>2</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Courses N</td>
<td>Students</td>
<td>N</td>
<td>Percent</td>
</tr>
<tr>
<td>-----------</td>
<td>----------</td>
<td>---</td>
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<tr>
<td>0</td>
<td></td>
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<td>2</td>
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<td>52</td>
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<td>3</td>
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<td>14</td>
<td>22</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>63</td>
<td>100</td>
</tr>
</tbody>
</table>
Some expectations were based on student perceived course reputation. Although nine students knew little or had limited previous knowledge of the course, twenty-three described it in superlatives, and sixteen expected it to be a difficult, demanding, and/or a challenging course. Most of the sixteen expected the extra work or effort to be worthwhile in terms of knowledge gained. Five students perceived the instructor to be an excellent teacher based on instruction-related comments. The course came highly recommended to four students, while three students heard that it would not be as good as the two previous courses taught by Dr. James. One student expected the course to be acceptable and another anticipated that the final examination would take from seven to fifteen hours, an unrealistic expectation.

In summary, most students expected the course to be "excellent," many expected a difficult, demanding, yet challenging experience that would be worth the time and effort involved.

While the preceding emphasized course reputation and expectation, students also had expectations concerning Dr. James as a teacher. Forty-two students cited specific instruction-related comments. Most frequently mentioned were clarity and organization. Additionally, students expected a knowledgeable, prepared teacher who was fair, available to them, and whose behavior reflected respect for students. Seven students referred to Dr. James only in terms of being an "excellent" teacher. Two students expected the course to be slow moving or boring.
When asked on the first day of class, prior to orientation to the class, what they would like to accomplish in this course, fifty-nine of the students enrolled identified goals as indicated below:

1. increasing knowledge, understanding, and/or skill in analyzing and interpreting data (32 students)

2. gaining ability to use information in their own research or in evaluating the research of others (21 students)

3. gaining a passing grade, an A, or performing well (4 students)

4. gaining an appreciation of research (2 students).

These objectives (except for the one relating to passing the course) can be summarized as being on a continuum of appreciation, knowledge and understanding, and application of analysis and interpretation of data. Over 90 percent of the students' objectives were expressed along this continuum.

The Instructional Arrangements

The lecture hall in which this class was conducted was typical in many respects. Stationary seats with small, folding side desk tops were closely spaced in tiered rows. Chalk boards lined the front wall, broken only by a retractable projector screen. At the front of the room was a stage raised from the floor by four steps. On the stage were a table, chair, and audio visual cart. Television monitors were mounted on each side wall above eye level. Four electrical outlets were evenly spaced on each side wall.

Dr. James characteristically arrived twenty minutes early, carrying a large cardboard carton which contained instructional
materials to be used or distributed during that class session. He spent this time (1) arranging materials to be distributed near the door in order that they might be picked up by students on their way into the classroom, (2) arranging the overhead projector and transparencies, and (3) organizing the large notebook and computer print-out book to which he referred while lecturing. Except for the first class session when Dr. James lectured from the stage, he lectured from the floor level between the stage and the first row of desks, where he positioned the audio visual cart and projector. He used the stage to arrange extra materials that might be needed during the class and placed his notebook and computer printout book on the two desks immediately in front of him. The overhead projector on which he wrote was placed to his right. The arrangement was not altogether satisfactory, as it necessitated Dr. James writing on transparencies with his arm raised to a position parallel to the floor.

Students also arrived early, sometimes as much as thirty-five minutes. Usually they arrived alone or with one other person and sat quietly, reading or conversing with another student. Occasionally, a student approached Dr. James with a question. Because of limited space between desks and the amount of material that was utilized in class, students soon learned to sit with a vacant desk between them so that they might have a place to rest their instructional materials.

Dr. James' intentions for the course materialized in the instructional arrangements that actually occurred. For example, during the first class session, an overview was presented identifying course objectives and an outline of topics to be covered; the use of the data
file and instructional materials were discussed, as were arrangements for small group sessions and evidence for a grade.

Within the first two weeks, patterns of teacher instructional behaviors emerged which were generally consistent throughout the quarter. While these patterns were observed by the researcher, they were also confirmed by interviewed students, acknowledged as accurate and intended by the instructor, and confirmed by sample analysis of instruction using O.S.I.A. IV.

Dr. James was a highly organized teacher, as will be evidenced by the ensuing description of the consistent patterns of behavior that emerged. He began and ended classes on time and class sessions were spent in instructionally functional behavior. In fact, it will be later demonstrated that only 1 percent of all class behaviors were instructionally nonfunctional.

Classes began with two types of teacher managerial instructional behavior. The first involved providing students with information, such as when to turn in assignments, arrangements for the last class session which was to be audio tape recorded, and for the final examination. The second type included all those behaviors related to providing students with additional opportunities to learn outside of class or discussing evidence for a grade option. These included: announcements about a lecture by a distinguished statistician, a SPSS workshop, availability of a graduate associate for assistance with programming, grade-no-grade option for during-course mastery tests, and Part I and II exercises. Some of these opportunities were provided for students in the form of mimeographed materials. In both instances
of managerial activity, students were invited to and did clarify points of confusion.

Lecture format was used to facilitate meeting of course objectives. The substantive teacher instructional behavior that directly related to the course content began with an overview of the topics to be presented during the class session. This was followed by an announcement of which instructional materials would be used that day, with the suggestion that students organize their materials so that they would be readily available when referred to during the lecture. Time was allotted for this activity. It should be noted that materials were often distributed to the class prior to their use, although this was not always the case.

To introduce new concepts, Dr. James made logical transitions between various elements of subject matter by relating concepts developed one week to those introduced the next. The overhead projector was used to present new information, identify major ideas, and supplement ideas with illustrations. Several types of instructional materials were used to accompany the presentation and engage students with the subject matter content (Table 12). These included mimeographed sheets and computer printouts which were used during the presentation of content. Major ideas in the form of charts or summaries were mimeographed and were used during the lecture to emphasize ideas and eliminate the need for extensive note-taking. Instructions for programming various statistical methods were mimeographed and supplemented by computer printouts of task definition runs. The latter provided the student with instructions for use in running his own examples or working computer exercises. Finally, computer printouts
<table>
<thead>
<tr>
<th>Date and Materials</th>
<th>Date and Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>September 29</strong></td>
<td>September 29</td>
</tr>
<tr>
<td>Information Sheet</td>
<td>Description and Interpretation of Data -- Topics of Study and Discussion</td>
</tr>
<tr>
<td>Research 975 -- Objectives, Evidence, Statement of Intent Research 975 -- Reference List Using the &quot;Statistical Package for the Social Sciences&quot; Descriptive Statistics -- Measures of Central Tendency and Variability Flyer &quot;IEC Computer Workshops for Students, Faculty and Staff&quot; JCL Cards including Job Cards Example 11-1 -- Creating New Variables Example 11-2 -- Data Transformation and Data Selection Example 11-3 -- Task Definition Cards Example 11-4 -- Task Definition Cards -- Descriptive Statistics Example 11-5 -- Correlation Coefficients and Scatter Diagrams Computer Printout -- Example 11-1 -- Task Definition run Computer Printout -- Example 11-2 -- Task Definition run Computer Printout -- Example 11-3 -- Task Definition run Computer Printout -- Example 11-4 -- Task Definition run Computer Printout -- List of sub-files comprising the file -- run</td>
<td></td>
</tr>
<tr>
<td><strong>October 7</strong></td>
<td>October 7</td>
</tr>
<tr>
<td>Application of Statistical Techniques and Interpretation of Data Part 1 -- Descriptive Statistics (Exercises which could be used for grades) Measures of Association in Contingency Tables Example of Reporting Descriptive Data -- Problem 1 -- Application of Statistical Techniques Example 11-5-1 -- Partial Correlation Example 11-5-2 -- Crossover Computer Printout -- Example 11-5-1 -- Task Definition run Computer Printout -- Example 11-5-2 -- Task Definition run Computer Printout -- Example 11-5-3 -- Task Definition run Computer Printout -- Example 11-5-4 -- Data run (distributed to students who had not completed assigned work)</td>
<td></td>
</tr>
<tr>
<td><strong>October 10</strong></td>
<td>October 10</td>
</tr>
<tr>
<td>Exercise 1 -- Inferential Statistics -- Sampling -- Interval Estimation -- Hypothesis Testing Computer Printout -- Example 11-6-1 -- Data run Computer Printout -- Example 11-6-2 -- Data run Computer Printout -- Measures of Association in Contingency Tables</td>
<td></td>
</tr>
<tr>
<td><strong>October 17</strong></td>
<td>October 17</td>
</tr>
<tr>
<td>Chi Square Test for Independence Example 11-6 -- Task Definition (Independent Groups) Example 11-6-1 -- Task Definition (Dependent Groups or Paired Samples) Computer Printout -- Example 11-6-1 -- Task Definition run Computer Printout -- Example 11-6-2 -- Task Definition run Computer Printout -- Frequency Distribution (For a specific variable) Computer Printout -- Sampling -- Hypothesis Testing -- Interval Estimation Data run</td>
<td></td>
</tr>
<tr>
<td><strong>November 24</strong></td>
<td>November 24</td>
</tr>
<tr>
<td>Computer Printout -- 95 Percent Confidence Interval -- Data run Computer Printout -- Testing Hypothesis about Correlated Coefficients Formulas for Estimating Sample Size Estimating Sampling Error -- Confidence Intervals</td>
<td></td>
</tr>
<tr>
<td><strong>November 31</strong></td>
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</tr>
<tr>
<td>Statistical Tests for the Two-Sample Case Statistical Tests for the Two-Sample Case Computer Printout -- T-Test for Independent Groups -- Example 11-6-1 -- Data run Computer Printout -- T-Test for Dependent Groups -- Example 11-6-2 -- Data run Application of Statistical Techniques and Interpretation of Data -- Part II -- Inferential Statistics (Exercises which could be used as guidelines for grades) Mastery Test 3, Answer Sheet JCL Card</td>
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</tr>
<tr>
<td><strong>November 7</strong></td>
<td>November 7</td>
</tr>
<tr>
<td>Chi Square Test of Homogeneity Example 11-6 -- Task Definition Cards -- One-Way Analysis of Variance with Post Hoc Comparisons Computer Printout -- Example 11-6-1 -- One-Way Analysis of Variance with Post Hoc Comparisons -- Data run</td>
<td></td>
</tr>
<tr>
<td><strong>November 10</strong></td>
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</tr>
<tr>
<td>Example 11-7 -- Task Definition Cards -- Factorial Analysis of Variance, ANOVA -- Analysis of Variance and Covariance Computer Printout -- Example 11-7-1 -- Simple Linear Regression -- Task Definition run Computer Printout -- Example 11-7-2 -- Simple Linear Regression -- Data run Computer Printout -- Example 11-7-3 -- Analysis of Covariance -- Task Definition run Computer Printout -- Example 11-7-4 -- Analysis of Covariance -- Data run Mastery Test 4, Answer Sheet</td>
<td></td>
</tr>
<tr>
<td><strong>November 25</strong></td>
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<tr>
<td>Example 11-7-1 -- Sample Linear Regression Computer Printout -- Example 11-7-1 -- Sample Linear Regression -- Analysis of Variance and Covariance Computer Printout -- Example 11-7-2 -- Simple Linear Regression -- Task Definition run Computer Printout -- Example 11-7-3 -- Simple Linear Regression -- Data run Computer Printout -- Example 11-7-4 -- Analysis of Covariance -- Task Definition run Computer Printout -- Example 11-7-5 -- Analysis of Covariance -- Data run Mastery Test 4 -- Analysis of Variance, Answer Sheet</td>
<td></td>
</tr>
<tr>
<td><strong>November 28</strong></td>
<td>November 28</td>
</tr>
<tr>
<td>Analysis of Covariance (AMOVA) Multiple Regression Example 11-7-6 -- Multiple Regression Computer Printout -- Example 11-7-6 -- Multiple Regression Computer Printout -- Example 11-7-7 -- Multiple Regression -- Data run Computer Printout -- Example 11-7-8 -- One-Way ANOVA with Multiple Regression Analysis -- Data run Illustration Example 11-7-9 -- Posttest and Post-Test Means Illustration Example 11-7-10 -- Analysis of Covariance Illustration of Multilevel Regression Analysis Illustration of One-Way ANOVA with Multiple Regression Course Summary Course Evaluation -- Instructions and Form</td>
<td></td>
</tr>
<tr>
<td><strong>November 29</strong></td>
<td>November 29</td>
</tr>
<tr>
<td>(Learning Resources Laboratory) Analysis of Covariance (AMOVA) Multiple Regression Example 11-7-6 -- Multiple Regression Computer Printout -- Example 11-7-6 -- Multiple Regression Computer Printout -- Example 11-7-7 -- Multiple Regression -- Data run Computer Printout -- Example 11-7-8 -- One-Way ANOVA with Multiple Regression Analysis -- Data run Illustration Example 11-7-9 -- Posttest and Post-Test Means Illustration Example 11-7-10 -- Analysis of Covariance Illustration of Multilevel Regression Analysis Illustration of One-Way ANOVA with Multiple Regression Course Summary Course Evaluation -- Instructions and Form</td>
<td></td>
</tr>
</tbody>
</table>
provided "concrete" examples of the ideas presented during the lecture. Regularly during the lecture, students were referred to various mimeographed sheets to emphasize points or to computer printouts to provide examples of concepts or information presented.

In addition to engaging students in the content through the use of instructional materials, Dr. James encouraged students to ask questions and/or to make comments. Also, he used questioning to evoke class response, which provided feedback to students and himself. Consequently, expository strategy was characterized by episodes of interactive instructional behavior. Other characteristics which typified Dr. James' lecture were: (1) relating ideas or information to other ideas or information, (2) orienting students to what came next, (3) emphasizing major ideas, (4) addressing students by name, and (5) gesturing, particularly to emphasize points. Humorous comments, usually emphasizing various points being presented, were interjected by the instructor.

In summary, lectures were characterized by teacher intent, were organized and structured, and were delivered at a consistent pace.

Concluding remarks were addressed to: (1) indicating the topics for discussion for the next class session, (2) suggesting appropriate readings for those who wished to read, and (3) assigning computer activities, especially early in the quarter when the topic was descriptive statistics. Initially, the task definition procedures to be used in assignments were reviewed in class by Dr. James. Later in the quarter, students were referred to the appropriate mimeographed sheets for instructions and computer printout samples.
Upon class dismissal, Dr. James and the students gathered their materials and proceeded to leave. Incoming students for the next class made it difficult to linger. Consequently, few persons, if any, remained after class to ask Dr. James a question. Questions were usually asked prior to class or during the break.

Nine small group sessions were held during the quarter. They were one hour in duration and attended by six to fourteen students. The number of students in attendance increased as the quarter progressed. These sessions were held in a small classroom outfitted with six rectangular tables and an appropriate number of chairs. Dr. James often arrived carrying his notebook and computer book, but rarely referred to them. As with the class, these sessions began and ended promptly. No agenda was prepared by the instructor. Students were invited to ask questions, which they immediately proceeded to do. The entire hour was spent in answering questions in the form of explaining or clarifying points. Dr. James fielded questions without hesitation, occasionally rising to use the chalk board to develop an illustration. Students shared time by taking turns asking questions. Occasionally, a student with a number of questions would check with other students before proceeding to monopolize time. Although some students left with unanswered questions, most had their questions answered. A few students did not ask questions, but came to the session primarily to listen to the discussion.

While the preceding description results from the researcher's observation, as recorded in field notes and from taped class sessions, analysis of three class sessions, i.e., the second, fifth, and eighth,
using the Observational System for Instructional Analysis (O.S.I.A. IV), provided the opportunity to analyze these patterns in terms of actual frequencies of events in five-second intervals, proportions of time spent in certain dimensions of instructional activity, and numbers and relationships of occurrences of instructional events.

Strategy analyses provided information about the relationship of instructional functions, instructional communication strategies, and the source of instructional behaviors (Appendix I). The matrix analysis displayed events and movement patterns which substantiated behavioral chains. Chain and pool analysis identified the numbers of designated chains. Subscript analysis provided frequencies and percentages of subscripted categories (Appendix J) and subfunction analysis provided the same information for subfunctioned categories (Appendix K). These latter two analyses, together with a time line analysis (Appendix L), provided information on patterns of designated subscripted and subfunctioned behaviors.

For the purpose of describing instructional functions, the following definitions are repeated:

**Substantive Behavior** — Behavior that is directly associated with achieving learning outcomes considered by those in the instructional situation to be a legitimate part of the subject matter of the field under study [Hough, et al., 1975, p. 15].

**Modified Managerial Behavior** — Behavior that involves structuring opportunities to learn outside of class or arrangements for demonstration of evidence that learning has occurred. Opportunities for learning outside of class may include, but are not limited to, use of computer, small group sessions, announcements of workshops or lectures, availability of the teacher or graduate associate to assist students or use of the learning resources center. Evidence may include, but is not
limited to, during-course mastery tests, Part I and Part II exercises, dissertation proposals, or analysis and interpretation of own data.

Managerial Behavior -- Behavior that is directly associated with creating the nonsubstantive conditions that are considered by those in the instructional situation to help influence the achievement of learning outcomes [Hough, et al., 1975, p. 15].

Appraisal Behaviors -- Behavior that judges or acknowledges a person, a behavior, or a product of a person's behavior who is a member of the instructional situation [Hough, et al., 1975, p. 15].

Table 13 describes class sessions 2, 5, and 8 in terms of instructional functions. In all three classes, only 1 percent of the class time was spent in instructionally nonfunctional behaviors, or 99 percent of all class time was devoted to instructionally functional behaviors. The relative proportions of substantive, modified managerial and appraisal behaviors were consistently similar, with substantive behaviors comprising 74 to 88 percent of the instructionally functional time. An exception was the modified managerial behavior with ranges from 21 to 5 percent. The progressive decrease in modified managerial behaviors from class two to class eight was explained by field observations which indicated greater emphasis in early sessions on orienting students to opportunities to learn outside of class and clarifying options for evidence to be used for a grade. As the quarter progressed, the need for such orientation and clarification decreased. In session two, the increase in orienting and clarifying time accounted for the decrease in substantive time.

Source of instructional events (teacher, student, and class) is described in Table 14. In a class that uses lecture as a primary instructional strategy, it is not unusual to observe a high
### TABLE 13

**COMPARISON OF INSTRUCTIONAL FUNCTIONS BY CLASS SESSION**

<table>
<thead>
<tr>
<th>Class Session</th>
<th>Number of Minutes</th>
<th>Substantive</th>
<th></th>
<th>Modified Managerial</th>
<th></th>
<th>Appraisal</th>
<th></th>
<th>Nonfunctional</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>F</td>
<td>Percent</td>
<td>F</td>
<td>Percent</td>
<td>F</td>
<td>Percent</td>
<td>F</td>
<td>Percent</td>
<td>F</td>
<td>Percent</td>
</tr>
<tr>
<td>2</td>
<td>103</td>
<td>886</td>
<td>74</td>
<td>258</td>
<td>21</td>
<td>42</td>
<td>4</td>
<td>12</td>
<td>1</td>
<td>1198</td>
<td>100</td>
</tr>
<tr>
<td>5</td>
<td>143</td>
<td>1423</td>
<td>87</td>
<td>127</td>
<td>8</td>
<td>65</td>
<td>4</td>
<td>24</td>
<td>1</td>
<td>1639</td>
<td>100</td>
</tr>
<tr>
<td>8</td>
<td>141</td>
<td>1448</td>
<td>88</td>
<td>84</td>
<td>5</td>
<td>92</td>
<td>6</td>
<td>12</td>
<td>1</td>
<td>1636</td>
<td>100</td>
</tr>
</tbody>
</table>

*Related to opportunities to learn outside of class and evidence to be used for a grade.*
### Table 14

**Comparison of Instructional Event Sources by Class Session**

<table>
<thead>
<tr>
<th>Class Session</th>
<th>Number of Minutes</th>
<th>Source</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Teacher</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Student</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>F</td>
<td>Percent</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F</td>
<td>Percent</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F</td>
<td>Percent</td>
</tr>
<tr>
<td>2</td>
<td>103</td>
<td>993</td>
<td>86</td>
</tr>
<tr>
<td></td>
<td></td>
<td>154</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>143</td>
<td>1486</td>
<td>92</td>
</tr>
<tr>
<td></td>
<td></td>
<td>31</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>141</td>
<td>1430</td>
<td>88</td>
</tr>
<tr>
<td></td>
<td></td>
<td>53</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>141</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1624</td>
<td>100</td>
</tr>
</tbody>
</table>

<sup>a</sup>Group responses.
percentage of time attributed to the teacher as a source of instructional events. Teacher as source ranged from 86 to 92 percent of the time. Two trends appeared. First, student as a source decreased from 13 to 2 and 3 percent, respectively, over the three courses. Second, class as a source increased from 1 to 9 percent. The higher percentage of student as source behavior attributed to class session two was explained in the time spent by students clarifying managerial issues which were also increased during early sessions. Class responses related to the instructor's use of questioning as a feedback mechanism related to substantive activity. This instructor activity increased over the duration of the class as increasingly more time was spent in substantive activity, consequently, class response also increased.

Communication strategies (direct, interactive, and private) are described in Table 15. Substantive direct communication, which reflects teacher expository or lecture behavior, comprises 57 to 73 percent of class time, while interactive behaviors, those involving interaction between teacher and student, represent 19 to 26 percent class time. This relatively high percentage of interaction time during a lecture presentation is due primarily to teacher questioning, which evoked a group or class response. The increasing trend observed in interactive behavior is associated with increased time spent in substantive behavior. Decreased time spent on managerial direct behavior was a function of having introduced and clarified managerial activities early in the quarter.

Interactive behavior can be further described in terms of student and teacher questioning behaviors. Table 16 identifies the number of student initiated questions followed by teacher behaviors.
<table>
<thead>
<tr>
<th>Class Session</th>
<th>Number of Minutes</th>
<th>Substantive Communication Strategies</th>
<th>Managerial Communication Strategies*</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Direct (T4)</td>
<td>Direct (T04)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Interactive (T5, 6, 7, 8, 9, 10, 11, 12)</td>
<td>Interactive (T05, 06, 07)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Private (T1, 2, 3)</td>
<td>Private (T01, 02, 03)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>F</td>
<td>Percent</td>
<td>F</td>
</tr>
<tr>
<td>2</td>
<td>103</td>
<td>569</td>
<td>57</td>
<td>194</td>
</tr>
<tr>
<td>5</td>
<td>143</td>
<td>1088</td>
<td>73</td>
<td>261</td>
</tr>
<tr>
<td>8</td>
<td>141</td>
<td>969</td>
<td>68</td>
<td>373</td>
</tr>
</tbody>
</table>

*Combined Managerial Behaviors.
### TABLE 16

**COMPARISON OF STUDENT INITIATED QUESTIONS BY CLASS SESSION**

<table>
<thead>
<tr>
<th>Student Initiated Questions</th>
<th>Class Session</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Student Questions, Teacher Initiates</td>
<td>0</td>
</tr>
<tr>
<td>Student Questions, Teacher Responds</td>
<td>3</td>
</tr>
<tr>
<td>Student Questions, Teacher Solicits Clarification</td>
<td>2</td>
</tr>
<tr>
<td>Student Questions, Teacher Solicits</td>
<td>3</td>
</tr>
<tr>
<td>Student Questions, Teacher Judges Correctness</td>
<td>1</td>
</tr>
<tr>
<td>Student Questions, Teacher Personal Positive Judgment</td>
<td>3</td>
</tr>
<tr>
<td>Student Questions, Teacher Acknowledgment</td>
<td>0</td>
</tr>
<tr>
<td>Student Questions, Teacher Judges Incorrectness</td>
<td>0</td>
</tr>
<tr>
<td>Student Questions, Teacher Negative Judgment</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>12</td>
</tr>
</tbody>
</table>
In this case, a chain involves student behavior, followed by teacher behavior. The frequency of student questions ranged from twelve to seventeen over the course of the three sessions. Typically, the teacher behavior, following student questions, was characterized by responding, judging correctness, soliciting clarification, soliciting, or personal positive judgments. Personal positive judgments usually referred to the acknowledgement of a student's idea as a "good" one. The teacher's behavior, following student questions, did not indicate acknowledgement or personal negative judgment and in only one instance did the instructor make a judgment of incorrectness. While one might expect typical teacher behavior to be a response, student questions were often phrased in such a way as to require a teacher judgment as a response.

The number of teacher initiated questions followed by class responses ranged from 58 to 82, with the judgment of correctness being the most frequent consistent teacher behavior following a class response (Table 17). Other teacher behaviors following class responses were initiating, soliciting, or, to a limited degree, acknowledgment. Class responses were not judged incorrect, nor did the class as a whole receive personal judgments by the instructor. Rather than judging a response as incorrect, the instructor rephrased or asked a new question. The increase in teacher initiated questions was intended by the instructor as a means of responding to his perception that some students were experiencing confusion. It was Dr. James' opinion that this questioning technique was a means of helping students to understand concepts through feedback provided by this technique.
<table>
<thead>
<tr>
<th>Teacher Initiated Questions</th>
<th>Class Session</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Teacher Questions, Class Responds, Teacher Initiates</td>
<td>18</td>
</tr>
<tr>
<td>Teacher Questions, Class Responds, Teacher Responds</td>
<td>13</td>
</tr>
<tr>
<td>Teacher Questions, Class Responds, Teacher Solicits Clarification</td>
<td>0</td>
</tr>
<tr>
<td>Teacher Questions, Class Responds, Teacher Solicits</td>
<td>11</td>
</tr>
<tr>
<td>Teacher Questions, Class Responds, Teacher Judges Correctness</td>
<td>14</td>
</tr>
<tr>
<td>Teacher Questions, Class Responds, Teacher Personal Positive Judgment</td>
<td>0</td>
</tr>
<tr>
<td>Teacher Questions, Class Responds, Teacher Acknowledgment</td>
<td>2</td>
</tr>
<tr>
<td>Teacher Questions, Class Responds, Teacher Judges Incorrectness</td>
<td>0</td>
</tr>
<tr>
<td>Teacher Questions, Class Responds, Teacher Personal Negative Judgment</td>
<td>0</td>
</tr>
<tr>
<td>Total Teacher Questions, Class Responds</td>
<td>58</td>
</tr>
<tr>
<td>Teacher Questions, Class Thinks, Teacher Initiates</td>
<td>0</td>
</tr>
<tr>
<td>Teacher Questions, Class Thinks, Teacher Responds</td>
<td>2</td>
</tr>
<tr>
<td>Teacher Questions, Class Thinks, Teacher Questions</td>
<td>3</td>
</tr>
<tr>
<td>Total Teacher Questions, Class Thinks</td>
<td>5</td>
</tr>
</tbody>
</table>
In a previous section, lecture was described in relation to the use of instructional materials and certain characteristics. The use of materials and these characteristics were defined as modifiers (subfunctions and subscripts) which were used in the OSIA IV analysis.

The modifiers used were defined as follows:

**Modified Arranging** -- Behavior that is directly associated with achieving learning outcomes considered by those in the instructional situation to be a legitimate part of the subject matter under study. In addition is included any manifest behavior, spoken or unspoken, that involves arrangement of materials associated with the lecture during a class session. Materials may include computer printouts, mimeographed handouts, or statistics books.

**Example** -- Involves any manifest, spoken behaviors, which illustrates ideas or concepts by work or symbol, the intent of which is to help make ideas or concepts concrete or real to the student. Such illustrations may include computer printouts, drawings, and problems presented on the overhead projector, or verbal illustrations.

**Material** -- Involves class and/or teacher use of material associated with lecture presentation. This may include computer printouts, mimeographed handouts, or books.

**Unspoken** -- Is a communication mode used to designate students' laughter response to the instructor's humor and the students' response to the teacher's solicitation to take out or turn to specific materials. (The latter is designated for use with material.)

**Emphasis** -- Involves the instructor's identification for students of those ideas, information, or concepts which the instructor considers to be important. This may include, but is not limited to, the following phrases: "remember this," "this is important," "a mastery test item," "a big idea," or "keep this in your head."

**Bridging** -- Involves events which refer to nonsubstantive information, materials, and/or arrangements which have been addressed during a previous session or will be addressed in a future session. This construct
allows one to place information, materials, and/or arrangements within the perspective of time outside the context of a specific class being observed.

**Orienting** -- Involves events which place substantive events within the perspective of time during a specific class session. This may involve, but is not limited to, behaviors which indicate "where we are," "what will be covered," and "how it fits to what we are about."

**Looping** -- Involves events in which ideas are related to previously addressed ideas or transition is made from one idea to another. Included are summaries and substantive transitions.

**Clarifying** -- Involves explicit opportunities provided by the instructor for students to raise questions, e.g., "Does anyone have a question?" or "Is that clear?"

**Humor** -- Involves a teacher behavior which results in student laughter.

**Name** -- Involves the instructor's acknowledgment of a student by identifying him by name.

Table 18 summarizes subfunctions or lecture characteristics. It should be noted that the subfunctions listed include not only independent use of subfunctions, but also various combinations of subfunction use. The two most frequently used subfunctions or lecture characteristics included example, which ranged from 30 to 43 percent, and material, which ranged in decreasing order from 65 to 30 and 21 percent, respectively. The latter can be explained in that early in the quarter considerable emphasis was placed on various descriptive statistical analyses. Time was spent reviewing accompanying computer printouts for the purpose of instructing students who intended to use the computer. During the latter portion of the quarter, reference to computer printouts tended to be illustrative of points raised during the lecture.
### Table 18

**Comparison of Subfunctioned Instructional Behavior by Class Session**

<table>
<thead>
<tr>
<th>Class Session</th>
<th>Number of Minutes</th>
<th>Non-Subfunction Behavior</th>
<th>Subfunctions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Example</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F</td>
<td>Percent</td>
</tr>
<tr>
<td>2</td>
<td>103</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>143</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>141</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Percentages do not total 100 percent as subfunctions represent combinations of subfunction use.*
Arranged behavior referred to reference to instructional material, e.g., "take out example III-E and turn to page four."

Unspoken referred to student laughter responses to humor or to responses to instructor's request to refer to instructional materials. Less than 10 percent of student time was involved in unspoken responses or manipulation of materials.

Figure 3, a time line, illustrates not only the time spent using materials and examples, but also demonstrates where the use of materials and examples occurred during the class session. It provides a visual comparison of the two subfunctions with each other over three class sessions. The use of these subfunctions and the overlap of the two are remarkably consistent. The most consistent use of material and example occurs between class sessions five and eight, which not only demonstrates when these events occur, but only when they overlap, that is, when material was used as an example. The high frequency of material use in the second class session is related to the topic, descriptive statistics. The use of material early and late during the second class reflects the instructor's directions for computer use. The center overlap reflects use of the computer printout as an example to illustrate a point.

Table 19 contrasts modifiers designated as subscripts. They are displayed in terms of numbers of events and frequencies of five-second intervals. With the exception of looping behavior in session five and naming in session three, there was a highly consistent use of these characteristics during the lecture. The least frequent occurring behavior was clarifying.
Figure 5. Comparison of Patterns of Instructional Behavior by Subfunctions Material and Example by Class Session.
<table>
<thead>
<tr>
<th>Class Session</th>
<th>Number of Minutes</th>
<th>Orient</th>
<th>Bridge</th>
<th>Loop</th>
<th>Name</th>
<th>Humor</th>
<th>Clarify</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Event</td>
<td>Event</td>
<td>Event</td>
<td>Event</td>
<td>Event</td>
<td>Event</td>
</tr>
<tr>
<td>2</td>
<td>103</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>4</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>143</td>
<td>11</td>
<td>7</td>
<td>31</td>
<td>7</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>141</td>
<td>5</td>
<td>11</td>
<td>13</td>
<td>21</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>
Comparison of patterns of subscripted instructional behaviors by class sessions is further described in Figures 4 through 9. Figures 4 and 5 show the events and spacing of bridging and orienting behaviors. These subscripted behaviors appeared at the beginning, middle, and end of the class session, with most frequent events occurring at the beginning of the class. Looping and emphasizing events are illustrated in Figures 6 and 7. Looping and emphasizing, which serve the purpose of relating one idea to another and identifying major ideas, occurred regularly during the lecture. Patterns for these behaviors are very consistent over time. Figure 8 shows unspoken events where students responded to the teacher solicitations to refer to instructional materials. Although different patterns of unspoken behavior emerge between the class sessions, depending on the topic of the day, students are consistently involved during the class session in manipulating materials. Student response to teacher humor, as illustrated in Figure 9, indicates that the instructor characteristically used humor throughout the lecture.

In summarizing the analyses of the second, fifth, and eighth classes using O.S.I.A. IV, it can be said that Dr. James' teaching was highly consistent. Ninety-nine percent of the class time was devoted to instructionally functional behaviors, of which approximately 75 percent or more were substantive in nature. Approximately one-quarter of the generally expository strategy was interactive. This was due largely to the instructor's use of questioning which evoked class response, however, it was substantiated that in this large class students raised questions. Differences between class two and classes
Figure 4. Patterns of Instructional Behaviors Subscripted as Bridge Compared by Class Session.
Figure 5. Patterns of Instructional Behaviors Subscribed as Orient Compared by Class Session.
Figure 6. Patterns of Instructional Behaviors Subscripted as Loop Compared by Class Session.
Figure 7. Patterns of Instructional Behaviors Subscripted as Emphasis Compared by Class Session.
Figure 8. Patterns of Instructional Behaviors Subscripted as Unspoken Compared by Class Session.
Figure 9. Patterns of Instructional Behaviors Subscripted as Humor Compared by Class Session.
five and eight were explained by early emphasis on modified managerial behavior which involved instruction and clarification of opportunities for learning and provision for evidence for a grade, and the emphasis early in the quarter on descriptive statistics which was accompanied by increased use of materials, largely the computer printouts. Lectures were supported by instructional materials and examples, while the teacher tended to orient students to where they were headed and made connections substantively and managerially to past and future classes. Evidence of this orienting and the connecting of substantive information through looping behavior, together with emphasizing certain points, occurred regularly during the class session. Humor was interspersed through each class session. The analysis of three classes substantiates by illustrating frequencies, percentages, and events, the observational description developed through field notes, and tape recordings of all class sessions described earlier in the chapter.

Student Reaction to Instructional Arrangements

Student reactions to the instructional arrangements of the course were obtained through the interim and final student questionnaires and were substantiated by responses given in student interviews and logs. General characteristics of the instructional arrangements (items 1-7) and the instructional arrangements themselves (items 8 and 9) as students observed or experienced them are described in Table 20. Items 1 through 7 are characteristics which were manifestations of the instructor's beliefs and were observed by the researcher. Items 8 and
<table>
<thead>
<tr>
<th>Characteristics of Instructional Arrangements</th>
<th>Observed or Experienced Opportunities</th>
<th>Cited Examples Which Facilitate Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Percent</td>
</tr>
<tr>
<td>Managerial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Demonstrates Abilities in Different Ways</td>
<td>51</td>
<td>98</td>
</tr>
<tr>
<td>Substantive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Opportunity to Apply Ideas Presented in Class</td>
<td>49</td>
<td>92</td>
</tr>
<tr>
<td>3. Use of Concrete Examples</td>
<td>55</td>
<td>100</td>
</tr>
<tr>
<td>4. Feedback</td>
<td>47</td>
<td>87</td>
</tr>
<tr>
<td>5. Logical Organization Presentation of Course Content</td>
<td>52</td>
<td>100</td>
</tr>
<tr>
<td>6. Organization of Course Makes Sense</td>
<td>49</td>
<td>94</td>
</tr>
<tr>
<td>7. Individualization</td>
<td>43</td>
<td>81</td>
</tr>
<tr>
<td>8. Instruction Arranged to Inhibit Learning</td>
<td>17</td>
<td>27</td>
</tr>
<tr>
<td>9. Instruction Arranged to Facilitate Learning</td>
<td>51</td>
<td>96</td>
</tr>
</tbody>
</table>
9 reflect student opinion on whether the instructional arrangements facilitated or inhibited their learning.

Approximately 80 percent of the students observed or experienced feedback and individualization, while 90 percent or more observed or experienced opportunities to demonstrate abilities in different ways, opportunity to apply ideas presented in class and organization that made sense to them. All students confirmed the occurrence of concrete examples and logical organization in presentation of course content. Students were requested to cite examples of these characteristics and to indicate whether the examples had particular value to them in facilitating their learning. Examples in each characteristic which held value ranged from 56 to 78 percent, with 78 percent being the use of concrete examples. Ninety-six percent felt instructional arrangements in general facilitated their learning, while 17 percent reflected responses that indicated some aspects of the instructional arrangements inhibited their learning. Among these aspects of instructional arrangements which inhibited learning were (1) fast pace, (2) large class size, (3) material overload, (4) the faulty assumption by the instructor that students had knowledge of SPSS or computer, and (5) lack of clarity. The reactions described in this section were obtained during session six.

Several things can be said about the way the class as a whole experienced the class during the sixth week. Generally, they felt that instructional arrangements were such that they facilitated learning. Students could identify various aspects of instruction that were particularly helpful and at the end felt that the during-course
mastery tests and lecture accompanied by materials and characterized by use of examples, looping, emphasis, and questioning were of most value to them in meeting their objectives. Students were pleased with the opportunity to present alternatives as evidence for a grade, however, many students who were carrying full class loads and working twenty hours weekly found that completing the mastery tests, and especially Part I and Part II exercises, were too time consuming. Some students adapted to this frustration by changing their goals and deciding not to submit exercises for a grade. Twelve students reported a frustrating experience at the time of the sixth session and nine times limitations of time were identified as a problem.

Also, during the sixth class session students were requested to complete two sentences, one regarding their feelings about the instruction and assignments after the first few sessions and presently (sixth session). Generally, students found the instruction to be clear, organized, and helpful, however, twelve students indicated frustration concerning the content difficulty, fast pace, and lack of clarity. Insufficient time required to complete assignments, which were optional, was a factor mentioned by a number of students. A few students felt things "were getting better" and some, although experiencing difficulty, had "faith" in the teacher "to clear things up."

Table 21 presents information about the relative value that specific previous experiences and instructional arrangements held for students in assisting them meet student and course objectives. On a scale of 1 to 5, where 1 was least value and 5 has most value, one
TABLE 21
VALUE OF SPECIFIC PREVIOUS EXPERIENCES AND INSTRUCTIONAL ARRANGEMENTS TO STUDENTS IN MEETING OBJECTIVES

**N = 62**

<table>
<thead>
<tr>
<th>Experiences and Instructional Arrangements</th>
<th>Value N</th>
<th>Not Applicable N</th>
<th>Value Mean&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>During-Course Mastery Tests</td>
<td>61</td>
<td>1</td>
<td>4.8</td>
</tr>
<tr>
<td>Instruction-Identifying &quot;Big Ideas&quot;</td>
<td>59</td>
<td>2</td>
<td>4.7</td>
</tr>
<tr>
<td>(Emphasis)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instruction-Summarizing (Loop)</td>
<td>62</td>
<td>0</td>
<td>4.7</td>
</tr>
<tr>
<td>Mimeographed Handouts</td>
<td>61</td>
<td>0</td>
<td>4.6</td>
</tr>
<tr>
<td>Instruction-Use of Examples</td>
<td>62</td>
<td>0</td>
<td>4.6</td>
</tr>
<tr>
<td>Instruction-Use of Questions</td>
<td>62</td>
<td>0</td>
<td>4.4</td>
</tr>
<tr>
<td>Previous Experience with SPSS</td>
<td>38</td>
<td>23</td>
<td>4.4</td>
</tr>
<tr>
<td>Computer Printouts</td>
<td>61</td>
<td>1</td>
<td>4.2</td>
</tr>
<tr>
<td>Computer Runs</td>
<td>61</td>
<td>0</td>
<td>4.0</td>
</tr>
<tr>
<td>Previous Statistics Course</td>
<td>59</td>
<td>2</td>
<td>4.0</td>
</tr>
<tr>
<td>Exercises - Part I</td>
<td>45</td>
<td>15</td>
<td>3.8</td>
</tr>
<tr>
<td>Small Group Sessions</td>
<td>43</td>
<td>19</td>
<td>3.8</td>
</tr>
<tr>
<td>Special Projects</td>
<td>41</td>
<td>20</td>
<td>3.6</td>
</tr>
<tr>
<td>Reading Assignments</td>
<td>62</td>
<td>0</td>
<td>3.6</td>
</tr>
<tr>
<td>Exercises - Part II</td>
<td>44</td>
<td>15</td>
<td>3.5</td>
</tr>
<tr>
<td>Previous Experience Punching</td>
<td>41</td>
<td>21</td>
<td>3.4</td>
</tr>
<tr>
<td>Computer Cards</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPSS Workshops</td>
<td>20</td>
<td>41</td>
<td>2.7</td>
</tr>
</tbody>
</table>

<sup>a</sup>On a scale of 1-5 where "1" has least value and "5" has most value.
item had a mean of 2.7, while mean scores for six items ranged from 3.4 to 3.8 and from 4.0 to 4.8 for ten items. The five most valuable items in assisting students meet objectives were in decreasing order of value:

1. during-course mastery tests
2. instruction--identified big ideas (emphasis)
3. instruction--summarizing (looping)
4. mimeographed handouts
5. instruction--use of examples.

While some optional items, e.g., evidence for a grade, were rated high and one item, mastery test, was rated highest, specific lecture characteristics and use of materials as a group ranked consistently higher. These rankings occurred just prior to the final examination.

**Student Reactions to the Instructor**

In responding primarily to interviews and, to a lesser degree, questionnaires, students provided supporting evidence concerning teacher confidence, knowledge, skill, and attitudes toward students. They inferred that the instructor was confident, citing several examples. First, they considered him knowledgeable, a characteristic they considered to be justification for confidence. Second, they mentioned that he was not threatened or defensive, but open to student questioning and to criticism of certain questions on a particular during-course mastery test. Finally, confidence was inferred from what appeared to be a comfortable presence in the classroom.
Students considered Dr. James to be knowledgeable of the subject matter. Evidence included his organization of subject matter, fluency in presentation, response to questions, and use of a variety of references in the lecture presentation. Additionally, they were able to cite or confirm examples of skillful lecturing. Specifically, skill was represented in characteristics of lecture that they identified or acknowledged as helpful were clarity and organization, as well as use of examples, summaries and transitions, and orienting.

Among the characteristic attitudes toward students which the researcher has described as a respect for students as individuals and learners, are the following characteristics cited by students as reflecting instructor attitudes toward them:

1. **Individualization** -- Evidence cited was the provision of small group sessions and the option of providing additional evidence for a grade.

2. **Lack of Criticism** -- Response to questions did not "put you down" or "make you feel like a dummy." Rather, he was open to questions and "he did not think less of you if you chose only to do the final examination."

3. **Valuing of Students** -- "He listens to you when you ask a question" or when engaged in conversation and "calls you by name."

4. **Responsibility** -- He expects that students can make decisions about reading assignments, evidence for a grade, and choice of objectives.

5. **Capability** -- Students indicated that they considered that the instructor believed that they were capable of learning but did not cite specific evidence.

6. **Flexibility and Empathy** -- Students cited examples of teacher understanding, as reflected in responses to requests for special consideration.
In summary, students felt that Dr. James was confident, knowledgeable, skilled, and was respectful of them as persons and students. It is interesting that these teacher characteristics were, for the most part, reflected in the instructional arrangements and, only to a limited degree, a result of one-to-one interaction of a student with the instructor.

Instructor's Reactions to Instructional Arrangements

In an interview during the sixth week of the quarter, Dr. James expressed several concerns regarding "how things were going." First, he sensed some apprehension on the part of students regarding statistics. He suggested as evidence of this perception a reluctance on the part of students to commit themselves to answer questions, both in small group sessions and in class. Second, he sensed a degree of confusion on the part of students which he felt might have been related to use of the computer. He indicated that he had tried to down-play the use of the computer. Also, he had checked to determine that most students had, in fact, used the computer to run data. Third, hesitation in student response during class led him to believe that students were not well prepared. He related that this was a common experience early in his classes and usually students became more prepared as the course progressed. Fourth, the class appeared to be running behind schedule, however, Dr. James did not appear overly concerned about this, as he indicated he would rather have students understand a concept than to be at a certain place at a certain time.
He accounted for running behind, in part, because he had found it necessary to dismiss the second class session early.

In response to these impressions, Dr. James suggested that he might use a mastery test (grade-no-grade option) to formally "see if we are together." He did not plan to modify his approach, as these impressions were typical of those he had experienced with other classes. He would continue to be alert to sensing "where students were."

During the eighth week, Dr. James expressed the impression that the class was moving more slowly than other classes that he had had. The class continued to run behind schedule. It also concerned him that good students raised questions that indicated to him that the "big ideas didn't get across." He gave a short surprise (grade-no-grade option) mastery test in class, however, he had not yet had the opportunity to review the test carefully to determine problems that students were having. Although students were moving more slowly, unless major problems arose, Dr. James indicated his intent to continue to move ahead, frequently cycling back to bring out and clarify major points. This intent accounted for increased teacher questioning and looping behaviors during lectures.

Instructor Beliefs and Attitudes

Toward Students

The instructional arrangements, as well as information obtained through continuing dialogue with Dr. James, provided insight regarding his beliefs about students. While these insights are inferred by the
researcher, they appear to be congruent with opinions expressed by students in the previous section.

Not only did Dr. James acknowledge that students learn and demonstrate knowledge differently, but he also used this as a factor in deciding to establish small group sessions. While these sessions provided an efficient use of his time, they also demonstrated recognition of students' need for additional opportunities to clarify issues and their desire to explore ideas further. In discussing the option of presenting additional evidence for a grade, Dr. James indicated that he felt, for some students, this option provided an opportunity to work with their own data or to explore interests beyond specific course requirements. Also, he recognized some students were poor test takers and would be anxious about relying on a single test grade to determine a final course grade. In providing an option, students could decrease the weight of the test and choose ways in which they performed best.

Further, it can be inferred that Dr. James considered students to be responsible for making decisions regarding their learning. First, specific readings were not required. Rather, he announced topics for discussion and suggested several sources for students who desired to read. The option of additional evidence provided further opportunities for students to assume responsibility for their learning. While a few students would have preferred specific assignments and required mastery tests, most students appreciated the opportunity to make their own decisions. In addition to considering students responsible, it can further be inferred, although less directly, that he considered students capable of learning. One example was his attempt
to "demystify" statistics during the first class session. Perhaps of greater significance was that students felt that he believed they were capable of learning.

Further evidence of the instructor's valuing of students may be inferred from several incidents. Early in the quarter, he provided computer printouts for students who had not run their own. He reasoned that it was conceivable that students could have a variety of reasons for not completing the assignment, but he felt it was important for them to have an example for use during the lecture. There was no evidence that students who had completed the assignments were distressed by this gesture. The addition of the during-course mastery tests was, in Dr. James' words, a recognition that students might be getting "bogged down" and could use other opportunities for demonstrating that learning had occurred. This recognition seemed to be supported in students' comments, first, that they had wished that the options of mastery tests had been provided earlier and, second, that they found during-course mastery tests most useful in facilitating their learning. A final example was the requirement for students to resubmit their objectives and evidence statements just prior to the end of the course. He reasoned that just as he often makes plans that, for a variety of reasons, could not be brought to fruition, so too, students who early in the quarter planned to submit various items of evidence might find it impossible to fulfill their commitments as the quarter neared completion.

It might be inferred from the evidence primarily related to instructional arrangements that Dr. James respected students as
individuals and learners and that this respect influenced, to a degree, his decisions about instructional arrangements.

**Course Outcomes**

Student outcomes were determined, in part, by responses to the question, "To what degree did you meet your course objectives." Thirty-six students responded with examples of specific ways that their objectives had been met. Nineteen students qualified the completion of their goals. Six of the nineteen students indicated that time limitations interfered with the accomplishment of as much as they had preferred, and ten indicated a level of accomplishment, but felt they had more to learn. A broken arm interfered with one student's accomplishments, and one student stated that he had not completed an intended project.

One student indicated that his level of mastery was not satisfactory because of lack of time as ample opportunities existed. Three students indicated that the degree to which they had met their objectives would be determined by how well they performed on the final examination.

Table 22 describes the number of students and the evidence they used for a grade, as well as the final grades earned. Over half of the students used one or more mastery tests as evidence for a grade, while approximately one-third submitted a combination of mastery tests, Part I and Part II exercises. One student used a project, and five chose to rely only on the final examination to determine their course grade. Sixty-three percent received an A or A-, 23 percent a B+, B or B-, six percent a C+ or C, and 8 percent an incomplete.
**TABLE 22**

COMPARISON OF EVIDENCE SUBMITTED FOR A GRADE AND FINAL GRADES OBTAINED BY STUDENTS

\( N = 62 \)

<table>
<thead>
<tr>
<th>Evidence</th>
<th>Grades</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A N</td>
<td>A- N</td>
</tr>
<tr>
<td>Mastery Tests, Exercises or Project and Final Examination</td>
<td>8 5 2 2 1 1</td>
<td></td>
</tr>
<tr>
<td>Mastery Tests and Final Examination</td>
<td>14 11 4 2 2 1</td>
<td></td>
</tr>
<tr>
<td>Exercises or Project and Final Examination</td>
<td>1 1 1 1</td>
<td></td>
</tr>
<tr>
<td>Final Examination Only</td>
<td>1 1 1 1</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>22 17 6 5 3 2 2 0 5</td>
<td></td>
</tr>
</tbody>
</table>
The following statements are typical of student reactions to their experience in the course, Research 975. The statements are intended to be a summary of a variety of aspects of student experience.

Until I was able to draw much of this information together in studying for the final, I felt I was "swimming" in a sea of information, procedures, computer output, etc. There seemed to be a big difference until the end between what we were learning in class and what we did with the computer for the projects. I had no experience with keypunch, or the computer, and felt completely lost in dealing with it. I feel that a few sessions outside of class for us with someone who could have explained how the cards are set up, what the punches mean, spacing (would have helped)—I wouldn't have felt so lost in this area and would have been able to progress faster. However...I felt this course was outstanding. This (course is) taught in the most outstanding manner I have experienced.... [Student volunteered comment, 12-4].

I had two statistics courses and research courses before Research 975. The course has built a sense of confidence in my own ability to view a wide range of problems and data, and apply important statistical techniques to analyze them. One of the very important or strong points of the course is the emphasis on the "big" or "major" ideas on statistics. It shows the students how they could use it....My confidence and interest to learn the course has been heightened by the knowledge that I have an instructor...who knows the subject matter, utilizes varied techniques of teaching, and cares that students learn [Student volunteered comment, 12-4].

As usual, the course was well organized, informative in nature, and related to real-life concerns. So much material was presented, however, that it was difficult to assimilate it all. Perhaps more self-checks are needed along the way to insure mastery of the subject matter. It is of such a nature that one could become lost and never recover. I cannot deny that I have learned a considerable amount and that the course material has served to allay some of my fears, misconceptions, and problems relative to statistics. [Unidentified Student--Teacher Evaluation Form, 11-28].
During an interview with Dr. James, following the completion of the course, he reflected on the outcomes of the course. The following statement summarizes his impressions:

At the last two or three weeks I got a different feeling about this class than I've had previously. I don't know (what caused that) but I felt they were really with it...the last three times I met them and their performance on the end of course test would tend to substantiate that because they did well. In fact, my guess is that, over all, the grades in this quarter are higher than they've been before [interview, 12-13].

He offered the following explanation:

But midway through, you know, as I indicated to you, I didn't think things were going well...by the way they were really with it now...I felt we fooled around too long with some of the introductory stuff. Now as to why the change, I don't know. Maybe I put out a little extra effort to try to get them with me or what I sensed them to be with me, to be sure that I was on target specifically. I'm pretty sure that happened. And maybe it just takes a while for students to begin for things to really begin to jell and for them to see the big picture and maybe that didn't happen as quick this time as before [interview, 12-13].

The researcher offered two suggestions, based on her observations and interactions with students. The first hypothesized that student "withitness" may have been influenced by the amount of time students spent trying to deal with the exercises and the computer. The time spent may not have been productive. To this Dr. James responded:

That's right...following that, what could have happened is that those who continued to do that had learned to use the computer so that it was not time consuming and they could concentrate on the other. Those who had not, just gave up on it and concentrated on it (course content). So that would make sense.... One thing I have learned, assuming I teach the course again, I think I will, I know I will, make certain of those...exercises and problems and each time...and I will have either the output for it or will indicate
exactly how you would go about doing that and, in effect, will use that as an example such that they can see how you would set that up [interview, 12-13].

A second hypothesis suggested by the researcher indicated that during-course mastery tests may have forced students to deal with the content immediately, if they intended to use them as evidence for a grade. Dr. James concurred:

That's right. And I guess now that you've mentioned that, that's one of the strategies I had in mind when I gave that little pop question thing (surprise short mastery test). And so there's another thing, you know. For some reason, it was pretty obvious, that kind of stuff, the during-course test, does get people on target so, really, I ought to be doing that much earlier [interview, 12-13].

Dr. James was "quite pleased" with the outcome of the course, as reflected in the test scores and the quality of the work done by students on some of the exercises. Although not a major disappointment, in referring to student experienced difficulties occurring early in the quarter which appeared resolved at the end, he was disappointed that the class did not begin where it ended. The words "I felt good about the course in the end" best described Dr. James' feelings about the course.

Summary

This chapter presented an in-depth description of the instructional experience of Dr. James and the sixty-two students enrolled in the course, Research 975. Included in the description were characteristics of the instructor and students, the classroom, the instructional arrangements, and the reactions to and outcomes of the experience.
Chapter V presents a model and supporting propositions developed for the purpose of understanding instructional arrangements. It is grounded in the description of instruction that emerged from this study and is used as a guide to identify the salient aspects of Dr. James' instruction.
CHAPTER V

A MODEL FOR UNDERSTANDING
INSTRUCTIONAL ARRANGEMENTS

Models are conceptual schemes which are useful in assisting the researcher gain insights into a phenomenon under study. The model presented in this chapter emerged from the description of the instructional experiences of Dr. James and his students and is intended to identify the salient elements and relationships which characterized his instruction. While the propositions which define these elements and their interrelationships in this model are not considered sufficient to explain potentially effective teaching, the data would suggest that they are necessary conditions for explaining Dr. James' instruction.

In this study, effective instruction is defined in terms of judgments made both by the instructor and by individual students. From the instructor's perspective, instruction is effective if students demonstrate learning and if instruction has been successful in facilitating demonstrated student achievement. From the student's view, instruction has been effective if it has been recognized by the student to contribute to the achievement of student learning goals. Instruction cannot be viewed in terms of effectiveness when student goals for taking a course
are other than learning. Instruction is further modified as being potentially effective. This modification implies that while, from the instructor's perspective, instruction may be optimally arranged, learning does not occur without active engagement of students.

**Overview**

In this chapter, the elements and relationships contributing to the potentially effective instruction of Dr. James are defined, elaborated, and supported. Elements include the teacher's perceptual organization, context, instructional decision making, and instruction. Relationships include the teacher's perceptual organization and context with instructional decision making, instructional decisions with teacher's perceptual organization and context, instructional decisions with instruction, instruction with teacher's perceptual organization and context, and instructional evaluation with instructional decision making. These relationships are illustrated in the model presented in Figure 10. The chapter will conclude with presentation and discussion of propositions concerning potentially effective instruction.

**Elaboration of the Model**

**Teacher's Perceptual Organization**

As indicated in Chapter I, in the role of teacher an individual brings a unique organization of an entire field of perceptions from which perceptions of himself as a teacher, perceptions of his students, and perceptions of the activity of teaching are differentiated and out
Teacher's Perceptual Organization

Congruence

Influence

Instructional Decision Making

Congruence

Feedback

Instruction

Result in

Potentially Effective Instruction

Context

Compatibility

Compatibility

Congruence

Influence

Figure 10. A Model for Potentially Effective Instruction.
of which his behavior as a teacher arises. It is this organization that has been defined as teacher's perceptual organization. If one accepts this construct and its relationship to behavior, then it would be reasonable to conclude that central to the understanding of a teacher's instructional behavior is knowledge of his perceptual organization. Perceptual organization cannot be observed, but rather is inferred from observation of the teacher's behavior from the perspective of the teacher. In this study, inferences about the instructor's perceptual organization have been made by students from their observations of the instructor's behavior and by the researcher from instructor and student self reports and direct observation of instructor and student behaviors (Table 23).

**Instructor Beliefs about Self as Teacher**

Dr. James is an experienced teacher who has received public recognition for his teaching. Additionally, students who have previously taken courses with him speak favorably of their experiences, while other students refer to his reputation as an excellent teacher. Dr. James spoke confidently about the knowledge and skills necessary for effective teaching while carefully planning and organizing the instructional experiences for the class under study. He identified being able to view learning from the perspective of the student as a major factor in arranging instruction. Organization and structuring of content, opportunities for learning outside of class, optional alternatives for grading, and scheduling of small group sessions appeared to reflect this concern for the student's perspective. In the
## Table 23

**Source of Information and Inference about Teachers Perceptual Organization**

<table>
<thead>
<tr>
<th>Beliefs about Self</th>
<th>Teacher's Perceptual Organization</th>
<th>Teacher</th>
<th>Students</th>
<th>Researcher</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Self Report</td>
<td>Behavior</td>
<td>Identify</td>
<td>Confirm</td>
</tr>
<tr>
<td>Capable of Effective Teaching</td>
<td>x</td>
<td>x</td>
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<td></td>
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<tr>
<td>Identifies with Students</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Open to Information Ideas and Experience</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Beliefs about Students</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respects Students as Individuals and Learners</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Worthy of Time and Effort</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capable of Learning</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Capable and Trustworthy of Assuming Responsibility for Decisions</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Recognition of Individualism in Learning</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Beliefs about Teaching</td>
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<td></td>
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<tr>
<td>Purpose--Facilitate Learning</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Together with Student</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Knowledge of Subject and Learning</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Skill in Presentation</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>
classroom, Dr. James spoke with a "comfortable" presence, responding to questions and criticism from an open rather than defensive posture. This openness and willingness to share with others was further reflected in his unhesitating response to all the researcher's questions and requests for information.

It would appear reasonable to suggest that Dr. James viewed himself as a person capable of effective teaching, who identified with students, and appeared open to information, ideas, and experience. These perceptions suggest that Dr. James held a positive view of himself as a teacher. This inference is consistent with the "positive view of self as a teacher" described by Combs, et al. [1976] who posit the construct teacher's perceptual organization.

Instructor Beliefs about Students

From observations of instruction, discussion with Dr. James, and students' remarks concerning the instructor's attitudes toward them, it appears plausible to infer that Dr. James respected students as individuals and learners. Student remarks were supported primarily with evidence from instructional arrangements and, to a lesser degree, from instructor-student interaction. That students felt valued as individuals was reflected in student statements about Dr. James, such as:

1. "He is flexible," "...empathetic...," "...understanding..."

2. "He really listens to you when you speak to him," or "He calls you by name," "...has learned everyone's name."
3. "He doesn't criticize you," "...put you down," "...think less of you if you choose only to do the final examination." "He doesn't make you feel like a dummy when you ask a stupid question."

4. "He is fair."

Specifically, Dr. James' instructional behaviors suggested that he believed students, as learners, were:

1. worthy of the time and effort involved in creating a highly organized arrangement of resources with a variety of opportunities for students to meet their needs based, in part, on an attempt to view learning from the perspective of the student

2. capable of learning, as evidenced by student volunteered reports

3. capable and trustworthy of assuming responsibility for decisions about learning, i.e., choice regarding objectives, assignments and evidence for a grade, alternative opportunities for learning outside of class

4. persons who learned and demonstrated learning differently, i.e., small group sessions to complement lectures, opportunities for student questioning, alternatives for learning outside of class, and alternative evidence for a grade.

It is interesting to note that Dr. James conveyed his beliefs about students primarily through instructional arrangements rather than through non-instruction-related instructor-student interactions.

In summary, Dr. James conveyed to students through instruction that he respected them as individuals and learners.

**Instructor Beliefs about Teaching**

In a discussion of teaching, Dr. James emphasized that as a teacher he was an advocate of maximum student achievement and/or learning. His intentions for the course and the ensuing instruction
reflected this perspective of teaching. The prevailing attitude of
students supported what appeared to be his belief that the purpose of
teaching was to help students learn. One student summed this student
attitude with the words, "His bottom line is that students learn!"
It would appear reasonable to conclude that Dr. James believed the
purpose of teaching was to facilitate learning and that this conclu­
sion is compatible and reflective of his apparent respect for students
as individuals and learners.

Instructor Beliefs about
Knowledge and Skill

From Dr. James' perspective, knowledge of subject matter and
"psychology of learning" were important elements of effective teaching.
Not only did he advocate these elements, but students considered him
to be knowledgeable of the subject content, as evidenced by logical
organization of content, use of a variety of references, and fluency
with which he responded to questions. That knowledge of "psychology
of learning" was important was demonstrated in the characteristics of
his lectures, e.g., logical organization, use of example, emphasis,
looping, orienting, questioning, and feedback. Opportunities to learn
outside of class and small group sessions promoted individualization.

In addition to knowledge, Dr. James considered skill in
presentation of the subject matter to be important for effective
teaching. In his view, information being presented should be accurate,
organized, clear, and interesting. Students cited his ability to
organize and explain with clarity to be hallmarks of his lectures,
which contributed to the reputation that he held as an "excellent"
teacher.
While Dr. James reported that knowledge and skill were important to effective teaching, evidence supports that Dr. James appeared to students to be knowledgeable and skilled as a teacher.

In the preceding discussion, the configuration of beliefs which characterize Dr. James' perceptual organization as a teacher have been inferred to be:

1. a positive view of self as a teacher
2. respect for students as individuals and learners
3. a belief that the purpose of teaching is to facilitate learning
4. a belief that knowledge of subject and learning, as well as skillful presentation of subject matter, is necessary for effective teaching.

This configuration is illustrated in Figure 11. In a later section of this chapter, it will be demonstrated that these aspects of perceptual organization contributed to and were reflected in skillful instructional decision making and instruction.

Context

Context refers to those factors that influence instructional arrangements that arise from institutional arrangements, student characteristics, and the nature of the field of study (Figure 12). In this study, institutional arrangements included factors related to academic policies, available resources, and teacher administrative responsibilities. Examples of academic policies include a ten-week quarter, two-and-one-half hour class sessions, and grading practices, including a final examination provision. Examples of resources included space and equipment, i.e., overhead projector, computer,
Figure 11. The Nature of Teacher's Perceptual Organization.
INSTITUTIONAL ARRANGEMENTS

ACADEMIC POLICIES

Two-and-One-Half Hour Class Session
Ten Week Quarter
Final Examination Period

RESOURCES

Space
Software--Transparencies
Equipment
Duplicated Material
Computer
Graduate Associate

INSTRUCTOR ADMINISTRATIVE RESPONSIBILITIES

Limited Instruction Related Time

STUDENT CHARACTERISTICS

Number, Identity, Level
Enrollment Status
Employment Status
Courses in Which Enrolled
Statistics and Research Courses Completed

FIELD OF STUDY

Interpretation and Analysis of Data
Catalog Description
Course Content Objectives

Figure 12. Elements of Context.
duplication, and services of a graduate associate. Because of administra- 
istrative responsibilities, the instructor's time available for 
instruction-related activity was limited. Student characteristics 
included those known to the instructor from the class roster, i.e., 
number of students enrolled, name and social security number of 
students, and college of enrollment. In addition, the instructor 
sought out information about program areas, enrollment status, employment status, number of courses in which enrolled, and number of 
statistics and research courses completed. Because most students had 
taken a prior course with the instructor, he also had information 
based on previous experiences with students. The field of study is 
limited by the course description, however, the nature of the subject 
matter will influence instructional arrangement decisions. In 
essence, context variables which influence instructional decision 
making consist of institutional arrangements, including academic 
policies, resources, and teacher availability, student characteristics, 
and the nature of the field of study.

Instructional Decision Making

Instructional decision making involves the teacher's decision 
regarding the arrangement of human, material, and temporal resources 
for the intention of facilitating learning. It also includes 
decisions about the scope of content, learning objectives, instruc-
tional strategies, and student evaluation.
Specifically, Dr. James made the following decisions:

1. Course content involved an overview of the use of descriptive and inferential statistics guided by four general objectives. (Students were provided opportunities to choose their own specific learning goals.)

2. A lecture format was supplemented with overhead transparencies, materials, and computer activities.

3. Small group sessions were scheduled weekly, as time permitted.

4. Provisions were made for opportunities to learn outside of class on a grade-no-grade option basis.

5. Options for submission of alternative evidence for a grade were provided.

It is reasoned that these decisions were influenced by various aspects of Dr. James' perceptual organization as a teacher and by the context. While it would be presumptuous to attempt to infer all influences bearing on Dr. James' decisions, the following relationships are suggested.

The decision to bound the subject matter for this course with an overview of descriptive and inferential statistics and their use, guided by objectives that involved selecting appropriate data analysis techniques, using the computer for computing statistics, interpreting analysis, and communicating the analysis in written report can be presumed to have been influenced by, among other factors, the following:

1. Teacher's perceptual organization
   a. teacher knowledge of subject matter
   b. teacher's prior experience with the course

2. Context
   a. time -- two-and-one-half hours weekly for ten weeks
b. graduate students with attendant research requirements
c. student's previous experience with statistics and research courses
d. number of students enrolled

The following factors could reasonably be said to have influenced the decision to use an expository strategy:

1. Teacher's perceptual organization
   a. teacher's experience and presumed skill with lecture technique
   b. teacher's prior experience with the course
   c. teacher's beliefs about learning
   d. teacher's knowledge of subject matter

2. Context
   a. time -- two-and-one-half hours weekly for ten weeks
   b. number of students enrolled
   c. available teacher time
   d. available resources -- projector, materials, computer, graduate associate
   e. subject matter and learning objectives

Optional opportunities to learn outside of class included reading and computer assignments, Part I and Part II exercises, mastery tests, and special projects. The option of providing alternative evidence for a grade could be indicated by choosing to have the exercises, mastery tests, or special projects entered for a grade. The decision to provide these learning opportunities and grading options appears to have been influenced by the following factors:
1. Teacher's perceptual organization
   a. teacher's beliefs about students, i.e., students as capable and trustworthy of making responsible decisions regarding their learning
   b. teacher's beliefs about learning, i.e., individualization, feedback, application
   c. teacher's previous experience with the arrangements
   d. teacher's beliefs about self

2. Context
   a. available resources
   b. teacher time

The decision to schedule small group sessions to provide more individualized contact for the purpose of clarifying student questions and providing opportunities to explore an idea beyond the lecture presentation appears to have been influenced by the following:

1. Teacher's perceptual organization
   a. teacher beliefs about students, i.e., recognition that students will have questions which, for a variety of reasons, will not be addressed during the lecture presentation, worthy of time required
   b. beliefs about teaching
   c. teacher enjoyment of student contact

2. Context
   a. limited teacher time for individual conferences

The instructional decisions which have been discussed to this point are those within the direct control of the instructor. Some decisions that influence instruction are generally considered beyond
the control of the instructor, or only controlled to a limited degree by the instructor. An example of this is the selection of a classroom and the particular furnishings of that room. Rooms are designated through a particular institutional arrangement based primarily on class size. Although an instructor may enter requests for specific room arrangements, these may not be available. Other examples of arrangements which may not be directly under the control of the instructor may include meeting time and availability of resources.

In this model, skilled instructional decision making is based on the degree of compatibility of instructional decisions with the context, and the degree to which the instructional decisions are congruent with Dr. James' inferred teacher's perceptual organization. Congruence is based not only on the correspondence of the decisions with the various organization of beliefs about self as a teacher, student, and teaching, but also on the degree of stability and consistency with which these beliefs influence decision making. While the determination "skilled" depends on compatibility with context and congruence with perceptual organization, it would be naive to believe that compatibility and congruence could be absolute. It is appropriate when viewing instructional decision making to consider decisions in terms such as "more" rather than "less" compatible and congruent with context and perceptual organization.

It is important to remember that teacher's perceptual organization is a complex interaction of beliefs. It is an inferred construct that arises out of an entire field of perceptions unique to the individual. While the predominant configuration of the teacher's
perceptual organization influences instructional decisions, at times other aspects of the teacher's entire field of perceptions may guide a particular decision. For this reason, compatibility is discussed in terms of degree while congruency is discussed in terms of degree of correspondence and stability and consistency of influence. Evidence has been presented in the previous chapter and in this section to suggest that Dr. James' instructional decisions were very compatible with the context and congruent, that is, correspondent and highly stable and consistent with his inferred perceptual organization.

Instruction

Skilled Instruction

A judgment regarding "skilled" instruction is based on the influence of decision making on instruction, decision making responsive to feedback from instructional evaluation, compatibility of instruction with the context, and congruence of instruction with the teacher's perceptual organization.

The influence of instructional decision making on instruction is seen in the actual implementation of the lecture strategy, small group sessions, opportunities to learn, and optional alternative evidence for a grade. In addition to these arrangements, other elements of instruction include teacher advance preparation for the course, student evaluation, and instructional evaluation.

That instructional evaluation influenced instructional decision making was clearly evident. Dr. James appeared to be responsive to existing opportunities, and he created new opportunities to evaluate
on-going instruction. He gained a "sense of how things were going" from information obtained from responses to teacher questioning in class and small group sessions, the nature of student questions in both settings, and the pace with which the class was moving. He created additional opportunities through further questioning during lecture, administering a short surprise mastery test in class with a grade-no-grade option, and determining student computer use. While he sensed that students were confused and progressing more slowly than other classes of students had progressed, he did not alter his overall approach to instruction. He did, however, intentionally become increasingly aware of cues from students' behaviors, and continued the same lecture strategies, placing greater stress on emphasis, looping, and questioning to promote greater clarity. One change was the addition of three during-course mastery tests late in the quarter that appeared to be a result of the perceived difficulty that students might be experiencing, thus providing them with feedback and another alternative to consider as evidence for a grade. This move seemed to reflect Dr. James' concern that students' time was perhaps becoming limited and that they might welcome another alternative so as not to be limited to only the final examination should they be unable to complete other options. It will be remembered that of sixty-two students, all but six chose to complete mastery tests and that they considered this option to be one of the most useful in contributing to their learning.

That lecture as a technique is compatible with the subject matter and the number of students enrolled in the course is a reasonable conclusion. That lecture is limited in providing opportunities
for application of ideas was acknowledged in the provision of a variety of opportunities for learning outside of class as well as supplemented by the use of concrete examples, e.g., computer printouts, during class. The particular strategies of using a projector, materials, and computer were compatible with the resources available to Dr. James.

The various aspects of instruction, as described in Figure 13, reflect congruence with the teacher's perceptual organization in terms of correspondence and overall stability and consistency of influence.

The implementation of lecture reflects the teacher's beliefs about the importance of "psychology of learning" and suggests that the teacher was knowledgeable and skilled in using the lecture technique. That he valued the student as a learner is demonstrated not only in the advanced preparation for the course and each class, but also the degree to which the lecture implemented what Dr. James believed is known about learning. While the characteristics of lecture reflect beliefs and knowledge of learning and demonstrate respect for the student as a learner, the implementation of small group sessions, opportunities to learn, and the option for alternative evidence for grade appear to reflect these beliefs as well as respect for the student as an individual. Specifically, students were given the opportunity to make decisions regarding their goals, learning tasks in which to engage, and what was to count as evidence for a grade. That Dr. James is capable of and skillful in creating instructional arrangements which facilitate learning is consistently confirmed by students. Further, they believed him to be knowledgeable, confident, and concerned that they learn.
Figure 13. Elements of Instruction.
The intentionality reflected in the totality of the arrangements and the perceived value of the arrangements by students reasonably support that Dr. James not only perceived the role of the teacher as one who advocates student learning, but also that students

In summary, that the instruction was considered skilled rests on the demonstrated evidence of the degree to which: (1) the particular arrangements chosen and implemented by Dr. James were directly influenced by instructional decision making; (2) instructional evaluation influenced instructional decision making; (3) arrangements were compatible with context; and (4) arrangements were congruent, that is, corresponded with the teacher's perceptual organization while it had a stable and consistent effect on instruction.

Potentially Effective Instruction

The intent of this study was not to evaluate Dr. James' instruction, but rather to describe the instructional experience of the instructor and students; however, a definition of effectiveness emerged from the description, as did evidence to suggest that for Dr. James, and for most of his students, his instruction could be considered effective.

Potentially effective instruction was defined earlier in this chapter in terms of judgments made both by the instructor and by individual students. From the instructor's perspective, instruction is effective if students demonstrate learning and it has been successful in facilitating demonstrated student achievement. From the
student's view, it has been effective if it has been recognized by the student to contribute to the achievement of student learning goals. "Potentially" is used to modify effective instruction because regardless of how optimally instruction has been arranged in order to contribute to learning, active student engagement must occur.

It will be remembered that in Chapter IV instructor and student reactions to the instruction were described. Dr. James was pleased with the achievement demonstrated by students in both the quality of work submitted and scores achieved on the final mastery test. He believed that this class had performed higher on the final mastery test than students in previous classes. While student achievement of learning goals was reflected in the grades achieved for the course, perhaps more useful in considering the effectiveness of instruction were student responses to a question regarding the degree to which their individual goals were achieved. On the whole, students reported that various learning goals were achieved. When they chose to qualify achievement, students assumed responsibility for anything less than achievement originally expected by them.

Propositions to Explain Potentially Effective Instruction

The instructional experiences of Dr. James and his students have been described in Chapter IV, and in this chapter a model has been presented to assist in gaining insights into what appeared to emerge as potentially effective instruction.
In this section, the model is reduced to necessary but not sufficient elements and relationships which are posited as a basis for understanding Dr. James' instruction as potentially effective.

Potentially effective instruction is a function of:

1. a teacher's perceptual organization that reflects the interaction of:
   a. a positive view of self as a teacher
   b. respect for students as individuals and learners
   c. a belief that the purpose of instruction is to facilitate learning
   d. knowledge of content and learning necessary for effective teaching

2. the influence of teacher's perceptual organization and context on instructional decision making

3. the compatibility of instructional decision making with context

4. the congruence of instructional decision making with teacher's perceptual organization

5. the influence of instructional decision making on instruction

6. the influence of feedback from evaluation on instructional decision making

7. the compatibility of instruction with context

8. the congruence of instruction with teacher's perceptual organization

9. the skill demonstrated by the teacher in instructional decision making and implementation of instruction.
Discussion

While these relationships are considered necessary and additive, the relationships between the various elements are relative rather than absolute. The relative nature of these relationships can be demonstrated with student examples where instruction was considered effective, although arrangements were not considered by the student to be optimal.

Before presenting student examples, an assumption is made about students. Students' reactions to instructional arrangements will be influenced by their unique organization of perceptions at any given moment. Just as it was posited that a teacher approaches teaching with an organization of perceptions about himself as a teacher, about students, and about teaching, so, too, it would appear from discussions held with students and observations of their behaviors, that students have a particular organization of perceptions in their roles as students. This organization appears to include students' views about themselves as learners, beliefs about the nature of instruction, and beliefs and expectations about teachers. Other influences that students bring to the instructional setting include their abilities to learn, motives for enrolling in a course, goals for learning, and outside responsibilities.

Certain aspects of the suggested student perceptual organization appeared to influence how students in this class interpreted the instruction and their judgment regarding its effectiveness. These included:
1. the students' beliefs regarding their ability to master the subject matter
2. the students' previous experience with the subject matter
3. the students' attitude toward the subject matter
4. the students' ability to set learning goals in relation to their perceived abilities and outside responsibilities
5. the students' ability to re-define learning goals in relation to their perceived abilities and outside responsibilities
6. the compatibility of the instructional arrangements with student learning styles
7. the students' beliefs about the teacher's respect for them as individuals and learners
8. the students' beliefs that the teacher is knowledgeable and that his purpose is to assist students in learning
9. the students' beliefs that they can learn from the teacher or the instruction.

Three examples drawn from information provided by students will be cited to support the relative nature of the relationship between the various elements of potentially effective instruction.

The first student's experience is recounted in the following way:

1. A student was motivated to take the course because it was her best opportunity to learn the content, but the course itself was the lowest in priority of the five courses in which she was enrolled. She appeared confident of her ability to master the subject matter and was able to set her learning goals.

2. She interpreted the highly structured organization of the lecture as less than ideally matching her learning style, one in which she preferred to organize the information. She was easily bored, however, found ways to compensate, i.e., eliminate readings prior to class. She chose not to engage
in additional learning opportunities which might have served to challenge her further.

3. The decision not to engage in additional activity was related to a lack of priority for the subject matter and trust that she could adequately demonstrate achievement of course goals through the final mastery test.

4. She indicated that her decision to remain enrolled in the course was based on her belief that the instructor was knowledgeable, as evidenced by the logical organization and structure demonstrated in lecture, her belief that Dr. James was sincere in his concern for student learning, and that he respected her as a person and learner. Finally, she felt that her learning goals would be facilitated by the instructor. "It will be the best shot I'll get."

It would appear, in this instance, that Dr. James' beliefs about student learning, especially recognition of individual learning styles, as implemented in the instructional arrangements, while compatible with the learning styles of most students, were not entirely compatible with those of this student. While this student's perceived capability and particular learning goals appeared to be central to her decision to remain enrolled in the course, the model for potentially effective instruction can be useful in explaining the other factors which contributed to this student's judgment that the instruction was effective. It would appear that when the match between instructional arrangements and an individual's learning style is less than optimal, as was the case with this student, the critical elements contributing to a judgment of effectiveness become the particular configuration of teacher's perceptual organization inferred by this student through her experience with the instructional arrangements. Those critical factors included a belief that the instructor was
capable, that he was sincere in his intent to assist students, and that he respected students as individuals and learners.

In a second example, a student who previously had not had courses with Dr. James enrolled in the course because of its reputation and her previous poor quality of experience with other research courses.

1. Following the first two sessions she became convinced that the subject matter was very relevant for her and that the instructor was knowledgeable and arranged instruction in a way that was highly compatible with facilitating her learning.

2. She attempted to engage in the computer exercises, but found them very time-consuming and incompatible with her other responsibilities.

3. While in the process of experiencing some confusion regarding the instructor's expectations of student learning, she decided to modify her goals in relation to the time available, concentrating on the lecture information which she found to be very clear.

4. With the addition of mastery tests, she became more aware of the instructor's expectations and in completing these tests received feedback on her learning.

5. She identified with the instructor's effort in preparing the learning experience and felt that he respected learners. She was surprised and pleased when, after a very short time, he addressed her by name.

In this case, the aspects of instruction which might be considered less than ideal were lack of clarity regarding performance, expectations for students, and inability on the part of this student to utilize the various options provided to demonstrate learning. She considered the re-definition of her learning goals to eliminate outside learning activities was important in adjusting to the anticipated
expectations of the course and her learning goals. She readily volunteered her opinion that the instructor was knowledgeable and the instructional arrangements were excellent. Further, she cited the addition of mastery tests as a critical event in clarifying for her the teacher's expectations and contributing to her learning through providing feedback. It would appear that the elements of the model that help to explain the resolution of lack of clarity was instructional evaluation, feedback, and instructional decision making. Dr. James sensed confusion, perceived time limitation on the part of students, and added the mastery tests. Further, the student recognized the value of the instructional arrangements, the ability and attitudes of the teacher toward students in meeting their goals. This recognition was based only on instructional experience, as she had no interaction with the instructor outside of class.

In a final example, the model will be used to explain effective teaching when there is incompatibility of student characteristics and resources with opportunities for learning. This student had two previous courses with Dr. James and considered him to be an excellent instructor, one who considered the purpose of teaching to be the facilitation of learning. She identified with his teaching strategies and attempted to improve her own teaching by emulating various aspects of his instruction. In this example the following were critical factors:

1. She chose to complete all opportunities for learning which could be submitted for a grade. Her rationale for this decision rested on her apprehension regarding the subject matter and her previous successful experience with this approach.
2. In choosing to complete all of the Part I and Part II computer exercises, she found that she had insufficient information and/or background to complete the task without spending considerable (twenty to thirty hours a week, initially) unproductive time. She availed herself of help provided by the computer center, the graduate associate, and fellow classmates, however, she continued to experience difficulty.

3. When the mastery test options became available, she chose to complete each of them and altered her decision to complete all of the computer exercises.

4. Because she had spent so much time on the exercises, she had not kept up with the material presented in class, finding herself very confused much of the time. She believed that she had made a poor judgment, initially, in choosing to do all of the exercises.

5. The decision to complete only part of the exercises and to attempt the mastery tests provided additional time to study and feedback which confirmed her confusion.

6. When she began to study for the final examination, she found that information in her notes was very clear and helped her to "put things" together.

This student found her abilities inadequate to cope with the opportunity for learning provided by the computer examples, and the resources for assistance to be inadequate. While she suggested that in the future additional instruction be provided students in completing computer exercises, she felt that the instructional experience assisted her in meeting her goals. The model is useful in providing insight into how instruction can be considered effective when the degree of compatibility of a task with a student's ability and resources was less than ideal. First, the student believed the instructor to be very capable, that he was concerned about student learning, and could help her achieve her objectives. Second, the
addition of the mastery tests provided her with feedback and alternative evidence for a grade. This would appear to support the relevance of both the influence of teacher's perceptual organization on instructional arrangements and instructional decision making based on feedback from instructional evaluation as useful factors in experiencing effective instruction.

The most useful element of the model would appear to be the skill with which the instructor organized lecture presentations to reflect beliefs about learning. This is reflected in the quality of the notes taken by the student and their usefulness to her in preparing for the final examination. While it would be unrealistic to explain the complexities of this student's experiences in such simplistic terms, the model does suggest how one aspect of instruction can be compensated for by another to create a potentially effective learning situation.

The examples cited in this section were chosen to demonstrate how the relationships between the relevant elements of potentially effective instruction are not absolute but relative. In these cases, some aspects of the instructional arrangements were not totally congruent or compatible with the student's, however, each was able to make judgments about the instruction which indicated that it was effective.

Summary

In this chapter, a model for potentially effective instruction was proposed and discussed with the intention of explaining Dr. James' instruction. Propositions for potentially effective instruction, as developed from the resultant description of the instructional
experience of Dr. James and his students, were presented. The chapter concluded with examples of how various aspects of the model were useful in explaining instruction when certain aspects were less than ideal for particular students.

A brief overview of this study and its findings is presented in Chapter VI. Conclusions are drawn and discussed in terms of generalization and implications for the future study of teaching.
CHAPTER VI

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

The design and implementation of this study were based on the premise that observing instruction from the perspectives of teacher, students, and the researcher would result in a description that was reflective of the complex nature of instruction. It was further assumed that this description would result in the generation of explanatory propositions that would contribute meaningfully to the further study of teaching. It is this description and resultant propositions for future study that are the subjects of this chapter.

Overview

This chapter is divided into two parts. The first is a presentation of a brief summary of the study and its findings. Findings include descriptions of instruction, the nature of the instructor's perceptual organization as a teacher, and its relationship to instruction. Second, conclusions are presented and discussed in terms of generalizations and their implications for the further study of teaching.
Summary of the Investigation

A field study approach was utilized to study the instructional experience of a university professor, the recipient of a university-wide award for distinguished teaching, and sixty-two graduate students enrolled in one of his courses. Information about the instruction and the instructor's and students' perceptions of their instructional experience was obtained from a variety of sources. These included: the researcher as a participant observer, extensive interviews with the instructor, intensive interviews with ten students, three student questionnaires administered to the entire class, instructional materials, and various documents. Field notes were kept of all interactions the researcher had with the instructor and participants.

Because instruction was considered to be the teacher's intentioned process of arranging resources to facilitate learning, information was analyzed from the teacher's perspective. Student and researcher perspectives were used to assist in the interpretation of the perspective of the teacher. Specific analyses included content analysis, comparative analysis, and computer analysis of events encoded using the Observation System for Instructional Analysis (O.S.I.A. IV).

Themes were developed and relationships established. These, in turn, were supported by descriptive information. The study resulted in the generation of a definition of potentially effective instruction and a set of propositions that were useful in making meaning of the instruction observed.
Findings about Instruction

The instructional arrangements observed in this study were characterized by teacher intent, as evidenced by the advanced preparation for the course and each class session and the organization and structure with which the arrangements were implemented. Decisions regarding instructional arrangements as well as implementation were responsive to the context variables of student characteristics, institutional arrangements, including academic policies, resources, and instructor time, and the nature of the field of study.

A lecture strategy, accompanied by the use of overhead transparencies and supplemented by instructional materials, namely, mimeographed handouts and computer printouts, was used to present information on the analysis and interpretation of data. Four learning objectives and the structure of the subject matter influenced the organization of the presentation. Lectures were characterized by frequent use of materials, examples, emphasis, looping, orienting, and questioning behaviors. It would appear that these behaviors contributed to the student perceived clarity of presentation.

Other characteristics of the instructional arrangements included providing opportunities for students to engage in learning activities outside of class, establishing small group sessions for the purpose of providing students an opportunity to clarify and expand ideas, and providing an option for submitting additional evidence for a grade.

Instructional evaluation which involved making use of existing opportunities, as well as creating opportunities, provided the
instructor with information about student response to instruction. This information influenced the modification of arrangements that were responsive to difficulties students appeared to be experiencing. While the instructor made some modifications, generally by providing additional opportunities for outside learning experiences and additional options for a grade, he basically did not alter his overall plan for the course during the quarter.

Instructional decision making and instruction were considered skillful on the basis of their congruence with the various aspects of teachers' perceptual organization and their compatibility with contextual influences. Of particular interest was that part of the teacher's perceptual organization that related to the instructor's beliefs about the application of principles from psychology of learning. It was evidence of this application that students identified as contributing to excellence in teaching.

Findings about Teacher's Perceptual Organization

Teacher's perceptual organization is an inferred construct of the interactions of a teacher's perceptions about himself as a teacher, his students, teaching, and the knowledge and skill necessary in teaching. It was hypothesized that one's perceptual organization influences his behavior at any moment of behaving. One's perceptual organization is a fluid, yet stable and consistent, organization of perceptions. While a teacher may make most decisions as a result of his particular perceptual organization as a teacher, at times,
various other aspects of his perceptual organization will influence teaching behavior.

Several findings about the teacher's perceptual organization emerged from this study. First, the inferred teacher's perceptual organization of the instructor in this study was characterized by the following:

1. a positive view of self as a teacher
2. respect for students as individuals and learners
3. a belief that the purpose of teaching is to facilitate learning
4. knowledge of subject matter and learning, and skill in presentation of information are necessary for effective teaching.

Second, the teacher's perceptual organization influenced the instructional arrangements, including teacher-student interactions. Third, the instructional decision making and instruction were congruent with the teacher's perceptual organization. Specifically, they had a correspondence with the perceptual organization, and the perceptual organization had a stable and consistent influence on decision making and instruction. Fourth, the teacher's perceptual organization was transferred to students through the instructional arrangements rather than through non-instruction-related teacher-student interaction. The specific teacher's perceptual organization was perceived by students and seemed to influence student reactions to the teacher and to the instructional arrangements.
Findings about Potentially Effective Teaching

While the intent of this study was not to evaluate the effectiveness of instruction, it became evident from information provided by the instructor and students that one could propose what appeared to be criteria of effectiveness for the participants of the study. Effectiveness would appear to be a combination of congruent judgments made by the instructor and individual students. From the teacher's perspective, effective instruction can be judged in terms of demonstrated evidence of learning by students and the degree to which the instructor perceived that the instructional arrangements contributed to student learning. From the student's perspective, effectiveness is judged by the degree to which the student believes that the arrangements influenced the achievement of his learning goals. Information provided by students suggested that they had a variety of learning goals, sometimes unknown to the instructor, and that the instructional arrangements assisted them in accomplishing these goals. It becomes necessary from the teacher's point of view to modify "effective" with the term "potentially" because the active involvement of students is ultimately necessary for learning to occur. In this study, there is sufficient evidence to support the statement that the instructional arrangements could be considered effective. It is interesting to note that these judgments could be inferred even when not all aspects of the instructional arrangements were considered optimal by each student or by the instructor.
In summarizing the findings, it can be said that the instructor demonstrated a particular perceptual organization as a teacher and that this organization influenced not only the instructional decision making and the instruction, but was perceived by students through the instructional arrangements. Students' reactions and engagement with the instruction were influenced by the particular teacher's perceptual organization exhibited by this instructor. An equally important finding was the fact that there was evidence of skillful instructional decision making and implementation of instructional arrangements. Finally, from the perspective of the instructor and of individual students, instruction was considered effective.

Conclusions and Implications

The significance of this study rests on the generation of empirically grounded information which contributes to the further understanding of the nature of the complexity of teaching, the degree to which conclusions can be generalized, and, finally, on the implications these conclusions hold for the future study of teaching.

Conclusions

The findings of this investigation support the generation of two major conclusions:

1. a useful definition of effective instruction
2. a set of propositions to explain potentially effective instruction.
Traditionally, the effectiveness of instruction has been determined either by student ratings of their instructional experiences or by their achievement on criterion measures. It would appear that these approaches are based on two assumptions. Because these approaches do not consider the degree of active student engagement in the instructional process when judging effectiveness, it would appear that, first, an assumption is made that instruction, in and of itself, can be judged effective. Second, the use of common criterion measures for all students suggests an assumption that a judgment of effectiveness is based on common learning goals.

The construct, "potentially effective instruction," used in this study recognizes that for instruction to influence learning, students must actively engage in instructional arrangements and that the instructor and individual students make judgments regarding the achievement of learning goals and the influence of instruction on the achievement of these goals.

In this study, varying goals were identified among students and between individual students and the instructor, suggesting the importance of a mutual determination of effectiveness and its effect on the congruence of judgments about effectiveness made by the instructor and individual students. It is suggested that this approach to determining effectiveness more nearly reflects the reality of the setting studied than those approaches which do not recognize the necessity of student engagement in instructional process and the existence of a variety of student learning goals.
The findings of this study support the following propositions about the nature of potentially effective instruction. While they cannot be considered to be sufficient to understand the complexity of the teaching-learning experience, evidence would support that they are necessary conditions.

Potentially effective instruction is a function of:

1. a teacher's perceptual organization that reflects the interaction of:
   a. a positive view of self as a teacher
   b. respect for students as individuals and learners
   c. a belief that the purpose of instruction is to facilitate learning
   d. knowledge of content and learning necessary for effective teaching.

2. the influence of the teacher's perceptual organization and the context on instructional decision making

3. the compatibility of instructional decision making and the context

4. the congruence of instructional decision making with teacher's perceptual organization

5. the influence of instructional decision making on instruction

6. the influence of feedback from evaluation on instructional decision making

7. the compatibility of instruction with context

8. the congruence of instruction with the teacher's perceptual organization

9. the skill demonstrated by the teacher in instructional decision making and the implementation of instruction.
Generalizability

While the conclusions generated by this study about the criteria for determining the effectiveness of instruction and the necessary elements of potentially effective instruction may appear to reflect common sense knowledge or conventional wisdom of the profession, it is significant that the conclusions have been empirically grounded. It would be inappropriate to generalize these conclusions to other settings, however, it is reasonable to consider the implications of this model for potentially effective instruction for other university faculty in instructional settings where graduate students are involved.

If one accepts the premise that an individual's behavior is influenced by an internal organization of the entire field of perceptions, it is appropriate to assume, as has been demonstrated in this and other studies, e.g., Combs, et al. [1974], that a teacher holds a certain organization of beliefs that has been identified as teacher's perceptual organization. Based on this premise and assumption, there are several reasonable implications of the model for potentially effective instruction.

It is possible that other university faculty members who have been publicly recognized for their teaching may share similar perceptual organizations as teachers, regardless of differing contextual influences and choice of instructional arrangements. Similarly, their skill in arranging and implementing instructional arrangements may be directly related to the correspondence of the arrangements with their perceptual organizations and the degree to
which there is stable and consistent influence of the perceptual organization on instruction.

Faculty members who do not share similar perceptual organization as teachers becoming sensitive to their perceptions about teaching, about themselves as teachers, about students and necessary requirements of teaching, as well as to the proposed impact of these beliefs on instruction, might be helped in examining and understanding the effectiveness of their own instruction by considering the findings of this study.

In situations where contextual influences and instructional strategies are similar to those of the instructor in this study, beliefs about learning, instructor planning and organization, and ongoing instructional evaluation may serve as a useful model for the effective use of these strategies.

Implications for Future Research on Teaching

The use of an integrated set of propositions to explain potentially effective instruction provides a conceptual frame of reference for the inclusion of the various elements which contribute to the complex activity of instruction. Kaplan [1964] likened explanation to a "concatenated description." He elaborated,

Because of concatenation, each element of what is being described shines, as it were light reflected from all the others; it is because they come to a common focus that together they throw light on what is being explained [p. 329].
Whereas research on teaching has often emphasized a single variable linkage approach, to have studied single variable effects in this study would have resulted in a distorted description and explanation of the instructional experience. It was the interrelatedness of variables within an organizing frame of reference that contributed to an understanding of the experiences of the participants and their judgment of instructional effectiveness. Related to the development of this description and, consequently explanation, was the research methodology which facilitated a multi-perspective and multi-method approach to gaining an understanding of the instructional experience. Without an approach such as this, it would not have been possible to develop an integrated set of propositions that represented a valid explanation of instruction as perceived by the participants. These conclusions would support the following recommendations:

Recommendation 1 -- Future research on the study of teaching should be guided by a conceptual frame of reference which is developed through a multi-perspective approach to investigation.

The usefulness of the propositions that emerged in this study rests on the success of the model for potentially effective instruction in integrating variables related to the specific process of arranging resources to facilitate learning and to teacher and student beliefs, attitudes, and reactions. Previous research on teacher's perceptual organization in the study of effective teachers has seldom related teacher's perceptual organization to the process of instructional arrangements, or to students' and teachers' reactions to the arrangements. This study demonstrated that the teacher's particular perceptual organization directly influenced instructional decision
making and instruction which contributed to its success in the ways in which students responded to the arrangements. That the construct of teacher's perceptual organization is useful in the study of instruction is supported by the way it served to concatenate the multiple variables, thus producing a meaningful description and explanatory set of propositions. Consequently, the following recommendation concerning the construct teacher's perceptual organization is made:

**Recommendation 2** -- The construct teacher's perceptual organization should continue to be used as a construct in the study of the specific process of arranging instructional resources to facilitate learning.

A further recommendation follows:

**Recommendation 3** -- The propositions for potentially effective instruction that resulted from this study should be tested in other instructional settings.

Questions for Future Study

Further research questions were prompted by the propositions posed in this study. They include:

1. Do other teachers who have received recognition for their teaching share similar perceptual organizations as teachers?

2. Do teachers who have been publicly recognized for teaching demonstrate different configurations of perceptual organization as a teacher?

3. What is the perceptual organization of other college teachers who have not been publicly recognized for their teaching?

4. How do differing configurations of teachers' perceptual organization affect instruction and students' response to instruction?
5. What effect do differing perceptual organizations have on instructional arrangements?

6. Is the influence of the teacher's perceptual organization apparent in instructional settings with differing influences and instructional strategies?

7. Are students able to consistently infer an accurate teacher's perceptual organization?

In conclusion, ultimately what is needed is a comprehensive theory to explain and predict effective instruction. Instructional theory will be developed only if research on teaching is focused on the complexity of the teaching-learning experience as it occurs within particular settings and is experienced by teachers and students. The role of the teacher and individual students cannot be overlooked. It is their accumulative experiences and multiple perspectives that provide valid information about the effectiveness of a process that they experience daily.
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BIBLIOGRAPHY


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APPENDIX A

STUDENT ORIENTATION
STUDENT ORIENTATION

The following is an outline of remarks that will be made to students on the first day of class.

1. Researcher's interest in study of teaching
2. Professor's willingness to have his course be a focus of study
3. Purpose of research
   a. description
   b. generation of propositions about teaching
   c. development of research methodology
4. Significance of study
   a. limited focus on complexity of teaching
   b. focus--instruction, student and teacher perspectives
5. Data collection and student involvement
   a. researcher as an observer-participant
   b. student questionnaires
   c. cohort student research group
6. Voluntary nature of participation
7. Confidentiality
   a. individuals
   b. specific course number
   c. university
8. Provide opportunity to address student questions
APPENDIX B

INITIAL STUDENT QUESTIONNAIRE
INITIAL QUESTIONNAIRE

Please answer the following questions using the back of this page should space following the questions be insufficient for your answers.

1. What factors motivated you to enroll in this course?

2. What would you like to accomplish in this course?

3. What have you come to know regarding the reputation of this course?

4. Have you taken another course with this Professor? _____Yes _____No

   Number of Courses _____

   If yes,

   Has this contributed to your decision to enroll in this course? _____Yes _____No

   Please explain.

   What have you come to expect of this professor as a teacher?
5. Describe the instructional arrangements and/or classroom conditions which interfere with your learning.

6. Describe the instructional arrangements and/or classroom conditions which best promote your learning.

7. Would you be willing to serve as a cohort participant researcher and meet with me regularly to contribute to the evolving research design and to share your perceptions of this class experience?

_____ Yes _____ No
APPENDIX C

INTERVIEW SCHEDULE -- TEACHER
INTERVIEW SCHEDULE -- TEACHER

This interview will be concerned with three general areas: the class under study, your teaching career and your beliefs about teaching.

Do you have any questions before we begin?

1. How long have you been on the faculty of (name institution)?

2. What are the responsibilities associated with your present position? Have they changed over time? How?

3. Would you describe (name course under study) in terms of (a) for whom it is intended, (b) class size, and (c) general content?

4. What are your plans for this course?
   Probe - organization, instructional method, student evaluation, rationale for decisions in these areas
   How long have you taught this particular course?
   How have your plans changed over time, evolved over time?

5. What has been the development of your teaching career?
   Probe - circumstances surrounding career choice, career history, career expectations

6. What kind of knowledge do you think a teacher must possess?
   What does he have to know to do your job?
   Which are most important?

7. What must a teacher be able to do? What skills must he possess? What are most important?

8. What kind of reputation would you most like to have with your classes and the students with whom you deal?

9. What kind of expectations do you have about students in your classes?
10. What are your greatest strengths as a teacher?

11. Teachers talk about "good" and "bad" days. Tell me about the circumstances surrounding a "good" day, "bad" day.

12. Think about something that has made you particularly proud as a teacher. Tell me about it.

13. People define teaching in different ways. How would you define your role as a teacher?

14. You have received three awards in recognition of teaching. What impact has this had on you?

15. Is there anything that you would like me to know that would help me better understand your teaching?
APPENDIX D

INTERVIEW SCHEDULE -- STUDENT
INTERVIEW SCHEDULE -- STUDENT

1. People define teaching in different ways.
   How would you define the role of a teacher?
   How do you think that Dr. James defines his role as a teacher?
   Probe -- examples

2. To what degree do you think that Dr. James is self confident as a teacher?
   Probe -- examples

3. To what degree do you think that Dr. James is knowledgeable as a teacher?
   Probe -- examples

4. As students we all have "good" and "bad" days in the classroom.
   Can you think of the circumstances under which you have experienced a "good" day in a class? Tell me about it. A "bad" day? Tell me about it.
   Have you experienced any "good" days in Dr. James' class? Tell me about them.
   Have you experienced any "bad" days in Dr. James' class? Tell me about them.

5. Teachers have different beliefs and attitudes toward students.
   What kind of beliefs and attitudes do you think Dr. James has about students in this class?
   Tell me how you have come to know of these beliefs and attitudes.

6. What expectations do you think Dr. James' has about students in this class?
   Probe -- examples

7. If you had to describe Dr. James' teaching style to a students who hasn't had a class from him, how would you describe it?
8. If you had to advise a new student about to enroll in this class, what advice would you give?

9. Do you believe that Dr. James sees students as "persons"?
   
   Probe -- examples

10. What suggestions would you make to improve this class?

11. I have made the following observations about instruction in this class. I am going to share them with you. Will you react to the accuracy of my observations? (to be developed from observations)

12. What are your current responsibilities outside of class? (family, work, course load)
APPENDIX E

INTERIM QUESTIONNAIRE
INTERIM QUESTIONNAIRE

Name ________________________________

Part One

Drawing on your experience to date in this class, please respond to the following:

1. Have you observed or experienced opportunities for students in this class to demonstrate their abilities in different ways? yes no
   Cite several examples of what you have observed or experienced.
   Star (*) those examples, if any, which have facilitated your learning.

2. Have you observed or experienced opportunities for students in this class to apply ideas presented in class? yes no
   Cite several examples of what you have observed or experienced.
   Star (*) those examples, if any, which have facilitated your learning.

3. Have you observed or experienced the use of concrete examples in the course instruction? yes no
   Cite several examples of what you have observed or experienced.
   Star (*) those examples, if any, which have facilitated your learning.
4. Have you observed or experienced feedback as part of the instruction in this class? 
   yes no
   Cite several examples of what you have observed or experienced. 
   Star (*) those examples, if any, which have facilitated your learning.

5. Have you observed or experienced instances where logical organization was used in the presentation of course content? 
   yes no
   Cite several examples of what you have observed or experienced. 
   Star (*) those examples, if any, which have facilitated your learning.

6. Have you observed or experienced instances where the organization of the course makes sense to the students? 
   yes no
   Cite several examples of what you have observed or experienced. 
   Star (*) those examples, if any, which have facilitated your learning.
Part Two

Complete the following two sentences.

1. Following the first few class periods, my initial reactions to this class, both the instruction and assignments, were:

2. My present reactions to the instruction and assignments are:
APPENDIX F

FINAL QUESTIONNAIRE
FINAL QUESTIONNAIRE

NAME ________________________________________

Part One

1. What suggestions do you have for improving this course?

Part Two

For each item, place a check mark (✓) in the space on the continuum that best describes your recollection of your instructor's teaching.

1. Clarity - Ideas were expressed in ways that were clearly understood; questions were asked by the teacher in a way that the intent of the questions was clearly related to larger concepts; and examples were used to illustrate concepts.

   Teaching lacked clarity to the point of being inadequate

   Teaching was extremely clear to the point of being outstanding

2. Variability of Teaching - Effectively used a variety of instructional activities and materials.

   Teaching lacked variability to the point of being inadequate

   Teaching varied effectively to the point of being outstanding

   Effectively used a variety of means of giving feedback to students regarding their attainment of course outcomes.

   Teaching lacked a variety of feedback to the point of being inadequate

   Teaching used a variety of feedback to the point of being outstanding

3. Enthusiasm - Displayed personal commitment to the importance of the course content; expressed a personal excitement about the ideas taught and excitement about thinking about these ideas with students in class.

   Teaching lacked enthusiasm to the point of being inadequate

   Teaching expressed enthusiasm to the point of being outstanding

4. Task-Oriented and/or Businesslike - Got down to the task of teaching promptly; developed and sustained a classroom atmosphere in which students considered it important to seriously consider and learn the content of the course.

   Teaching lacked a task-oriented and/or businesslike quality to the point of being inadequate

   Teaching reflected a task-oriented and/or businesslike quality to the point of being outstanding
5. **Criticism** - Displayed strong personal criticism of students; ridiculed students and/or made students the object of sarcasm; in expressing criticism, ridicule or sarcasm of students did so in a way that appeared to enhance the teacher's position of authority rather than expressing a concern that students learn course content.

Teaching was characterized by the use of personal criticism to the point of being inadequate.

Teaching was characterized by an absence of personal criticism to the point of being outstanding.

6. **Indirectness** - Created and sustained a classroom atmosphere in which students felt free to engage in venturing their own opinions, alternative ideas and explanations without concern that such venturing would be ignored or devalued.

Teaching lacked the quality of indirectness to the point of being inadequate.

Teaching reflected the quality of indirectness to the point of being outstanding.

7. **Opportunity to Learn Criterion Material** - Provided for instructional opportunities in class and/or outside of class (by means of structured assignments) through which students could really learn the content of the course if they availed themselves of those opportunities.

Teaching was characterized by a lack of opportunity to learn to the point of being inadequate.

Teaching was characterized by providing opportunities to learn to the point of being outstanding.

8. **Multiple Level of Discourse** - Provided opportunities for students to acquire and/or review fundamental learnings (such as basic concepts and processes) and to use these fundamental learnings in activities that required higher order thought process.

Teaching was characterized by a lack of multiple levels of discourse to the point of being inadequate.

Teaching was characterized by use of multiple levels of discourse to the point of being outstanding.

9. **Structuring Comments** - Provided overviews of the content of the course and/or class sessions; established cognitive boundaries within which students felt that they knew what they were doing and how to proceed.

Teaching was characterized by lack of structuring to the point of being inadequate.

Teaching was characterized by appropriate structuring to the point of being outstanding.

Established expectations and means of attaining those expectations in a way that was understandable.

Teaching was characterized by understandable established expectations/means of attainment to the point of being outstanding.
10. **Extra-Class Concern for Student's Learning** - Provides ample opportunity outside of class for conferences, small group sessions and/or conversations with students regarding the context of the course, related substantive issues and/or student progress toward attainment of course outcomes.

Teaching was characterized by lack of concern for student's learning to the point of being inadequate.

Teaching was characterized by extra-class concern for student learning to the point of being outstanding.

11. **Intellectual Challenge** - Engaged students in activities and/or the exploration of ideas in a way that stretched their thinking and introduced them to new ideas and/or ways of thinking about and/or using ideas.

Teaching was characterized by lack of challenge to the point of being inadequate.

Teaching was characterized by challenging students to the point of being outstanding.

**Part Three**

1. Place a check on the space on the continuum that most nearly describes this teacher.

   This teacher considers students to be

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<th>Unfriendly</th>
<th>Unworthy</th>
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2. On a continuum from 1 to 5 where 1 represents little value and 5 represents great value to you in meeting your course objectives, rate the following items by placing a 1, 2, 3, 4, or 5 on the space provided. If the item is clearly not applicable in your case, indicate with the letters NA.

   - reading assignments
   - during course mastery tests
   - special projects
   - mimeographed handouts
   - computer runs
   - computer printouts
   - exercises - set 1
   - exercises - set 2
   - instruction - use of examples
   - instruction - use of questions
   - instruction - summarizing
   - instruction - identifying "big ideas"
   - small group sessions
   - having had a previous statistics course
   - having had previous experience punching computer cards
   - having previous experience with SPSS
   - SPSS workshop
4. To what degree did you meet your course objectives? Explain.

5. Please feel free to add other comments which might help me to better understand this course as you have experienced it.
APPENDIX G

EXCERPTS FROM INTERVIEWS WITH DR. JAMES
EXCERPTS FROM INTERVIEWS WITH DR. JAMES

R = Researcher
T = Dr. James

September 12

R: What will be the format of presentation of data?

T: Well, I guess I would call it predominantly lecture. I'll do most of the talking. I will involve students in discussion and questions, but it will be predominantly me talking, with questions from the group--I'll ask questions, this sort of thing. But I would guess it's not even appropriate to label it a lecture/discussion, it's more like lecture than it is discussion.

R: What has gone into making your decision to present material in this way, to use the data base and to provide the 800 student data base?

T: I guess the major factor that has gone into that situation is the fact that I am convinced that students learn best when they can apply the ideas or when they can use concrete situations to help develop the idea. So, for that reason, I guess I want to make it as realistic as possible. One way, of course, would be to have each student have their own data base and then to analyze it. Well, this isn't possible, so, therefore, I have gone to the use of the data base which is information that the students are aware of, obtained in courses they have had previously with me, and try to use that as a way of getting at the basic ideas, the very basic concepts, see it in action, and be able to do it as well as possible. And I guess if I had to pull out a rationale for that it has to do with what I think I know or what I believe about transfer of learning and that is, if you are going to expect transfer which is what I am teaching for, for their own research, then maybe I had better teach them to transfer and one way to do that is to put this in a real-lived concept. (Instructor proceeds with an example.) So that's really my major rationale for wanting to use that large data base is try to make the very basic rationale of inferential statistics very real.

R: Do you intend to use any audio visual equipment?

T: The overhead.
R: Has that evolved or why have you found that a particularly useful...?

T: Well, I have found that at one time I used to use the chalk board. I found that it is probably easier for me and I think it is more fair to the students if I can have the same information on the overhead, and present it to them in that fashion, particularly with the larger classes. I can have direct contact with the students without having to turn my back and write on the board and this kind of thing. One of the things students have helped me learn over a period of time now on the overhead is that if there is extensive material on the overhead, that I now move to, in effect, duplicate that and distribute it to students so they do not have to write down a great deal. They can use then those pages to make whatever additional notes based upon my comments because on the overhead, basically, I just try to capture the major idea. I've observed this, that if there is a great deal on the overhead, students are writing that down and they are missing what I am saying and a universal thing I have observed is that graduate students will write down whatever you put on the overhead.

R: Will you be using any other materials in addition to the computer printouts and the overhead?

T: There will be other handouts that have to do with various aspects of the course, but most of them will be connected with the computer printout. There will be exercises the students will be asked to do on the computer, and there will be handouts about those. There will be some computer printouts that I will run and distribute to students that I probably will not ask students to do. I do have some handouts on other topics in the course--handouts on Chi Square and handouts on descriptive statistics. Each student is asked to have a basic statistics book and I encourage them to have the SPSS manual, since we will be using that system.

R: You mentioned that the students will be involved in activities related to the computer printout sheets. Is there any other activity that the students might be involved in?

T: I suggest to students---I pose a group of questions that they could respond to in terms of the data base. My questions are in terms of the data base as a way of them designing their own analysis, deciding what analysis to use--getting the computations and reporting the data. This is a way of them going beyond the exercises. I make that optional and students may do that or they may not. They may do it and submit it to me for a grade if they wish to--as a part of their grade.

R: How do you determine the evaluation of the students' performance?
T: I require that they complete an end of course test, and from that point on the student may elect to submit additional evidence. That evidence could be things like, as I mentioned, these series of exercises where I pose questions—they analyze the data and report it. I evaluate in terms of—did they use the most appropriate or inappropriate statistics, did they do the correct computations, did they interpret it correctly, and did they report it? I have on occasion provided other data bases for students if they wish to use that to demonstrate to me that they can accomplish the four purposes of this course. I would also accept things like their own data analysis plans for their research or if they wish to design a project, collect some data and analyze it, anything that pertains to—Can you select the appropriate statistics? Do you know why you are using it? Can you compute that statistic using the computer? Can you interpret the results? Can you report the results? In the past, students have relied primarily on end of course test and the analysis of some of the case problems that I have presented to them. Students coming up with other ways of demonstrating competence have been fairly limited.

R: What factors have entered into your determination to vary the opportunity for students to demonstrate...their abilities?

T: Well, my basic feeling is—well a very basic idea is that different students can demonstrate competence in different ways based upon some of their own characteristics, whatever it is. For instance, some people do not do well on multiple choice tests. Other students do not do well if they are asked to write a paper. So what I've attempted to come up with is a system where I have what I consider the minimum necessary to, as validly as possible, categorize a student level of achievement. At the same time, allow the student to, in effect, determine how and what kind of evidence they wish to present, under the assumption that they will go to their strong point, to their strong suit as to show they can demonstrate competence. If they are good test takers, they probably see little need to go beyond what I require. I would have to admit the system is tilted to people who are good test takers. But if you are not, then at least you have the option of coming up with something that demonstrates your competence that you have found to be very successful. Developing a paper on developing your proposal or whatever it happens to be.

R: How do students indicate their choice?

T: I ask the students fairly early in the quarter to indicate to me what type of evidence they propose to be used in determining their grade. Not only the type of evidence, but maybe a few more details about it. I respond to that simply by saying that's o.k., or we need to talk about this a little more. Then I allow the student to change that at any time that he or she thinks
he should up until the end of the quarter, remembering that there is one item that cannot be changed and that is what I require.

R: (Taken from a lengthy response to an earlier question about career development).

T: As far as my teaching style, teaching methods, I think that some very basic ideas have been there all along. What I have done is, probably...... I like to say refined, maybe shifted emphasis a little, but the very basic ideas are that. Well let me back up just a little. As part of my graduate study (names university) I had a lot of work in educational psychology, having to do with the psychology of learning and I guess I became even more convinced that we do know a great deal about how people learn, we do know a great deal about what's more effective and what's not so effective, and so I made a very definite effort to make sure that I could defend really what I was doing on the basis that it ought to make sense. If I were to come down to the very basic ideas, one of them is that what is being taught content-wise and organization-wise has to make sense to the student. The words I use, I guess, are organization, meaning, and structure. There is a meaningful structure to what is being done, and it is made very clear to the student.

* * * * *

R: What kind of knowledge do you think a teacher needs to possess? Specifically, what kind of knowledge does a teacher need to teach the course that you are teaching, and do what you are doing?

T: O.K., specifically for the course. Now you are talking about what kind of knowledge pertaining to the content of the course.

R: Knowledge of teaching related to the course.

T: Knowledge of teaching or knowledge of statistics or both?

R: Both.

T: First of all, I think a prerequisite for an effective teacher is knowledge of the content that is being taught. I am particularly talking about university level and graduate level. So I think a person has to have a basic knowledge of statistics and data analysis such that the person does feel comfortable with what is to be taught. Part of that has to do with seeing these interconnections, these relationships to knowing that when you are doing one thing that is simply an extension of something else, to know the big ideas behind it--the very basic concepts. So I think that is essential. Then to be an effective teacher I am convinced that a person has to know something about the psychology of learning. To assume that people just pick that up from experience is false in my opinion. You do tend to evolve
some of those things but if you were to make a little study, not a little study but some study of the whole process of teaching and learning, I think you could enhance that very fast. You could see that why it is that certain things tend to work and certain things do not tend to work. I think there is a body of knowledge that is worth knowing if a person is going to be an expert teacher. People in this college, and some other colleges that I have done some seminars with, are very receptive to this idea that there is something that there is to know about teaching and learning which they don't know. Once you've begun to point these out to them and work with them in certain ways, why all of a sudden they change their notion that all you have to do to teach is to know your subject and that is obviously a myth. There are a lot of people who know their subject matter who cannot teach. At this level I think that you can know all there is to know about teaching, but if you don't know your subject matter you are probably not going to be an effective teacher.

R: What do you think a teacher has to be able to do? What kind of skills does a teacher need to teach your course?

T: First of all, teachers have to have skills that some way forces them, if it is possible, to think as the student thinks and to try to see the course from the perspective of the student (to) realize that many of the students in the course, regardless of what level it is, are not as enthused about it as you are. They are never going to be if it is an elective course. If it is an advanced graduate course, that isn't as much of a problem. I guess really I ought to have an experience teaching in lower division undergraduate required courses, and I would really put that to the test, but I think if these are skills, maybe it is perspective. I think the teacher has to be able to see things from the point of view or try to see things from the point of view of the student. I've suggested that what we ought to do occasionally is try to think back about our own student experiences. In talking to faculty members I find there is a discrepancy in that many faculty members, most faculty members, were not typical students when they were high school or college students. So we've got an unrepresentative group. We've got people who were academically oriented, and they were probably in the upper level of their class. A lot of us were attempting to achieve good grades in whatever the subject was in order to get that grade. Well, that's one thing. Other things it relates back to, I guess, are the things I've already talked about. The instructor has to have some kind of a skill to organize the content of the course in a way that makes sense not only to him or her but to students, and I have used the terms "logical organization of subject matter" and "psychological organization." The expert organizes subject matter logically. Students organize subject matter psychologically. They begin where they are, and we probably ought
to be looking at it that way because the psychological organization of subject matter could evolve into logical organization. Then an instructor needs skills not only in organizing subject matter, but how the instructor does, in effect, present material or whatever it is that is presented. If you are going to talk about it, you have got to be able to, in effect, prepare a very decent lecture if that is what it is going to be. You've got to know how to use things to supplement simply talking--chalk board, overhead, handouts, slides, whatever it is to realize there are many ways you can communicate ideas.

R: What do you mean by decent lecture?

T: First of all, the information is accurate and clear but it is organized in a fashion where students will listen, can understand what is going on rather than just simply enduring something. And a lot of it might have to do with how a person speaks or how a person acts. I've come to the conclusion that if a person is possessed with some personal qualities that are akin to effective acting that they ought to use them to the maximum in a classroom. If they have an absolutely beautiful, however you describe it, voice, they ought to use it. If they can by varying pitches of the voice...or facial expression...that ought to be used as long as what is being taught is the purpose.

***

R: What kind of reputation would you most like to have with your classes and students with whom you work? What kind of reputation would you most like to have with those students?

T: I would like for those students to view me as being a person who is their advocate, who is more interested in their achievement, their learning and their accomplishments than getting in the way of them. I would like for students to view me as being a person they could disagree with. I guess I would hope that students would see me as being fair, and if they felt that the grade situation was not appropriate that they would feel very comfortable in discussing that with me first before they discuss it with anyone else. And most of all, I guess I would like for them to feel that they learned something.

R: What kinds of expectations do you have of students?

T: Well, I expect students--are you talking about the level of students I am teaching now? I expect students to be very serious about what they are doing. I expect students to be willing to commit the time and the effort necessary to do what needs to be done. I expect students to accept the responsibility, that the success of the course, that they have some responsibility for that success, and if the course isn't going
the way they think it ought to be that they are the prime group that ought to be saying something about it, and they should say it at the time it is happening, not after the course is over. If we are not dealing with the issues they think we ought to be, they need to say so...Techniques being used are not turning them on or anything we ought to do there—so these are the kinds of things, I guess.

R: What do you feel your strengths are as a teacher?

T: Well, I would hope they would be the things I have just talked about when I said here are the things I think a teacher ought to do—trying to look at things from a student's perspective, trying to realize that I am an advocate of student achievement, trying to apply the basic ideas of teaching and learning that I guess I see as sound and am convinced are sound. And I would say flexibility and being willing to accept student ideas for evaluation is one way, and being open to students and available to students.

* * * * *

September 19

R: Teachers refer to good and bad days as they come out of classrooms. I would like you to think about a time or a day that you feel good about and describe the circumstances that would contribute to a good day in relationship to teaching.

T: O.K. The good days, as far as teaching is concerned: The ingredients that I see that make a good day for teaching begin with me having spent enough time so that I know exactly what it is that I want to accomplish and that I don't have to just move from one thing to the other and then take whatever comes—that I see clearly the entire class session—that I know exactly what I want to accomplish. In fact, my best days I guess that I feel good about I probably would not have to look at a single thing because it would all be there and I would know it... exactly, well you know when something happens you know this is where it is.... So that's one ingredient. Another factor that contributes to what I would say is a good day has to do with the mood, the preparation, the responsiveness of students—if they are in a mood of really being involved, if they are well prepared, if they are motivated, interested and get active in whatever it is, whether it is discussion or whether it is just active listening or this kind of thing. I would say an indication of that has to do with questions and comments of the students. Questions indicate that they are very much involved in what is going on, that they are, in effect, understanding what is going on, but they are seeking further clarification and further understanding, and comments where they have put things together which weren't clear. Then another
factor is just simply how people act, that I'm not tired, that I feel active and alert and students do the same. They may not all feel that way, but they look that way. I would say a thing that contributes to a good day is a lot of feedback from students that indicates that, yes, they really are understanding or they are getting insights or making connections or they are extending their transferring of what is going on.

R: Would you necessarily say that the bad day is the opposite of that or are there other things that contribute to bad days?

T: Much of the bad day thing is the other end of the continuum of those things. There are factors, I guess other factors which can contribute to bad days--maybe logistical factors, the equipment won't work or expecting a computer printout and you didn't get it, or there is some interruption or some routine thing that just kind of falls apart. But I would say, basically, I say bad days are more or less the other end of the continuum.

R: Is there anything else that you would like me to know that would help me to understand your teaching better, that we haven't covered?

T: It just takes a heck of a lot of time. I think good teaching has got to be very time consuming... If I knew the amount of time that I spend getting ready to teach and then the things that go along with teaching, and the amount of time I spend in a formal classroom as a proportion of the total is not the major portion. And I guess I feel strongly that if a person's time commitment to teaching is only when the class meets, that person is probably not a very good teacher. I guess I would say that I probably for every class session, I may spend as much time getting ready for that session as the session actually takes. Because what I found is that to be ready to read the students, to read what is going on, is to know exactly where I am going. When I really have it all tucked in, then I can kind of play the field. I know where I want to go, but I am willing to slide around and so forth with whatever I see is probably the way the student sees the thing coming out, and I can come back to.... One other thing--is that I think, and this phrase comes from my predecessor in this job, if you are going to be a good teacher you've got to be a student of teaching. If I'm going to be a good geneticist, I've got to be a student of genetics. If I'm going to be a good teacher, an expert teacher, I've got to be a student of teaching, which, in effect, is a teaching/learning process which means you've got to think about it, read about it and talk about it. You've got to participate in activities that increase your competence.
October 16

R: You originally spoke of trying, in your instruction, to know where the students are. Can you cite any examples of feedback that you have received from students this quarter that have influenced the way in which you have taught?

T: Well, the most direct feedback would be in the small groups, and, you know, I guess I was a little surprised whenever it was last week when (names a student), you know she's a good student, made the statement that she really didn't know what was going on. By the way, I think she has had a stat course. Reading tables, looking it up, and this type of thing. That comment will have a lot, it will be in the back of my head tomorrow, and it will have a lot to do with how I approach this whole thing of probability. I'm not going to change it, but what it will do is I will attempt to really do it by the numbers and try to get at the basic understanding of what is going on, and I'll be using the same basic approach that I used before. But some way I'm going to try to really head this up...to at least give students the opportunity to make sure they understand what is going on. And, for some reason, what is so clear to me by way of some very basic ideas seems to be very difficult for students at this stage to grasp.

R: Maybe it hasn't been presented in basic statistics.

T: Well, I think that's right and you see, most of the time if you've only had one course in statistics, you've dealt with manipulation and calculation and not with the basic rationale. And I'm approaching it from a different point of view--from the point of view of what is the sense behind all of this? I just don't worry about how you calculate and it's probably difficult for students to shift....

R: You've been providing extra printouts for the students that don't have them. How does that relate to your notion about student responsibility? Will you continue to do that?

T: Yes, I'll continue to do that. It probably encourages some students not to do the run, but I guess the reason I do it is that I have a feeling that some students have good intentions in doing that and either time prevents it or they never get it done. I was surprised the last week. Fewer students asked for printouts than the week before. I first thought that was a good sign that most people had done the work, but I also have a sneaking suspicion that some students who didn't do the run did not, in effect, admit that they hadn't, because I did notice several students share with another student. So, you know I guess one alternative would be that if you don't do the run, you
I don't see the printout, but so far I haven't got to that.

R: Because then in terms of your strategy if they don't have the materials there....

T: I guess it is more important that if they didn't do it they ought to have them. I guess there is a way of somewhat taking the hard stand, I only do 50 extra copies. When they are gone ....But you know, you never, well you get a sense about certain students as to whether they are or not and I can fairly well predict the people who are, who I have fairly good ideas about, that they are not doing the runs. Of course, the people who are doing it for audit frequently do not, or sometimes do not do the run.

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R: During the first interview you spoke about the importance of psychology of learning and learning theories. Can you specifically identify some principles and some specific examples in terms of arrangement of instruction?

T: Attempting to implement?

R: To implement.

T: Well, my first one would pertain to what I think I characterize as organization structure. Of each time trying to make very explicit where we are, how this fits with what we are all about, and specifically here is what we are going to do today. And then, hopefully, throughout that day of instruction we will, I guess, frequently loop, frequently summarize, in an effort to make sure that what I see as a very close fitting logical structure is becoming evident. So that would be one specific. Another specific would be this feedback thing. The main technique I'm using for students to give feedback right now is this thing of questioning. What is the most perfect measure of central tendency because that is a variable and then either getting a response from students which, if I do that, serves two purposes: gives feedback to me as well as feedback to them. Or if I do not wait for responses to this and then I say it is the mean and there is a certain value for them to, so that they have immediate feedback, can I or can I not answer questions? Then another specific would be this thing that relates to the fact that different people learn by different strategies, styles, etc., and the individualization aspect would be the small groups as an effort to give them an opportunity to present very specific and very individualized questions. Because those sessions people do get feedback. They ask questions they do not ask in the total group. And then another aspect of this organization is structure in the feedback with things that I make available for students, the printouts, the mimeographs, etc.
try to, as far as possible, organize it such that is does have a structure. Then, in effect, the student in the final analysis has to take responsibility for learning at this level...not to require a lot, or at least not to present things so that you've got to do this, but to say here are some opportunities. You decide which of these that you see as most useful to you.

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**November 1**

**R:** On the feedback there were some comments that the mastery tests were not for grade and you have reversed that. I wonder what went into that decision about the during-course mastery test?

**T:** Well, I guess as I began to read those, you know, the kind of evidences they were doing, I got the impression that there probably ought to be additional avenues open to them and it occurred to me and as I reflect back, a lot of people, in effect, are going to come down to the wire and about the only thing they are going to have is the end of course mastery test. I guess my feeling was, maybe I ought to open it up a little—allow them to use those during-course tests if they wish to.

**R:** How do you deal with learning names? It seems to me, at this point, you are addressing just about everyone by name and I'm wondering if by the time it gets to the third course you have just a few names to learn. How do you deal with this?

**T:** In this course there are only about half-dozen people whom I do not know. And I've got them primarily zeroed in, but I've kind of been ignoring that, in fact, up until yesterday. So at the very beginning of your thing, and I guess at the very end of the break while I was getting them back in, sometime during the time you were having the questionnaire, I got the attendance sheet and I located the people who I did not know...and for the first time really put a little time into that. And now, you know, I've fairly well got them locked in.

**R:** Is that something that you think is important enough that in earlier classes you've worked out a system to do that?

**T:** I try to do it much earlier. And the way I....

**R:** It must be important to you to learn, to address people by name...
T: Yes, I feel it is, and my feedback from students is that one of the things by the grapevine about my teaching is the fact that I know the students and call them by name. One thing they don't realize is that if I don't, the persons name I don't know, when I'm responding to that student, I never use their name... If you ask a question the second time of class and I, for some stroke of luck know who you are, I'll use your name. And that just floors people. How in the world did he know I was (names researcher), when there are 65 or 70 people in here and we've only been here twice. "Jim Jones" over there, raising questions and talks all the time and I don't have the slightest idea of who he is. I never mention his name. But the next time I'll know who is is simply because he's got my attention. I'll go immediately to that list and I'll look and the next time he says something...I some way learned his name...I have to concentrate on that. I think it's important. It falls under what I call the personal touch.

December 13

R: When you are assigning final grades, do you ever rely on more than point determination?

T: Yes, well, a qualified yes for that. I only do that when the grade is low.

R: I think I noticed where one student had a D on a test and got a C in the course.

T: There's where I would pay a great deal of attention. If a student, well this one person, the only evidence he had was end of course test and I've had him before and I could, even, I didn't, I could have looked up his grades. He has never done well. He's a very reserved. He probably hasn't said a word in three courses. He never comes to small group sessions and my own opinion was that the difference between a C and a D is not that much anyway, and so I just simply jumped it a little ....I remember another one in that course in this quarter. I think if you looked at the points she should have gotten an A-, but my own impression was that she probably knows about as much as anyone in there and I gave her an A. Then all of a sudden I got scanning the end of course scores and I noticed there was one person who got a perfect score. This is after all the grades have been given and I wonder who that is--I'm just curious. I looked and it is (names student). And so that made me feel I was right in my judgment in boosting her from an A- to an A... So, you know, these kinds of things. There was one person in the course who, the girl who sits up front (names student). I kind of had the impression she knew what was going on but she really bombed that test. So I gave her an incomplete and I've forgotten the alternative grade, it
was probably a D. If I never hear from her, that's what her grade will be....you know, my feeling is that something just wasn't right. If she wants to do something, I'm willing to do some extra something with her to increase that grade.

R: You've really used the same kind of judgment when people have turned in evidence, too, haven't you?

T: Yes.

R: If they've done poorly, or the grade doesn't represent their work?

T: Yes. If they've really goofed it up, I simply say, you can insist on a recorded grade, but I never have had anyone insist.
APPENDIX H

EXCERPTS FROM THREE STUDENT INTERVIEWS
EXCERPTS FROM INTERVIEW WITH STUDENT 2

November 11

R = Researcher  S = Student

R: How do you think Dr. James defines his role as a teacher?

S: His role as a teacher? I would say that he sees his role as a teacher, in that class, as to make it as easy as possible for people to learn, not to just be able to do, but to learn and understand very difficult material.

R: Can you think of anything he does that leads you to believe that?

S: Yeh, he obviously prepares a great deal for his lessons in that I find them extremely logical in the way in which the material is developed. He seems to have a master plan of development. There is a great deal of repetition. It is very easy to pick out what the major concepts are that he wants to develop. He just presents it in a way that goes from very simple to complex with lots of examples.

R: To what degree do you think that Dr. James is self-confident as a teacher?

S: I think he's very self-confident. He should be.

R: What makes you think he's self-confident?

S: Well, he's prepared. He's obviously taught the class enough to know that he can accomplish his objectives if he deals with material in that way.

R: To what degree do you think Dr. James is knowledgeable about the content of that class?

S: I think he's extremely knowledgeable. I don't think there's any question--I think what's interesting to me is that he presents more than one source and he doesn't present the material as though its...for many things that there is an absolutely definite answer but that there are different views and I think you don't become, he presents in a way that you're not confused by the different views. He presents a view but he also presents the idea that other people may look differently on it. He presents a consensus.

* * * * *
R: Can you think of either good or bad days that you have experienced in this particular class?

S: Basically, I've experienced mostly good days, I think, because I know where he is and where he is going. I've developed insights into material I haven't had before...relationships. I'm not so sure I would have been able to do that if I hadn't had courses before in statistics. But what he has done is put them together. I think probably a bad day is the day we took the quiz. But that turned out o.k.

R: Why was that a bad day:

S: Well, because I obviously didn't know the material on the quiz as well as I thought I had. I think, basically, they've been good days.

R: Teachers have different attitudes or beliefs about students. What kind of beliefs and attitudes do you think Dr. James has about the students in this class?

S: I think he recognizes the diversity of interests and needs and abilities before everybody is in there. Do you mean as people or students as learners of material?

R: In both areas. In other words, you could say, does he see students as learners and as people?

S: I think he communicates primarily through the organization of the course and the requirements of the course. He communicates a particular point of view of students as learners at very different points with very different needs. In terms of students as people, there isn't a great deal of that option except that he obviously, in his communication with those people who ask questions or whatever, he communicates a respect for the individual. In other words, he doesn't come across as, "how come you don't understand that, dummy." He respects the person as a person by the way in which he calls people by name, too. I think that has a great deal to do with that.

R: Were that any other examples, that you can think of, that would either support his attitude about learners or his attitudes about students as people?

S: You could pick out anything that he has done in terms of the way in which he has organized the class—opportunity for small group session, opportunity for different people to get out of the course different things if they want or if they don't. I think the way in which he presents the material, not only because it is organized but because it reflects an understanding of major concepts which kind of fit together, would be evidence that
he supports a type of learning or a need to learn that is logical and conceptually oriented. The need to understand the material, not just be able to plug it into the computer, and know where to find it. I think you could pick anything he has done in terms of organization.

R: What kinds of expectations do you feel Dr. James has about students in his classes?

S: I think he has different levels of expectation. I think there are minimum expectations in terms of understanding basic concepts—in terms of being able to know what statistic to use and what it means once you use it. I think beyond that, that he has different expectations for different people. In other words, he recognizes the fact that there are some people in there who want to be able to go all the way by themselves, and then there are some people who just want to be able to read literature on research and understand what they are doing. Then there are also those people in that class who not only want to know that you use a particular statistic, but what's happening when you use it. I think there are all those levels, and the minimum expectation is just that you understand what it is when you have it, and which one to use. That's what I would say. I think, in terms of expectation of outside work, that the minimum expectation would be to do anything you have to do to get to that point, but that anything you do above that would be your own expectation.

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R: If you had to describe Dr. James teaching style to a student who hasn't had his class, how would you describe his style?

S: I guess I would describe it basically as presenting material in extremely logical order with an emphasis on basic concepts. Lots of examples. Lots of repetition. Starting with an idea and just building on it. You know, in terms of scope and sequence, I guess that's how I would talk about that, and then in terms of the way in which he presents it, I guess you would have to say something about the fact that he's prepared every week with materials that are already prepared for the overhead projector and he knows exactly what he needs when and in order—but, at the same time, can stray from that. In other words, go back and find what he needs, so obviously he's spent a lot of time preparing materials and understands just what he's got and how to use them. He uses it very effectively. I think the first time when I realized he was going to teach the whole course by overhead projector I was concerned but, you know, how could you teach it with an overhead projector without—but he has examples for everything.

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R: Do you believe that a student has any responsibility in contributing to the success of a class?

S: For that particular class? I guess the success of it, in other words, if a few people don't prepare and they ask questions that could have been answered by themselves, if they had stayed up with the preparation, then they would be interfering with other people's learning. But if they don't prepare and they don't interfere, I don't see that as a problem. That's their own business.

R: Do you have any suggestions about improving the instruction as it relates to you?

S: I don't think I could improve what actually goes on in class. I don't think I could make any improvement on that. I think he is just super at that. I think in terms of the arrangement, that I wouldn't pass out those exercises until later in the course because the first instinct is to panic, and if you wait a little while, you have more basis to work with. But other than that I wouldn't make any recommendations. Well, I guess I would help him. If I were him, I would lay my cards out on the table a little more about what I expect and what you can do if you want to, rather than have the students indirectly figure that out.

R: Am I hearing you say that there was lack of clarity with regard to the expectations as far as assignments or determining a grade?

S: Not any expectations for the assignments, but expectations basically that the assignments were related to content and that the content of some of the assignments goes quite a ways beyond what the expectation is. The basic expectation is for the course.

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R: Is there anything else you would like to tell me about, in relation to this course, that would help me to understand where you are coming from or about your reactions to the course, that I haven't covered?

S: Basically, I started off with an objective which was just to understand the material and not to go much more beyond that because of priorities and time. I have this thing about a computer center, learning all this stuff and then having it be obsolete two years after you get out because ideas have changed, or you go some place who uses a different computer set up and you just can't do things the same way. I think that I've changed a little bit on that, in that I still have the objective to get the basic understandings down, but I'm just for
the fun of it, I'm programming some of those things which I
don't know how helpful they are going to be, they are just a
challenge. But I'm enjoying the course.

R: You don't look like you're uptight about it.

S: Basically, I'm not uptight about it. Maybe I should be, but
I'm not.

R: Do you get the impression that people around you are?

S: I think, basically, that it all depends on what they have
designed for their objectives. I think those people who want
to do, who really want to go a way with the computer business,
that they are overwhelmed in there, but they put that on them­selves. I think people who don't have statistics, any statis­tics background at all, are not finding it as easy to under­stand what he's doing. I think one of the reasons I don't have
trouble understanding is because I've asked questions before
because what he's doing in terms of relationships is exactly
what I want to know and the questions--I've never had anybody
help me with that part. And the course, the way he's designed
it is exactly what I want.
EXCERPTS FROM INTERVIEW WITH STUDENT

November 27

R = Researcher  S = Student

R: How do you think Dr. James defines teaching?

S: Well, probably something like this: setting up in a limited amount of time, and mostly a limited amount of time, a sequence of learning experiences for a large body of students, or for students. In setting up, teaching means collecting the materials and organizing them, thinking through the material so that it can be presented to students in the most logically, coherent, and clear way that's possible. He sets up learning experiences in the way of lectures, take-home tests, assignments, and whatever, which most succiently and coherently transmit a body of knowledge to students. I don't know that he would consider it so much a dialogue, but that may be the nature of the substance that he's working with.

R: What kinds of things have led you to think that that's what Dr. James thinks of teaching? In other words, I would like to know how did you come to that conclusion.

S: That's been my experience of his teaching and I don't think that there's very much that he does without forethought, so that I would assume that he's considered pretty carefully how he wants to present this material to students and he structures that in a way that he thinks would be easiest for them to learn.

R: Do you think Dr. James is self-confident as a teacher? Can you think of some examples that support your answer?

S: Well, as a teacher of the subject that I've seen him teach, he is self-confident because I think he's self-confident of his knowledge of the material. And as far as evidence for that, mostly he is open and amenable to challenge, question, and intervention at any time. And if he were not self-confident, he would have closed things off at a level with which he could definitely, within which he could definitely master. But he opens it up. For example, two weeks ago or whatever, we can review a mastery test and say this question does not have a correct answer and he threw the questions out rather than taking a defensive position and saying, well, you should have chosen the one that came closest, which is a typical response from a teacher who is not so confident about the material. But I don't sense
from him any uneasiness at all. If anything, I sense from him a need to go beyond what he's doing. I mean, I think he's not only mastered this material, but perhaps he's taught it too many times. He needs to go beyond. He welcomes a challenge.

R: To what degree do you think Dr. James is knowledgeable about the subject matter that he teaches and can you cite some examples that support your answer?

S: Very knowledgeable. One example is just his general way of structuring the course. He has obviously thought it through so carefully, so many times, and from so many different perspectives, including the perspective of new and intermediate students, that his mastery of the material may assess itself by the logic of his course. It's so clear—you don't get that clear unless you've really thought it through many times and so comfortable with different arrangements. Then you settle on a pattern that seems to work best for the majority of students. That takes a sophisticated understanding and beyond that I have never asked him a question that he wasn't able to respond to. That doesn't necessarily mean that I'm asking him difficult questions, but what it does mean is that his understanding is broad enough so that a half-baked question that comes from me, with a language that I don't really understand and I'm not really sure how to say what I'm asking in the language of the material, he is able to pick up on what I mean and make a translation that fits it into the body of knowledge that we are dealing with, and answer from that body of knowledge. I've never found him lacking in any question that was directed to him.

R: Have you experienced any good days in Dr. James' class?

S: Well, like the day that I experienced in Dr. X's class? That kind of good day? If that's the standard I'm going by, let's call that a 10, let's call the other day a 1. Then I would say the extremes, within which Dr. James' classes would fall, would be the low would be about a 3 and the top would be about 7.

R: Can you describe what you experience when you have a 7 and what you experience when you have a 3?

S: When I have a good day in his class, I understand what he's saying. I see implications for it beyond the material, and that's probably more important than it sounded when it came out. But I see a use, an implication, or its just a neat way of phrasing it, or a neat way of looking at something, or a pattern that I can recognize, or something that I can cue into next time or some other time, in some other place. The material is hard that day, comparatively hard, and there's enough, it's sufficiently hard, difficult, and/or sufficiently ambiguous so that I have an
opportunity, while I'm sitting there, to re-organize it so that I can make sense of it. The process of thinking it through in my terms and articulating on paper, let's say in my terms, is an involving process in an otherwise straight lecture format. The 3's, the days that are really boring, he tends to take material that can be dealt with in half an hour and he'll take it and he'll deal with it in two-and-a-half hours. Now I'll go bananas. I can't stand to sit there for that long when I know what has come. I know what is going on and what's coming next. I know that I need to understand it in his way of speaking it so I can't leave. His way of phrasing it will reappear, so I need to cash in on that, cue in on that. I can't walk away. On the other hand, I can barely stay awake because it is so boring.

R: Do you feel like you are being violated on those days, too? (NOTE: Student has previously referred to bad days in other classes when an instructor violates a student's intelligence)

S: No, I don't. I really don't. I'm sympathetic to the fact that there are people in that class with a very wide range of experience. There are parts of that class I have a harder time with than other people do. There are parts of that class I have an easier time with than other people do. I trust implicitly his judgment in structuring his course so that I honestly feel that he felt that students really caught on fast when he did it this way, it structured out this way, and might not catch on very well if he condensed it to half an hour. I'll go with his judgment on that. I think he's sensitive enough to the ways, in the past, that the students have learned, that he wouldn't deliberately, he wouldn't deliberately structure it so that he wasted everyone's time. And if he did structure it so that he wasted everyone's time, he would probably be sensitive enough to pick up on the fact that everyone was sitting there with their eyes closed and so he wouldn't do it again.

R: Teachers have different beliefs and attitudes about students. What kinds of beliefs and attitudes do you think Dr. James has about students in his class?

S: I would say he likes students and he wants them to ask questions when they have questions. He respects their intelligence and he takes them seriously. He is sympathetic to the sometimes difficult job of being a student because he is very flexible.

R: O.K. Can you think of examples of things that have happened that have led you to believe that he takes students seriously, respects students, and is sympathetic?

S: I think he likes students because he bothers to learn our names and his respect for students shows in his willingness to accept questions during class, during break, after class in his office,
his willingness to meet outside of class once a week. On his time, it is twice a week in small group sessions. I have never noticed in his tone of voice any hint of irritation or sense that this is the 45th time I have gotten this question. So that he is on a very even keel and he doesn't get mad at students. He stays with them. He is very patient and I would think he respects our intelligence mostly by his willingness to listen to what we are asking, to wait long enough so that he knows what we're asking and then also to accept our challenge. For example, when we answer a mastery test question one way and he answers it another way, if we can present an intelligent argument defending our position, and I've done it three times in three quarters, he will accept that. That's lovely, really.

R: What expectations do you think Dr. James has of students in his classes?

S: Well, I think he expects students to stay with him, to read the material when it is assigned, and to participate to the extent they want to participate. He gives them that range but to stay with him. Because I think he has pretty much bent over backwards to build a good course for students and I think he expects students to respond accordingly--to use the opportunity he has been able to provide to learn what they want to learn; to be in contact with him when they want, and to make it what they will but to be responsible in that respect. I don't think he expects students to wait for it all to happen. Although he certainly sets things up beautifully.

R: How have you come to those conclusions?

S: Well, I don't really know. I can't seem to think of examples but...well, one way I would think is the fact that despite the range of material that we can use for evidence, everyone takes the final and the final is not easy. At least I haven't found them to be easy.

R: Based on past experience?

S: Yes. So he really expects you to know a base-line of material.

R: If you had to describe Dr. James' teaching to a perspective student, how would you describe it? How would you describe the course?

S: Lecture, highly organized, the continual use of the overhead projector. He takes students step-by-step, almost word-by-word, through a body of material and he offers pretty wide range of options for students in terms of fulfilling the requirements for the course, so flexibility.
R: Do you believe that the student has a responsibility to contribute to success of the class, success as measured by students?

S: Yes.

R: How would you see that?

S: Ultimately, the student is the single most responsible person for the outcome of the class for that student. It is not the responsibility of the teacher to give the student a good time. The responsibility of the teacher is to create conditions within which students, from a variety of backgrounds and talents and interests, can build for themselves a valuable course; but then, it is the responsibility of the student to decide what you want to know; find it out; get it, and pattern your actions accordingly. I throw a lot of responsibility on the student.

R: You may not be prone to giving advice, but if a perspective student asks you for some suggestions about how to cope with that class, do you have anything to tell them?

S: It depends upon what kind of coping problem they are having.

R: What should they be prepared for and do you have any suggestions for them before they take the course?

S: Well, if the student were nervous about the material or if they were worried about taking three such courses, I would really encourage them to go and talk with him because the sooner they establish contact with him, the sooner they can begin to relax because there is no single better person in that whole class than Dr. James in setting students minds at ease. He would do that as well as he can and the student settles down or not.

R: How does he do that?

S: Well, first of all, when the material is hard, he tells you this is tricky but this is the main point, and when the material is iffy, he says this is kind of iffy. It is pretty much just basic old thinking about things, only reformalized it a bit. Or he'll say, here is a handout and another handout. He sets it up for you to be as clear and easy as possible.

**

R: Do you believe that Dr. James sees students as persons?

S: Yes. Well, pretty much for some of the reasons I stated before. His relationships with students are sufficiently complex for me to say he sees students as persons. So he treats them with respect. He respects their intelligence. He is flexible with
them. He knows that different students are going to need different things. He is patient with them. He is reasonable. He is stable. He is a stable person to relate to and he considers their judgment. If there is a question and they can defend their position, it is sufficient for him and this is how you treat people.

** ** ** **

R: Can you make some suggestions as to how you would improve that course?

S: Well,

R: Let me put it this way. Can you make some suggestions in terms of things that the teacher is in control of?

S: I honestly don't think I can. The reason is that even through there are suggestions I could make if the course was being taught to 50 (names self), the course is not being taught to 50 people like me. I don't think it is being taught to more than 10-15 percent of people like me, so I think 80-85 percent of the people in that class are being hit at eye level. It is excellent for them in terms of stimulating them, challenging them, and supporting them. Suggestions that I would make, would make it a little more exciting or whatever for me would, in terms of the overall group that it serves, probably do more harm than good.

R: What kinds of things would make it good for you?

S: Make it harder--more reading. Of all the courses, this has probably been the best, I think. It has been the hardest, at least.

R: Does that mean it's new material or new organization?

S: All the material for me has been new. From the very beginning the material has been new. But this material has been more difficult to learn. It's trickier, it's more subtle. And there are fine distinctions to be made between this and that... So in many ways, this has been more to my liking, but I don't know, it's strange, I haven't, except for the past three weeks maybe, I haven't been on my toes in the class. You know, I used to not do my homework so that I could be on my toes in class. That's pretty bad, for me. Considering how much I can learn in a three hour course, I'm learning maybe 60 percent of what I could potentially learn. In the time that I would allow to a three hour course, considering that I'm taking three other three hour courses, there's room in my life to fill
it up more than it has been filled up with this. But, I don't know that I'd make any changes that wouldn't actually be detrimental to the rest of the class.

* * * * *

R: Is there anything you would like to tell me about, that would help me to understand your experiences, that I didn't ask you?

S: Well, maybe. One thing. I'm a real professional student and I don't mean to be joking about this, although it sounds a little bit funny, but what I mean is I try hard to be a good student. I try hard to be helpful to other students and if I like the teacher, I will try harder to make his day enjoyable when he's in class with me. And that, I'm usually pretty good at it. I've done well being in the role of a student. Aspects of James' style which are not helpful to me or which I find lacking, first of all, I take responsibility to make compensation. Second of all, since I really honestly feel that he tries his damnest, I can live with that. If I didn't feel that he really put out for students, I would never have finished this sequence, never. I would have quit after one quarter and never come back. But it has been his personality that has kept me in this course really more than anything else. I can learn from a variety of teachers and I can learn from a variety of styles. His style is not the best style for me to learn, but mixed with his style is a personality that says I will be as accommodating as I can and you can work with me. You will learn a hell of a lot. Now that's really all I really need. I would prefer it this way or that way.

R: You don't have the opportunity in his class to give of yourself in terms of being responsive to the teacher and to give the kind of feedback that you can?

S: Well, to a certain extent I do, but I can't make this class a top notch class for me. I just can't. But on the other hand, I don't resent that for very long. If I really resented it, I wouldn't be in the class. I can compensate for that and I can appreciate things that are going on in that class, despite the fact that I'm not sitting on the edge of my seat each week. So that what I'm saying is that my perspective, as I think about this course, is the perspective of someone I would classify as a good student and I don't mean good in terms of A. I mean good in terms of trying hard and thinking about it and making a concerted effort. I find him sufficiently flexible and responsible as to be compatible with me even though his particular style doesn't turn me on as much as I might like.
EXCERPTS FROM INTERVIEW WITH STUDENT 8

November 30

R = Researcher  S = Student

R: How do you think Dr. James defines teaching?

S: His organization of the instructional material is very obvious. So I think he definitely must feel that organization of the presentation of material is very important to the learning process, which I agree. I think he is also concerned about individual students and is willing to present difficult information in as simplistic manner as possible so that the student feels this is within my grasp, I can do it, I can learn this. That has really been a help to me because I think, first of all, the subject that he teaches, everybody is immediately scared from, and his approach is, he always makes me feel, you know, he always comes in and he is very calm in his presentation. His manner of speaking is kind of slow and easy and nice and it just makes you feel you can do it, you can grasp this. This is not beyond you. I think with that particular subject that that is very important. Sometimes I wish for more variety in his tone of voice or in his mannerisms or use of materials, but with what he is teaching, I think he presents it in a very effective way.

R: What do you think he might think his role is or the teacher's role is?

S: I perceive him to think that his role is to have the knowledge and the resources to make available to the students so that they can understand the material.

R: To what degree do you think Dr. James is self-confident as a teacher?

S: I think he's very self-confident.

R: Can you think of some examples of things that would lead you to believe this?

S: Well, I've just always felt that he has a tremendous grasp of the subject area matter, not to the point that I think he flubs over things, that he just assumes students understand. I don't think he does that, but I feel that he has used it in a practical way so much that it has become a real part of him. I don't feel that any of it is foreign to him at all. I don't think he has
the attitude that "I know it all and that I know everything there is to know about the subject." I feel very confident in anything he says really about the subject. Maybe it's because of my lack of information in the field, but you know, I trust him completely with the information that he presents to the class. I feel that he is that confident in himself as far as the subject matter is concerned.

R: Are there any other ways that you think of that would demonstrate confidence or lack of confidence in addition to knowledge of the subject matter?

S: He is never threatened by any questions that the students ask, or by any issues that are raised in the classroom. I have felt that he is very open to the possibility of their being other answers or other means of developing certain points or certain materials that he is dealing with. I never see him become defensive or threatened by any question that a student may ask. Plus, I think he deals with students replies and answers in a very positive way. No matter how simplistic the question might be, or whatever, he never makes you feel that that's really stupid. I think he has a real way in which he can kind of bring in something that's irrelevant into the total scope of it and help you see a place where it might be applicable.

R: To what degree do you think he is knowledgeable as a teacher? You have already alluded to that.

S: Well, of course, I know that he has read and written a great deal in the field. Plus the fact that I know it just seems like his organization and presentation isn't one that he has to depend on his notes or that he has to depend on the textbook even though he always has it available and it is there at his command. I also don't perceive him as being the kind that just comes in and reels it off. I feel that he uses his notes and materials to his advantage, and yet, I don't feel like his notes are stuck in them and I'm pretty sure he could probably teach without them, but I think he uses them well. I guess just the fact that, you know, I've had him in the three courses and it has just made me feel that he is extremely expert in the field. Maybe his presentation of the material has something to do with it. I think this is the type of subject that could be presented where it would just be way over our head, you know, and his terminology and everything. I think he really is able to get down to where the students can understand it. To me, that's when a teacher really shows expertness, not by the number of words that they use that are beyond my vocabulary or by any type of fancy technique, but where they are really able to apply it and help the student understand it. I should have mentioned that when we were talking about his expertise and knowledge, like when he comes in for the small group sessions, there is not a book or a note or anything. I think that is illustrative of his expertise in the field. (NOTE: This last response appeared later in the interview.)
R: Can you think of any good days that you might have had in Dr. James' class?

S: Well, I wouldn't describe my days in his class as being bad days. I think because of my own apprehension and anxiety throughout the course itself, plus the fact that for me to really excel in this class I would need to spend at least 5-10 more hours a week on the course than I have time to, (but with my schedule I just cannot and I have to recognize that). I always go into the course feeling apprehensive and a little bit anxious about am I going to be able to understand this? Am I really going to be able to get ahead on it? The good days have been those days when he has asked a question in class and I have known the answer and I have been able to reply with the answer or that I have felt, hey, I understood that. Like even last night when I listened to the tape, it was long and I got tired, but I felt like I understood what he was talking about. A couple of days ago, I guess wanting sympathy or empathy, I said something to other students and they're like, oh I think this is just a cake course, and I, like oh you do? And that makes me feel like, uuh. So there are a lot of factors involved in that but, overall, my good days are those that I just feel good about what's happening and that there is some tangible reinforcement. That always makes it better.

R: Teachers have different beliefs and attitudes about students. What do you feel that Dr. James' beliefs and attitudes toward students are and what has made you think this?

S: I think that he believes students can do it. And I think he has just a real trust in students that you can do it. You can grasp this--you can work with this. You can apply this to your particular research. I think, to me he shows that in just his approach because, in the beginning of every course that I've had with him, one of the first things he said was this material is not beyond you. You can grasp this. This is not as difficult and complex as your preconceptions may be. And I just think that he has a real trust in students that you can do it. You are capable people. And that is a good and important feeling to me. My own personal needs, that fulfills one of them. I need that kind of reinforcement--that you are a capable person and to me, he illustrates that in his teaching approach. Plus the fact, he does learn who his students are and something about them. He calls them by name in class; rarely mistakes a name. I don't think I've ever heard him mistake a name. I didn't even know that he knew my name because all of his classes are fairly large--about 50-75-100 students--and the first course that I had him, the first time that I ever really had a personal conversation with him, was after the very last class session and he asked if anyone wanted to stay to review. Several did, and then we ended up walking out together afterward, and half way, chatting. I have regretted that there
has not been more time to know him on a more personal basis, but most of my frustrations with him have been from a very academic point of view concerning the course. I have also felt that he does not object or mind students questions or their calling him at his office. Like one time I called him at home, which I rarely do. I mean that is one of the few times in my life I can ever remember calling an instructor at home, and he was very compliant and very kind. And so I just think that he has a great interest in students' learning and is willing to give them any help. To add to that, I think the fact that he offers the help sessions during the week. For me they were, at times, like I work every morning after class until two and so I just asked him one week if he could have an afternoon or evening session. The very next week he had an afternoon session at four. I just feel that he is interested enough in his students to make his schedule such that he can be available to them with the help sessions, personal consultation. I think he has a couple of students, that he has even told persons they might want to make appointments with him eventually. So, I just think his belief is that students are capable—that they can do it. That he trusts them. Just like with all the mastery tests and things. I think he has to have a real trust in students with those because that information can get out so easily. I think that's important in teaching. I think he treats his students as adults and I think that's important too. I think he expects a payoff maybe. I just think because of his willingness to give and to work and to be available to work on presentation of material, etc., that he expects students to do their part. I think sometimes those expectations are important because most of us try to live up to expectations, or many of us do, and I don't object to that. That is not offensive to me. That may or may not be true at all. These are just my perceptions of him.

R: I'm silent because my next question is what expectations does Dr. James have of students?

S: We're just really on top of this. Well, I think he does expect us to do our part, like with all the extra reading. He makes that material available to help us and I think he has the right to expect us to at least search out that material that we are lacking in or need more information in. That's why he gives it to us. Plus all the help that he gives us like the mastery tests. To me, those are just a tremendous help in studying because, another thing for me, and where I'm coming from in my orientation in academics, etc., this material is very hard for me to sit down and study. I don't sit down and study it like I do from some of my social courses, or psychology, or family courses. Those mastery tests really are good study guides for me. So I think he expects us to do outside preparation, to take advantage of those opportunities that he gives us for extra help. I think he expects us to ask questions in class—
to really seek out those things that we need to know or are important for us to know and just to be responsible as students. I think he expects those things. Because to me he is very, this will probably sound out of place, but I think there are a lot of persons who are not mature at any age and to me he is very mature. He's a very mature teacher in his approach and his expectations, etc., and I think he treats us as mature students.

*****

R: If you were to describe Dr. James teaching style to a student who was anticipating taking 975, how would you describe his teaching; his style?

S: I would say that he is very methodical—that he's very well organized. He presents material in a logical and rational manner. He illustrates accordingly and he makes application to help you get an understanding of it with the computer printouts. I've never done anything with computers before. I've never looked at, oh I looked at computer printouts with my students' test scores, but the first one we did, it was like, oh this is nice—what is it. He makes all that become very real—very workable and, to me, that is the key to this course—is making it seem workable and useable to the student.

*****

R: What would you do to improve that course? If you were to think about the weaknesses, or just things that you would like to see done differently, what kinds of things would you suggest?

S: That's hard (addresses researcher by first name). That was one of the things that you indicated on the last questionnaire form that we filled out. I don't know because I think when you are, as a teacher, you have to consider the material that must be presented and I think he is probably doing as much as he can with the material that needs to be presented—with the basics that we need for statistical analysis. You know that was one of the things he said on the tape. We really have just scratched the surface. Sometimes I feel it gets a little draggy, you know, because we are in there for two-and-a-half hours. The material is intense. For me, I could have used a slower pace this quarter. With this course the pace to have been slower to have been slowed down a bit would have been helpful to me because it was just taking me a little bit longer to grasp the concepts and to apply them and to understand what was going on. But he had a lot of material to cover and I think he kept it at a pace as evenly distributed as he could.

R: Do you think that he had a tendency to speed up toward the end?
S: Not necessarily. Because I felt we kind of hit the ground running and stayed there all the way through the course, I really did. I felt toward the end of the class sessions, he may have speeded up a little bit the last two or three weeks because he just realized there is not going to be next week to catch up. I felt that a little bit, but overall, I don't feel that he accelerated information toward the end of the course. I really don't. But all of it could have been a slower pace for me, which would have helped some. You know, as far as different teaching techniques and that kind of thing, I don't know what else really you could use. It is hard to be creative. How can you be creative with something like that? The little anecdotes and cartoons and things—he didn't bring in as many this time as he did in previous courses, but it always does kind of help when he does present the lighter side of it. With me, sometimes I feel so overwhelmed and bogged down with it that if he can kind of present a lighter approach to it, that is helpful I think he tries to do it somewhat.
APPENDIX I

EXAMPLE OF O.S.I.A. IV STRATEGY ANALYSIS

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APPENDIX J

AN EXAMPLE OF O.S.I.A. IV SUBSCRIPT ANALYSIS

SESSION 5
### Subscript Analysis

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**B = Bridge**  **C = Clarify**  **H = Humor**  **L = Loop**  **N = Name**

**O = Orient**  **T = Teacher**  **S = Student**  **Q = Class**
APPENDIX K

AN EXAMPLE OF O.S.I.A. IV SUBFUNCTION ANALYSIS
SESSION 5
### SUBFUNCTION ANALYSIS

#### ACTUAL FREQUENCIES

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\( T = \) Teacher  \( S = \) Student  \( Q = \) Class  \( V = \) Example  \( A = \) Arrange  \( M = \) Material  \( U = \) Unspoken  \\
\( AV = \) Arrange Example  \( MV = \) Material Example  \( MA = \) Material Arrange  \( UV = \) Managerial  \\
\( UA = \) Emphasis  \( UM = \) Unspoken Material  \( UMA = \) Emphasis Material
### Subfunction Analysis

#### Percentages

|   | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 | T11 | T12 | T13 | T14 | T15 | T16 | T17 | T18 | T19 | T20 | T21 | T22 | T23 | T24 | T25 | T26 | T27 | T28 | T29 | T30 | T31 | T32 | T33 | T34 | T35 | T36 | T37 | T38 | T39 | T40 | T41 | T42 | T43 | T44 | T45 | T46 | T47 | T48 | T49 | T50 | T51 | T52 | T53 | T54 | T55 | T56 | T57 | T58 | T59 | T60 | T61 | T62 | T63 | T64 | T65 | T66 | T67 | T68 | T69 | T70 | T71 | T72 | T73 | T74 | T75 | T76 | T77 | T78 | T79 | T80 | T81 | T82 | T83 | T84 | T85 | T86 | T87 | T88 | T89 | T90 | T91 | T92 | T93 | T94 | T95 | T96 | T97 | T98 | T99 | T100 |
|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
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T = Teacher  S = Student  Q = Class  V = Example  A = Arrange  M = Material  U = Unspoken
AV = Arrange Example  MV = Material Example  MA = Material Arrange  UV = Managerial
UA = Emphasis  UM = Unspoken Material  UMA = Emphasis Material
APPENDIX L

AN EXAMPLE OF O.S.I.A. IV TIMELINE ANALYSIS

SESSION 5