AN INVESTIGATION OF TEACHER CLARITY AMONG
SELECTED STUDENT TEACHERS INVOLVED
IN A NATIONAL COMPETITION

DISSERTATION

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the Degree Doctor of Philosophy in the Graduate
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By

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* * * * *

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CHAPTER I
INTRODUCTION

During the past several decades, teacher effectiveness research has identified a number of teacher classroom behaviors which seem to facilitate student learning. One of them, teacher clarity, has been the subject of continuous research particularly at The Ohio State University where a line of inquiry began in 1974. Since then numerous investigations have attempted to operationally define the teacher clarity construct in terms of its low-inference constituents and to link this process variable with desirable student outcomes, i.e., student achievement and satisfaction. This study sought to extend this line of research on teacher clarity.

Statement of Purpose

The intent of the study was to examine teacher clarity in natural K-12 classrooms. The research involved documenting and analyzing clarity behaviors exhibited by a sample of student teachers who participated in the 1985-86 National Student Teaching Competition sponsored by the National Education Association (N.E.A.). Each student teacher in the competition was required to submit a videotape showing the entrant teaching a lesson to students in actual classroom settings. The preservice teachers involved in this competition
represented three different grade levels (elementary, intermediate, and secondary) and a wide variety of content areas.

The several specific purposes of the study included the following: a) to determine the average teacher clarity of the sample; b) to look for links between teacher clarity and demographic or contextual variables; c) to determine relationships between the clarity of the subjects and the ratings they received in the student teaching competition; and d) to determine whether the Revised Teacher Clarity Observation Instrument can be used effectively to document teacher clarity in natural classrooms.

**Background of the Study**

Teacher clarity first gained visibility and prominence as a construct when Rosenshine and Furst (1971) in their review of fifty research studies, identified a rather loosely defined teacher behavior labeled clarity as most promising in terms of its relationship to student achievement. Shortly thereafter Cruickshank and his colleagues at The Ohio State University initiated a line of inquiry that focused first on developing an empirically acceptable operational definition of teacher clarity. In an effort to operationalize this high-inference variable, the ensuing early studies conducted at Ohio State during the mid-1970s sought to identify, refine, and generalize the low-inference behaviors associated with teacher clarity. Cumulative investigations by the early researchers (Cruickshank, Kennedy, Bush, and Myers) identified
a set of specific, observable behaviors which not only defined the clarity construct, but also discriminated between clear and unclear teachers, as perceived by junior high school and university students. In addition, this research program generalized a refined list of low-inference behaviors associated with teacher clarity that held constant across different geographic locations and explored relationships between these behaviors and selected demographic variables (e.g., teacher age, sex, and professional status).

Studies conducted at other institutions in the middle and late 1970s substantiated the findings obtained by the early Ohio State researchers. These mostly independent, yet related investigations yielded similar low-inference operational components of clarity and supported the generality of teacher clarity across geographic boundaries and subject area. Several investigators attempted to document the positive effects of teacher clarity on student achievement and to explore some of the correlates of low-inference clarity.

More recent research conducted at The Ohio State University during the 1980s further explicated the teacher clarity construct in terms of its low-inference constituents, its generalizability, and its relationship to student outcome measures. Studies by Hines (1981), Williams (1983), and Larsen (1985) showed strong positive relationships between teacher clarity and student achievement and satisfaction. Hines also found that the low-inference clarity behaviors derived from junior high school students were observable,
generalizable to the college level, and reliable and valid measures of the high-inference clarity variable. In addition to the clarity-achievement link, the Williams investigation revealed that clarity was stable or consistent across time, different subject matters, and different groups of students. Gloeckner (1983) and Larsen (1985) demonstrated that teachers can be taught to be more clear. Larsen proposed a revised model of teacher clarity which included teachers' perceptions of clarity and specific content-related factors. Armaline (1985) examined the empirical research on teacher clarity using philosophical analysis and suggested certain areas which require improvement. He noted that the teacher clarity research is still in need of a theoretical base to guide the research and an adequate conceptual definition which would include both learners' and teachers' perceptions of clarity.

Justification and Significance

A number of the researchers mentioned above have concluded that future teacher clarity research should focus on the following: a) the investigation of clarity in the context of the natural classroom, b) the ability to observe and measure clarity in natural classroom settings across various grade levels and subject areas, and c) the relationship between teacher clarity and various demographic and contextual variables (e.g., curriculum content, teacher age, sex, and academic standing). The proposed research addresses these concerns among others.
Most of the recent research conducted by The Ohio State University investigators under the direction of Cruickshank and Kennedy has been confined to the study of teacher clarity in laboratory or artificial settings on the college level. Hines (1981), Williams (1983), and Gloeckner (1983) utilized a peer teaching experience known as Reflective Teaching (Cruickshank, Holton, Fay, Williams, Kennedy, Myers, & Hough, 1981) as the context in which teaching was observed and as the means to assess participating preservice teachers' clarity. The Reflective Teaching Lessons used in these studies were characterized by content designed for single-episode learning, meaning that there were no lessons preceding and following the episode being studied, nor were the lessons tied to long-range goals. Furthermore, the content included magic square operations, multiplying matrices, paper folding, and memorizing discipline terms and intentionally did not reflect subject matter normally taught in K-12 classes. In addition to controlling the instructional content, the lesson objectives and criterion measures (i.e., student achievement tests) were controlled in these Reflective Teaching episodes.

Larsen (1985), attempted to approximate natural classroom teaching by using small groups of elementary students as learners. However, these teaching experiences were artificial in that variables normally controlled by teachers such as selection of content material, lesson objectives, lesson length, and means of testing student achievement were controlled by the investigator.
Furthermore, teaching small groups of students is not the same as teaching a whole class.

While many clarity investigations were conducted in college settings, one (White, 1979) sought to examine clarity in the context of the high school classroom. Even though preservice teachers taught lessons to high school students in natural classroom settings, the teaching situation was contrived in a manner similar to the Larsen study (i.e., lesson content, objectives, and assessment measures were controlled by the investigator). In addition, the subject matter of the lessons was new to the high school students and did not necessarily match the topics being studied in the class or the type of content normally presented. For example, White (1979) noted that the math lesson which focused on presenting information regarding the contributions of a famous person in the field (Leonhard Euler), was not representative of the type of lesson math teachers usually teach (p. 46).

Up to this point, most of the research related to teacher clarity has been conducted in laboratory settings which normally precede field studies in order to allow for the control of various extraneous variables. The next logical step in teacher clarity inquiry involves the investigation of clarity in the context of the natural classroom. This context includes teaching content that is appropriate to the topics being studied in the class as part of a logical sequence and to the type of lesson normally taught in the particular subject area. Essentially, the type of contrived or
controlled teaching utilized in much of the teacher clarity research removes the teaching experience from a realistic context.

A related concern which merits special attention according to recent researchers, Larsen (1985), Armaline (1985) and Cruickshank and Kennedy (1986), involves the prerequisite ability of investigators to reliably observe and record the low-inference indicators of teacher clarity in actual teaching situations. Both Larsen and Armaline proposed modification in the Teacher Clarity Observation Instrument developed by Hines (1981) and widely used in the recent clarity studies. Instead of counting the frequency of occurrence for the low-inference behaviors, Larsen devised an intermediate-inference form consisting of a five-point rating scale for each behavior. Armaline recommended that certain behaviors generated by earlier research, but eliminated by Hines for methodological reasons, be included in the instrument in order to improve its ecological validity by making it more useful in real classrooms.

If the teacher behaviors associated with clarity are observable and measurable in natural K-12 classrooms using the instrument developed by Hines (1981) and slightly revised for this study, then both preservice and inservice teachers' clarity can be assessed. Identifying the degree of clarity exhibited by preservice teachers would provide useful information regarding what specific behaviors they already have and/or need to acquire. Teacher educators could thereby improve the preparation of teachers by providing
opportunities for preservice teachers to learn and practice clarity behaviors in realistic settings, assessing their performance of these behaviors, and informing them of the results and ways to enhance their clarity skills. The teacher education curriculum could also incorporate what is known about clarity based on factual information or research.

In addition, assessing the clarity behavior of preservice and inservice teachers can improve the teacher selection process (Cruickshank, 1985). Since clarity is related to successful and effective teaching, it should be a criterion for being admitted into a teacher education program and for obtaining a teaching post. Selection processes that assess the degree to which preservice and inservice teachers perform clarity behaviors in a realistic teaching context help ensure that the right applicants are chosen for future and current teaching positions.

Another aspect of teacher clarity which a number of investigators including Bush (1976), Kennedy, Cruickshank, Bush, and Myers (1978), Hines (1981), Murray (1983), Gloeckner (1983), and Cruickshank and Kennedy (1986), have identified as requiring further research involves the extent to which and how certain teacher characteristics and attributes such as age, sex, and grade point average are related to clear teaching. Even though research has resulted in contradictory findings regarding the relationship between teacher age and clarity, it is still considered a promising variable for future research. In a reanalysis of data obtained from the Kennedy et al.
(1978) study, Gloeckner (1985) found a strong relationship between teacher sex and clarity. Results of Gloeckner's study indicated that students identified male teachers as their most clear teachers and female teachers as their most unclear teachers. While the relationship between clarity and teacher grade point average has not been specifically analyzed in any of the teacher clarity studies, Gloeckner (1983) reported that American College Test (A.C.T.) scores for the preservice teachers involved in his study approached significance. Gloeckner (1983) did not find any statistical significance between clarity and other teacher attributes such as personality type.

Several investigators including Bush (1976), Holland (1979), Williams (1983), and Gloeckner (1985), have found support for further study of the relationship between teacher clarity and subject matter or content taught. While Holland's results indicated that mathematics and science teachers had higher clarity scores than teachers of other subject areas, there was strong support for the stability of teacher clarity across subject area. Williams also reported considerable stability in teacher clarity ratings across different subject matters. Gloeckner's research demonstrated that in general there was a difference in clarity scores across different content areas with mathematics teachers being perceived as clear and science teachers being perceived as unclear. In addition, Hines (1981) and Cruickshank and Kennedy (1986) suggested that future
research be conducted to determine the extent to which clarity is a function of the content taught.

It is important to examine relationships between teacher clarity and selected demographic and contextual variables in order to expand the knowledge base regarding the clarity construct. Once a link is established between teacher clarity and certain variables, then the nature and type of relationship could be explored (i.e., curvilinear, causal, or moderating). If teacher clarity ratings depend upon the nature of the subject or content area as several researchers (Holland, Gloeckner, and Larsen) postulated, then various methods need to be investigated to determine whether teaching broad conceptual ideas, for instance, lends itself to clarity better than teaching skills or teaching in a step-by-step manner. Since teacher clarity is a form of didactic teaching, there is also the possibility that it might be easier for teachers of a particular subject area to perform the clarity behaviors due to the type of behaviors contained in the observation instrument being used to assess clarity. For example, perhaps mathematics teachers "write important points on the board" or "provide students with time for practice" more often than English teachers. If a profile of a typical clear teacher could be developed, then preservice and inservice teachers with the appropriate attributes or characteristics could be selected for demonstration and investigation purposes.

In conclusion, justification for the present study is based on the following grounds: a) that teacher clarity has not been
investigated in the context of the natural K-12 classroom; b) that it is necessary to determine whether teacher clarity can be observed and measured in natural classroom settings across various grade levels and subject matters; and c) that there is a paucity of research regarding the relationship between teacher clarity and variables such as curriculum content and teacher age, sex, and grade point average.

**Research Questions**

This study addressed the following specific research questions:

1. What is the average teacher clarity for the sample considered in this investigation and how do individual scores compare to the mean?

2. Is there a significant difference in clarity ratings between finalists and nonfinalists who participated in a national student teaching competition?

3. Is there a significant difference in clarity ratings across grade levels (elementary, intermediate, and secondary)?

4. Does teacher clarity differ according to subject matter taught?

5. What is the relationship between teacher clarity and various teacher characteristics including age, sex, grade point average, education specialty, college rank, size of college attended, immediate career plans, and reasons for entering a national competition?
6. To what extent can the low-inference teacher behaviors which define the clarity variable be observed and measured in natural classroom settings?

Definition of Terms

**High-inference behaviors**: Those teacher behaviors which require observers or raters to make subjective judgments or ratings about their quality and/or occurrence in the classroom setting (e.g., "teacher is clear").

**Low-inference behaviors**: Those teacher behaviors that can be objectively observed and counted in the classroom setting (e.g., "uses examples when explaining").

**Teacher clarity**: "A cluster of teacher behaviors that result in learners' gaining knowledge or understanding of a topic, if they possess adequate interest, aptitude, opportunity, and time" (Cruickshank & Kennedy, 1986, p. 43). These teacher behaviors focus on four major factors including stressing or emphasizing important aspects of content, explaining instructional content, providing for synthesis of content, and assessing student understanding. Teacher clarity is a form of didactic teaching as opposed to heuristic teaching.

**Selected demographic and contextual variables**: The selected variables include teacher age, sex, and grade point average; subject matter and grade level taught; education specialty; college rank and size; immediate career plans; and reason(s) for entering the
national competition. Several variables (subject matter, age, sex, and grade point average) were chosen for the investigation on the basis of previous clarity research findings described earlier in this chapter. Grade level and education specialty were included as variables in the study due to strong inference by this investigator that these variables could be logically linked to clarity. The remaining variables were selected for inclusion since they can generally be found in demographic surveys. Information regarding these variables was obtained from lesson plans submitted to the National Education Association as part of the competition entry requirements and from self-report forms completed by the student teachers in this study.

Limitations

1. Since the sample of preservice teachers used in this study was limited to consenting student teachers involved in a national student teaching competition, generalization of the findings will be restricted to the population from which the sample was drawn.

2. Since some of the low-inference clarity behaviors require knowledge of the subject matter, observers with expertise in the content areas represented in this study were needed to rate teacher clarity. This criterion greatly limited the pool of available observers for the study in that only people with certain areas of expertise (e.g., elementary
language arts, secondary science, social studies, etc.) were selected for observer training. Matching observers and content areas also made it virtually impossible to randomly assign videotapes to observers.

3. Each videotaped lesson was rated by only one trained observer with the exception of three videotapes used to establish interrater reliability which were rated by all observers.

4. Since lessons included in this study were didactic in nature, findings can only be generalized to expository teaching.

5. The Teacher Clarity Observation Instrument developed by Hines (1981) was slightly revised for the present study in order to make it more useful in real classrooms. Since the instruments used to observe clarity behaviors in recent studies are not identical, comparisons across clarity studies will be limited.

6. Since this study was not designed to warrant the making of causal inferences, causal claims will not be made.

7. Self-reported information via the demographic survey could result in unreliable data for several variables (e.g., grade point average, etc.).

8. Many variables contained categories with small numbers of subjects resulting in extreme or outlier scores which limited the statistical power of the data analysis procedures.
CHAPTER II

REVIEW OF RELATED RESEARCH

This literature review primarily focuses on the research related to the teacher clarity construct. Specifically, this review examines two decades of research in an attempt to delineate not only the historical background, but also the current status related to the concept of teacher clarity. Special emphasis is given to the recent studies conducted at The Ohio State University in the area of teacher clarity since they serve as the immediate context from which the present study emerged.

This chapter consists of five major sections and a summary. The first section examines the Rosenshine (1971) and Rosenshine and Furst (1971) reviews which identified teacher clarity as one of the most promising variables in the teacher effectiveness research. Section two investigates the launching of the Ohio State line of inquiry into the teacher clarity variable. Section three analyzes related studies conducted by researchers at other institutions in conjunction with The Ohio State University work. Section four reviews investigations related to teacher clarity, but independent from the Ohio State University program of research. Section five evaluates a series of recent studies conducted at The Ohio State University which further explicate the teacher clarity construct.
The Initial Studies

In a comprehensive review of fifty process-product studies, Rosenshine and Furst (1971) attempted to document relationships between process variables (teacher classroom behaviors) and product variables (student outcomes, i.e., achievement gains). They ranked teacher clarity first among the five "most promising" process variables. Cruickshank and Kennedy (1986) reported that the combined reviews of research by Rosenshine (1971) and Rosenshine and Furst (1971) identified ten process-product studies which purportedly investigated the relationship between teacher clarity and student learning. All investigations revealed positive and highly promising findings in support of teacher clarity: Chall and Feldman (1966); Belgard, Rosenshine, and Gage (1968); Fortune (1967); Fortune, Gage, and Shutes (1966); Hiller, Fisher, and Kaess (1969); Morsh, Burgess, and Smith (1955); Solomon, Bezdek, and Rosenberg (1963); Wallen (2), first and third grades (1966); and Wright and Nuthall (1970).

Rosenshine and Furst concluded that eight of the ten studies cited above treated clarity as a high-inference variable. The three studies which assessed teacher clarity by counting low-inference behaviors were: Hiller, Fisher and Kaess (1969); Solomon, Bezdek, and Rosenberg (1963); and Wright and Nuthall (1970). The Solomon, Bezdek, and Rosenberg (1963) study used both high- and low-inference measures. A tabular categorization of the ten studies presumed to
study clarity according to the type of measure used and who did the rating can be found in the Cruickshank and Kennedy (1986) review (Table 1, p. 44).

Rosenshine and Furst cautioned that the research they reviewed contained several limitations including the following: a) the vast majority of studies were of a descriptive nature, b) the process variables investigated were generally derived from high-inference ratings, and c) many of the studies exhibited marked deficiencies in method and analysis (Cruickshank & Kennedy, 1986, p. 45). The findings of the Rosenshine and Furst review received considerable criticism from Heath and Nielson (1974), who reanalyzed forty-two of the original fifty studies cited by Rosenshine and Furst. They reported numerous failings, several noted by Rosenshine and Furst, such as weak research designs, shallow definitions of student achievement, and sterile operational definitions of teacher behaviors. Heath and Nielson also maintained that Rosenshine and Furst combined operational definitions with little in common as examples of a single teaching variable (e.g., the teacher clarity variable) and claimed significant research findings that could not be supported when the statistical results were closely examined.

In an extremely comprehensive review of the clarity literature, Cruickshank and Kennedy (1986) agreed with the Heath and Nielson (1974) criticisms regarding definitional problems and specious categories as they relate to the teacher clarity variable. "As we have learned, 'teacher clarity' as a construct was an inference by
Rosenshine from results of research not initiated, per se, in the name of clarity" (Cruickshank & Kennedy, 1986, p. 53). Cruickshank and Kennedy (1986) concluded that "in only three studies (Belgard et al., 1968; Fortune et al., 1966; and Solomon et al., 1963) were the investigators discernibly interested in clarity as we now view it" (p. 53). However, it should be noted that these three studies provided "much of the strongest support for the clarity-achievement relationship" (Cruickshank & Kennedy, 1986, p. 54).

In the studies that were presumed by Rosenshine and Furst to be closely related to or proxies for clarity, Cruickshank and Kennedy (1986) concluded that Wallen (1966) "investigated behavior that conforms to the clarity construct" (p. 54). Cruickshank and Kennedy objected to the classification of Hiller et al. (1969) as a clarity study, "until there is further study of the legitimacy of the clarity-vagueness continuum" (p. 54). A more complete, tabular summary of the ten original studies, the variables studied, and probable connections made by the researchers can be found in the Cruickshank and Kennedy (1986) review, which in part is based on a reconsideration of the studies identified by Rosenshine and Furst that provided support for the teacher clarity variable (Table 2, p. 55).

Even though there were definitional and statistical problems associated with the initial studies, they provided the impetus necessary to launch at least two programs of research (teacher clarity and the inhibitors of clarity). Since the ten original
studies are somewhat outdated and have been reanalyzed extensively in the Cruickshank and Kennedy (1986) review, each study will not be examined individually in this section.

The Ohio State Research Program

As a direct result of the body of early research described in the previous section, researchers at The Ohio State University initiated a line of inquiry beginning in 1974 that focused directly on the teacher clarity construct. According to Cruickshank and Kennedy (1986), the early program of research at Ohio State was aimed toward resolution of the following questions: a) What specific instructional behaviors are perceived by learners as making teaching more clear? b) Are those specific behaviors related to each other in some way that might permit them to be grouped into "families" or factors of intermediate dimensionality? and c) Are some of the low-inference behaviors more able than others to discriminate between clear and unclear teachers? (p. 54).

In an effort to begin to identify the low-inference constituents of the teacher clarity construct and to respond to the first two questions above, Cruickshank, Myers, and Moenjak (1975) asked 1,009 students in grades six through nine in Columbus, Ohio to describe five behaviors frequently performed by their most clear teachers. The thousands of responses obtained from this open-ended approach were then inspected for similarity and face validity, with items
irrelevant to clear teaching discarded. This procedure yielded a list of 110 low-inference behaviors.

The 110 items were further inspected in a subjective manner which led to the following twelve (thirteen if number ten below is divided, as was the case in the original study) intermediate-inference categories:

1. Providing students with feedback or knowledge of how well they are doing;
2. Teaching things in a related step-by-step manner;
3. Orienting and preparing students for what follows;
4. Providing standards and rules for satisfactory performance;
5. Using a variety of teaching materials;
6. Repeating and stressing directions and difficult points;
7. Demonstrating;
8. Providing practice;
9. Adjusting teaching to the learner and topic;
10. Providing illustrations and examples;
11. Communication so students understand; and
12. Causing students to organize materials in a meaningful way.

(Cruickshank & Kennedy, 1986, p. 56)

In direct response to the third question previously posed by Cruickshank and Kennedy (1986) regarding the ability of low-inference behaviors to discriminate between clear and unclear teachers, Bush (1976) and Bush, Kennedy, and Cruickshank (1977), using the 110 items from the preceding study, sought to specify the set of teacher
behaviors which discriminated best between clear and unclear teachers, at least as perceived by their students. To do so, Bush (1976) randomly divided the 110 behaviors identified by Cruickshank, Myers, and Moenjak (1975) into two 55-item sets and developed two random orderings of behaviors for each of these sets, resulting in four different instruments. Two distinct versions of each of the four instruments were created and administered to 1,549 ninth-grade students in the Cleveland, Ohio parochial school system. The first version requested students to think about their most clear teacher and to indicate on a five-point scale the frequency with which they perceived this teacher to exhibit each of the fifty-five behaviors presented in the instrument. The second version requested students to respond in a similar fashion thinking of their most unclear teacher.

The results of this study suggested that teacher clarity, as perceived by students, was a multidimensional phenomenon. Based upon factor analyses of students' responses, five salient intermediate-level factors or dimensions associated with the clarity construct emerged. These dimensions were labeled: a) explaining, b) providing for student understanding, c) explaining with concrete written or verbal examples, d) relevancy/synthesis, and e) structuring. While the first three factors were prominent, the last two dimensions were reported to be relatively weak.

Results of discriminant analyses revealed that the behaviors were able to differentiate between clear and unclear teachers and that a
number of specific behaviors were better (prime) discriminators of teacher clarity than others. The following prime behaviors were reported to be performed frequently by clear teachers but infrequently by unclear teachers:

1. Gives the student individual help;
2. Gives explanations that students understand;
3. Teaches at a pace appropriate to the topic and students;
4. Takes time when explaining;
5. Answers student questions;
6. Stresses difficult points;
7. Shows students examples of how to do class or homework;
8. Reviews work with students in preparation for a test;
9. Gives the student enough time to practice; and
10. Supports the lesson with specific details.

(Bush et al., 1977, p. 57)

These prime discriminating behaviors belonged to one of two prominent intermediate factors, either explaining with concrete written or verbal examples or providing for student understanding via explanation. According to Bush et al., "the significant intermediate dimensions of teacher clarity pertain to the teacher acts of: a) explaining ideas and directions and b) using ample illustrations during the process of explaining ideas and directions" (p. 57).

These investigators also explored multivariate relationships between the 110 behaviors and selected status and demographic
variables. Research results suggested that teacher age was negatively related to clarity, indicating that younger teachers were perceived as being more clear than older teachers. In addition to teacher age (estimated by student), the most promising variables were teacher sex, pupil sex, and subject matter taught by teacher.

In order to cross validate the Bush findings and to determine if they can be generalized across different geographic locations, an investigation was conducted by Kennedy, Cruickshank, Bush, and Myers (1978). They administered a highly refined instrument of student perception of teacher clarity to 1,363 junior high school students from Ohio, Tennessee, and Australia. The refined instrument consisted of sixty-one low-inference behaviors, including the forty-three most discriminating behavioral statements from the original Bush study and eighteen new behavioral statements generated by the researchers.

Four versions of the new instrument incorporating these sixty-one behaviors were developed. Each version of the instrument consisted of two distinct but parallel sets of behavioral statements, with each set consisting of thirty-four items. Seven items were common to both sets. In this study, unlike the Bush study, students were asked to target both their most clear and unclear teacher and to respond to two sets of parallel behaviors (each set consisting of thirty-four items) in terms of the frequency with which each type of teacher
performed the behavior. Half the students responded by thinking of their most clear teacher first; the other half started with their most unclear teacher.

Like the Bush study, results of this study showed that teacher clarity was a multidimensional construct. Factor analyses of students' responses produced four intermediate-inference factors that were similar to the prominent factors identified in the Cleveland studies. These factors were labeled: a) assesses student learning, b) provides student opportunity, c) uses examples, and d) reviews and organizes. In addition, similar factor solutions were obtained across all three geographic locations, indicating generalizability of the clarity construct.

The results of discriminant analyses yielded twenty-eight low-inference behaviors which were found to discriminate highly between clear and unclear teachers. These behaviors were labeled prime discriminators of teacher clarity, and the ten most discriminating behavioral statements were the following:

1. Explains things simply;
2. Gives explanations we understand;
3. Teaches at a pace appropriate to the topic and students;
4. Stays with the topic until we understand;
5. Tries to find out if we don't understand and repeats things;
6. Teaches step-by-step;
7. Describes the work to be done and how to do it;
8. Asks if we know what to do and how to do it;
9. Repeats things when we don't understand; and
10. Explains something and then works an example.

(Kennedy et al., 1978, p. 6)

Even though a one-to-one correspondence between the list of prime discriminators reported by Kennedy et al. (1978) and a comparable list given by Bush et al. (1977) could not be determined due to instrument revision, obvious similarities were found. Not only were the prime discriminators identified in the Kennedy et al. (1978) study consistent with previous work, but they also were stronger in their ability to discriminate between student-perceived clear and unclear teaching.

In addition, these researchers investigated relationships between the clear vs. unclear teacher clarity variable and selected status and demographic variables. Results of multivariate analysis revealed a positive (but modest) link between student selection of their most clear and unclear teacher and their assessment of how well or poorly they performed in that teacher's class. According to Kennedy et al., this finding suggested that the "students in this study did not confuse the concept of most clear teacher with more generic constructs of good teacher and favorite teacher (particularly one who awards high grades)" (p. 8). Research results did not support the Bush et al. suggestion that teacher age was negatively related to clarity.
Related Studies

According to Cruickshank and Kennedy (1986), the success of the early Ohio State studies stimulated interest in the conduct of similar investigations which represented efforts to further define clarity and to explore some of the correlates of low-inference clarity (pp. 58-59). These investigations were conducted during the middle and late 1970s, both in conjunction with and independently of the Ohio State line of inquiry. The next three studies conducted at other institutions were directly related to the Ohio State research.

As was the intent of Bush (1976), Bush et al. (1977), and Kennedy et al. (1978), Smith (1978) sought to identify the principal low-inference components of the clarity construct. From a review of the relevant literature, Smith identified forty-one potential low-inference behavioral correlates of "clarity of presentation". These teacher behaviors (including some items from the Bush studies), were rated by a panel of thirty-one experts in teacher education on three dimensions: a) value, b) learnability, and c) measurability.

The expert ratings produced eleven variables which met all three criteria for selection as potential low-inference clarity behaviors. As a result of extensive pilot testing, ten of these items were retained. Smith then developed a training manual comprised of the ten operationalized behavioral items which was used by two trained raters to rate the audiotaped teaching of ninety-nine community
college instructors. Various statistical analyses of the resultant ratings yielded the following ten most promising low-inference behaviors:

1. Uses examples with explicit referents;
2. Lets students ask questions;
3. Answers student questions;
4. Asks questions related to material being presented;
5. Encourages students to ask questions;
6. Shares over-all structure of the lecture with students;
7. Teaches step-by-step;
8. Prepares students for what they will be doing next;
9. Uses verbal markers of importance; and
10. Summarizes material at appropriate points in the presentation.

Factor analysis of the ratings indicated that the ten variables listed above clustered in three factors which were labeled: a) organization, b) makes organization of the presentation explicit to the students, and c) uses questioning skills, examples. It should be noted that many of the ten most promising low-inference behavioral items offered by Smith are similar to the prime discriminators of clarity identified earlier in the Ohio State research.

The objective of research conducted by Holland (1979) was to investigate key aspects of the generality of teacher clarity in terms of subject area and geographic region, with primary emphasis on subject area. In order to determine the stability of the clarity
construct with respect to these two variables, Holland (1979) further analyzed the data originally collected for the study by Kennedy et al. (1978). Specifically, Holland's study focused on whether mathematics or science teachers, because of the nature of their subject matter (hierarchical or step-by-step), would differ in clarity from social studies or English teachers, whose subject matter tends to be less hierarchical.

Based on results of multivariate analyses of variance, Holland found that there was "strong support for the stability of teacher clarity across subject area and geographic region in terms of low-inference and intermediate-inference behavior components" (p. 121). However, for subject area in particular, results revealed a greater difference in overall clarity scores between clear and unclear mathematics and science teachers than for teachers of other subjects, indicating that student-perceived clarity might be partly a function of subject matter. Despite these differences in clarity across subject area, discriminant analyses showed that there was a high degree of substantive agreement in the patterns of prime discriminators for both subject area and geographic region.

White (1979) undertook an investigation designed to focus on the relationship of teacher clarity to student achievement outcomes. She administered the four clarity instruments developed by Kennedy et al. (1978) to 306 high school students who were asked to rate their most clear and most unclear teacher on the sixty-one behavioral items listed. Using factor analysis procedures, White obtained essentially
the same four factor structures that were reported by Kennedy et al. She then incorporated twelve of the low-inference behavioral statements with the highest loadings (.50 or above) on either of the two primary factors into a teacher clarity observational instrument.

While White described these twelve items as prime discriminators, Hines (1981) suggested that the use of this term was misleading. Hines pointed out that since the investigator did not perform discriminant analysis, the items selected for inclusion in the instrument were not necessarily those that discriminated well between clear and unclear teachers. Hines reported that only six of the twelve items were among the twenty-eight prime discriminators listed by Kennedy et al.

In the second phase of White's study, sixteen preservice student teachers (only twelve of these were later included in the analyses) taught a specially prepared lesson to their regular class in one of three subject areas -- mathematics, history, or English. The preservice teachers were videotaped in the three subject areas mentioned above in one of five Metropolitan Nashville high schools. The resultant sixteen videotapes were observed and rated by a panel of judges to determine if the teacher clarity behaviors occurred at all, and if they did occur, were they performed satisfactorily (i.e., to the satisfaction of the judges). Composite clarity scores based on the instrument described earlier were then correlated with learner achievement scores derived from a ten-item quiz administered to students at the end of the lesson.
Contrary to results obtained from other investigations attempting to link clarity and achievement, White found a negative correlation \( r = -0.4988, p = 0.049 \) between teacher clarity and student achievement. White's explanation for this negative finding was that teachers judged to be clear tended not to present a large proportion of the prescribed lesson content due to the fact that they often taught material irrelevant to and/or unrelated to the assigned lesson. White also claimed that many of the preservice teachers who scored high on the clarity rating scale had difficulty in pacing their lessons. Based on the results of her study, White concluded that teacher clarity is not a sufficient condition for obtaining gains in student achievement. She recommended that in future investigations clarity should be considered within the context of the student's opportunity to learn the criterion material taught.

Hines (1981) criticized the second phase of White's study on the grounds that several methodological and measurement problems were evident. According to Hines, the operational definition of clarity used was both limited and questionable since White did not identify or incorporate the prime discriminators of clarity into the observation instrument as reported and the behavioral items comprising the clarity instrument were not fully representative of the range of teacher clarity behaviors (p. 58). Furthermore, White did not take into account the frequency of occurrence of observed teacher behaviors, only their presence or absence. Hines suggested that the frequency method of measuring the clarity variable seemed to
be a critical component in the measurement of the low-inference behaviors associated with clarity. Hines concluded that these problems could have resulted in the negative relationship found between the clarity variable and student achievement.

**Independent Studies**

Before returning to the more recent studies conducted at The Ohio State University during the early and middle 1980s, the independent research conducted mainly in the middle and late 1970s will be reviewed. The next group of studies consists of clarity investigations that were conducted independently of the Ohio State line of inquiry.

French-Lazovik (1974) reported on two studies conducted at two different universities fifteen years apart which yielded almost identical results. The purpose of these studies was to determine what teaching characteristics were meaningful in predicting college students' judgments of teaching effectiveness. In both studies, students (n = 9,700) were asked to rate their college teachers (n = 277) on more than forty descriptive statements using a five-point scale, and then to provide an overall rating of teaching effectiveness.

The results of this study showed that the lists of top-ranking items obtained from the effectiveness ratings obtained in the two studies were nearly identical. French-Lazovik suggested that the top ten predictors of teaching effectiveness could be described under the
following three broad categories: a) clarity of exposition, b) arousal or broadening of interest, and c) motivation of intellectual activities or stimulation of thought (p. 377). The following items (labeled prime predictors) comprised the clarity of exposition category: a) interprets difficult or abstract ideas clearly, b) makes good use of examples and illustrations, c) has presented the course in an organized manner, and d) inspires confidence in his/her knowledge of the subject. French-Lazovik’s analyses offered “strong evidence” that clarity, along with the other two categories mentioned above, were “the major determiners of students’ general evaluation of teaching effectiveness” (p. 382).

Frey, Leonard, and Beatty (1975) investigated the relationship between instructional ratings and exam performance. Students (n = 778) enrolled in twenty-one sections of calculus and ten sections of educational psychology at three Midwestern universities, rated their instructors at the end of each course on a twenty-one item questionnaire, called the Endeavor Instructional Rating Form (EIRF). This rating form which provided information about seven aspects of the teaching situation, contained three items under the label “clarity of presentations”. These instructor’s ratings were then correlated with each section’s final exam performance.

Based on correlational analysis, the following three rating scale factors “showed a fairly strong correlation with final exam performance: student accomplishment (r = .59), presentation clarity (r = .58), and organization-planning (r = .51)” (p. 440). However,
not only was there no mention of significance for this analysis, but there were also several flaws in reporting other results (e.g., the nature of the factor measures). Nevertheless, the investigators reported that three of the seven instructional rating factors (including presentation clarity) "provide a valid index of which teachers are most successful at preparing students for their final exam" (p. 443). Furthermore, they concluded that student ratings of instruction over at least the three rating factors identified above correlate highly with educational achievement.

Good and Grouws (1977) studied eighteen fourth-grade mathematics teachers to determine if differences in classroom behavior could be identified among teachers who differed in effectiveness. Effectiveness in this study referred to the teacher's ability to improve student performance on a standardized achievement test. Using mathematics residual gain scores from the Iowa Test of Basic Skills for more than 100 students across two consecutive years, the investigators identified nine teachers who were consistently effective and nine teachers who were consistently ineffective.

Observational data were collected by two trained raters who observed each teacher's classroom six or seven times. In order to obtain "blind" ratings, observations were made in forty-one classrooms. The following sets of information were collected: a) time measures to describe how mathematics instructional time was utilized, b) low-inference descriptions of teacher-student
interaction patterns, c) high-inference interaction variables, and d) descriptions of materials and homework assignments.

Classroom process data were analyzed using a one-way analysis of variance model to determine ways in which effective and ineffective teachers differed in their classroom behavior during mathematics instruction. Among the many significant results in a number of areas, the researchers found that the ability to make clear presentations was one of the necessary skills for effective whole class instruction. Good and Grouws reported that effective or high achievement teachers regularly obtained higher clarity scores and generally introduced and explained material more clearly than did the nine ineffective or low achievement teachers. According to the authors, "teaching effectiveness appeared to be strongly associated" with several clusters of behavior including one labeled "general clarity of instruction, and availability of information as needed" (p. 53).

Evans and Guymon (1978) conducted an experimental study which sought to determine the effects of clarity of explanation on student achievement and students' perceptions of teacher and course effectiveness. The following two components of clarity of explanation (as identified by factor analysis studies) were used to operationally define the clarity construct: a) appropriate use of examples and b) logical sequencing of instruction.

Nineteen college student volunteers enrolled in an introductory psychology class were randomly assigned to one of three groups:
a) treatment (given clear lecture presentation), b) treatment (given unclear lecture presentation), and c) control (given no lecture presentation). Participants in the experimental groups viewed one of two versions (clear and unclear) of a videotaped biology lecture presented by the same college instructor. Control subjects did not view either version of the lecture. In order to assess student learning, a twelve-item posttest on the instructional content was administered to all participants. Participants in the two experimental groups (clear and unclear lecture) also completed an affective questionnaire and a teacher rating form which measured students' attitudes and opinions regarding course and teacher effectiveness.

The results showed that students who received the clear lecture presentation scored significantly higher on the posttest than the students who participated in the unclear presentation. In addition, students in the clear lecture group rated the teacher higher on factors related to clarity of explanation than those in the unclear lecture group. There was no significant difference between ratings of these groups of students on other teacher effectiveness variables. There also was no significant difference between the groups on the affective measures.

Further, Evans and Guymon found that student ratings on clarity of explanation correlated higher with student achievement scores than did any of the other teacher effectiveness factors rated (e.g., relevance/usefulness of course content, interest in subject matter,
and teacher knowledge of subject matter). The researchers suggested that this finding demonstrates the value of using student rating forms to measure teacher effectiveness. Evans and Guymon concluded by claiming that "this study adds support to the factor analytical studies which found that 'clarity of presentation' was composed of, among other items, the use of examples and organizational structure" (p. 9).

Murray (1983) "compared the frequency of occurrence of sixty low-inference teaching behaviors in groups of university lecturers who had consistently received either low, medium, or high overall effectiveness ratings from students in previous courses" (p. 139). Each group (low, medium, and high) consisted of eighteen lecturers who were selected on the basis of previous ratings of overall effectiveness on a faculty questionnaire for student evaluation of teaching. The observation instrument (Teacher Behaviors Inventory) contained sixty items covering the following eight categories of classroom behavior: a) speech, b) nonverbal behavior, c) explanation, d) organization, e) interest, f) task orientation, g) rapport, and h) participation. Trained observers who visited regular classes taught by the participating lecturers, rated the frequency of occurrence of each of these specific, observable behaviors on a five-point scale.

"Factor analysis of individual teaching behaviors yielded nine readily interpretable factors, of which three (clarity, enthusiasm, and rapport) differed significantly across groups" (Murray, 1983,
p. 146). Murray noted that the clarity factor seemed to reflect a "clarity of explanation" or "expositional skill" dimension, and included items from four separate categories of the Teacher Behaviors Inventory (p. 143). Several items comprising the clarity factor (e.g., uses concrete examples, repeats difficult ideas, asks questions of class as a whole, and stresses important points) were similar to the low-inference behaviors identified in other clarity studies including the early Ohio State research efforts.

In addition, Murray suggested that "whereas clarity and rapport are important factors in differentiating a medium-rated or 'average' lecturer from a low-rated or 'poor' lecturer, the critical factor in differentiating an 'outstanding' lecturer from an 'average' lecturer is enthusiasm" (p. 143). Murray also found that while medium-rated lecturers were equal to high-rated lecturers in clarity, they were not equal to high-rated lecturers in enthusiasm. However, high-rated teachers scored high on both the clarity and enthusiasm dimensions. Further evidence showed that lecturers high on clarity could be low on enthusiasm, but not the opposite (i.e., low clarity and high enthusiasm). This result indicated that a certain level of perceived clarity is necessary in order for a teacher to be perceived by students as enthusiastic.

Murray noted that one limitation of his study was the possibility that teaching behaviors which differentiated among low-, medium-, and high-rated teachers affect student ratings but not student learning. He concluded that "it seems likely that there is at least some degree
of overlap between teaching behaviors that affect student ratings and teaching behaviors that affect student achievement" (p. 148). This study provided further support for the use of student perception ratings in obtaining reliable and valid information on the quality of college teaching.

Finally, Murray attempted to determine whether the nine teacher behavior factors were related to specific teacher or course variables. He found that the teacher clarity factor was "higher for teachers aged thirty-two to forty than for younger or older teachers" (p. 146). This finding did not support the previously reported contradictory results of Bush et al. and Kennedy et al. regarding the relationship between teacher age and clarity, but it did indicate that teacher age could be a promising variable in future investigations. Murray recommended that "further research is needed to determine the extent to which low-inference teaching behaviors are differentially effective for different subject areas, teaching methods, and types of students" (p. 147). Recent clarity studies have addressed several aspects of this concern.

**Recent Ohio State Studies**

Research on teacher clarity described up to this point has focused on the identification of specific low-inference behaviors associated with the clarity variable in order to obtain a meaningful operational definition of this construct. These investigations have set the stage for further study of the clarity variable. Very recent
studies conducted at The Ohio State University have contributed to a growing body of knowledge about clarity by attempting to pursue teacher clarity beyond description and definition. This most recent research effort is a continuation of the line of inquiry initiated by Cruickshank and associates at Ohio State, and directly addresses several questions which remained unanswered following the earlier series of studies conducted at Ohio State: a) Can the low-inference constituents of clarity be reliably and systematically observed and measured? b) What is the relationship between low-inference teacher clarity behaviors and student achievement? c) What is the relationship of clarity to various teaching situations and learning outcomes? and d) To what extent do student perceptions of teacher clarity mediate the effects of clarity on learning outcomes?

In a replication of the Kennedy et al. (1978) study, Hines (1981) extended their research to the college level. She investigated college students’ perceptions of teacher clarity to determine whether the low-inference teacher behaviors which defined the clarity variable at the junior high school level were generalizable to the college level, and to identify a set of low-inference teacher behaviors which operationally define the clarity variable, as perceived by college students. Her research also focused on the ability to observe and measure (by employing both low- and high-inference measures) the clarity variable and the relationships between teacher clarity and student outcomes. In addition, the
hypothesis advanced by Kennedy et al. that student perceptions of teacher clarity may mediate the effects of clarity on learning outcomes was examined.

To accomplish the first objective noted above, Hines administered four alternate forms of the clarity instrument used in the Kennedy et al. study (modified slightly to apply to the college level) to a highly representative sample of 573 undergraduates at The Ohio State University. Each alternate form consisted of fifty-eight behavioral statements (forty-two from the Kennedy et al. study and sixteen generated by the investigator) organized into two separate but parallel item sets, and two open-ended items which allowed respondents to list additional behaviors they perceived to be characteristic of their clear and unclear college teachers. Students were asked to indicate the frequency with which they perceived their most clear and most unclear college teachers to exhibit the teacher behaviors identified on the clarity questionnaire. The resultant student responses were subjected to factor and discriminant analyses.

The results of both types of analyses were similar to those found by Kennedy et al. The factor analyses yielded three very strong clarity factors, labeled: a) provides for student understanding and assimilation of instructional content, b) explains/demonstrates how to do the work by use of examples, and c) structures instruction and instructional content/presents content in a logical sequence. While
the first two clarity factors resembled the prominent clarity factors identified in the Kennedy et al. study, the third factor was a newly identified clarity factor.

Based on discriminant analyses, the forty-two teacher behaviors drawn from Kennedy et al. and eleven items added by Hines were found to exhibit extremely high discriminatory power in differentiating between clear and unclear teachers. In addition, Hines reported that twenty-seven of the twenty-eight prime discriminators of clarity at the junior high level and nine other behavioral statements not previously identified as prime discriminators at the junior high level emerged as prime discriminators of clarity at the college level (p. 323). Thus, the research by Hines showed that the teacher clarity construct could be operationalized in terms of specific low-inference behaviors which were generalizable across at least two educational levels, junior high and college.

The second phase of the Hines (1981) study, designed to accomplish the remaining objectives listed above, was subsequently reported by Hines, Cruickshank, and Kennedy (1985). To determine the relationship of teacher clarity to student achievement and satisfaction, thirty-two preservice teachers taught the same lesson to a small group of four to six peers within a Reflective Teaching context (Cruickshank, Holton, Fay, Williams, Kennedy, Myers, & Hough, 1981). Teachers and students were randomly assigned to groups. Lessons lasted no more than twenty-five minutes and were videotaped. Upon completion of the lesson, student achievement was assessed.
through a posttest specifically developed for the lesson. Students and teachers also completed a post-instruction questionnaire in which they rated the teaching exhibited during the lesson over twenty-nine low-inference clarity behaviors taken from Hines (1981). In addition, students and teachers rated their degree of personal satisfaction with the lesson.

The videotaped lessons were then rated by two trained observers using the Teacher Clarity Observation instrument developed by Hines (1981). The observers not only rated the twenty-nine low-inference items on both quantity (eighteen items involved tabulating frequencies) and quality (eleven items involved Likert-type ratings), but they also rated the quality of several intermediate- and high-inference clarity behaviors. Concerning the issue of reliability, Hines et al. reported that observer ratings of the low-inference teacher clarity behaviors yielded an extremely high reliability estimate (0.97). In addition, the findings indicated that the low-inference constituents of clarity were valid measures of the high-inference clarity variable and could be observed and reliably measured.

Results of a combination of statistical analyses revealed that all clarity measures across all inference levels and across all providers of measurement were positively and significantly related to learner achievement and satisfaction. While observer ratings of the low-inference clarity behaviors demonstrated the strongest relationship to student achievement, student ratings were most
closely linked to student satisfaction. In addition, results of path analyses performed to assess the hypothesis regarding the mediation effects of perceived clarity on achievement and satisfaction, suggested that student perceptions of teacher clarity strongly mediated the effects of clarity on student satisfaction with the learning experience. However, Hines et al. found that student perceptions of whether or not a teacher was clear showed little relationship to student achievement.

In direct response to several questions resulting from the research headed by Hines, Williams (1983) investigated the stability of teacher clarity over time across different subject matters and different groups of students. Specifically, she sought answers to the following questions:

1. Will there be significant changes in the clarity behavior of teachers when they teach a) the same material to the same students on different occasions a week apart; b) the same material to different students on different occasions; c) different material to the same students on different occasions; and d) different material to different students on different occasions?

2. What relationships exist between consistently clear as opposed to consistently unclear teachers with regard to learner achievement and satisfaction?

To address the first series of questions, fifty-two preservice teachers grouped according to the four conditions noted above, taught
either the same or different content to either the same or different groups of learners (four to six undergraduate peers) at two different times. As in the studies by Hines (1981) and Hines et al. (1985), Reflective Teaching (see Cruickshank et al., 1981) provided the context in which teaching was observed. Subsequent to the teaching of the Reflective Teaching lesson, learners (n = 456) completed a criterion-referenced posttest on the lesson content and the post-instruction clarity questionnaire used in Hines (1981) and Hines et al. (1985). Trained observers then rated the videotaped lessons using the Teacher Clarity Observation Instrument developed by Hines (1981).

Based upon a combination of complex analytic procedures, Williams found that most of the selected clarity behaviors examined in this study were consistently performed by preservice teachers during the time period studied. Moreover, preservice teachers behaved consistently at the intermediate- and high-inference levels, and in the majority of low-inference situations, according to observations by both trained raters and learners. In addition, the consistency of clarity (or lack of clarity) behavior was observed (with minor exceptions) for two different teaching tasks and for two different learner audiences. However, two important considerations relative to this study must be noted here: a) stability of teacher clarity behavior over time involved a short period of time, i.e., approximately one week and b) instructional content taught involved two Reflective Teaching lessons which were content neutral in the
sense that they would not normally be taught as part of any particular academic discipline, even though the Magic Square Task could be considered a mathematics lesson.

To answer the second question listed above, learner group mean scores on the posttest and a student satisfaction measure (question eighteen) from the post-instruction questionnaire were analyzed. The findings suggested that over time the consistently clear teacher produced gains in student achievement scores, while achievement scores decreased for the consistently unclear teacher. Williams also found that student satisfaction ratings were higher over time for the clear teachers and lower for the unclear teachers.

Directly inspired by the research conducted by Hines (1981), Gloeckner (1983) attempted an experimental investigation to determine whether clarity behaviors could be taught to preservice teachers and whether preservice teachers trained to be clear would achieve better results in terms of student achievement and satisfaction than those not trained in clarity. To address the problem of whether clarity could be taught, Gloeckner developed and field tested a training program that was administered to an intact class (n = 25) of preservice teachers. The control group consisted of twenty-two preservice teachers enrolled in another section of the same education course.

For pretest purposes, each subject in both the control and experimental groups, taught a three-minute segment of the same Reflective Teaching lesson to the entire class. After the
experimental group received ten hours of clarity training extending over a period of ten days, all subjects once again taught a three-minute segment of the same Reflective Teaching lesson used in the pretest to their entire class. Each lesson was videotaped and rated by trained observers on both the quantity and quality of clarity exhibited in each teaching performance. Results showed that while there was no significant difference between the two groups on the pretests, there were large differences between the control and experimental groups in both the quantity and quality of clarity behaviors performed on the posttests conducted upon completion of the training period.

To assess the effect of the clarity training on student achievement and satisfaction, the experimental group competed with a new group (n = 24) of untrained preservice teachers from four different sections of the same education course. Each designated teacher taught two different Reflective Teaching lessons to small groups of three or four peers. Each lesson lasted no more than fifteen minutes and one-third of the lessons, randomly chosen, were videotaped and rated for clarity by trained observers. Following the teaching of the lesson, posttests based on the lesson content were administered in each learning group to measure student achievement. Learners also rated their teacher’s clarity using the post-instruction clarity questionnaire developed by Hines (1981), and responded to a question indicating their degree of satisfaction with the teaching.
Results revealed that trained teachers did not perform better than untrained teachers in bringing about learner achievement or satisfaction. In addition, there was no difference in clarity ratings by learners or observers between trained and untrained teachers. Thus, the training program resulted in little or no transfer effect. One reason why trained teachers did not outperform untrained teachers could be that they taught unfamiliar students, whereas the untrained teachers taught familiar students (their classmates). Another possible explanation for this unexpected finding could be the introduction of competition and a test in the second phase of the study. In the first phase of the study, the trainees were told to perform as many clarity behaviors as possible in their three-minute lesson presentation, without worrying about preparing learners for a test. Perhaps in the second part of the study when they were required to administer a posttest measuring student learning and to compete with their peers, the trained teachers decreased their focus on clarity, while highly motivated, untrained teachers unknowingly increased their clarity levels. Thus, problems with the design of this study led to difficulties in interpreting and generalizing the results.

In a study resembling Gloeckner's, Larsen (1985) attempted to extend Gloeckner's work into a more natural classroom setting and to improve upon his research in the area of experimental design. Unlike Gloeckner's study, Larsen investigated the teacher clarity construct in the context of teaching mathematics. He also focused on concept
development with elementary students, rather than skill acquisition at the college level. The primary purposes of Larsen's experimental study were to determine whether preservice teachers could be taught to be more clear and to examine the relationship between clarity and achievement.

To address these and other research concerns, thirty-two preservice mathematics teachers were randomly assigned to one of two experimental groups, treatment or control. Preservice teachers within each group were then randomly assigned to one of three elementary schools and one of three grade levels (4, 5, or 6). A small group of five elementary students was randomly chosen from intact classes and assigned to each preservice teacher. The setting approximated natural teaching circumstances in that these small groups of elementary children served as learners in the experiment.

Next, each preservice teacher taught a lesson on the base five numeration system to his or her assigned group. Five weeks later, following intervention in the form of exposure to one of two training units, the preservice teachers taught a second lesson to their groups which dealt with a different concept in the same numeration system. Both groups (treatment and control) were exposed to training units dealing with teacher effectiveness, developed and taught by the principal investigator of the study. The training units, which were incorporated into a mathematics methods course, extended over a period of four weeks (ten total hours) and provided a combined format of lecture, discussion, and exercises in Reflective Teaching (see
Cruickshank et al., 1981). While the training units were as similar as possible, the one which the treatment group received dealt specifically with the teacher clarity construct. The training unit received by the control group presented generic views of effective teaching without mentioning teacher clarity.

Each lesson lasted approximately thirty minutes and was audiotaped. Teachers were rated by the researcher of the study for their clarity using a modified version of the Teacher Clarity Observation Instrument (Hines, 1981). While the modified instrument incorporated the same eighteen dimensions of teacher clarity included as low-inference behaviors in the instrument developed by Hines, instead of counting the frequency of occurrence for these behaviors, Larsen devised an intermediate-inference form consisting of a five-point rating scale for each of the eighteen behaviors. The remaining items on the Hines (1981) instrument (seven low-inference, four intermediate-inference, and several high-inference behaviors) which were rated using a five-point Likert scale, were not included on the modified clarity instrument designed by Larsen. In her critical review of the White (1979) study, Hines (1981) reported that the frequency of occurrence of the clarity behaviors seemed to be an essential component in the measurement of the low-inference constituents of clarity, since this was the basis on which these behaviors were identified (p. 59). A similar criticism could be aimed at Larsen's attempt to measure the eighteen low-inference
behaviors on an intermediate-inference scale. At the conclusion of each lesson, learners completed a fifteen-item test on the lesson's content to assess student achievement.

While it should be noted that the results of Larsen's research were not entirely consistent with those of earlier studies, the following conclusions were supported by experimental evidence:

1. Preservice teachers can be trained to exhibit greater clarity;

2. In the context of concept acquisition, clarity and achievement are positively related;

3. No interaction was detected between teacher clarity and teacher mathematical competence;

4. Among the clarity behaviors considered, the behavior "stresses important aspects of content" appears particularly potent;

5. Factor analysis suggests that the trait teacher clarity may best be captured by evaluating the behaviors of emphasis, explanation, and revision;

6. Over the five week period of the experiment, teachers were unstable with respect to their clarity ratings; and

7. Audio analysis of teaching events emerges as a valid and reliable means by which teachers can be rated on their clarity.

(Larsen, 1985, pp. 93-94)
In addition, Larsen developed an extended model of teacher clarity which defined clarity from a number of perspectives, including Receptive, Selective, and Collective Clarity. In essence, Larsen proposed that the current Teacher Clarity Observation Instrument (Hines, 1981), which defines Receptive Clarity, be modified to include a rating of teacher performance on selective behaviors that are subject specific and that characterize critical elements in the teaching of mathematics, such as questioning, symbolism, translation, application, generalization, verbalization, and solution strategies. Larsen hoped his refined model would "provide a cornerstone for debate and future research" (p. 103).

Conducted at about the same time as the Larsen dissertation, the most recent study in the Ohio State line of recent research investigated teacher clarity from a philosophical perspective. Using the philosophical technique called conceptual analysis, Armaline (1985) proposed to examine the concepts "clarity" and "inhibitors to clarity" in terms of their logical properties within the teaching/learning context. While the literature contained a line of empirical research related to the low-inference study of each individual area (clarity and inhibitors to clarity), there was no treatment of the logical properties of each concept and the relationship of one concept to the other. Thus, Armaline's intent was to explore the conceptual relationship between clarity and inhibitors to clarity in an attempt to synthesize the two lines of inquiry. He was primarily concerned with how the operational
definitions derived from empirical work for these two constructs
compared with the conceptual definitions used in ordinary language.

Armiline initially focused on comparing clarity as an ordinary
language term with the low-inference operational definition of
teacher clarity employed in the research context. As a result of
this analysis, he found that clarity in ordinary language consisted
of a double product sense, meaning that clarity can be achieved in
both a psychological sense based on student perception and a logical
sense based on a complete, accurate, correct rendering of the content
by the teacher. Operational and conceptual clarity differed with
respect to these two products or outcomes. While operational teacher
clarity involved the psychological student-perceived notion,
conceptual clarity involved both product senses. However, the
empirical research related to clarity relied solely on the
psychological sense and essentially ignored the logical sense.
Armiline suggested that a more complete operational definition of
teacher clarity would include items encompassing both senses of clear
teaching.

Operational and conceptual clarity also differed in terms of
teaching methods allowed by the construct. Clear teaching as
operationally defined in the empirical research limited method to
explaining or lecturing, whereas conceptual clear teaching could be
achieved in other ways which might be devoid of explaining
behaviors. To determine the relationship between operational clarity
and explanation, Armiline examined the philosophical literature
related to pedagogical explanation. Results of his analysis supported the claim made above that operational teacher clarity restricted teaching method to explaining, coupled with behaviors designed to check on the adequacy of the explanation with respect to student understanding.

In comparing the various operational definitions of teacher clarity derived from Bush et al. (1977), Kennedy et al. (1978), Hines (1981), and Hines et al. (1985), Armaline found that even though the Teacher Clarity Observation Instrument developed by Hines and the earlier Bush/Kennedy clarity work overlap a great deal, some significant differences exist. While the Bush/Kennedy research generated twenty-eight prime discriminators of teacher clarity, Hines discovered a total of forty-three prime discriminators. In refining the instrument for her study, Hines eliminated items not directly observable and/or not appropriate for laboratory teaching. Of the eliminated items, at least seven appeared on the Kennedy et al. list of prime discriminators. Thus, the Hines instrument created a more limited, restricted concept and used a narrower set of items than was generated by the earlier research. By removing items that placed the teaching episode in a realistic context, Hines developed an instrument that could lack validity when used in actual classrooms. The specific items eliminated and the criterion for elimination will be discussed in more detail in Chapter Three of the present study.

Armaline also explored the role of the individual behavioral items included in the Hines instrument, since it is the list used
most frequently by present clarity researchers. Armaline reported that while no single behavior on the low-inference level is necessary or sufficient for clear teaching, some individual low-inference items appear to carry greater weight than others (e.g., "provides time for students to practice" over "explains what unfamiliar words mean"). He suggested that "perhaps a weighting system would help draw the low-inference total closer to a quantifiable high-inference score" (p. 205). He further indicated that even though the final clarity assessment is based upon both quantity (determined by counting frequency of performance on low-inference behaviors) and quality (determined by rating low-, intermediate-, and high-inference items on a five-point scale), the primary gauge of the ultimate clarity rating is quality of performance on the factor (intermediate-inference) level. According to Armaline, "no single behavior is necessary, but some set of behaviors from the low-inference list (or from the factors) must be present in sufficient quantity and quality to justify the use of the term" (p. 213).

In addition, Armaline found that teacher clarity is a term that has both theoretical (operational) and ordinary uses, making it hard to distinguish between the two. Any attempt to build precision into a term used in ordinary language (such as clarity) by developing a strict listing of operational behaviors, results in possible conceptual distortion and the creation of a new concept. Armaline noted that due to the imprecise nature of operationally defining
clarity using the Hines instrument described above, clarity more closely resembles a term used in ordinary language than it does a technical term. Armaline concluded that "clear teaching is technical in the sense that it is being operationalized to function within a particular line of research" (p. 213).

Another issue investigated by Armaline involved the relationship between clarity and inhibitors to clarity. Basically, he found that these two research programs are parallel efforts and that both require more and better conceptualization and grounding in some philosophical or theoretical base. The result of Armaline's philosophical analysis of the empirical research related to inhibitors to clarity will not be examined in detail since they are beyond the scope of the present study. Additional concerns addressed in the Armaline study included the following: a) viewing clear teaching in the natural classroom as episodic, interspersed with periods of incongruence and inquiry, b) communication problems arising from multiple operational definitions that employ the same clarity label, and c) the potential for operational clarity being a prescriptive method for teaching without considering desired outcomes.

Summary

In their comprehensive review of process-product studies, Rosenshine and Furst (1971) identified eleven teacher behavior variables that were related to student achievement. The process
variable with the strongest research support was labeled "teacher clarity." However, the Rosenshine and Furst review was severely criticized by Heath and Nielson (1974) which led some researchers to view with suspicion the validity of the findings.

In a reconsideration of the early studies reviewed by Rosenshine and Furst, Cruickshank and Kennedy (1986) concluded that many of the studies included in the review under the teacher clarity label did not intend to measure teacher clarity directly. Furthermore, a number of the early studies did not provide adequate operational definitions of the clarity variable, thus making it difficult to determine which specific teacher behaviors were being assessed. In addition, the concepts studied in the name of clarity were highly diverse: clarity of aims, lesson presentation, clarity of speech, vagueness as absence of clarity, clarity of presentation, appropriateness/difficulty of the lesson, concluding a discussion without understanding, clarity of points and ease of understanding, intellectual effectiveness as explaining concepts clearly, and teacher phrasing of questions. Such a wide range of interpretations of clarity resulted in further conceptual ambiguity regarding the definition of clarity.

Due to strong criticism of the Rosenshine and Furst review, the original support claimed for the teacher clarity variable was questioned by many researchers. According to Cruickshank and Kennedy (1986), "despite criticism to the contrary, a construct 'like clarity' was detected in the research of the 1960s and the construct,
albeit poorly conceived, should not have been ignored" (p. 45). Research on teacher clarity was not abandoned, but instead was actively pursued by investigators at The Ohio State University. Since 1974 when the Ohio State line of inquiry was initiated, research on teacher clarity has been accumulating and the body of knowledge about teacher clarity continues to grow.

The early Ohio State studies attempted to operationally define the clarity construct by identifying its low-inference constituents. These studies laid the foundation not only for the most recent Ohio State research, but also for investigations conducted at other institutions both in conjunction with and independently of the Ohio State work. Following the mapping of the clarity construct by the early Ohio State program, subsequent research efforts sought to further explicate the teacher clarity construct and explore some of the correlates of low-inference clarity. In addition, several studies succeeded in establishing a firm link between teacher clarity and student achievement.

Based on the literature reviewed in this chapter, this researcher concurs with the significant findings from the research on teacher clarity reported by Cruickshank (1985) in a recent article, which include the following: a) teacher clarity is a multidimensional phenomenon; b) teacher clarity appears to be stable across time, content taught, different students, educational levels, and geographic locations; c) certain teacher clarity behaviors are more central and important than others; d) teacher clarity is consistently
and positively related both to student achievement and satisfaction; 
e) learners judge a teacher's effectiveness in large part on the 
basis of clarity; and f) teacher clarity can be enhanced through 
training (pp. 44-45).

While the recent Ohio State studies attempted to pursue teacher 
clarity beyond description and definition, both Larsen (1985) and 
Armaline (1985) suggested that the clarity construct requires further 
refinement. Larsen's proposed model presented a more integrative 
view of teacher clarity by including teacher perceptions of clarity 
and content-specific factors, as well as learner perceptions. Larsen 
also reported that research conducted on teacher clarity needs to 
utilize natural classroom settings. Larsen's selective clarity 
(based on teacher perceptions) was remarkably similar to Armaline's 
notion of logical clarity which involved the teacher relaying content 
accurately, completely, and correctly.

Measurement of the clarity variable was another concern common to 
both studies. Armaline questioned whether a true operational 
definition has been developed for the high-inference clarity 
construct since he found that "the ultimate clarity rating seems 
based more on quality of performance on the factor 
(intermediate-inference) level than on frequency of performance of 
the low-inference behaviors" (p. 206). In addition, he noted as did 
Hines (1981), that the clarity research lacks an adequate theoretical 
base. Thus, it appears that new definitional and conceptual problems 
have emerged which need to be addressed in future research.
In conclusion, this literature review focuses on research related to the evolution of teacher clarity as a significant variable in process-product teacher effectiveness studies. Research evidence supporting teacher clarity as a correlate of student achievement has been slowly accumulating over the past ten years. In addition, considerable progress has been made toward identifying a low-inference array of teacher behaviors associated with the clarity variable. Recently, initial steps have been taken to explore the contextual consequences of clarity. The present study continues the direction established by previous researchers and expands upon their efforts by attempting to observe and measure teacher clarity in natural classrooms and to determine to what degree selected demographic and contextual variables are related to clear teaching.
CHAPTER III
RESEARCH PROCEDURES

The central intent of this study was to examine teacher clarity in natural classroom settings involving different grade levels and content areas. Descriptive data were used to make comparisons among individuals and groups of participants involved in the study. The relationship between teacher clarity and selected demographic and contextual variables was also investigated. An additional purpose of the present study was to determine whether teacher clarity can be observed and measured by trained observers. This chapter provides a description of the procedures used to achieve the general objectives listed above and to answer the specific research questions posed earlier in this study. The research procedures are addressed under four major headings, including: a) sample, b) research design, c) instrumentation, and d) data analysis procedures.

Sample

Student teachers (n = 225) who participated in the 1985-86 National Student Teaching Competition sponsored by the National Education Association (N.E.A.) constituted the population for this study. According to the rules established by the N.E.A. for this competition, only members of the N.E.A. Student Program were eligible
to enter the competition. The N.E.A. Student Program was designed to promote professional relations and the teaching profession among teacher education students across the United States through involvement in local and national association activities as student N.E.A. members. Each entrant in the competition was required to submit a form verified by the supervising and/or cooperating teacher indicating that the participant was currently enrolled in or had just completed a student teaching program at a college or university in the United States before the deadline for entering the competition (March 4, 1986).

The sample for this investigation consisted of 123 student teachers who consented to participate in teacher clarity research being conducted at The Ohio State University which included the present study. The student teachers who agreed to participate in this research signed permission forms (see Appendix A) allowing the videotapes they submitted for the N.E.A. competition to be borrowed for use in this study. These videotapes were then duplicated and returned to the participants. Usable data were collected for 116 student teachers. Data from seven participants could not be utilized in the final analyses due to technical difficulties (i.e., no sound or picture), lessons that were not expository in nature (i.e., student presentations rather than lessons presented by the teacher), and a lesson involving only one student in a tutorial situation which did not constitute a natural classroom setting.
As a result of the N.E.A. Student Teaching Competition, one
winner and two runners-up were selected from each of three
categories: elementary (N-K-5), intermediate (6-8), and secondary
(9-12). They were judged on a five-point Likert-type rating scale
ranging from "Inadequate" to "Excellent" by volunteer master teachers
from the Washington, DC area on the basis of the following criteria:
a) planning and preparation, b) knowledge and presentation of subject
matter, c) management of instruction, and d) interaction and
communication. Seven of the nine finalists and semifinalists were
among the 116 competition entrants who consented to participate in
the present research.

Frequencies of responses and relative frequencies (percentages of
the total) for each level of the study's demographic and contextual
variables are displayed in Table 1. There were missing data on four
variables (grade point average, age, immediate career plans, and
reasons for entering the N.E.A. competition) for three participants
who did not respond to a demographic survey administered to the
sample.

Overall, the participants in this study possessed the following
characteristics: a) ninety percent were female, b) seventy-nine
percent were seniors, c) sixty-six percent were elementary majors, d)
seventy-two percent were under the age of twenty-six, and e)
fifty-two percent had a grade point average of 3.5-4.0. In addition,
sixty-one percent of the sample taught videotaped lessons on the
elementary (N-K-5) level and eighty percent taught lessons dealing
<table>
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<tr>
<th>Variable</th>
<th>Level</th>
<th>Frequency</th>
<th>Percentage</th>
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<td>23-26</td>
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<td>2.5 - 2.9</td>
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<td>6.03</td>
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<td>Music Ed.</td>
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<td>of Lesson</td>
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<td>Secondary (9-12)</td>
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<td>Mathematics</td>
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<td>Social Studies</td>
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<td></td>
<td>English</td>
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<td>Home Ec./Ind. Arts</td>
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<td></td>
<td>Music</td>
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<td></td>
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<td></td>
<td>Business</td>
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<td>Medium (10,000-20,000)</td>
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<td>Large (over 20,000)</td>
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<td>10. Reasons for Entering</td>
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<td>Competititon</td>
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<td>11. N.E.A. Rating</td>
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<tr>
<td>Total Cases</td>
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with the following four content areas, generally described as "required subjects": a) mathematics, b) science, c) language arts (including English and reading), and d) social studies.

Approximately one-half of the sample attended small colleges or universities (under 10,000 students) and indicated that they entered the N.E.A. competition for the experience or as a result of being selected. Concerning their immediate career plans, eighty-four percent of the participants indicated a desire to teach in public or private schools. Six percent of the participants were finalists or semifinalists in the N.E.A. competition.

Research Design

The methodology employed in this study was a combination of descriptive research and a type of descriptive research known as causal-comparative or ex-post facto research. Descriptive studies attempt to determine the existing or current status of a phenomenon and report the way things are. In general, descriptive data are usually collected through questionnaires, surveys, interviews, or observation.

Causal-comparative research is similar to descriptive research in that it describes conditions that already exist. However, causal-comparative research also tries to discover how and why a phenomenon occurs. Causal-comparative studies endeavor to identify factors that have led to existing differences in the behavior or status of groups of individuals. This type of research involves
investigating subjects in life situations as opposed to controlled laboratory conditions. Likenesses and differences among phenomena are studied in the causal-comparative method to determine what factors or circumstances seem to accompany or may account for certain events, conditions, processes, or practices. According to Gay (1981), "the basic causal-comparative design involves selecting two groups differing on some independent variable and comparing them on some dependent variable" (p. 200).

Since the present study was concerned with the assessment of teacher clarity in natural classroom settings and the relationship between teacher clarity and certain demographic variables, it sought to report the way things are and measure what already exists. In addition, this study attempted to determine not only how selected demographic and contextual variables are related to teacher clarity, but also which ones seemed to explain or account for differences in clarity ratings. The demographic and contextual variables investigated in this study were chosen for a variety of reasons (i.e., previous clarity research findings, logical inference, and typical information contained in demographic surveys) explained in detail in Chapter I. Thus, selected demographic and contextual variables (e.g., sex, age, grade point average, grade level and subject area taught, etc.) were the independent variables while the dependent or criterion variable was teacher clarity.

Information regarding the various independent variables was obtained by asking participants involved in this research to respond
to self-report questionnaires. The dependent variable was measured by observing participants' behavior in videotaped naturalistic teaching circumstances.

The data collection process involved the following steps:

1) Approval to conduct teacher clarity research with participants in the 1985-86 National Student Teaching Competition sponsored by the National Education Association was obtained from the manager of the N.E.A. Student Program (see Appendix A).

2) All of the student teachers (n = 225) who entered the competition were asked to participate in this research by signing permission forms (see Appendix A) allowing videotapes of their teaching submitted to the N.E.A. as a required part of the competition to be used by Ohio State University researchers for teacher clarity research purposes.

3) Signed permission forms were obtained from 123 student teachers who agreed to participate in the Ohio State research program on teacher clarity.

4) Videotaped lessons taught by the consenting student teachers were received from the N.E.A. following completion of the competition in April (1986). The videotapes were then duplicated by Teacher Education Laboratory personnel and returned to the participants.
5) Each videotape was viewed by this investigator to determine the length of the individual lessons (N.E.A. rules stipulated lessons should not exceed thirty minutes), the technical quality of the duplicated videotapes, and the appropriateness of the lessons to the study of teacher clarity in terms of teaching method (i.e., didactic as opposed to heuristic). As a result of this review videotapes of 116 participants were deemed usable for this study, while seven participants' videotapes were eliminated.

6) The 116 videotapes were divided among five trained observers according to their areas of expertise who rated them for teacher clarity by using a slightly modified version of the Teacher Clarity Observation Instrument (Appendix C) developed by Hines (1981). Data obtained from these observations for each videotaped teaching session consisted of frequency counts for twenty-five low-inference clarity behaviors and qualitative ratings based on a five-point Likert-type scale for six additional low-inference clarity items, four intermediate-inference items, and one high-inference item.

7) Information regarding selected demographic variables was obtained by asking participants to complete a survey developed by this investigator (Appendix B). All but three of the 116 student teachers who participated in this study returned completed surveys. Additional demographic
information and data relating to several of the items (e.g., grade level and subject matter taught, college major, and name of university attending) on the survey mentioned above were obtained from lesson plans and entry forms submitted to the N.E.A. by the participants as a required part of the competition.

Prior to the formal observation of the 116 videotaped lessons used in this study, six graduate students in education with different areas of expertise (to be delineated later in this section) specifically related to the subject matter covered in the videotaped lessons, received five days of training (approximately thirty total hours) in order to become qualified to observe or rate clarity behaviors using the revised Hines (1981) instrument. The nature of some of the clarity behaviors required knowledge of subject matter content so that the observers could make informed judgments. Due to unforeseen circumstances, one observer who completed the training sessions did not rate any of the videotapes used in the formal observation.

The observer training sessions were conducted by Dr. E. Jane Williams due to her expertise in the clarity area and prior work as a trainer and rater using the Hines (1981) instrument. Williams rated videotapes in research studies conducted by Hines (1981) and Williams (1983), and trained raters using the Hines (1981) clarity instrument for her study (Williams, 1983) and for an investigation by Loadman, Williams, Cruickshank, Haefele, and Kennedy (1984). This
investigator, who was one of two trained observers who rated
videotapes for teacher clarity in the Loadman et al. (1984) study,
participated in the clarity training sessions conducted by Williams
for the present study. However, since this researcher initially
reviewed all of the videotapes to determine their quality,
usefulness, and appropriateness, she did not rate videotapes used in
the formal observation in order to avoid introducing investigator
bias into the observational data.

As mentioned, over a five-day period prior to the formal
observation of the 116 videotaped lessons included in this study, the
observers were trained by Williams in the use of the revised version
of the Teacher Clarity Observation Instrument developed by Hines
(1981). The first step in the training process involved discussions
of the operational definitions provided in the instrument for each
teacher behavior and specific aspects of how the instrument is
organized (e.g., low-, intermediate-, and high-inference measures).
Next, the observers memorized the letter codes assigned to each
low-inference behavioral statement contained in Section I of the
instrument (see Appendix C). Memorization of the low-inference
behaviors and their codes facilitated the observation and the
recording of these behaviors as they were observed.

During subsequent training sessions observers used the
observation instrument to record observational data while viewing
samples of videotaped lessons. The videotapes utilized in the
training sessions were Reflective Teaching lessons (see Cruickshank
et al., 1981) taught by preservice teachers in the Williams (1983) study. These videotaped Reflective Teaching lessons also served as training tapes for the Williams (1983) study and the research conducted by Loadman et al. (1984). To accurately code the training tapes it was necessary for the observers to become familiar with the content of the Reflective Teaching Lessons employed (i.e., The Magic Square Task and The Discipline in Elementary Schools Task). Since these lessons were single-episode lessons taught in controlled, laboratory conditions, Williams continually attempted to make the transition to the natural classroom setting during the training sessions.

Measures of observer agreement were computed at various points during the training period. Scott's coefficient ($\rho$) was considered a practical and acceptable measure to determine agreement and consistency between observers (Frick & Semmel, 1978; Scott, 1955). Training was considered adequate when relatively high observer agreement ($\rho = .80$) was consistently obtained across three consecutive observed teaching episodes involving the Reflective Teaching Lessons used for training purposes.

The following procedures were employed by observers in the formal observation of videotaped lessons included in this study:

1) Each videotaped lesson was initially viewed in its entirety without recording the teacher behaviors observed.

2) Next, each observer independently observed and recorded the specific teacher behaviors of interest as they occurred. In
order to obtain an accurate record of the low-inference teacher behaviors included in Section I of the instrument, observers recorded the preassigned letter codes of these behaviors as they occurred during the lesson on a separate sheet of paper, resulting in a coded script of the videotape. On completion of observation of the lesson, observers tallied the low-inference behavioral items from the coded tape-script onto the observation instrument. This method for recording observational data necessitated two or more viewings of the videotape or sections thereof.

3) Once observers recorded the frequency of occurrence of the low-inference behaviors (Section I of the instrument), they rated on a five-point Likert-type scale the quality of teacher performance of those behaviors contained in Section II of the instrument. Then each observer rated four intermediate-inference items and one high-inference item using a five-point Likert-type scale.

The 116 videotaped lessons included in this study were divided as evenly as possible among the five trained observers according to their content area and grade level expertise. Due to the large number of elementary language arts lessons (thirty-one), these videotapes were randomly divided between the two observers with this area of specialization. In addition, these two observers rated lessons representing other content areas on the elementary level which resulted in an unequal quantity of videotapes being observed by
them. Areas of expertise for each observer were determined by teaching certification specialities and additional qualifications such as college courses and training in specific subject matter.

The major areas of expertise for each observer and the number of videotapes they rated included the following:

1) Intermediate and secondary physical education, health, special education, and electives -- fifteen videotapes.

2) Elementary and intermediate language arts and elementary math -- thirty-four videotapes.

3) Elementary language arts, science, and music -- thirty-one videotapes.

4) Intermediate and secondary math and science -- eighteen videotapes.

5) Elementary social studies and special education -- fifteen videotapes.

In order to measure observer agreement, all five observers rated three additional videotaped lessons included in the 116 composing this study, at various points in the formal observation period -- one at the beginning, one in the middle, and one at the end. The three videotapes used to assess observational consistency were selected because all of the raters had some knowledge of the subject matter (intermediate language arts) presented in the videotaped lessons, and therefore would be qualified to rate these lessons for teacher clarity. The standard used for computing observer agreement was
established by this investigator and Dr. Williams who independently rated the three videotapes and discussed discrepancies in ratings.

Observers rated one of the three "reliability videotapes" at the beginning of the formal observation period in order to ensure a smooth transition from the Reflective Teaching Lessons used in the training sessions to videotaped lessons taught in natural classrooms involving a variety of content areas. After the beginning and middle reliability checks, any major discrepancies were discussed and resolved. Computing periodic measures of observer agreement provided information regarding the degree to which all observers were maintaining their skills throughout the formal observation period.

The degree of observer agreement on the low-inference clarity behaviors for these three lessons as measured by Scott's coefficient ranged from .86 to .97. The overall average observer agreement on the high-inference clarity measure for the three "reliability videotapes" was 87 percent. Specific ratings (ranging from 1-5 with 5 representing the highest clarity rating) on the high-inference item for each observer for the three videotapes and the level of agreement (measured against the standard) which ranged from 80 to 100 percent are shown in Table 2.

Throughout the formal observation period, observer ratings for various videotapes were randomly checked by this investigator to make sure there were no major difficulties or problems. Several videotaped lessons were rated by more than one observer when
<table>
<thead>
<tr>
<th>Observer</th>
<th>Beginning Videotape</th>
<th>Middle Videotape</th>
<th>Final Videotape</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>5</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Rater #1</td>
<td>5</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Rater #2</td>
<td>5</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Rater #3</td>
<td>5</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Rater #4</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Rater #5</td>
<td>4</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Percent Agreement</td>
<td>80</td>
<td>80</td>
<td>100</td>
</tr>
</tbody>
</table>
appropriate subject areas were involved as an additional type of reliability check. An average of the two ratings was used for data analysis purposes.

Instrumentation

The Teacher Clarity Observation Instrument (Appendix C) developed by Hines (1981) and slightly revised (as will be explained later) for this study was used by trained observers to tabulate the frequency of occurrence of specified low-inference clarity behaviors performed by teachers in the videotaped lessons included in the research project and to abstract ratings of low-, intermediate-, and high-inference clarity behaviors from the videotaped lessons. This observation instrument included the following: a) instructions for completing it; b) thirty-six low-, intermediate-, and high-inference teacher clarity behavioral items derived from prior research on the clarity construct; and c) operational definitions for the low-inference teacher clarity behavioral items which were to be tabulated according to their frequency of occurrence.

The main body of the observation instrument was divided into two sections. Section I contained twenty-five low-inference teacher clarity behavioral items which were to be measured in terms of their frequency of occurrence during the lesson. These behavioral items were grouped into four subsets with each subset reflecting an
"underlying intermediate dimension of the clarity construct in keeping with the nature of the factor structures observed for this construct" (Hines, 1981, p. 116).

Section II contained eleven teacher clarity behavioral statements which were measured on a Likert-type scale with five response categories appropriate to each statement. One behavioral statement (item 36) was a global or high-inference measure of the teacher clarity variable. Four behavioral statements (items 32–35) related to the four intermediate-inference clarity dimensions formulated in Section I. The remaining six behavioral statements (items 26–31) were low-inference measures of a qualitative nature which lend themselves to being measured in terms of scale ratings as opposed to being counted. Hines (1981) found that these low-inference behavioral statements related to specific teacher behaviors which were prime discriminators between clear and unclear teachers in her study. They also were associated with one of the four subsets in Section I.

The observation instrument used in this study as described above reflected several minor revisions agreed upon by Hines and Williams in direct response to concerns noted by Armaline (1985). Armaline reported that in the process of refining the Teacher Clarity Observation Instrument for her (1981) study, Hines eliminated nine behavioral statements from the list of forty-three prime discriminators generated in Phase One of her research which replicated with college students the Bush et al. (1977) and Kennedy
et al. (1978) work. The nine behavioral statements that were not selected for inclusion in the observation instrument failed to meet the following two criteria established by Hines (1981): a) the extent to which the given teacher behavior was directly observable by external observers; and b) the appropriateness of the given behavior to the particular teaching context for the study (p. 393). According to Armaline, at least seven of the nine eliminated items were included in the Bush et al. (1977) and Kennedy et al. (1978) array of twenty-eight prime discriminators of teacher clarity.

Armaline (1985) argued that "the Hines instrument delimits clarity to observable items relevant to isolated, single-episode teaching" (p. 202). Armaline also suggested that eliminating items that are not appropriate to the research context employed (i.e., single-episode teaching simulations via Reflective Teaching) could remove the teaching episode from a realistic context. According to Armaline (1985), the issue of eliminating items for research purposes "could lead to faulty use of the instrument in a real classroom setting" (p. 203).

Since this study employed a realistic teaching context, the original Teacher Clarity Observation Instrument developed by Hines (1981) was revised in accordance with Armaline's suggestions by adding seven behavioral statements eliminated by Hines for failure to meet the criterion involving the teaching context utilized in the study. The following low-inference items grouped according to their respective intermediate-inference dimensions were the seven
behavioral statements (described above) added to Section I of the original instrument resulting in the twenty-five low-inference items which appear on the Revised Teacher Clarity Observation Instrument used in this study:

A. **Stresses (Emphasized) Important Aspects Of Content**
   1. Stresses difficult points;
   2. Repeats instructions/directions;

B. **Explains The Content Of Instruction**
   3. Works examples/problems and explains them;
   4. Explains how to do assignments by using examples;
   5. Explains assignments and the materials students need to use;

C. **Provides For Student Assimilation/Synthesis Of Content**
   6. Compares new material to what students have already learned;
   7. Reviews work before a test.

Items eliminated from the original instrument for failure to meet the criterion related to observability were not added to the revised instrument. This researcher agreed with Hines that items which cannot be observed by third-party observers but require student input to answer, should not be included in the revised observation instrument.

Section II of the revised instrument used in this study included one modification in the original instrument. The choices on the Likert-type scale for the high-inference clarity item on the Hines
instrument ranged from "very clear" to "very vague". Armaline (1985) argued that it is "conceptually inaccurate to view 'clarity' and 'vagueness' as polar opposites" (p. 200). In response to Armaline's argument, the "vague" and "very vague" choices on the high-inference scale on the revised instrument were changed to "unclear" and "very unclear".

Internal consistency reliability estimates for the original Hines instrument ranged from .75 for the low-inference measures (Section I) to .97 for the observer ratings (Section II). These findings indicated that observer ratings of the teacher behaviors yielded a higher reliability estimate than the frequency measures. According to Hines (1981), the high reliability estimates for the observed behavior measures contained in the instrument suggested a "high level of consistency of the measures in differentiating between teachers and their generalizability over teachers, behaviors, and observers" (p. 239). In addition, Hines found that the low-inference constituents of clarity were valid measures of the high-inference teacher clarity variable.

Demographic data were collected by means of a self-report survey developed by this investigator (Appendix B). This survey was designed to obtain information about the preservice teachers participating in the study regarding selected variables (i.e., sex, age, grade point average, college rank, immediate career plans, grade level and content area of lesson taught in the N.E.A. competition, and area(s) of certification) deemed to be related to teacher clarity
for reasons explicated earlier in this chapter (e.g., previous research findings, logical inference, etc.). Each survey was numbered in the upper right-hand corner so that the demographic information obtained could be correlated with other data (i.e., teacher clarity ratings) for each individual and follow-up mailings of the survey could be sent to those individuals who did not respond to earlier mailings.

The survey was constructed and implemented according to guidelines presented in Dillman (1978). In constructing the survey, the following recommendations by Dillman were followed: a) clear directions for how to answer the survey questions were provided; b) answer categories were identified with numbers on the left; c) response categories and the numbers that represent them were arranged in a vertical line so as to establish a vertical flow; d) the questions were arranged on the page so that they would be easy and quick to complete and aesthetically pleasing; and e) the survey appeared to be interesting. Since the survey was demographic in nature and short (seven items), Dillman’s suggestions regarding booklet format, printing procedures, and ordering of questions were not applicable.

The implementation process involved designing a cover letter (Appendix B) to accompany the survey and conducting various mailings of the survey. Composed according to Dillman’s recommendations, the cover letter which was a single page in length included the following: a) an explanation of the purpose and usefulness of the
study; b) a discussion of the importance of responding to the survey and thereby assisting in the success of the study; c) an assurance that their responses will be confidential and used only for research purposes; and d) an opportunity to obtain a copy of the results of the study.

The first mailing consisted of a cover letter, the survey instrument, and a preaddressed, postage-paid return envelope. This package was mailed so that the respondents would receive it as soon after the mailout date as possible. In order to maximize the response rate, Dillman suggested that follow-up procedures include three carefully timed mailings. Following Dillman’s procedures, the three follow-up mailings were completed approximately one week, three weeks, and seven weeks after the original mailout. Each follow-up mailing sent only to nonrespondents included a cover letter (revised after the second follow-up), a replacement survey, and a preaddressed, postage-paid return envelope. The follow-up procedures employed in this study differed somewhat from Dillman’s recommendations in that he suggested a postcard reminder should be sent to everyone for the first follow-up mailing and the final mailing should be sent by certified mail. The response rate for participants in this study completing the demographic survey was ninety-seven percent.
Data Analysis Procedures

Following data collection, obtained responses to both instruments were prepared for statistical analyses. Data analysis procedures designed to provide answers to the research questions addressed in this study included the use of descriptive statistics and other statistical techniques (e.g., chi-square, analysis of variance, and log-linear analysis). This section describes the specific data analysis procedures used in this study. The results of these procedures are reported in Chapter IV.

Research Question 1: What is the average teacher clarity for the sample considered in this investigation and how do individual scores compare to the mean?

In order to determine the average teacher clarity, descriptive statistics which included means and standard deviations were computed for both the low-inference and high-inference clarity measures. Individual scores were compared to the mean for each clarity measure by examining the distributions of the scores.

Research Question 2: Is there a significant difference in clarity between finalists and nonfinalists who participated in a national student teaching competition?

A one-way analysis of variance (ANOVA) was used to investigate the difference in high-inference clarity ratings and low-inference clarity scores between participants in this study who were finalists and nonfinalists in the N.E.A. student teaching competition. The independent variable (N.E.A. rating) consisted of two groups: those
student teachers identified by N.E.A. as finalists (n = 7) and those identified as nonfinalists (n = 109). The dependent variable was teacher clarity as measured by observer ratings for the high-inference clarity item and aggregate frequency scores for the low-inference clarity behaviors contained in Section I of the observation instrument.

**Research Question 3**: Is there a significant difference in teacher clarity across grade levels (elementary, intermediate, and secondary)?

**Research Question 4**: Does teacher clarity differ according to subject matter taught?

**Research Question 5**: What is the relationship between teacher clarity and various teacher characteristics including age, sex, grade point average, education specialty, college rank, size of college attended, immediate career plans, and reasons for entering a national competition?

A series of one-way analyses of variance were employed to examine differences between teacher clarity and each of the specific demographic and contextual variables enumerated in Research Questions 3, 4, and 5. The independent variables included: teacher age, sex, and grade point average; grade level and subject matter taught; education specialty; college rank; size of college attended; immediate career plans; and reasons for entering a national
competition. The dependent variable in each case was teacher clarity as measured by both high-inference observer ratings and low-inference scores.

In addition, since the data were categorical or qualitative in nature, a relatively new procedure called log-linear analysis (Kennedy, 1983) was utilized to identify significant differences between clarity (the response variable) and the independent variables listed above. The first step in conducting log-linear analysis involved the construction of a series of two-dimensional contingency tables pairing clarity and selected independent variables. Standard chi-square statistics were then calculated for the two-dimensional tables. Based upon the obtained chi-square values, two variables were selected as prominent explanatory variables.

Next, a three-dimensional contingency table was constructed using the two prominent explanatory variables chosen above and the clarity variable. A special log-linear procedure known as logit-model analysis was employed to analyze the resultant data. In conducting logit-model analysis, all relevant models were examined in order to identify the most acceptable model, i.e., the most restricted model (containing the fewest terms or factors possible) that still represented an adequate fit. Interpreting the logit model which best fits or explains the data involved determining whether meaningful main effects and interactions existed among the three variables.
Research Question 6: To what extent can the low-inference teacher behaviors which define the clarity variable be observed and measured in natural classroom settings?

In order to determine the extent to which the low-inference teacher clarity behaviors can be observed and measured, descriptive statistics including frequencies, means, and standard deviations of measures of the observed behaviors contained in Sections I and II of the Revised Teacher Clarity Observation Instrument were computed and compared.

Summary

This chapter described the research procedures used to conduct the study. A description of the sample and the rationale for sample selection were presented. The research methods employed in this study including procedures for data collection and observer training were provided in the research design section. The process of developing and implementing data collection instruments was addressed. The final section of this chapter described the statistical analyses performed in order to examine the specific research questions posed in this study. The next chapter (Chapter IV) reports the results of these analyses.
CHAPTER IV
RESULTS

This chapter reports and interprets the results of the data analyses used to answer the six research questions posed in the study. Specific results for each research question addressed in this investigation are presented.

Research Question 1: What is the average teacher clarity for the sample considered in this investigation and how do individual scores compare to the mean?

The means and standard deviations for both the low-inference and high-inference clarity measures are shown in Table 3. The mean for the low-inference clarity measure (100.88) represented the average aggregate frequency of occurrence of the observed behaviors contained in Section I of the observation instrument. The mean for the high-inference clarity measure (4.15) indicated that the student teachers who participated in this study were on the average "Clear" based on the ratings of trained observers.

Frequencies of scores and relative frequencies (percentages of the total) for the low-inference clarity measure are displayed in Table 4. Overall, the low-inference clarity scores as shown in Table
TABLE 3

MEANS AND STANDARD DEVIATIONS FOR LOW-INFERENCE AND HIGH-INFERENCE CLARITY MEASURES
(N = 116)

<table>
<thead>
<tr>
<th>Clarity Measure</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-inference</td>
<td>100.88</td>
<td>34.36</td>
</tr>
<tr>
<td>High-inference</td>
<td>4.15</td>
<td>0.79</td>
</tr>
</tbody>
</table>
TABLE 4

RELATIVE FREQUENCY DISTRIBUTION OF INDIVIDUAL SCORES FOR
LOW-INFERENCE CLARITY
(N - 116)

<table>
<thead>
<tr>
<th>Clarity Scores</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-49</td>
<td>4</td>
<td>3.45</td>
</tr>
<tr>
<td>50-69</td>
<td>15</td>
<td>12.93</td>
</tr>
<tr>
<td>70-89</td>
<td>30</td>
<td>25.86</td>
</tr>
<tr>
<td>90-109</td>
<td>28</td>
<td>24.14</td>
</tr>
<tr>
<td>110-129</td>
<td>13</td>
<td>11.21</td>
</tr>
<tr>
<td>130-149</td>
<td>12</td>
<td>10.34</td>
</tr>
<tr>
<td>150-169</td>
<td>8</td>
<td>6.90</td>
</tr>
<tr>
<td>170-189</td>
<td>6</td>
<td>5.17</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>116</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>
4 ranged from 30-188. The data presented in Table 4 indicated that the low-inference clarity scores for sixty-one percent of the sample ranged from 70 to 129, which represented approximately one standard deviation below and above the mean (see Table 3). This information suggested that the frequency distribution of the individual scores for the low-inference clarity measure approximated a normal distribution since one standard deviation below and above the mean in an ideal normal distribution contains about sixty-eight percent of the scores.

Frequencies of scores and relative frequencies for the high-inference clarity measure are reported in Table 5. These data suggested that approximately eighty-five percent of the sample received ratings of 4 (Clear) and 5 (Very Clear). The combined total of the other three high-inference categories (Somewhat Clear, Unclear, and Very Unclear) accounted for only fifteen percent of the total. Since eighty-five percent of the high-inference clarity ratings were equal to or above the mean, the frequency distribution for the high-inference clarity measure was negatively skewed (i.e., a large number of the scores were positive).

Research Question 2: Is there a significant difference in clarity between finalists and nonfinalists who participated in a national student teaching competition?

Based on the frequencies presented in Table 6, seven of the 116 N.E.A. National Student Teaching Competition entrants who participated in this study were finalists while 109 were
### TABLE 5

**RELATIVE FREQUENCY DISTRIBUTION OF INDIVIDUAL SCORES FOR HIGH-INFERENCE CLARITY**

*(N = 116)*

<table>
<thead>
<tr>
<th>Clarity Scores</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - (Very Unclear)</td>
<td>1</td>
<td>.86</td>
</tr>
<tr>
<td>2 - (Unclear)</td>
<td>3</td>
<td>2.59</td>
</tr>
<tr>
<td>3 - (Somewhat Clear)</td>
<td>13</td>
<td>11.21</td>
</tr>
<tr>
<td>4 - (Clear)</td>
<td>59</td>
<td>50.86</td>
</tr>
<tr>
<td>5 - (Very Clear)</td>
<td>40</td>
<td>34.48</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>116</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>N.E.A. Finalists/Nonfinalists</th>
<th>N</th>
<th>$\bar{X}$</th>
<th>SD</th>
<th>RANGE</th>
<th>$\bar{X}$</th>
<th>SD</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finalists</td>
<td>7</td>
<td>4.57</td>
<td>0.53</td>
<td>4-5</td>
<td>109.86</td>
<td>14.38</td>
<td>86-131</td>
</tr>
<tr>
<td>Nonfinalists</td>
<td>109</td>
<td>4.13</td>
<td>0.79</td>
<td>1-5</td>
<td>100.29</td>
<td>35.24</td>
<td>30-188</td>
</tr>
</tbody>
</table>
nonfinalists. Descriptive information contained in Table 6 indicated that the means on both the high-inference and low-inference clarity measures for the finalists (4.57 and 109.86, respectively) were higher than the means for the nonfinalists (4.13 and 100.29, respectively). An examination of the standard deviations displayed in Table 6 showed that the nonfinalists exhibited a higher degree of variability on both the high-inference and low-inference measures (standard deviations of 0.79 and 35.24, respectively). In addition, the range of scores for the nonfinalists was greater than for the finalists on both the high-inference and low-inference clarity measures (see Table 6).

A one-way analysis of variance for each of the clarity measures indicated that there was not a significant difference in high-inference or low-inference clarity between finalists and nonfinalists in the N.E.A. National Student Teaching Competition. The summary information of the analysis for the high-inference clarity measure is shown in Table 7. The F ratio was 2.10 (p = 0.1496, 1 and 114 df). The results of the analysis for the low-inference clarity measure are displayed in Table 8. The F value was 0.51 (p = 0.4781, 1 and 114 df).

**Research Question 3:** Is there a significant difference in clarity ratings across grade levels (elementary, intermediate, and secondary)?

Based on the frequencies displayed in Table 9, seventy-one of the 116 student teachers involved in this study taught lessons on the
TABLE 7

ANALYSIS OF VARIANCE OF HIGH-INFEERENCE CLARITY RATINGS BY
N.E.A. RATING

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
<th>F Ratio</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>1</td>
<td>1.2908</td>
<td>1.2908</td>
<td>2.10</td>
<td>0.1496</td>
<td></td>
</tr>
<tr>
<td>Within</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>114</td>
<td>69.9161</td>
<td>0.6133</td>
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<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>115</td>
<td>71.2069</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
TABLE 8

ANALYSIS OF VARIANCE OF LOW-INFERENCE CLARITY SCORES BY N.E.A. RATING

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
<th>F Ratio</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>1</td>
<td>600.7133</td>
<td>600.7133</td>
<td>0.51</td>
<td>0.4781</td>
<td></td>
</tr>
<tr>
<td>Within</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>114</td>
<td>131634.7911</td>
<td>1185.8990</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>115</td>
<td>132235.5044</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>
elementary level, twenty-three taught lessons on the intermediate level, and twenty-two taught lessons on the secondary level. Descriptive statistics contained in Table 9 showed that the means on the high-inference clarity measure for the elementary and intermediate grade levels were equal (4.17), while the mean for the secondary level (4.09) was slightly lower. Similarly, the standard deviations for the elementary and intermediate levels on the high-inference measure were almost identical (0.84 and 0.83, respectively), while the secondary level exhibited the lowest degree of variability (standard deviation of 0.53).

Information presented in Table 9 revealed that the mean for the elementary level (104.77) on the low-inference measure was the highest of the three grade levels, while the mean for the secondary level (93.59) was the lowest. The standard deviations on the low-inference measure ranged from 28.98 for the intermediate level to 36.48 for the elementary level. The elementary level not only exhibited the highest degree of variability on both clarity measures, but the range of high-inference ratings and low-inference scores was also the greatest for this grade level (see Table 9).

A one-way analysis of variance for each of the clarity measures indicated that there was not a significant difference in high-inference or low-inference clarity across grade levels. The summary information of the analysis for the high-inference clarity measure is shown in Table 10. The F ratio was 0.09 (p = 0.9145, 2 and 113 df). The results of the analysis for the low-inference
<table>
<thead>
<tr>
<th>GRADE LEVEL</th>
<th>N</th>
<th>$\bar{X}$</th>
<th>SD</th>
<th>RANGE</th>
<th>$\bar{X}$</th>
<th>SD</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary</td>
<td>71</td>
<td>4.17</td>
<td>0.84</td>
<td>1-5</td>
<td>104.77</td>
<td>36.48</td>
<td>30-188</td>
</tr>
<tr>
<td>Intermediate</td>
<td>23</td>
<td>4.17</td>
<td>0.83</td>
<td>2-5</td>
<td>96.00</td>
<td>28.98</td>
<td>35-135</td>
</tr>
<tr>
<td>Secondary</td>
<td>22</td>
<td>4.09</td>
<td>0.53</td>
<td>3-5</td>
<td>93.59</td>
<td>31.90</td>
<td>63-182</td>
</tr>
</tbody>
</table>

TABLE 9

FREQUENCIES, MEANS, STANDARD DEVIATIONS, AND RANGES FOR HIGH-INFERENCES AND LOW-INFERENCES CLARITY ACROSS GRADE LEVELS 

(N = 116)
### TABLE 10

**ANALYSIS OF VARIANCE OF HIGH-INFERENCE CLARITY RATINGS**

**BY GRADE LEVEL**

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
<th>F Ratio</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>2</td>
<td>0.1125</td>
<td>0.0563</td>
<td>0.09</td>
<td>0.9145</td>
<td></td>
</tr>
<tr>
<td>Within</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>113</td>
<td>71.0944</td>
<td>0.6291</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>115</td>
<td>71.2069</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
clarity measure are displayed in Table 11. The F value was 1.16
(p = 0.3167, 2 and 113 df).

**Research Question 4:** Does teacher clarity differ according to subject matter taught?

The frequencies presented in Table 12 showed that ninety-three of the 116 student teachers involved in this study taught lessons dealing with the following four basic subjects generally described as "required": a) nineteen taught mathematics, b) twenty-two taught science, c) thirty-seven taught language arts (including English and reading), and d) fifteen taught social studies. The remaining twenty-three participants taught "elective" subjects composed of home economics, industrial arts, physical education, health, music, agriculture, and business.

Descriptive statistics contained in Table 12 indicated that the means on the high-inference clarity measure ranged from 3.60 for home economics-industrial arts to 4.37 for mathematics. While the mean for mathematics was the highest of the ten subject areas on the high-inference measure, the standard deviation for mathematics (0.49) was the lowest on this measure. The standard deviation for music (1.22) was the highest on the high-inference measure. The range of high-inference clarity ratings was the greatest for science (1-5).

Information displayed in Table 12 revealed that the means on the low-inference clarity measure ranged from 73.00 for business to 122.00 for agriculture. Agriculture not only exhibited the highest mean, but also the highest degree of variability among the ten
TABLE 11

ANALYSIS OF VARIANCE OF LOW-INFERENCE CLARITY SCORES
BY GRADE LEVEL

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
<th>F Ratio</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>2</td>
<td>2735.8964</td>
<td>1367.9482</td>
<td>1.16</td>
<td>0.3167</td>
<td></td>
</tr>
<tr>
<td>Within</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>113</td>
<td>129499.6080</td>
<td>1177.2692</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>115</td>
<td>132235.5044</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TABLE 12

FREQUENCIES, MEANS, STANDARD DEVIATIONS, AND RANGES FOR
HIGH-INFERENCE AND LOW-INFERENCE CLARITY
ACCORDING TO SUBJECT MATTER
(N = 116)

| SUBJECT MATTER          | N | X   | SD  | RANGE | | X   | SD  | RANGE |
|------------------------|---|-----|-----|-------| |-----|-----|-------|
| Agriculture            | 3 | 4.33| 0.58| 4-5   | | 122.00| 49.37| 65-151 |
| Business               | 3 | 3.67| 0.58| 3-4   | | 73.00 | 4.58 | 68-77  |
| English                | 6 | 4.33| 0.52| 4-5   | | 95.20 | 29.31| 66-135 |
| Home Ec./Ind. Arts     | 5 | 3.60| 0.55| 3-4   | | 99.80 | 49.03| 63-182 |
| Language Arts/Reading  | 31| 4.16| 0.86| 2-5   | | 113.70| 42.31| 35-188 |
| Mathematics            | 19| 4.37| 0.49| 4-5   | | 110.47| 27.04| 56-159 |
| Music                  | 5 | 4.00| 1.22| 2-5   | | 74.60 | 14.17| 54-91  |
| Physical Ed./Health    | 7 | 4.14| 0.90| 3-5   | | 82.43 | 28.41| 30-119 |
| Science                | 22| 4.27| 0.93| 1-5   | | 97.86 | 27.02| 42-152 |
| Social Studies         | 15| 3.93| 0.70| 3-5   | | 88.33 | 26.78| 42-135 |
subject areas on the low-inference measure (standard deviation of 49.37). The standard deviation for business (4.58) was the lowest on the low-inference measure. In addition, the range of low-inference clarity scores was the smallest for business (68-77). The range of low-inference scores was the greatest for language arts-reading (35-188).

A one-way analysis of variance for each of the clarity measures showed that there was not a significant difference in high-inference or low-inference clarity among subject areas. The summary information of the analysis for the high-inference clarity measure is presented in Table 13. The F ratio was 0.81 (p = 0.6109, 9 and 106 df). The results of the analysis for the low-inference clarity measure are displayed in Table 14. The F value was 1.91 (p = 0.0583, 9 and 106 df). The critical F statistic for 9 and 106 degrees of freedom for an alpha level 0.05 was approximately 1.98. Thus, the critical F value exceeded the calculated F ratio in this analysis. Therefore, even though the calculated F value for the low-inference measure approached significance, there was not a significant difference in low-inference clarity among subject areas.

Research Question 5: What is the relationship between teacher clarity and various teacher characteristics including age, sex, grade point average, education specialty, college rank, size of college attended, immediate career plans, and reasons for entering a national competition?
<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
<th>F Ratio</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>9</td>
<td>4.5715</td>
<td>0.5079</td>
<td>0.81</td>
<td>0.6109</td>
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</tr>
<tr>
<td>Within</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>106</td>
<td>66.6354</td>
<td>0.6286</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>115</td>
<td>71.2069</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TABLE 14

ANALYSIS OF VARIANCE OF LOW-INERENCE CLARITY SCORES BY
SUBJECT MATTER

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
<th>F Ratio</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>9</td>
<td>18906.0485</td>
<td>2100.6720</td>
<td>1.91</td>
<td>0.0583</td>
<td></td>
</tr>
<tr>
<td>Within</td>
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</tr>
<tr>
<td>Groups</td>
<td>106</td>
<td>113329.4559</td>
<td>1100.2860</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>115</td>
<td>132235.5044</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Descriptive statistics for these variables are presented in Tables 15-22. Based on the frequencies regarding teacher age displayed in Table 15, eighty-four of the 116 participants in this study were twenty-six years old or below, twenty-nine were twenty-seven years old or above, and three who did not respond to the demographic survey were of unknown age. Information contained in Table 15 showed that the mean for the over 34 age group (4.67) was the highest of the six teacher age groups on the high-inference clarity measure, while the mean for the 19-22 age group (3.98) was the lowest. The standard deviations on the high-inference clarity measure ranged from 0.49 for the 27-30 age group to 0.90 for the 19-22 age group. The 19-22 age group not only exhibited the lowest mean and the highest degree of variability on this measure, but the range of high-inference clarity ratings was also the greatest for this group (1-5).

Data presented in Table 15 revealed that the means on the low-inference clarity measure ranged from 81.67 for the nonrespondents to 115.60 for the 27-30 age group. The over 34 age group showed the lowest degree of variability (standard deviation of 11.93) on this measure and the smallest range of low-inference clarity scores (95-117). The 23-26 age group exhibited the highest degree of variability (standard deviation of 35.96) on the low-inference measure and the greatest range of low-inference clarity scores (30-188).
TABLE 15

FREQUENCIES, MEANS, STANDARD DEVIATIONS, AND RANGES FOR
HIGH-INFERENCE AND LOW-INFERENCE CLARITY
AMONG TEACHER AGE GROUPS

(N = 115)

<table>
<thead>
<tr>
<th>TEACHER AGE</th>
<th>N</th>
<th>X</th>
<th>SD</th>
<th>RANGE</th>
<th>X</th>
<th>SD</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 34</td>
<td>3</td>
<td>4.67</td>
<td>0.58</td>
<td>4-5</td>
<td>103.33</td>
<td>11.93</td>
<td>95-117</td>
</tr>
<tr>
<td>31 - 34</td>
<td>11</td>
<td>4.00</td>
<td>0.89</td>
<td>2-5</td>
<td>99.18</td>
<td>35.89</td>
<td>35-188</td>
</tr>
<tr>
<td>27 - 30</td>
<td>15</td>
<td>4.33</td>
<td>0.49</td>
<td>4-5</td>
<td>115.60</td>
<td>34.11</td>
<td>68-182</td>
</tr>
<tr>
<td>23 - 26</td>
<td>37</td>
<td>4.30</td>
<td>0.70</td>
<td>3-5</td>
<td>95.34</td>
<td>35.96</td>
<td>30-188</td>
</tr>
<tr>
<td>19 - 22</td>
<td>47</td>
<td>3.98</td>
<td>0.90</td>
<td>1-5</td>
<td>101.80</td>
<td>34.09</td>
<td>42-178</td>
</tr>
<tr>
<td>Unknown</td>
<td>3</td>
<td>4.33</td>
<td>0.58</td>
<td>4-5</td>
<td>81.67</td>
<td>22.12</td>
<td>61-105</td>
</tr>
</tbody>
</table>
Based on the frequencies regarding teacher sex shown in Table 16, twelve of the 116 participants in this study were males and 104 were females. Information contained in Table 16 indicated that the means on both the high-inference and low-inference clarity measures for the females (4.18 and 101.93, respectively) were higher than the means for the males (3.92 and 92.08, respectively). Males displayed a higher degree of variability (standard deviation of 1.08) on the high-inference measure and a greater range of high-inference clarity ratings (1-5). Females exhibited a higher degree of variability (standard deviation of 34.49) on the low-inference measure and a greater range of low-inference clarity scores (30-188).

According to frequency data presented in Table 17, ninety-four of the 116 student teachers involved in this study reported grade point averages of 3.0 or above, nineteen reported grade point averages below 3.0, and three who did not respond to the demographic survey had unknown grade point averages. Descriptive statistics contained in Table 17 showed that the lowest mean (1.00) and standard deviation (0.00) on the high-inference measure and the smallest range of high-inference clarity ratings (1-1) were reported for the participant with the 2.0-2.4 grade point average. The nonrespondents possessed the highest mean (4.33) on the high-inference measure. The participants with 3.5-4.0 grade point averages demonstrated the highest degree of variability (standard deviation of 0.74) on the
<table>
<thead>
<tr>
<th>TEACHER SEX</th>
<th>N</th>
<th>( \bar{X} )</th>
<th>SD</th>
<th>RANGE</th>
<th>( \bar{X} )</th>
<th>SD</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>104</td>
<td>4.18</td>
<td>0.75</td>
<td>2-5</td>
<td>101.93</td>
<td>34.49</td>
<td>30-188</td>
</tr>
<tr>
<td>Male</td>
<td>12</td>
<td>3.92</td>
<td>1.08</td>
<td>1-5</td>
<td>92.08</td>
<td>33.37</td>
<td>42-151</td>
</tr>
</tbody>
</table>
TABLE 17

FREQUENCIES, MEANS, STANDARD DEVIATIONS, AND RANGES FOR
HIGH-INERENCE AND LOW-INERENCE CLARITY
ACCORDING TO GRADE POINT AVERAGE
(N = 116)

<table>
<thead>
<tr>
<th>Grade Point Average</th>
<th>High-Inference Clarity</th>
<th>Low-Inference Clarity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>X</td>
</tr>
<tr>
<td>3.5 - 4.0</td>
<td>60</td>
<td>4.22</td>
</tr>
<tr>
<td>3.0 - 3.4</td>
<td>34</td>
<td>4.32</td>
</tr>
<tr>
<td>2.5 - 2.9</td>
<td>18</td>
<td>3.78</td>
</tr>
<tr>
<td>2.0 - 2.4</td>
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<td>1.00</td>
</tr>
<tr>
<td>Unknown</td>
<td>3</td>
<td>4.33</td>
</tr>
</tbody>
</table>
high-inference measure and, along with the group having 3.0-3.4 grade point averages, the greatest range of high-inference clarity ratings (2-5).

Information regarding the low-inference clarity measure shown in Table 17 indicated that the participants with 3.5-4.0 grade point averages displayed the highest mean (109.78) and standard deviation (35.68) and the greatest range of low-inference clarity scores (35-188). The student teacher with the 2.0-2.4 grade point average exhibited the lowest mean (42.00) and standard deviation (0.00) on the low-inference measure and the smallest range of low-inference clarity scores (42-42).

Based on the frequencies regarding education specialty presented in Table 18, seventy-seven of the 116 participants in this study specialized in elementary education; thirty-eight were mainly secondary education majors consisting of business, English, home economics, vocational, mathematics, music, physical education, health, science, and social studies; and one majored in special education. Descriptive statistics contained in Table 18 revealed that the means on the high-inference clarity measure ranged from 3.67 for those specializing in business education to 4.43 for those majoring in English education. The standard deviations on the high-inference measure ranged from 0.00 for the special education major to 1.30 for social studies education majors. The special education major not only displayed the lowest variability on the high-inference measure, but also the smallest range of
TABLE 1B

FREQUENCIES, MEANS, STANDARD DEVIATIONS, AND RANGES FOR HIGH-INFERENCE AND LOW-INFERENCE CLARITY AMONG EDUCATION SPECIALITIES

\((N = 116)\)

<table>
<thead>
<tr>
<th>EDUCATION SPECIALTY</th>
<th>N</th>
<th>X</th>
<th>SD</th>
<th>RANGE</th>
<th>X</th>
<th>SD</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Ed.</td>
<td>3</td>
<td>3.67</td>
<td>0.58</td>
<td>3-4</td>
<td>73.00</td>
<td>4.58</td>
<td>68-77</td>
</tr>
<tr>
<td>Elementary Ed.</td>
<td>77</td>
<td>4.18</td>
<td>0.82</td>
<td>1-5</td>
<td>106.03</td>
<td>35.30</td>
<td>30-188</td>
</tr>
<tr>
<td>English Ed.</td>
<td>7</td>
<td>4.43</td>
<td>0.53</td>
<td>4-5</td>
<td>99.17</td>
<td>27.96</td>
<td>66-135</td>
</tr>
<tr>
<td>Home Ec./Voc.Ed.</td>
<td>7</td>
<td>3.86</td>
<td>0.69</td>
<td>3-5</td>
<td>108.14</td>
<td>50.69</td>
<td>63-182</td>
</tr>
<tr>
<td>Mathematics Ed.</td>
<td>5</td>
<td>4.20</td>
<td>0.45</td>
<td>4-5</td>
<td>94.40</td>
<td>7.37</td>
<td>86-102</td>
</tr>
<tr>
<td>Music Ed.</td>
<td>3</td>
<td>4.33</td>
<td>0.58</td>
<td>4-5</td>
<td>71.33</td>
<td>15.14</td>
<td>54-82</td>
</tr>
<tr>
<td>Phys. Ed./Health Ed.</td>
<td>3</td>
<td>4.00</td>
<td>1.00</td>
<td>3-5</td>
<td>78.67</td>
<td>11.68</td>
<td>66-89</td>
</tr>
<tr>
<td>Science Ed.</td>
<td>5</td>
<td>4.40</td>
<td>0.55</td>
<td>4-5</td>
<td>86.80</td>
<td>13.24</td>
<td>73-107</td>
</tr>
<tr>
<td>Social Studies Ed.</td>
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<td>3.80</td>
<td>1.30</td>
<td>2-5</td>
<td>76.75</td>
<td>42.16</td>
<td>35-135</td>
</tr>
<tr>
<td>Special Ed.</td>
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<td>4.00</td>
<td>0.00</td>
<td>4-4</td>
<td>108.00</td>
<td>0.00</td>
<td>108-108</td>
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</tbody>
</table>
high-inference ratings (4-4). The range of high-inference clarity ratings was greatest for the elementary education majors (1-5).

Data reported in Table 18 indicated that the means on the low-inference clarity measure ranged from 71.33 for those who specialized in music education to 108.14 for those majoring in home economics-vocational education. The home-economics-vocational education majors also exhibited the highest degree of variability (standard deviation of 50.69) on the low-inference measure. The elementary education majors displayed the greatest range of low-inference clarity scores (30-188). As was the case with the high-inference measure, the special education major demonstrated the lowest variability (standard deviation of 0.00) on the low-inference measure and the smallest range of low-inference clarity scores (108-108).

According to frequency information presented in Table 19, ninety-two of the 116 student teachers involved in this study were seniors, thirteen were graduate students, four were post-degree students, five were juniors, and two were sophomores. Descriptive statistics contained in Table 19 showed that the sophomores displayed the lowest mean (3.50) and the highest degree of variability (standard deviation of 2.12) on the high-inference measure. The mean for graduate students (4.31) was the highest of the five college ranks on the high-inference measure. Post-degree students exhibited the lowest standard deviation (0.50) on the high-inference measure.
<table>
<thead>
<tr>
<th>COLLEGE RANK</th>
<th>N</th>
<th>$\bar{X}$</th>
<th>SD</th>
<th>RANGE</th>
<th>$\overline{X}$</th>
<th>SD</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate</td>
<td>13</td>
<td>4.31</td>
<td>0.63</td>
<td>3-5</td>
<td>86.58</td>
<td>25.88</td>
<td>42-135</td>
</tr>
<tr>
<td>Post Degree</td>
<td>4</td>
<td>4.25</td>
<td>0.50</td>
<td>4-5</td>
<td>103.25</td>
<td>44.57</td>
<td>72-167</td>
</tr>
<tr>
<td>Senior</td>
<td>92</td>
<td>4.16</td>
<td>0.73</td>
<td>2-5</td>
<td>102.93</td>
<td>35.23</td>
<td>30-188</td>
</tr>
<tr>
<td>Junior</td>
<td>5</td>
<td>3.80</td>
<td>1.64</td>
<td>1-5</td>
<td>96.60</td>
<td>33.35</td>
<td>42-119</td>
</tr>
<tr>
<td>Sophomore</td>
<td>2</td>
<td>3.50</td>
<td>2.12</td>
<td>2-5</td>
<td>100.50</td>
<td>31.82</td>
<td>78-123</td>
</tr>
</tbody>
</table>
and the smallest range of high-inference clarity ratings (4-5). The range of high-inference clarity ratings was the greatest for juniors (1-5).

Data regarding the low-inference clarity measure shown in Table 19 indicated that the graduate students demonstrated the highest mean (103.25) and the highest standard deviation (44.57). The mean and standard deviation on the low-inference measure were lowest for the graduate students (86.58 and 25.88, respectively). The range of low-inference clarity scores was smallest for sophomores (78-123) and greatest for seniors (30-188).

Based on frequency information displayed in Table 20, sixty-two of the 116 participants in this study attended small colleges (enrollment under 10,000 students), twenty-seven attended medium colleges (enrollment between 10,000 and 20,000 students), and twenty-seven attended large colleges (enrollment over 20,000 students). Descriptive statistics contained in Table 20 showed that the means on the high-inference clarity measure for the large and medium colleges were equal (4.18), while the mean for the small colleges (4.13) was slightly lower. The small college category not only exhibited the lowest mean on the high-inference measure, but also the lowest variability (standard deviation of 0.73). The highest standard deviation (0.92) on the high-inference measure among the three college sizes and the greatest range of high-inference clarity ratings (1-5) were reported for the large colleges.
TABLE 20

FREQUENCIES, MEANS, STANDARD DEVIATIONS, AND RANGES FOR
HIGH-INFEERENCE AND LOW-INFEERENCE CLARITY
ACCORDING TO COLLEGE SIZE
(N = 116)

<table>
<thead>
<tr>
<th>COLLEGE SIZE</th>
<th>N</th>
<th>( \bar{X} )</th>
<th>SD</th>
<th>RANGE</th>
<th>( \bar{X} )</th>
<th>SD</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large</td>
<td>27</td>
<td>4.18</td>
<td>0.92</td>
<td>1-5</td>
<td>103.76</td>
<td>39.61</td>
<td>42-182</td>
</tr>
<tr>
<td>Medium</td>
<td>27</td>
<td>4.18</td>
<td>0.79</td>
<td>2-5</td>
<td>98.35</td>
<td>31.02</td>
<td>55-188</td>
</tr>
<tr>
<td>Small</td>
<td>62</td>
<td>4.13</td>
<td>0.73</td>
<td>2-5</td>
<td>100.79</td>
<td>33.91</td>
<td>30-180</td>
</tr>
</tbody>
</table>
Data regarding the low-inference clarity measure presented in Table 20 revealed that the large colleges demonstrated the highest mean (103.76) and standard deviation (39.61). The mean and standard deviation on the low-inference measure were lowest for the medium colleges (98.35 and 31.02, respectively). The range of low-inference clarity scores was smallest for the medium colleges (55-188) and greatest for the small colleges (30-180).

According to frequency information displayed in Table 21, ninety-eight of the 116 student teachers involved in this study intended to teach in public or private schools as their immediate career plans, ten planned to attend graduate school, five wanted to secure employment in the private sector (e.g., business and industry), two planned to join the military, and three who did not respond to the demographic survey were of unknown intentions regarding their immediate career plans. Descriptive statistics concerning the high-inference clarity measure contained in Table 21 indicated that the nonrespondents exhibited the highest mean (4.33) and the lowest standard deviation (0.58). The mean for the participants intending to join the military service (3.50) was the lowest on the high-inference measure. The highest degree of variability (standard deviation of 1.73) was reported for the private sector category. The range of high-inference clarity ratings was greatest for the group planning to attend graduate school (1-5).

Data regarding the low-inference clarity measure presented in Table 21 showed that the two participants planning to join the
<table>
<thead>
<tr>
<th>IMMEDIATE CAREER PLANS</th>
<th>N</th>
<th>X</th>
<th>SD</th>
<th>RANGE</th>
<th>N</th>
<th>X</th>
<th>SD</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate School</td>
<td>10</td>
<td>4.10</td>
<td>1.20</td>
<td>1-5</td>
<td></td>
<td>92.00</td>
<td>27.40</td>
<td>42-134</td>
</tr>
<tr>
<td>Military Service</td>
<td>2</td>
<td>3.50</td>
<td>0.71</td>
<td>3-4</td>
<td></td>
<td>127.00</td>
<td>77.78</td>
<td>72-182</td>
</tr>
<tr>
<td>Priv. Sch. Teaching</td>
<td>5</td>
<td>4.00</td>
<td>0.71</td>
<td>3-5</td>
<td></td>
<td>75.20</td>
<td>10.80</td>
<td>62-87</td>
</tr>
<tr>
<td>Private Sector</td>
<td>3</td>
<td>4.00</td>
<td>1.73</td>
<td>2-5</td>
<td></td>
<td>79.50</td>
<td>2.12</td>
<td>78-81</td>
</tr>
<tr>
<td>Pub. Sch. Teaching</td>
<td>93</td>
<td>4.18</td>
<td>0.72</td>
<td>2-5</td>
<td></td>
<td>103.80</td>
<td>34.92</td>
<td>30-188</td>
</tr>
<tr>
<td>Unknown</td>
<td>3</td>
<td>4.33</td>
<td>0.58</td>
<td>4-5</td>
<td></td>
<td>81.67</td>
<td>22.12</td>
<td>61-105</td>
</tr>
</tbody>
</table>
military service demonstrated the highest mean (127.00) and standard deviation (77.78). The mean on the low-inference measure was lowest for the group intending to teach in private schools (75.20). The lowest degree of variability (standard deviation of 2.12) on the low-inference measure and the smallest range of low-inference clarity scores (78-81) were displayed by the three participants who plan careers in the private sector. The range of low-inference clarity scores was greatest for the participants intending to teach in public schools (30-188).

According to frequency information shown in Table 22, ninety-five of the 116 participants in this study entered the N.E.A. National Student Teaching Competition for the following four reasons: a) thirty-one entered the competition for teaching experience, b) twenty-five were selected to enter the competition by a superior, c) twenty-one entered for the challenge, and d) eighteen wanted to win the prize money and trip. Three student teachers involved in the study did not respond to the demographic survey which meant their reasons for entering the competition were unknown. The remaining eighteen participants entered the competition for a variety of reasons, including the following: a) to compete with their peers, b) to enhance their careers, c) to obtain evaluation and feedback regarding their teaching, d) to promote the teaching profession, and e) to improve their teaching effectiveness.

Descriptive statistics contained in Table 22 indicated that the means on the high-inference clarity measure ranged from 3.50 for the
### Table 22

Frequencies, Means, Standard Deviations, and Ranges for High-Inference and Low-Inference Clarity Across Reasons for Entering the N.E.A. Competition

(N = 116)

<table>
<thead>
<tr>
<th>Reason for Entering N.E.A. Competition</th>
<th>High-Inference Clarity</th>
<th>Low-Inference Clarity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>( \bar{x} )</td>
</tr>
<tr>
<td>Challenge</td>
<td>21</td>
<td>4.24</td>
</tr>
<tr>
<td>Competition w/Peers</td>
<td>6</td>
<td>4.50</td>
</tr>
<tr>
<td>Enhance Career</td>
<td>2</td>
<td>3.50</td>
</tr>
<tr>
<td>Evaluation/Feedback</td>
<td>3</td>
<td>4.33</td>
</tr>
<tr>
<td>Prize Money/Trip</td>
<td>18</td>
<td>4.22</td>
</tr>
<tr>
<td>Promote Profession</td>
<td>2</td>
<td>4.00</td>
</tr>
<tr>
<td>Selected by Superior</td>
<td>25</td>
<td>4.28</td>
</tr>
<tr>
<td>Teaching Effectiveness</td>
<td>5</td>
<td>4.20</td>
</tr>
<tr>
<td>Teaching Experience</td>
<td>31</td>
<td>3.90</td>
</tr>
<tr>
<td>Unknown</td>
<td>3</td>
<td>4.33</td>
</tr>
</tbody>
</table>
student teachers who entered to enhance their careers to 4.50 for those who entered in order to compete with their peers. The standard deviation for those who sought evaluation and feedback (1.15) was the highest of the ten reasons for entering the competition on the high-inference measure. The participants who entered the competition to promote the teaching profession exhibited the lowest variability (standard deviation of 0.00) and the smallest range of high-inference clarity ratings (4-4). The range of high-inference clarity ratings was the greatest for the group who entered the competition for teaching experience (1-5).

Information regarding the low-inference clarity measure presented in Table 22 revealed that the participants who entered the competition to enhance their careers demonstrated the highest mean (144.00) and standard deviation (53.74). The mean for those who entered the competition to improve their teaching effectiveness (78.50) was the lowest on the high-inference measure. The student teachers who wanted to promote the teaching profession displayed the lowest variability (standard deviation of 19.09) on the low-inference measure. The range of low-inference clarity scores was greatest for the participants who were selected to enter the competition by a superior (35-181) and those who entered for the teaching experience (42-188). The range of low-inference clarity scores was smallest for the student teachers who entered the competition to promote the teaching profession (74-101).
Analysis of variance summary data used to determine the relationship between teacher clarity and the various teacher characteristics delineated in Research Question 5 are reported in Tables 23-38. A one-way analysis of variance conducted for each of the eight variables and each clarity measure indicated that only one variable, namely grade point average, yielded a significant result. There was not a significant difference in high-inference or low-inference clarity among the remaining seven variables.

The results of the analysis of variance for the high-inference clarity ratings and low-inference clarity scores for grade point average are displayed in Tables 27 and 28 respectively. The critical F statistic for 4 and 111 degrees of freedom for an alpha level of 0.05 is approximately 2.45. Since the calculated F ratio for both the high-inference (6.67) and low-inference (3.64) clarity measures exceeded the critical F value, there was a significant difference in clarity for grade point average.

A post hoc comparison analysis employing Tukey's HSD-procedure was conducted to determine differences among the various grade point average groups. According to Tukey's test for the high-inference clarity measure, the group with the lowest grade point average (2.0-2.4) was significantly different than the other groups. Tukey's test for the low-inference clarity measure yielded a significant difference between the groups possessing grade point averages of 2.5-2.9 and 3.5-4.0.
Summary data of the analyses of variance for both clarity measures among the other seven variables dealing with teacher characteristics are presented in the remaining Tables (23-26 and 29-38). Since these analyses resulted in no significant differences, specific information included in each table will not be discussed in detail.

**TABLE 23**

ANALYSIS OF VARIANCE OF HIGH-INFERENCE CLARITY RATINGS

BY TEACHER AGE

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
<th>F Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>5</td>
<td>3.8318</td>
<td>0.7663</td>
<td>1.25</td>
<td>0.2898</td>
</tr>
<tr>
<td>Within</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>110</td>
<td>67.3751</td>
<td>0.6125</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>115</td>
<td>71.2069</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TABLE 24

ANALYSIS OF VARIANCE OF LOW-INFERENCE CLARITY SCORES BY TEACHER AGE

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
<th>F Ratio</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>5</td>
<td>5519.8099</td>
<td>1103.9620</td>
<td>0.93</td>
<td>0.4643</td>
<td></td>
</tr>
<tr>
<td>Within</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>110</td>
<td>126715.6945</td>
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<td></td>
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</tr>
<tr>
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<td>115</td>
<td>132235.5044</td>
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</tr>
</tbody>
</table>
### TABLE 25

**ANALYSIS OF VARIANCE OF HIGH-INFERENCE CLARITY RATINGS**

**BY TEACHER SEX**

<table>
<thead>
<tr>
<th>Source</th>
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<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
<th>F  Ratio</th>
<th>Prob.</th>
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</thead>
<tbody>
<tr>
<td><strong>Between</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>1</td>
<td>0.7614</td>
<td>0.7614</td>
<td>1.23</td>
<td>0.2693</td>
<td></td>
</tr>
<tr>
<td><strong>Within</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>114</td>
<td>70.4455</td>
<td>0.6179</td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>115</td>
<td>71.2069</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
TABLE 26

ANALYSIS OF VARIANCE OF LOW-INFERENCE CLARITY SCORES BY
TEACHER SEX

<table>
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<th>Source</th>
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<th>Mean Square</th>
<th>F</th>
<th>F</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
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<td>1040.0729</td>
<td>0.88</td>
<td>0.3502</td>
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</tr>
<tr>
<td>Within</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
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</tbody>
</table>
### TABLE 27

**ANALYSIS OF VARIANCE OF HIGH-INFERENCE CLARITY RATINGS**

**BY GRADE POINT AVERAGE**

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
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</thead>
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<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>4</td>
<td>13.8046</td>
<td>3.4511</td>
<td>6.67*</td>
</tr>
<tr>
<td>Within</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
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<td>57.4023</td>
<td>0.5171</td>
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</tr>
<tr>
<td>TOTAL</td>
<td>115</td>
<td>71.2069</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p. < .05*
### TABLE 28

**ANALYSIS OF VARIANCE OF LOW-INERENCE CLARITY SCORES BY GRADE POINT AVERAGE**

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Groups</td>
<td>4</td>
<td>15708.9834</td>
<td>3927.2458</td>
<td>3.64*</td>
</tr>
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<td><strong>Within</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
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<td>116526.5210</td>
<td>1078.9493</td>
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</tr>
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<td><strong>TOTAL</strong></td>
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<td></td>
<td></td>
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</tbody>
</table>

*p. < .05*
<table>
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<th>Mean Square</th>
<th>F</th>
<th>F Ratio</th>
<th>Prob.</th>
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</thead>
<tbody>
<tr>
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<td></td>
</tr>
<tr>
<td>Groups</td>
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<td>0.53</td>
<td>0.8531</td>
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</tr>
<tr>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
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<td>71.2069</td>
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</tbody>
</table>
### Table 30

**Analysis of Variance of Low-Inference Clarity Scores by Education Specialty**

<table>
<thead>
<tr>
<th>Source</th>
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<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
<th>F Ratio</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
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<td>12411.7832</td>
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<td>1.19</td>
<td>0.3119</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
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<td>1163.3371</td>
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<td></td>
<td></td>
</tr>
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<td>Mean Square</td>
<td>F</td>
<td>F Prob.</td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>----</td>
<td>----------------</td>
<td>-------------</td>
<td>-----</td>
<td>---------</td>
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</tr>
<tr>
<td>Between</td>
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<td>Groups</td>
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<td>0.73</td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Groups</td>
<td>111</td>
<td>69.3736</td>
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</tr>
<tr>
<td>TOTAL</td>
<td>115</td>
<td>71.2069</td>
<td></td>
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</tr>
</tbody>
</table>
TABLE 32

ANALYSIS OF VARIANCE OF LOW-INFERENCE CLARITY SCORES

BY COLLEGE RANK

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
<th>F</th>
<th>Ratio</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td></td>
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<td></td>
<td></td>
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<td></td>
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<tr>
<td>Groups</td>
<td>4</td>
<td>2946.5377</td>
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<td>0.6525</td>
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<td>129288.9667</td>
<td>1197.1201</td>
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<td>132235.5044</td>
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</tr>
</tbody>
</table>
TABLE 33

ANALYSIS OF VARIANCE OF HIGH-INFEERENCE CLARITY RATINGS
BY COLLEGE SIZE

<table>
<thead>
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<th>Source</th>
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<th>F</th>
<th>F</th>
<th>Prob.</th>
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</thead>
<tbody>
<tr>
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<td></td>
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<tr>
<td>Groups</td>
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<td>0.0910</td>
<td>0.0455</td>
<td>0.07</td>
<td>0.9303</td>
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</tr>
<tr>
<td>Within</td>
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<td></td>
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</tr>
<tr>
<td>Groups</td>
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<td>71.1159</td>
<td>0.6293</td>
<td></td>
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<td></td>
</tr>
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<td>71.2069</td>
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<td></td>
</tr>
</tbody>
</table>
TABLE 34

ANALYSIS OF VARIANCE OF LOW-INFERENCE CLARITY SCORES BY COLLEGE SIZE

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
<th>F Ratio</th>
<th>Prop.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>2</td>
<td>374.7856</td>
<td>187.3928</td>
<td>0.16</td>
<td>0.8555</td>
<td></td>
</tr>
<tr>
<td>Within</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>113</td>
<td>131860.7188</td>
<td>1198.7338</td>
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<td></td>
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</tr>
<tr>
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<td>132235.5044</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
### TABLE 35

**ANALYSIS OF VARIANCE OF HIGH-INFERENCE CLARITY RATINGS**

**BY IMMEDIATE CAREER PLANS**

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
<th>F Ratio</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>5</td>
<td>1.2478</td>
<td>0.2496</td>
<td>0.39</td>
<td>0.8541</td>
<td></td>
</tr>
<tr>
<td>Within</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>110</td>
<td>69.9591</td>
<td>0.6360</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
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<td>71.2069</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Table 36

Analysis of Variance of Low-Inference Clarity Scores by Immediate Career Plans

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
<th>F</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>5</td>
<td>8249.0982</td>
<td>1649.8196</td>
<td>1.42</td>
<td></td>
<td>0.2206</td>
</tr>
<tr>
<td>Within</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>110</td>
<td>123986.4062</td>
<td>1158.7515</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>115</td>
<td>132235.5044</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 37

**Analysis of Variance of High-Inference Clarity Ratings by Reasons for Entering the N.E.A. Competition**

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
<th>F Ratio</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>9</td>
<td>4.4033</td>
<td>0.4893</td>
<td>0.78</td>
<td>0.6397</td>
<td></td>
</tr>
<tr>
<td>Within</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>106</td>
<td>66.8036</td>
<td>0.6302</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>115</td>
<td><strong>71.2069</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 38

ANALYSIS OF VARIANCE OF LOW-INERENCE CLARITY SCORES BY REASONS FOR ENTERING THE N.E.A. COMPETITION

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
<th>F Ratio</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>9</td>
<td>9508.0933</td>
<td>1056.4548</td>
<td>0.89</td>
<td>0.5407</td>
<td></td>
</tr>
<tr>
<td>Within</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>106</td>
<td>122727.4111</td>
<td>1191.5283</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>115</td>
<td>132235.5044</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Log-linear analysis was utilized to further identify significant differences between teacher clarity and selected demographic and contextual variables. The following five variables were selected for log-linear analysis due to significant results on the analyses of variance or findings from previous clarity research studies: a) grade point average, b) teacher age, c) subject matter, d) teacher sex, and e) grade level. The first step involved collapsing the data for these variables into smaller, more concise categories. High-inference teacher clarity was changed from a variable with five levels to a trichotomous variable by combining the lower three levels of clarity (very unclear, unclear, and somewhat clear) into one category labeled "Average and Below."

Grade point average was transformed into a variable with three levels by combining the two groups with the lowest grade point averages (2.5-2.9 and 2.0-2.4) into one category labeled "Below 3.0." The upper two teacher age groups (31-34 and Over 34) were combined into one category labeled "Over 30", resulting in a variable with four levels. The subject matter variable was converted into five levels by adding language arts and English together, and by combining the following areas into one category labeled "Electives": a) physical education and health, b) music, c) agriculture, d) business, and e) home economics and industrial arts. The teacher sex and grade level variables were not changed.

The next step in the log-linear analysis involved determining the criteria for selecting which variables among the five listed above
were highly related to the teacher clarity variable. Chi-square statistics were used as the measure of association between teacher clarity and each of the five variables (i.e., grade point average, teacher age, subject matter, teacher sex, and grade level). Based on the computed chi-square values, only grade point average ($\chi^2 = 9.51$, $p = .05$, 4 df) was significantly related to teacher clarity. Since the chi-square values for the remaining variables were not significantly related to teacher clarity, subject matter ($\chi^2 = 9.90$, $p = .27$, 8 df) which displayed the next closest value, was selected along with grade point average for inclusion in the log-linear analysis. Subject matter or content was also chosen since previous researchers (e.g., Bush, 1976; Holland, 1979; Williams, 1983; Gloeckner, 1985) found support for further study of this variable and its relationship to teacher clarity.

Next, a three-dimensional (3 x 5 x 3) contingency table shown in Table 39 was constructed using the two prominent explanatory variables (grade point average and content) selected above and the logit or response variable (teacher clarity). Sample size problems limited the log-linear analysis to three variables or dimensions. Results of the logit-model analysis (a special log-linear procedure) employing the computer program BMDP4F (Dixon, 1983) are reported in Tables 40 and 41. The component chi-square values contained in Table 41 showed that neither the main effects for the explanatory variables
### TABLE 39

OBSERVED FREQUENCIES BY TEACHER CLARITY, GRADE POINT AVERAGE, AND CONTENT

<table>
<thead>
<tr>
<th>TEACHER CLARITY</th>
<th>CONTENT</th>
<th>GRADE POINT AVERAGE</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3.5-4.0</td>
<td>3.0-3.4</td>
<td>BELOW 3.0</td>
<td>TOTAL</td>
<td></td>
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<tr>
<td>Very Clear</td>
<td>Mathematics</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Science</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Language Arts/English</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Social Studies</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electives</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td></td>
<td>7</td>
<td>3</td>
<td>7</td>
<td>17</td>
</tr>
<tr>
<td>Clear</td>
<td>Mathematics</td>
<td>8</td>
<td>2</td>
<td>2</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Science</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Language Arts/English</td>
<td>11</td>
<td>4</td>
<td>3</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Social Studies</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electives</td>
<td>5</td>
<td>6</td>
<td>0</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td></td>
<td>31</td>
<td>16</td>
<td>12</td>
<td>59</td>
</tr>
<tr>
<td>Average and Below</td>
<td>Mathematics</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Science</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Language Arts/English</td>
<td>9</td>
<td>5</td>
<td>0</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Social Studies</td>
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<td>1</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electives</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td></td>
<td>22</td>
<td>15</td>
<td>3</td>
<td>40</td>
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</tbody>
</table>

Total of the observed frequency table 116
TABLE 40

GOODNESS-OF-FIT (LIKELIHOOD-RATIO) OF SPECIFIED LOGIT MODELS TO OBSERVED FREQUENCIES FOR TEACHER CLARITY, GRADE POINT AVERAGE, AND CONTENT

<table>
<thead>
<tr>
<th>MODEL#</th>
<th>MARGINALS FITTED</th>
<th>RESIDUAL CHI-SQUARES</th>
<th>df</th>
<th>$\chi^2$</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>[C], [AB]</td>
<td></td>
<td>28</td>
<td>27.01</td>
<td>.5178</td>
</tr>
<tr>
<td>(2)</td>
<td>[AB], [AC]</td>
<td></td>
<td>24</td>
<td>19.69</td>
<td>.7142</td>
</tr>
<tr>
<td>(3)</td>
<td>[AB], [AC], [BC]</td>
<td></td>
<td>16</td>
<td>12.48</td>
<td>.7102</td>
</tr>
<tr>
<td>(4)</td>
<td>[ABC]</td>
<td></td>
<td>0</td>
<td>0.00</td>
<td>.0000</td>
</tr>
</tbody>
</table>
### Table 41

**Summary of Logit-Model Analysis of Teacher Clarity by Grade Point Average and Content**

<table>
<thead>
<tr>
<th>Source of Residuum</th>
<th>Model Comparisons</th>
<th>Chi-Square</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Due to Grade</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Point Average</td>
<td>(1) - (2)</td>
<td>7.32</td>
<td>4</td>
<td>.1199</td>
</tr>
<tr>
<td><strong>Due to Content:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Given G.P.A.</td>
<td>(2) - (3)</td>
<td>7.21</td>
<td>8</td>
<td>.5142</td>
</tr>
<tr>
<td>Due to Interaction</td>
<td>(3) - (4)</td>
<td>12.48</td>
<td>16</td>
<td>.7102</td>
</tr>
<tr>
<td><strong>Null-logit Model</strong></td>
<td>(1) - (4)</td>
<td>27.01</td>
<td>28</td>
<td>.5178</td>
</tr>
</tbody>
</table>

**Note:** Models and model numbers correspond to those that appear in Table 40.
nor their interaction achieved significance. Since the omnibus test failed to demonstrate statistical significance, follow-up procedures were not conducted.

Research Question 6: To what extent can the low-inference teacher behaviors which define the clarity variable be observed and measured in natural classroom settings?

Summed frequencies, means, standard deviations, and ranges of measures of the observed behaviors contained in Section I and Section II of the Revised Teacher Clarity Observation Instrument are reported in Tables 42 and 43, respectively. Sections I and II of the instrument appear in separate tables since different types of measurement units were employed in each section. Behavioral items 1-25 (Table 42) representing the low-inference teacher behaviors included in Section I of the instrument were measured in terms of their frequency of occurrence during the lesson. Behavioral items 26-36 (Table 43) contained in Section II of the instrument were measured in terms of observer ratings on a five-point Likert-type scale. Items 26-31 (Table 43) which are considered low-inference measures of a qualitative nature, and items 1-25 (Table 42) together serve to operationally define the clarity variable. Items 32-35 (Table 43) are intermediate-inference clarity behaviors. Item 36 (Table 43) is the global or high-inference measure of the teacher clarity variable.

Even though all of the behavioral items contained in the instrument were observed during the teaching in natural classroom
TABLE 42

FREQUENCIES, MEANS, STANDARD DEVIATIONS, AND RANGES OF OBSERVED FREQUENCY OF OCCURRENCE OF LOW-INFERENCE CLARITY BEHAVIORS IN SECTION I OF THE OBSERVATION INSTRUMENT

(N = 116)

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>BEHAVIOR</th>
<th>N</th>
<th>MEAN</th>
<th>S.D.</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Points out what is important for students to learn</td>
<td>55</td>
<td>2.51</td>
<td>2.08</td>
<td>1-9</td>
</tr>
<tr>
<td>2.</td>
<td>Repeats things that are important</td>
<td>98</td>
<td>6.98</td>
<td>7.13</td>
<td>1-38</td>
</tr>
<tr>
<td>3.</td>
<td>Writes important things on the board</td>
<td>99</td>
<td>6.64</td>
<td>5.93</td>
<td>1-34</td>
</tr>
<tr>
<td>4.</td>
<td>Stresses difficult points</td>
<td>4</td>
<td>1.25</td>
<td>0.50</td>
<td>1-2</td>
</tr>
<tr>
<td>5.</td>
<td>Repeats instructions/directions</td>
<td>46</td>
<td>2.85</td>
<td>2.61</td>
<td>1-12</td>
</tr>
<tr>
<td>6.</td>
<td>Summarizes the material presented</td>
<td>27</td>
<td>1.18</td>
<td>0.48</td>
<td>1-3</td>
</tr>
<tr>
<td>7.</td>
<td>Explains things</td>
<td>106</td>
<td>7.23</td>
<td>5.09</td>
<td>1-27</td>
</tr>
<tr>
<td>8.</td>
<td>Uses examples when explaining</td>
<td>105</td>
<td>13.37</td>
<td>11.19</td>
<td>1-53</td>
</tr>
<tr>
<td>9.</td>
<td>Works examples/problems and explains them</td>
<td>17</td>
<td>2.53</td>
<td>2.45</td>
<td>1-9</td>
</tr>
<tr>
<td>10.</td>
<td>Explains how to do assignments by using examples</td>
<td>9</td>
<td>1.00</td>
<td>0.00</td>
<td>1-1</td>
</tr>
<tr>
<td>11.</td>
<td>Explains assignments and the materials students need to use them</td>
<td>20</td>
<td>2.00</td>
<td>2.75</td>
<td>1-10</td>
</tr>
<tr>
<td>12.</td>
<td>Explains what unfamiliar words mean</td>
<td>23</td>
<td>4.39</td>
<td>10.57</td>
<td>1-52</td>
</tr>
<tr>
<td>13.</td>
<td>Explains something and then stops so that students can think about it</td>
<td>2</td>
<td>2.00</td>
<td>0.00</td>
<td>2-2</td>
</tr>
<tr>
<td>14.</td>
<td>Shows similarities and/or differences between things</td>
<td>17</td>
<td>2.35</td>
<td>2.91</td>
<td>1-10</td>
</tr>
<tr>
<td>15.</td>
<td>Compares new materials to what students have already learned</td>
<td>11</td>
<td>2.09</td>
<td>2.66</td>
<td>1-10</td>
</tr>
<tr>
<td>16.</td>
<td>Shows students how to remember things</td>
<td>6</td>
<td>1.50</td>
<td>0.84</td>
<td>1-3</td>
</tr>
<tr>
<td>17.</td>
<td>Reviews what has already been studied (taught)</td>
<td>93</td>
<td>2.40</td>
<td>1.71</td>
<td>1-10</td>
</tr>
<tr>
<td>18.</td>
<td>Reviews work before a test</td>
<td>2</td>
<td>1.00</td>
<td>0.00</td>
<td>1-1</td>
</tr>
</tbody>
</table>
TABLE 42 (Continued)

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>BEHAVIOR</th>
<th>N</th>
<th>MEAN</th>
<th>S.D.</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.</td>
<td>Asks questions to find out if students understand</td>
<td>113</td>
<td>48.34</td>
<td>23.71</td>
<td>4-124</td>
</tr>
<tr>
<td>20.</td>
<td>Has individual student(s) work publicly</td>
<td>83</td>
<td>9.49</td>
<td>7.78</td>
<td>1-33</td>
</tr>
<tr>
<td>21.</td>
<td>Examines students' work privately</td>
<td>47</td>
<td>9.23</td>
<td>7.67</td>
<td>1-32</td>
</tr>
<tr>
<td>22.</td>
<td>Allows time (pauses) for students to ask questions</td>
<td>41</td>
<td>1.49</td>
<td>0.81</td>
<td>1-4</td>
</tr>
<tr>
<td>23.</td>
<td>Repeats things when students do not understand</td>
<td>22</td>
<td>1.86</td>
<td>1.42</td>
<td>1-6</td>
</tr>
<tr>
<td>24.</td>
<td>Answers students’ questions</td>
<td>44</td>
<td>3.75</td>
<td>3.20</td>
<td>1-12</td>
</tr>
<tr>
<td>25.</td>
<td>Provides time for students to practice</td>
<td>104</td>
<td>2.72</td>
<td>1.89</td>
<td>1-15</td>
</tr>
<tr>
<td>ITEM #</td>
<td>BEHAVIOR</td>
<td>N</td>
<td>MEAN</td>
<td>S.D.</td>
<td>RANGE</td>
</tr>
<tr>
<td>-------</td>
<td>--------------------------------------------------------------------------</td>
<td>-----</td>
<td>------</td>
<td>------</td>
<td>-------</td>
</tr>
<tr>
<td>26.</td>
<td>Answered students' questions adequately</td>
<td>43</td>
<td>4.02</td>
<td>0.60</td>
<td>3-5</td>
</tr>
<tr>
<td>27.</td>
<td>Used relevant examples when explaining</td>
<td>116</td>
<td>4.13</td>
<td>1.00</td>
<td>1-5</td>
</tr>
<tr>
<td>28.</td>
<td>Taught the lesson step-by-step</td>
<td>116</td>
<td>4.35</td>
<td>0.78</td>
<td>1-5</td>
</tr>
<tr>
<td>29.</td>
<td>Provided students with sufficient examples of how to do the work</td>
<td>116</td>
<td>4.05</td>
<td>1.05</td>
<td>1-5</td>
</tr>
<tr>
<td>30.</td>
<td>Presented the lesson in a logical manner</td>
<td>116</td>
<td>4.29</td>
<td>0.86</td>
<td>1-5</td>
</tr>
<tr>
<td>31.</td>
<td>Adequately informed students of the lesson objective(s) or what they would be expected to be able to do on completion of the lesson</td>
<td>116</td>
<td>3.64</td>
<td>1.15</td>
<td>1-5</td>
</tr>
<tr>
<td>32.</td>
<td>Stressed (emphasized) the aspects of content it was important for students to learn</td>
<td>116</td>
<td>4.09</td>
<td>0.88</td>
<td>1-5</td>
</tr>
<tr>
<td>33.</td>
<td>Explained the content of instruction</td>
<td>116</td>
<td>4.18</td>
<td>0.86</td>
<td>1-5</td>
</tr>
<tr>
<td>34.</td>
<td>Provided for student assimilation and synthesis of content</td>
<td>116</td>
<td>3.52</td>
<td>1.07</td>
<td>1-5</td>
</tr>
<tr>
<td>35.</td>
<td>Assessed student understanding and provided for better understanding of content when necessary</td>
<td>116</td>
<td>4.36</td>
<td>0.93</td>
<td>1-5</td>
</tr>
<tr>
<td>36.</td>
<td>Teacher clarity</td>
<td>116</td>
<td>4.15</td>
<td>0.79</td>
<td>1-5</td>
</tr>
</tbody>
</table>
settings of the 116 lessons included in this study, some teacher behaviors were observed to occur on average many times more frequently than other behaviors. For example, the lowest frequencies were reported in Table 42 for the low-inference behaviors "explains something and then stops so that students can think about it" (item 13) and "reviews work before a test" (item 18), while the highest frequency was reported for the low-inference behavior "asks questions to find out if students understand" (item 19).

The means for the low-inference clarity behaviors shown in Table 42 ranged from 1.00 for "explains how to do assignments by using examples" and "reviews work before a test" to 48.34 for "asks questions to find out if students understand." The same behavioral items that exhibited the lowest means also displayed the lowest standard deviations (0.00), along with "explains something and then stops so that students can think about it" (standard deviation of 0.00). Similarly, the low-inference item with the highest mean ("asks questions to find out if students understand") demonstrated the highest degree of variability (standard deviation of 23.71).

Concerning the low-inference behaviors that are rated in a qualitative manner (items 26-31) contained in Table 43, the means ranged from 3.64 for "adequately informed students of the lesson objective(s) or what they would be expected to be able to do on completion of the lesson" to 4.35 for "taught the lesson step-by-step." The lowest standard deviation for items 26-31 was reported for "answered students' questions adequately" (0.60), while
the highest standard deviation was reported for "adequately informed students of the lesson objective(s) or what they would be expected to be able to do on completion of the lesson" (1.15).

**Summary of Results**

Descriptive statistics were used to determine the average teacher clarity for the student teachers involved in this study and to compare individual scores to the mean. These data suggested that while the distribution of individual scores on the low-inference clarity measure approximated a normal distribution, the distribution of scores on the high-inference clarity measure was negatively skewed, which meant that a high percentage of the student teachers who participated in this study received high-inference ratings above the mean (4.15). Relative frequency information revealed that approximately eighty-five percent of the participants obtained ratings of 4 (Clear) and 5 (Very Clear) on the high-inference clarity measure.

One-way analyses of variance were utilized to determine differences in high-inference and low-inference clarity between participants in this study who were finalists and nonfinalists in the N.E.A. student teaching competition. Results indicated that there was not a significant difference in high-inference clarity ratings or low-inference clarity scores between the finalists and nonfinalists.

To assess differences between teacher clarity and the selected demographic and contextual variables investigated in this study, a
series of one-way analyses of variance were conducted. The results of these analyses showed that there was a significant difference (p < 0.05) on both the high-inference and low-inference clarity measures for grade point average. There was no evidence found to support significant differences in high-inference or low-inference clarity among the remaining variables. Logit-model analysis was employed to further examine differences between teacher clarity and two prominent explanatory variables, namely grade point average and subject matter or content. Evidence was not found to support significant main or interaction effects of grade point average and subject matter (content) on teacher clarity.

Descriptive statistics computed to determine the extent to which the low-inference teacher clarity behaviors can be observed suggested that all of the behavioral items contained in the revised clarity instrument were observed to occur in the videotaped lessons included in this research. These data also revealed wide variations in the observed frequency of occurrence of the low-inference clarity behaviors.
CHAPTER V
SUMMARY AND DISCUSSION

This chapter presents a summary and discussion of the results of the study. The discussion focuses on selected implications for practice suggested by the study’s findings. The chapter concludes with recommendations for future research.

Summary

The primary objectives of this study were: a) to determine the average teacher clarity of the sample considered in this investigation and how individual scores compared to the mean; b) to determine the relationship between the clarity of the subjects involved in the study and the ratings they received in a student teaching competition; c) to determine the relationship between teacher clarity and selected demographic and contextual variables (i.e., teacher age, sex, and grade point average; grade level and subject matter taught; education specialty; college rank and size; immediate career plans; and reasons for entering the competition); and d) to determine whether the low-inference teacher behaviors which define the clarity variable can be observed and measured in natural classroom settings.
To accomplish these objectives, videotaped lessons taught by a sample of student teachers (N = 116) who participated in the 1985-86 N.E.A. National Student Teaching Competition were analyzed for teacher clarity. The videotaped lessons, representing three different grade levels and a wide variety of content areas, were taught to students in actual classroom settings. Five trained observers rated the videotaped lessons for low-inference and high-inference teacher clarity behaviors by using a slightly modified version of the Teacher Clarity Observation Instrument developed by Hines (1981). In order to obtain information regarding selected demographic variables, a self-report survey developed by this investigator was administered by mail to the participants in this study. All but three of the student teachers completed the survey.

To determine the average teacher clarity for the sample considered in this investigation and how individual scores compared to the mean, descriptive statistics including frequencies, means, and standard deviations were computed for both the low-inference and high-inference clarity measures. These data indicated that the distribution of the individual scores for the low-inference clarity measure approximated a normal distribution, while the distribution for the high-inference measure was negatively skewed. Approximately eighty-five percent of the sample received high-inference clarity ratings that were equal to or above the mean (4.15), which meant that
there was an uneven distribution on the positive end (Clear and Very Clear). Thus, most of the participants in this study were generally clear teachers.

To determine the difference in high-inference clarity ratings and low-inference clarity scores between participants in this study who were finalists and nonfinalists in the N.E.A. student teaching competition, a one-way analysis of variance for each clarity measure was employed. The results of these analyses showed that there was not a significant difference in high-inference or low-inference clarity between finalists and nonfinalists.

In order to examine differences between teacher clarity and the specific demographic and contextual variables enumerated above, a one-way analysis of variance was conducted for each variable and each clarity measure. Among the ten independent variables included in the analyses, only grade point average yielded a significant result. The results of these analyses indicated that there was a significant difference ($p < 0.05$) on both the high-inference and low-inference clarity measure for grade point average. Follow-up comparison procedures suggested that the student teachers in this study with the higher grade point averages exhibited greater teacher clarity. There was not a significant difference in high-inference or low-inference clarity among the remaining variables. One variable (subject matter) approached significance ($p = 0.058$) on the low-inference clarity measure, but it was not statistically significant.
Log-linear analysis was utilized to further identify significant differences between teacher clarity and certain demographic and contextual variables (i.e., grade point average, teacher age, subject matter, teacher sex, and grade level). The various levels constituting three of the five variables were combined in order to create more concise categories for each variable included in the analysis. High-inference teacher clarity (the response variable) was changed from a variable with five levels to a trichotomous variable by combining the lower three levels of this clarity measure into one category.

Based on chi-square statistics which were used as the measure of association between teacher clarity and each of the five variables, only grade point average was significantly related to teacher clarity. Since the chi-square values for the remaining variables were not significantly related to teacher clarity, subject matter which displayed the next closest value, was selected along with grade point average for inclusion in the log-linear analysis. Results of the three-dimensional logit-model analysis indicated that neither the main effects for the explanatory variables (grade point average and subject matter) nor their interaction achieved significance. Thus, grade point average and subject matter (content) had no significant effect on clarity.

To determine whether the low-inference teacher behaviors which define the clarity variable can be observed and measured in natural classroom settings, the original observation instrument used in
previous clarity research was revised for this study by including an additional seven low-inference items deemed valuable in enhancing the usefulness of the instrument in real classroom settings. Descriptive statistics including frequencies, means, and standard deviations showed that all of the behavioral items contained in the instrument were observed to occur in the videotaped lessons included in this study. The data also revealed that some behaviors were observed to occur on average many times more frequently than other behaviors (see Table 42).

Discussion

The intent of this study was to examine teacher clarity in natural classroom settings involving different grade levels and content areas. This investigation provided an important link between previous teacher clarity research efforts which have utilized simulated teaching situations in laboratory settings at the college level and future clarity studies involving inservice teachers in actual K-12 classrooms. While this study involved natural teaching circumstances, the lessons were taught by student teachers who might have established a somewhat artificial or controlled teaching experience in order to design a lesson suitable for televising for the N.E.A. competition.

The findings of this research generally supported the notion that the low-inference teacher behaviors which define the clarity variable can be observed and measured in actual teaching situations. Using a
revised version of the original observation instrument modified to improve its usefulness in real classrooms, trained observers with expertise relating to specific subject areas were able to observe and record all of the twenty-five low-inference behaviors contained in Section I of the instrument during the teaching of the videotaped lessons included in this study which involved various grade levels and subject areas. In addition, as was reported previously in Chapter III, the degree of observer agreement for three selected videotaped lessons as measured by Scott's coefficient ranged from .86 to .97, indicating that there was a high level of agreement between observers in recording the same behaviors and a high level of objectivity regarding the behavioral items themselves.

Concerning the observation and measurement of the low-inference teacher behaviors, it was interesting to note that the wide range in variation of the observed frequency of occurrence of the clarity behaviors reported in Table 42 and mentioned previously in this chapter was similar to the variation in frequency found in the Hines (1981) study (see Table 37, p. 230). For example, the behavioral item with the highest mean (25.84) and standard deviation (12.72) in the research by Hines (1981), "asks questions to find out if students understand," was the same item which displayed the highest mean and standard deviation in this research (Table 42). The behavioral item in the Hines study with the lowest mean (0.09) and standard deviation (0.39) was "explains something and then stops so that students can
think about it." While the same item in this research did not possess the lowest mean, it was the item with the lowest standard deviation (0.00) and frequency (2).

Hines (1981) suggested that wide variations in frequency are to be expected due to the nature of some of the clarity behaviors. According to Hines, while certain behaviors (e.g., "summarizes the material presented in class") probably would occur but once in a given lesson, other behaviors (e.g., "asks questions to find out if students understand" and "explains aspects of content") would likely occur much more frequently and throughout the lesson. Hines (1981) noted that the clarity behaviors which occur less frequently in a teaching situation are not necessarily less important to clear teaching than those that occur more frequently (p. 332). Hines also suggested that in addition to the quantitative dimension (frequency of occurrence), the qualitative dimension (appropriateness) of certain low-inference clarity behaviors was necessary to yield a valid measure of the teacher clarity construct.

Overall, the descriptive statistics for the observed frequency of occurrence of most of the low-inference behaviors presented in Table 37 in the Hines study and Table 42 in this study were very similar. Besides the above two examples, other items in both studies with fairly low means and standard deviations included the following: a) "summarizes the material presented," b) "allows time for students to ask questions," and c) "shows students how to remember things." Behavioral items with similar means in the Hines study and the
current study included "explains things" (7.69 and 7.23, respectively), "uses examples when explaining" (15.00 and 13.37, respectively), and "points out what is important for students to learn" (2.28 and 2.51, respectively).

Regarding the seven items contained in the revised version of the observation instrument that were not included in the original Hines instrument (i.e., items 4, 5, 9, 10, 11, 15, and 18), the frequency ranged from 2 to 46, with six of the seven items occurring less than twenty times. The average frequency of occurrence for these items ranged from 1.00 to 2.85 and the standard deviations ranged from 0.00 to 2.75 (see Table 42). On the whole, the behaviors added to the instrument occurred less frequently than the original eighteen low-inference behaviors.

This finding could be due to the lack of opportunity to observe numerous examples of these behaviors during the clarity training sessions and during the formal observation of the 116 lessons included in this study. The videotapes used for training purposes were Reflective Teaching Lessons, which meant that several of the seven new behaviors such as those related to explaining assignments were not observable since these lessons constituted isolated, single-episode situations which would not require future work or assignments. The same principle could apply to a lesser extent to the videotaped lessons included in this study since they might have been contrived, single-episode lessons taught in controlled or staged situations, as mentioned earlier.
In addition, perhaps these and other behaviors occurred less frequently because the student teachers were not proficient in their use. Therefore, teacher educators should consider methods to help student teachers improve the use and frequency of use of these behaviors. For instance, the low frequencies of occurrence for items 4 and 13 in Table 42 suggest that student teachers need to learn how to stress difficult points more often in a lesson and how to provide more opportunities for students to think following explanations.

Relationships between the frequency of occurrence of clarity behaviors and variables such as the type of content taught, grade level taught, teacher sex, and teacher age must also be determined. The specific low-inference behaviors included in the observation instrument could be easier for some teachers to perform more frequently depending on the nature of their subject area. For example, it might be easier for a mathematics teacher who is teaching students their multiplication tables to provide students with time for practice or to work problems at the chalkboard than a science teacher who is presenting broad conceptual ideas. Normative data regarding the use of clarity behavior by teachers need to be developed in order to further examine relationships between frequency of occurrence of the clarity behaviors and appropriate and normal usage of each clarity behavior for variables such as the type of content taught and so forth. Norms could also be used to develop a
profile of the clarity behaviors a teacher normally uses and their frequency of occurrence during a typical thirty-minute expository teaching act.

Another issue related to the observation and measurement of clarity, dealt with the finding by Hines (1981) that the low-inference constituents of clarity were valid measures of the high-inference clarity variable. While this issue was not a research question addressed in this study, simple Pearson product-moment correlations were computed for various clarity behaviors. The correlation coefficient for the low-inference clarity measure and the high-inference clarity measure ($R = 0.44$) was much lower than the results obtained by Hines ($R = 0.99$). This was a disturbing finding since a major premise underlying the original Teacher Clarity Observation Instrument developed by Hines (1981) and widely used in recent clarity research involves the contention that the low-inference and high-inference clarity measures are highly and significantly related. However, Armaline (1985) questioned whether a true operational definition has been developed for the high-inference clarity construct since he found that quality of performance on the intermediate-inference level rather than frequency of performance on the low-inference level was the primary gauge of teacher clarity.

The discrepancy in the correlational results obtained by Hines and this investigator could be due to a number of possible factors, including the following: a) the low range of variability in the high-inference measure; b) situational differences such as simulated
teaching experiences using the same Reflective Teaching Lesson in a controlled, laboratory setting versus lessons involving varied content taught in natural classroom settings; c) inconsistent observer ratings on videotapes not used for "reliability" purposes; d) the use of different measures of clarity for calculating the correlation coefficients in each study; and e) a revised observation instrument containing an additional seven items that might not be as valid or reliable as the original instrument.

Regarding the relationship between teacher clarity and the demographic and contextual variables examined in this study, the findings supported the conclusion that there were no significant differences between teacher clarity and any of these variables. Based on analyses of variance and chi-square statistics, grade point average yielded significant results. However, when the data were subjected to a more powerful procedure, logit-model analysis, there were no significant main or interaction effects of grade point average on teacher clarity. The evidence indicated that while grade point average could possibly have some effect on teacher clarity, it cannot be detected due to limited sample size.

Even though previous researchers found support for the relationship between teacher clarity and three of the variables examined in this study (i.e., teacher age, sex, and subject matter taught), the findings reported in this study did not yield significant differences between teacher clarity and these variables.
However, since the student teachers involved in this study were self-selected volunteers, these findings are not generalizable. The results of this research effort must be interpreted with caution since there were several limitations regarding the nature of the data which resulted in weak and restricted statistical power. First, the high-inference clarity measure was extremely skewed with an uneven distribution of scores on the positive end of the clarity scale which resulted in limited range and variance for this measure. In addition, the independent variables included in this study contained various categories with unequal numbers in them resulting in extreme or outlier scores. For example, concerning the subject matter variable, two groups had frequencies as small as 3, while the frequency for the largest group was 31.

Despite the limitations involving statistical power and significance, there were consistent tendencies for a number of variables that should be noted. Descriptive data presented in Chapter IV supported the following uniform trends: a) finalists in the N.E.A. competition exhibited on average higher teacher clarity on both the high- and low-inference measures than the nonfinalists; b) females on average displayed high teacher clarity on both clarity measures than males; c) the participants who taught elementary lessons demonstrated on average the highest teacher clarity on both clarity measures, while the student teachers who taught lessons on the secondary level exhibited the lowest average clarity of the three grade levels; d) the student teachers who taught agriculture and
mathematics lessons were on average among the highest of the ten content areas on both clarity measures, while those who taught business lessons were on average among the lowest on teacher clarity; e) the participants between the ages of 27 and 30 and over 34 displayed higher average teacher clarity than their counterparts under the age of 30 and between 31 and 34; f) the student teachers with a reported grade point average of 3.0 and above demonstrated on average higher teacher clarity than those with a reported grade point average below 3.0; g) the business education and social studies education majors were on average among the least clear of the various education specialties; and i) the participants who attended large colleges exhibited on average the highest teacher clarity on both clarity measures than those who attended small or medium colleges.

An interesting tendency noted for several variables was that the group with the highest average clarity on one measure (i.e., low- or high-inference) had the lowest average clarity on the other measure. The following are examples of this tendency: a) graduate students exhibited on average the highest clarity on the high-inference measure and the lowest clarity on the low-inference measure; b) the student teachers who intended to join the military service as their immediate career plans displayed on average the lowest clarity on the high-inference measure and the highest clarity on the low-inference measure; and c) the participants who entered the N.E.A. competition to enhance their careers demonstrated on average the lowest clarity on the high-inference measure and the highest clarity on the
low-inference measure. One possible explanation for these contradictory results could be inconsistent observer ratings for these categories. Another explanation involves an issue discussed earlier concerning the low correlation found in this study between the low-inference and high-inference clarity measures.

The finding previously discussed regarding the ability of the trained raters in this study to use the revised observation instrument to effectively observe and measure teacher clarity behaviors in natural classrooms involving different grade levels and content areas, has implications for the process of teacher evaluation. According to Cruickshank (1985), teacher evaluation or rating instruments are widespread and suffer from two major shortcomings: a) "criterion contamination which refers to the inclusion of criteria that are extraneous or unrelated to good teaching (e.g., personality factors)"; and b) "criterion deficiency which refers to the omission or exclusion of pertinent criteria" (p. 45). Cruickshank (1985) suggested that "if effective teachers are clear, then clarity should be a criterion on which their performance is judged" (p. 46). Thus, teacher evaluation instruments used to rate effective teaching behaviors should include teacher clarity. Even though the student teachers who participated in this study were above average on teacher clarity, perhaps the N.E.A. might consider incorporating specific teacher clarity behaviors into their evaluation criteria in order to enhance their selection procedures.
An important aspect of teacher evaluation involves the ability of observers to objectively judge teaching competence during classroom observations. In order to assess teacher clarity observers must be trained to count or rate the behaviors contained in the instrument. For example, the judges of the N.E.A. student teaching competition could be trained to use the observation instrument in order to select the finalists and semifinalists on the basis of teacher clarity. Supervisors and administrators should also be trained to utilize the clarity observation instrument when observing teachers for evaluation purposes in natural classroom settings.

In addition, Cruickshank (1985) noted that the ability to assess the clarity behavior of preservice and inservice teachers can improve the teacher selection process. Since clarity is related to teaching success and effectiveness, then it should be a criterion for being admitted into a teacher education program and for obtaining a teaching position. The selection process might involve applicants teaching one or more brief lessons which could then be observed and rated on clarity by trained observers. Selection procedures that measure the degree to which preservice and inservice teachers perform clarity behaviors in realistic teaching situations help ensure that the right applicants are chosen for future and current teaching positions.

The recruitment and selection of teacher education candidates and the hiring of prospective applicants for teaching posts could also be impacted by the tendency noted earlier for individuals with
self-reported (or true) grade point averages above 3.0 to exhibit on
average higher clarity than those with grade point averages below
3.0. Since previous researchers have found that teacher clarity is
related to successful and effective teaching, perhaps candidates with
grade point averages above 3.0 should be recruited and selected for
teacher education programs and teaching positions since they tend to
display higher clarity.

Recommendations for Future Research

Based on the findings of this study, the following promising
lines of inquiry are recommended for further study.

1. This research project should be replicated with a large
   random sample of student teachers in order to verify the
   results and to obtain normative data regarding the use of
   clarity behavior.

2. A follow-up study should be conducted in which the results
   of the logit-model analysis would be reanalyzed to explore
   possible significance between teacher clarity and grade
   point average using relatively new procedures known as
   focused comparisons (Kennedy & Bush, 1988).

3. A teacher clarity training manual including videotaped
   examples of the specific low-inference behaviors along with
   verbal explanations defining the behaviors should be
   developed in order to make the training of observers more
   objective and standardized.
4. Future clarity training for observers who will rate lessons taught in actual classrooms should include examples of the seven items contained in the revised version of the Teacher Clarity Observation Instrument that were added to the original instrument.

5. The revised observation instrument should continue to be used in studies involving natural classroom settings in order to further test its validity and reliability.

6. Future clarity research should be conducted with inservice teachers in the context of the natural classroom and should focus on the following issues: a) the training of teachers to be more clear; b) teacher perceptions of clarity; c) the stability of clarity behaviors over time, across topics, and with different grade levels; and d) the relationship of clarity to student achievement.

7. Research dealing with the relationship between teacher clarity and various demographic and contextual variables, especially grade point average, should be pursued.

8. The internal consistency of the revised observation instrument should continue to be studied in order to determine the relationship between the low-inference behaviors and the high-inference clarity variable.
9. The relationship between teacher clarity and variables such as teaching style or method, enthusiasm, and classroom climate factors should be examined in future research efforts.

10. The limiting effects of extreme or outlier scores on statistical power and significance should be further examined by conducting a follow-up study in which these scores would be eliminated and the data reanalyzed using analysis of variance and log-linear techniques.
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APPENDIX A

CORRESPONDENCE WITH N.E.A. OFFICIALS AND PERMISSION FORM FOR COMPETITION PARTICIPANTS
December 3, 1985

NEA Student Program
1201 16th Street Northwest
Washington, DC 10036-3290

Dear Sirs:

Today's mail brought the announcement of the National Student Teaching Competition which seems like an excellent idea.

In the "Information and Rules" section I note that one criterion (2b) on which participants will be judged is clear communication. It is in relationship to this that I write. We have been conducting research on teacher clarity for some time and wonder if we might examine the contest submissions in order to study teacher clarity more fully. Most of the teaching we have observed has been that of preservice teachers teaching peers in education classes. Access to your tapes would enable us to study preservice teacher clarity in natural classrooms.

Specifically we wonder if we could borrow the tapes and analyze the teaching on each according to its clarity. In so doing we would be able to determine whether we have identified all the teacher behaviors associated with clarity, the frequency of occurrence of clarity behavior for each participant and the relationship between frequency and appropriate usage, norms or averages for the occurrence of each given clarity behavior, relationships between the occurrence of clarity behaviors and the type of content taught and so forth. Our ability to do these things would add to the store of facts we are trying to accumulate on teacher clarity. Our research is not and has not been supported by outside sources so all we do is a part of our everyday job. Can you be of assistance in our efforts to understand teaching?

Sincerely,

Donald R. Cruickshank
Professor

xc: Professor John Kennedy
    Shirley Hamilton

enclosure: article from Journal of Teacher Education (1985)
December 12, 1985

Mr. Donald R. Cruickshank  
Professor  
Department of Educational  
Theory and Practice  
Teacher Education  
Ohio State University  
225 Ramseyer Hall  
29 West Woodruff Avenue  
Columbus, Ohio 43210-1177

Dear Professor Cruickshank:  

I received your request to use the tapes submitted to us for judging in our student teaching competition for your research.  

First, let me say after reading the article on your research in the Journal of Teacher Education, that it sounds very interesting and worthy of support. Unfortunately, confidentiality and privacy laws being what they are today, I am not free to share the tapes outside of the competition without permission.  

If you would provide me with a letter to the students outlining your request, and a permission form for them to sign to release, I will see that each contestant receives them and has an opportunity to assist you. If I could have the letter by February 15, there should be no problem getting the request to each student teacher. The tapes should be available to you by the middle of May.  

Sincerely,  

Betty K. Sayler  
Manager, NEA Student Program  

BKS:cs
PERMISSION FORM

I hereby grant permission for the transmission of my video tape, submitted to the National Education Association under the NEA National Student Teaching Competition Program, to Donald R. Cruickshank, Professor at The Ohio State University for use in the research program on teacher clarity taking place there. It is my understanding that the tape will be used only for research purposes and that use for any other purpose is not granted.

NAME

University address

Home address

University you are attending

Year of graduation

Telephone where you may be reached
April 14, 1986

Betty K. Sayler
Manager, N.E.A. Student Program
1201 16th Street North West
Washington, D.C. 20036-3290

Dear Ms. Sayler:

As a doctoral student at Ohio State University working with Dr. Donald Cruickshank, I will be rating the videotapes obtained from the N.E.A. student teaching competition for teacher clarity as part of my dissertation. Enclosed are the permission forms Dr. Cruickshank has received from student teachers who have agreed to release their videotapes for use in the teacher clarity project. I have arranged for duplication of the videotapes so that the originals can be returned to the respective student teachers as soon as possible. I understand that in the near future you will be sending us approximately eighty videotapes from student teachers who have already given you their permission to release their videotapes.

Thank you so much for facilitating the process of securing the videotapes for our use in conducting teacher clarity research. Without your cooperation and assistance this project would not have been possible. I will send you and the participating student teachers a copy of the results when my teacher clarity research is completed. If you have any questions or require further information, please don't hesitate to contact me.

Sincerely,

Shirley A. Hamilton

cc: Dr. Donald Cruickshank
May 12, 1986

Ms. Betty K. Sayler
Manager, N.E.A. Student Program
1201 16th Street North West
Washington, DC 20036-3290

Dear Ms. Sayler:

An inventory of the materials obtained from the N.E.A. Student Teaching Competition for The Ohio State University Teacher Clarity Research Project has been completed. The attached list contains the names of 122 student teachers who have agreed to participate in our project, and information based on the inventory regarding the status of various individuals for whom we need additional materials (i.e., videotapes, lesson plans, and permission forms).

Comparing the videotapes with the permission forms collected from the participating student teachers, we discovered that two videotapes are missing. The two individuals for whom we have permission forms but no videotape are Todd Fry and Charlotte Wolfley. On the other hand, we have a videotape but no permission form for Lynn Fry. We received a lesson plan but no videotape or permission form for Lisa Wilson. In addition, we only have lesson plans to accompany 39 videotapes. Please advise us regarding the steps we should take in order to obtain the missing videotapes, lesson plans, and permission forms.

One issue our current research will focus on is the extent to which student teachers judged to be superior in the N.E.A. competition demonstrate teacher clarity behaviors. In order to deal with this issue, we need to understand in more detail the selection process used in the N.E.A. competition. Could we obtain the procedure, criteria, and sample judging forms utilized by the judges in selecting the finalists of the N.E.A. competition? If possible, could we also gain access to the final scores attained in the N.E.A. competition for all of the individuals who have agreed to participate in the teacher clarity project? These scores will remain strictly confidential and will be reported as group data rather than as individual data, thus ensuring anonymity.
May 12, 1986
Ms. Betty Sayler

There was a note from you on the bottom of one of the boxes containing the videotapes indicating that several videotapes should be returned to the N.E.A. Unfortunately, the note was not attached to any of the videotapes so we cannot determine which ones are involved. Please notify us as to which videotapes you are referring to and we will send them to you as soon as possible. We are currently in the process of duplicating all of the videotapes so that we can send the originals to their respective owners. Could you also send us the total number of student teachers who participated in the N.E.A. competition?

Thank you for your continued cooperation and assistance with our study.

Sincerely,

Donald R. Cruickshank
Professor

Shirley A. Hamilton
Graduate Assistant
May 29, 1986

Donald R. Cruickshank
The Ohio State University
225 West Woodruff Avenue
Columbus, Ohio 43210

Dear Professor Cruickshank:

Thank you for your letter of May 12. I regret that there were errors made in handling the tapes and lessons plans.

Enclosed is the permission form for Lynn Fry's tape. The tapes of Charlotte Wolfby, Todd Fry and Lisa Wilson have evidently been returned to them. I can only suggest you write them and ask them to send the tapes back to you.

Fortunately, we still have the lesson plans and will send them to you. However, in reviewing files I find we do not have the lesson plans for Monica Lea Rodeghiero, Beth Sylvester and Audrey Williams.

I will be glad to send you a copy of the judging criteria, but I no longer have the rating forms.

I do not want you to return any tapes to me—the note you found is not relevant.

Thank you for the time and attention you are directing toward the tapes and honoring the students' requests.

Sincerely,

Betty Sayler, Manager
NEA Student Program

BS:ct
APPENDIX B

TEACHER CLARITY DEMOGRAPHIC SURVEY
AND RELATED MATERIALS
May 21, 1986

Dear N.E.A. Participant:

Thank you for agreeing to participate in the Ohio State University teacher clarity research project. Your videotape has been received from the N.E.A. and is currently being duplicated. Your original videotape should be delivered to you by the end of May or as soon as possible. We appreciate your willingness to permit us to use your videotape for our teacher clarity research.

In addition to utilizing videotapes to obtain teacher clarity ratings, certain demographic information is vital to our present study. In order to obtain this data, we need your assistance. Would you please take a few minutes to complete the attached survey and return it in the enclosed self-addressed stamped envelope by June 9?

All responses will be strictly confidential. Only the investigators directly in charge of the teacher clarity study will have access to the data. The results will be reported as group data rather than as individual data, thus ensuring anonymity. Your name will not enter either in the data itself or in the data analysis.

Thank you for your time and consideration. Without your support and cooperation this project would not have been possible. Our findings will have a significant impact on future teacher clarity research and teacher preparation programs. If you would like a copy of the teacher clarity research results when the study is completed, please indicate this by placing a check mark in the appropriate box on the attached survey. If you have any questions or require further information, please feel free to contact us.

Sincerely,

[Signature]

Donald R. Cruickshank
Professor

[Signature]

Shirley A. Hamilton
Graduate Assistant
OHIO STATE UNIVERSITY TEACHER CLARITY DEMOGRAPHIC SURVEY

Please complete the following items by CIRCLING THE NUMBER that represents the most appropriate response or by FILLING IN the appropriate blank. Thank you for your assistance. Please respond by June 9.

SEX
1. MALE
2. FEMALE

AGE
1. 19 - 22
2. 23 - 26
3. 27 - 30
4. 31 - 34
5. Over 34

UNDERGRADUATE GRADE POINT AVERAGE
1. 3.5 - 4.0
2. 3.0 - 3.4
3. 2.5 - 2.9
4. 2.0 - 2.4
5. Below 2.0

COLLEGE RANK
1. JUNIOR
2. SENIOR
3. POST-DEGREE
4. OTHER

IMMEDIATE CAREER PLANS
1. GRADUATE SCHOOL
2. PUBLIC SCHOOL TEACHING
3. PRIVATE SCHOOL TEACHING
4. MILITARY SERVICE
5. PRIVATE SECTOR EMPLOYMENT
6. OTHER

GRADE LEVEL OF LESSON TAUGHT IN N.E.A. COMPETITION
1. ELEMENTARY (N-K-5)
2. INTERMEDIATE (6-8)
3. SECONDARY (9-12)

PLEASE IDENTIFY CONTENT AREA OF LESSON TAUGHT IN N.E.A. COMPETITION

AREAS OF PREPARATION OR CERTIFICATION

MAJOR AREA:
MINOR AREA:

PLEASE BRIEFLY EXPLAIN THE REASON(S) YOU ENTERED THE N.E.A. STUDENT TEACHING COMPETITION.

I would like a copy of the teacher clarity research results.
July 3, 1986

Dear N.E.A. Participant:

We still need your help in obtaining certain demographic information vital to our teacher clarity study. Will you please take a few minutes to complete the attached survey and return it in the enclosed self-addressed stamped envelope by July 21? If you have already returned a survey, please complete another one in case your original survey has been misplaced.

All responses will be strictly confidential. Only the investigators directly in charge of the teacher clarity study will have access to the data. The results will be reported as group data rather than as individual data, thus ensuring anonymity. Your name will not enter either in the data itself or in the data analysis.

Thank you for your continued cooperation and assistance. If you have any questions or concerns, please feel free to contact us.

Sincerely,

Donald R. Cruickshank
Professor

Shirley A. Hamilton
Graduate Assistant

enclosures
Aug. 3, 1986

Dear N.E.A. Participant:

We still need your help in obtaining certain demographic information vital to our teacher clarity study. Will you please take a few minutes to complete the attached survey and return it in the enclosed self-addressed stamped envelope by Aug. 11? If you have already returned a survey, please complete another one in case your original survey has been misplaced.

All responses will be strictly confidential. Only the investigators directly in charge of the teacher clarity study will have access to the data. The results will be reported as group data rather than as individual data, thus ensuring anonymity. Your name will not enter either in the data itself or in the data analysis.

Thank you for your continued cooperation and assistance. If you have any questions or concerns, please feel free to contact us.

Sincerely,

[Signature]

Donald R. Cruickshank
Professor

[Signature]

Shirley A. Hamilton
Graduate Assistant

enclosures
August 3, 1986

Dear N.E.A. Participant:

Due to a malfunction in our equipment while duplicating your student teaching videotape for our teacher clarity research, there is no sound on our copy of the videotape. Since it is impossible to rate your videotape for teacher clarity without the proper sound quality, would you be willing to resubmit your videotape so that it can be included in our O.S.U. teacher clarity study? If you still wish to be a participant in our study, please send your videotape to me at the above address as soon as possible. I will duplicate it and return it to you immediately. Your mailing costs will be reimbursed.

Your participation in our study is necessary in order to obtain significant results. Thank you for your continued cooperation and assistance.

Sincerely,

Shirley A. Hamilton
Graduate Assistant
APPENDIX C

REVISED TEACHER CLARITY OBSERVATION INSTRUMENT
**OBSERVATION FORM**

**Section 1**

Indicate to the right of the appropriate behavioral item the total number of times that behavior was observed in this teaching episode.

<table>
<thead>
<tr>
<th>TEACHER BEHAVIOR</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STRESSES (EMPHASIZES) IMPORTANT ASPECTS OF CONTENT</strong></td>
<td></td>
</tr>
<tr>
<td>1. Points out what is important for students to learn</td>
<td></td>
</tr>
<tr>
<td>2. Repeats things that are important</td>
<td></td>
</tr>
<tr>
<td>3. Writes important things on the board</td>
<td></td>
</tr>
<tr>
<td>4. Stresses difficult points</td>
<td></td>
</tr>
<tr>
<td>5. Repeats instructions/directions</td>
<td></td>
</tr>
<tr>
<td>6. Summarizes the material presented</td>
<td></td>
</tr>
<tr>
<td><strong>EXPLAINS THE CONTENT OF INSTRUCTION</strong></td>
<td></td>
</tr>
<tr>
<td>7. Explains things</td>
<td></td>
</tr>
<tr>
<td>8. Uses examples when explaining</td>
<td></td>
</tr>
<tr>
<td>a) Uses verbal examples</td>
<td></td>
</tr>
<tr>
<td>b) Uses written examples</td>
<td></td>
</tr>
<tr>
<td>9. Works examples/problems and explains them</td>
<td></td>
</tr>
<tr>
<td>10. Explains how to do assignments by using examples</td>
<td></td>
</tr>
<tr>
<td>11. Explains assignments and the materials students need to use</td>
<td></td>
</tr>
<tr>
<td><strong>PROVIDES FOR STUDENT ASSIMILATION/SYNTHESIS OF CONTENT</strong></td>
<td></td>
</tr>
<tr>
<td>12. Explains what unfamiliar words mean</td>
<td></td>
</tr>
<tr>
<td>13. Explains something and then stops so that students can think about it</td>
<td></td>
</tr>
<tr>
<td>14. Shows similarities and/or differences between things</td>
<td></td>
</tr>
<tr>
<td>15. Compares new material to what students have already learned</td>
<td></td>
</tr>
<tr>
<td>16. Shows students how to remember things</td>
<td></td>
</tr>
<tr>
<td>17. Reviews what has already been studied (taught)</td>
<td></td>
</tr>
<tr>
<td>18. Reviews work before a test</td>
<td></td>
</tr>
<tr>
<td><strong>ASSESSES AND TRIES TO ENSURE STUDENT UNDERSTANDING OF CONTENT</strong></td>
<td></td>
</tr>
<tr>
<td>19. Asks questions to find out if students understand</td>
<td></td>
</tr>
<tr>
<td>a) Asks questions of the class</td>
<td></td>
</tr>
<tr>
<td>b) Asks questions of specific students</td>
<td></td>
</tr>
</tbody>
</table>
20. Has individual student(s) work publicly  
21. Examines students' work privately  
22. Allows time (pauses) for students to ask questions  
23. Repeats things when students do not understand  
24. Answers students' questions  
25. Provides time for students to practice  
   a) Students engage in independent seatwork  
   b) Students engage in group work

SECTION II

Please respond to the items below based on your observation of this teaching episode. On the scale provided to the right of each item, circle the number which best corresponds to your perception relative to that item.

<table>
<thead>
<tr>
<th>The instructor:</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Somewhat Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>26. Answered students' questions adequately</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. Used relevant examples when explaining</td>
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<tr>
<td>28. Taught the lesson step-by-step</td>
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<tr>
<td>29. Provided students with sufficient examples of how to do the work</td>
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<tr>
<td>30. Presented the lesson in a logical manner</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31. Adequately informed students of the lesson objective(s) or what they would be expected to be able to do on completion of the lesson</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
32. Stressed (emphasized) the aspects of content it was important for students to learn

33. Explained the content of instruction

34. Provided for student assimilation and synthesis of content

35. Assessed student understanding and provided for better understanding of content when necessary

36. The instructor was
Teacher Clarity Instrument Abbreviations

1. PI
2. RI
3. WB
4. StP
5. RD
6. Sum
7. Ex
8. Eg (VEg; WEg)
9. WP
10. EgAs
11. ExAs
12. ExUw
13. ExSt
14. Sim
15. Comp
16. SLR
17. Ry
18. RvT
19. QC, QS
20. SB
21. SD
22. TQ
23. Rp
24. AN
25. TPI, TPG
CLARITY OBSERVATION INSTRUMENT
OPERATIONAL DEFINITIONS FOR BEHAVIORAL ITEMS

1. **Points out what is important for students to learn.**

   The teacher deliberately draws students' attention to those aspects of the content of instruction that are important for them to learn. The teacher may say, for example, "It is important for you to know this."
   "You must understand this."
   "It is very important for you to learn."
   etc.

2. **Repeats things (terms, rules, definitions, concepts) that are important.**

   The teacher during the lesson presentation repeats (for emphasis) a specific aspect of the content of instruction (e.g., point, idea, rule, etc.).

   This behavior may be initiated by the teacher or it may occur while he/she is elaborating on some statement/comment made by a student or during the review process. It does not however occur as a direct response to a student question or comment indicating that he/she does not understand something that has been said (taught).

3. **Writes important things (terms, rules, definitions) on the board/chart.**

   The teacher writes on the chalkboard (chart, slides, etc.) important words, phrases, rules, concepts, ideas, etc. related to the content of instruction.

   The teacher may initiate this behavior, or it may occur in response to a student's question or comment.

4. **Stresses difficult points.**

   The teacher deliberately draws students' attention to those aspects of content of instruction that are difficult for them to understand. For example, the teacher may say "Pay careful attention to this concept, it may be hard to understand."

   This behavior may be initiated by the teacher or it may occur in response to a student question or comment. A concept or idea may be difficult but not necessarily important.
5. **Repeats instructions/directions.**

The teacher during the lesson presentation repeats (for emphasis) specific instructions/directions before students begin working.

This behavior may be initiated by the teacher or it may occur in response to a student comment or question.

6. **Summarizes the material presented in the lesson.**

The teacher, on completion of the lesson presentation, gives a summary of the instructional content presented in the lesson.

7. **Explains things (aspects of the content).**

The teacher explains specific aspects of content.

This behavior is usually initiated by the teacher or it may occur in response to a student question or comment to further illuminate an aspect of the content of instruction not previously explained.

8. **Uses examples when explaining.**

The teacher uses verbal, written, practical examples while explaining some aspect of the content of instruction. For example, during an explanation the teacher uses an example to illustrate a particular point.

This behavior may be initiated by the teacher, or it may occur in response to a student's question or comment.

9. **Works examples/problems (e.g., on chalkboard) and explains them.**

After explaining a total concept, the teacher works through or shows the students how to do an example. For example, the teacher may state, "Now I will work an example for you."

This behavior may be initiated by the teacher or it may be in response to a student's question or comment.

10. **Explains how to do assignments by using examples.**

The teacher explains to the students how to do the assignment by giving examples -- either written or verbal. The assignment should be one that is due at a later point in time -- not used as time for practicing material presented previously in the lesson.
This behavior may be initiated by the teacher or it may be in response to a student’s question or comment.

11. **Explains assignments and the materials students need to use.**

   The teacher explains what the assignment is and the materials needed to do the assignment. The assignment should be one that is due at a later point in time -- not used as time for practicing material presented previously in the lesson. Materials can include such things as graph paper, reference books, special equipment, etc. In some cases the materials may be understood, e.g., paper and pencil.

   This behavior may be initiated by the teacher or it may occur in response to a student’s question or comment.

12. **Explains what unfamiliar words mean.**

   The teacher tells students the meaning of a word(s) with which students are unfamiliar.

   This behavior may be initiated by the teacher or it may occur in response to a student’s question or comment.

13. **Explains something and then stops so that students can think about it.**

   The teacher explains some aspects of the content of instruction and then deliberately pauses to provide time for students to think about what has been said.

   The teacher, after the explanation, explicitly tells students that he/she is providing them some time to think about what was said.

   This behavior may be initiated by the teacher or it may occur in response to a student’s question or comment.

14. **Shows similarities and differences between things.**

   The teacher describes, explains, or shows how two or more things (i.e., ideas, concepts, objects, ways of doing things, etc.) are alike and/or how they differ by giving examples and nonexamples -- what it is and what it is not.

   This behavior may be initiated by the teacher or it may occur in response to a student’s question or comment.
15. **Compares new material to what students have already learned.**

The teacher compares the new material that will be presented to that which students have previously learned. For example, she/he may state "Last week we ..., and now we will be going over... . This new material is different from (similar to) what you had before... ."

This behavior may be initiated by the teacher or it may occur in response to a student's question or comment.

16. **Shows students how to remember things.**

The teacher shows students (e.g., by use of some memory trick, making reference to something familiar to students, etc.) how to remember some specific aspect of content.

This behavior may be initiated by the teacher, or it may occur in response to a student's question or comment.

17. **Reviews what has already been studied (taught).**

The teacher reviews (goes over) specific aspects of content previously taught to ensure that students understand and remember those aspects of content.

During the review, it may take the form of the teacher asking students questions about the content, or synthesizing certain aspects of content before proceeding to the next step in the lesson.

18. **Reviews work before a test.**

The teacher reviews (goes over) specific material for a test. This is a session designed specifically for reviewing for the test. It is based on more material than that from a single lesson. This is designed to ensure that the students understand the material for the test.

During the review, the teacher may ask student(s) questions about the content or synthesize aspects of the content presented.

19. **Asks questions to find out if students understand.**

The teacher, after explaining, repeating, or reviewing some aspects of the content of instruction, asks a direct question
(e.g., "Do you have any questions"?, "Do you understand"?, "Is that OK"?, or asks questions about the content taught), to find out if students understand what has been said (taught).

The teacher may initiate this behavior or it may occur in response to a student's question or comment or some nonverbal cue from students indicating that they do not understand.

20. **Has individual students work publicly (e.g., on the chalkboard).**

The teacher asks individual students to work at the chalkboard or aloud, while other students pay attention to what is being said or done.

This is done to find out if they understand and can verbalize the process -- the thought process.

21. **Examines students' work privately (e.g., at student's/teacher's desk).**

The teacher checks an individual student's written or practical work at the student's or teacher's desk, or some designated private area in the classroom.

22. **Allows time (pauses) for students to ask questions.**

The teacher after explaining, repeating, reviewing some aspects of the content, or responding to a student's question or comment, deliberately pauses and provides time for students to ask questions about the content of instruction.

The teacher may directly solicit questions from students, or may pause for a while and give some nonverbal cue to students indicating that they are invited to ask questions.

23. **Repeats things when students do not understand.**

The teacher repeats aspects of the content of instruction (previously addressed) which students directly or indirectly communicate to the teacher that they do not understand.

24. **Answers students' questions.**

The teacher answers content-related questions asked by student(s).
25. **Provides time for students to practice (e.g., work problems/examples).**

The teacher, during the class period, provides time for students to do written or practical assignments related to the content of instruction. This may take the form of individual seatwork or group work. The teacher may play an active (leading) role in the case of group work.