An Exploration of the Relationship Between Specific Instructional Leadership Behaviors of Elementary Principals and Student Achievement

by

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(Abstract)

This study explored the relationship between specific instructional leadership behaviors of elementary principals and student achievement as measured by the Iowa Test of Basic Skills (ITBS). One hundred twenty-five principals were systematically and proportionally selected from Arizona, Iowa, and Virginia. Seventy-two percent of the principals met all criteria and agreed to participate.

The Measure of Elementary Principal Instructional Leadership Behavior, MEPILB, was developed for eight teachers at each school (total of 576) to indicate those instructional leadership behaviors demonstrated by their principals. Other data collected and analyzed were fourth grade ITBS mean normal curve equivalent, NCE, scores for two years, 1987-88 and 1989-90; percentage of students on free- and reduced-price meals as a proxy measure of socioeconomic status (SES); percentage of Parent-Teacher Association or organization membership as measure of parental involvement; district per

pupil expenditures; and several school and principal demographic information.

A principal components analysis with varimax rotation was performed on the MEPILB results to determine underlying instructional leadership dimensions. Four factors were revealed with two of those significantly associated with student achievement: monitoring instruction and testing ($p < .05$), and providing instructional feedback ($p < .10$). When these variables were added in the full regression model with SES, no significance was found between the two instructional leadership factors and student achievement. SES contributed the largest amount of explained variance to student achievement.

The results of this study identified specific instructional leadership behaviors of elementary principals, but these behaviors were not found to significantly contribute to the variance in student achievement.

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CHAPTER 1

THE PROBLEM

Introduction

School effectiveness has been a topic for much debate over the past 25 years. This debate began when James Coleman was contracted by the Department of Justice to examine discrimination in education. Coleman concluded more of the difference in academic achievement of students was explained by student's family background and less by school-related factors. The Coleman Report determined variations in school facilities, curriculum, and staff had little effect on achievement when these factors were examined independent of family background (Coleman, 1966). School variables found to have the most significant association with achievement, independent of family background, were the teachers' characteristics and attitudes (Austin, 1979). The results of several other studies which evaluated the Elementary and Secondary Education Act gave support to Coleman's conclusions (McLaughlin, 1975; Ginsberg, 1970; and Hanusek, 1972).

These rather pessimistic results for educators initiated an increase in studies conducted in an attempt to find other variables which might affect student achievement. There was a shift in research emphasis from the study of input variables, such as pupil characteristics and quantities of school resources, to school processes. The studies most referred to as a result of this shift are

Weber's examination of student reading achievement in four inner-city schools in 1971, the 1974 State of New York Office of Educational Review Revice of two New York City schools, the California School Effectiveness Study in 1976, the ESAA In-Depth Study conducted in 1978 by Wellisch and others, Brookover's study of school social systems and student achievement in 1979, the study of London secondary schools and their effects on students by Rutter in 1979, and Edmonds' school improvement project also conducted in 1979 (Sweeney, 1982). These studies served as alternatives to the gloomy findings of Coleman and others and helped to revive the feelings of optimism about school administration and teachers (Mackenzie, 1983).

Although a few more recent researchers believe conceptual and methodological problems exist with some of these studies, each of them found similar factors which were characteristic of effective schools. The researchers consistently described effective schools as having the following attributes:

1. The school climate is conducive to learning. The climate is free of discipline problems and vandalism.
2. The expectation of teachers is that all children can achieve.
3. An emphasis is placed on basic skills instruction and high levels of student time-on-task.
4. A system of clear instructional objectives for monitoring and assessing student performance exists.

5. The school principal is a strong, programmatic leader who sets school goals, maintains student discipline, frequently observes classrooms and creates incentives for learning (Bossert, 1985).

For as many studies which exist regarding the characteristics of effective schools, there is a multitude of additional research pointing to the key role of the principal in successful schools. Most of this research identifies general dimensions of leadership which enhance student achievement. The general dimensions include: 1) emphasizing achievement, 2) providing an orderly school atmosphere, 3) coordinating instructional programs, 4) frequently evaluating pupil progress, 5) setting instructional strategies, and 6) supporting teachers (Sweeney, 1982).

Some studies have been conducted which serve to identify more specific instructional management/leadership behaviors of principals associated with higher school outcomes (Fishman, 1986; Leitner, 1988; Andrews & Soder, 1987; Larsen, 1987; Hallinger, 1983; Freeman, 1987; and Thomason, 1988). Several of these studies are limited by factors such as small sample size, use of principal self-perceptions to identify principal instructional leadership behaviors, not including average-achieving schools in the population sample, and lack of control for student socioeconomic background. Some of these studies, however, have provided an excellent base of behaviors upon which to build preservice and inservice training programs for principals, principal selection models, and evaluation instruments.

This study will extend the research previously conducted on the association between principal instructional leadership and student achievement. The methodology used was chosen to strengthen many of the limitations in past research completed on this significant relationship.

Actual teacher observations of principal instructional leadership behavior were used rather than perceptions of teachers or principal self-reports. Schools for this study were systematically and proportionally selected from three states. As a result, all levels of student socioeconomic status and achievement were represented. The achievement data used were the average complete composite normal curve equivalent scores over a three-year period. The impact of student socioeconomic status was examined and controlled for in this study.

Statement of the Problem

The specific research question to be answered by this study is:

What proportion of the variance in student achievement can be attributed to the instructional leadership behavior of the elementary principal, controlling for student socioeconomic status, parental involvement, and district per pupil expenditure?

Significance of the Study

This study will explore the relationship between selected school output and elementary principals' instructional leadership behaviors. If the results yield

any specific principal instructional behaviors which can be positively correlated with higher test data, those behaviors can serve to build a model of effective instructional leadership which can be included in principal preservice training, principal selection, continuing education and evaluation programs.

Model and Definition of Variables

The model examined in this study included one independent variable, one dependent variable, and three control variables. The independent variable was the instructional leadership of the principal. The socioeconomic background of students, student enrollment, level of parental involvement, and the district per pupil expenditure were the control variables. The dependent variable was the mean normal curve equivalent (NCE) score for students over a three-year period.

Instructional Leadership

Instructional leadership was defined as the principals' behavior which is associated directly with the curriculum and instruction program in their schools which primarily focuses on student achievement. The principals' instructional leadership totals were determined by their total score on the Measure of Elementary Principal's Instructional Leadership Behavior, MEPILB.

Socioeconomic Status of Students

The socioeconomic status of students was determined by the percentage of students at each school who received free or reduced-price meals. This information was gathered from individual principal surveys.

Per Pupil Expenditure of Districts

The per pupil expenditure was the dollar amount each district with participating schools spent per student. These data were obtained from the State Departments of each participating state.

Parental Involvement

The percentage of parental involvement was derived from the percentage of membership in the school's Parent-Teacher Organization affiliated with the National Parent-Teacher Organization or the parent organization within the school not affiliated with the national organization. This information was provided by the principal in the principal survey.

Student Achievement

Student achievement for each school was measured by the average of the fourth grade Iowa Test of Basic Skills (ITBS) complete composite normal curve equivalent, NCE, scores for 1987-88 and 1989-90. (Note: NCE scores are normalized standard scores with a mean of 50 and a standard deviation of

21.06. NCE data were used in this study due to their standardized nature for use in multiple regression analyses.) Student achievement data were obtained through the principal survey.

Limitations of the Study

The limitations of this research study are:

1. This study was limited to a systematic, proportional sample of elementary schools in those states using the Iowa Test of Basic Skills on a statewide basis which report a comparable composite score; Arizona, Iowa, and Virginia. Only principals and teachers volunteering to participate were included.

2. The dependent variable, student achievement, was limited to one grade level at each school and was the single measure of school effectiveness. No measure of student ability was included.

3. The measure of parental involvement was limited to the percentage of membership in the national parent-teacher organization or the parent organization within the school not affiliated with the national group. Fifteen percent of the schools involved in the study had neither an affiliation with the national PTA group nor a parent group organized within their school.

4. There were items unmarked or marked "no" by teachers on the Measure of Elementary Principals' Instructional Leadership Behavior which may have been negatively coded due to lack of opportunity to observe the

behaviors, rather than the lack of principal performance. As a result, however, principals' overall scores on the MEPILB were underinflated rather than overinflated estimates of their instructional leadership behavior.

Summary

In Chapter 1, a brief introduction was given of the factors identified in the literature as those associated with school effectiveness. The importance of the principal's instructional behavior in enhancing student achievement was discussed. Limitations in the effective schools research and in the study of the relationship between student outcomes and principal behaviors also were identified. The research question to be answered by this study was identified and an explanation of the model and definitions of specific terms used in the study were given. These terms were instructional leadership, student socioeconomic status, per pupil expenditure of districts, parental involvement, and student achievement. Limitations of the current study also were noted.

Chapter 2 describes some of the effective schools research. The role of the principal in effective schools will be discussed. Research on the relationship of the elementary principal's instructional leadership behavior with student achievement will be included also. Limitations of past research on this relationship will be presented, as well as ways in which this study will serve to strengthen these limitations.

CHAPTER 2

REVIEW OF THE LITERATURE

Chapter 2 contains a review of the literature involving research on effective schools and principal instructional leadership. This chapter is divided into four major sections. The first section is a brief review of the effective schools research and how the principal has been identified as one of the vital components associated with school success. The second section describes previous studies which examined the work behavior of elementary principals and their conflicting managerial and instructional roles. The third section deals with the relationship between principal leadership and student achievement. A brief review of the most significant older case studies is given. Since much has been written and discussed regarding these studies, attention is given to the more recent research on the correlational and causal relationships of instructional leadership and student achievement. The final section concludes with an exploration of the conceptual and methodological limitations to some of this previous research. The ways in which this research study will strengthen these limitations are reviewed.

Much has been written and discussed over the past 25 years about the impact of numerous factors on student outcomes. The Coleman Report, published in the mid-1960's, examined which variables are the most critical in

producing positive effects on schooling. Contrary to what educators believe, Coleman did not state education had little impact on student achievement; he actually concluded school resources and organizational characteristics had less effect on school outcomes than family background variables (Coleman, 1966). Still, many researchers in education were not content with these results and challenged the rather pessimistic findings regarding the school's role in producing positive outcomes. Numerous studies were conducted over the next 25 years with the intent of investigating variables other than family background which might affect student achievement.

The shift in research emphasis moved from the analysis of the impact of school input variables such as student socioeconomic status, dollars spent for education, and amount of resources per school to school processes such as teaching techniques and expectations, administrative leadership and school climate. Heyns (1978) was one of the first to examine the effect of the total learning environment on school effectiveness. She suggested the time students spent in school may be critical, particularly for those from lower SES with rather limited home resources and educational exposure.

The earliest research examining school process effects was conducted by Weber (1971), Rutter et al. (1979), Wellisch and others (1978), Edmonds (1979), and Brookover and Lezotte (1977). Conceptual and methodological problems exist with some of these studies; however, most of the early research

points to a similar set of characteristics present when recognizing effective schools. As Purkey and Smith (1982) stated:

> We find it [research of effective schools] is weak in many respects, most notably in its tendency to present narrow, often simplistic, recipes for school improvement derived from nonexperimental data. . . theory and common sense, however, do support many of the findings of school effectiveness research (p. 427).

Mackenzie (1983) described the "core elements" and "facilitating elements" of effective schools. Core elements are more generalized dimensions of effective schools where the facilitating elements are specific conditions making it easier to implement the core element dimensions. In Figure 2.0, the research consensus around the core elements of effective schools is shown as developed by Mackenzie.

Steller agreed with Mackenzie's analysis of the effective schools research and specified the five factors found consistently in the research on effective schools as being:

1. strong instructional leadership by the principal;
2. clear instructional focus;
3. high expectations and standards;
4. safe and orderly climate; and
5. frequent monitoring of student achievement (Steller, 1988).

Leadership Dimensions:

Core Elements

Positive climate and overall atmosphere
Goal-focused activities toward clear, attainable and relevant objectives
Teacher-directed classroom management and decisionmaking
In-service staff training for effective teaching

Efficacy Dimensions:

Core Elements

High and positive achievement expectations with a constant press for excellence
Visible rewards for academic excellence and growth
Cooperative activity and group interaction in the classroom
Total staff involvement with school improvement
Autonomy and flexibility to implement adaptive practices
Appropriate levels of difficulty for learning tasks
Teacher empathy, rapport, and personal interaction with students

Efficiency Dimensions:

Core Elements

Effective use of instructional time; amount and intensity of engagement in school learning
Orderly and disciplined school and classroom environments
Continuous diagnosis, evaluation, and feedback
Well-structured classroom activities
Instruction guided by content coverage
Schoolwide emphasis on basic and higher order skills

Taken from Mackenzie, D. E. (1983). Research for school improvement: An appraisal of some recent trends. Educational Researcher, 12, 8.

Figure 2.0. Dimensions of Effective Schooling

Most of the researchers recognized these characteristics for effective schools must be evident. Each characteristic is necessary, but not sufficient in itself, for a school to be effective.

A problem with existing research is that a causal model of effective schools has not been clearly established. Rather, the characteristics above demonstrate a correlational existence with effective schools, not a causative relationship. For instance, few studies have been conducted on effective schools to determine if the strong instructional leadership, high expectations of staff, and other characteristics create an effective school. Many educators ask if first, the school is recognized as being effective and then strong staff and leaders with the above characteristics are drawn to that school. Much additional research needs to be conducted using causal models and employing such analysis techniques as path and LISREL analyses (Rowan, Bossert, & Dwyer, 1983; and Heck, Larsen & Marcoulides, 1990); however, the complex nature of these techniques and researchers' lack of familiarity with them have limited their use.

Much of the effective schools research results point to the principal as the key to productive schools. All of the characteristics of effective schools can be influenced, either directly or indirectly by the principal. This influential relationship has led numerous researchers and educators to identify the principal and the principal's instructional leadership as key elements in school effectiveness (Duke, 1982; Weber, 1971; Hallinger & Murphy, 1986; Brookover

& Lezotte, 1977; Andrews & Soder, 1987; Teddlie & Stringfield, 1985; and Bossert, 1985).

What Do Principals Actually Do?

Numerous studies point to the reality of the principalship and the lack of time possible for instructional leadership (Peterson, 1977; Casey, 1980; Goldhammer et al., 1971; Kmetz & Willower, 1982; and Rallis & Highsmith, 1986). Many principals say they want to be the instructional leader everyone says they should be; however, their day is characterized by variety, brevity, and fragmentation (Kmetz & Willower, 1982). Peterson (1977) found principals spend about 80% of their day in the office dealing with problems. In his study, Goldhammer et al. (1971) discovered the principal's hectic schedule left little time for making instructional decisions.

Casey (1980) studied this conflict between what principals feel they should do, think they do, and actually demonstrate in terms of instructional leadership. She found principals tend to overestimate the amount of time spent with parents and students and underestimate the time spent with office personnel. Casey contends principals prefer to think they spend much time changing and affecting lives but observed results show this is not reality. She concluded the rather routinized work performed by principals resembles much of lower-level management in organizations.

The work behavior of the elementary principal has been examined to determine how their day is actually spent. In the early 1980's, Kmetz and Willower conducted structured observations of five elementary school principals in northeast United States to investigate their work behavioral patterns. The results of their study centered around specific tasks in five major categories and the analysis of purpose for those tasks (Kmetz & Willower, 1982).

Categories included organizational maintenance, school program, pupil control, extra-curricular activities and a residual category which included all activities not fitting into the other four categories. Kmetz and Willower (1982) determined school program, consisting of instruction and curriculum, occupied 27.1 percent of the elementary principal's time. School program included such activities as teacher observations, any contacts with teachers to discuss teaching methods, planning, implementing, and evaluating the instructional program. Organizational maintenance included such behaviors as public relations, pupil personnel services and school plant. These behaviors, many of which were management functions, took 38.6 percent of their time. Pupil control consisted of all activities to maintain discipline. This category of behaviors consumed 23.6 percent of their day. The elementary principals observed were involved in few extra-curricular activities, occupying only 3.7 percent of their time. The residual category included personal behaviors such

as phone calls or errands and accounted for 7 percent of their time (Kmetz & Willower, 1982).

Several noteworthy conclusions were made by Kmetz and Willower. Although school program included curriculum and instruction, many of the other activities were indirectly related to the instructional program. The structured observations were a more accurate record of the principals' behavior and eliminated the error in principal self-reports. The researchers felt the most important implication of this research was:

> Events ordinarily controlled the principal rather than the other way around. In other words, the principal had not worked out means for deliberately allocating their attention. They seemed to spend little time thinking about the activities in which they were engaged or attempting to anticipate and give meaning to future ones . . . a key concern for the practitioner should be how to allocate attention to valued pursuits while handling the continuous action demands of administration (Kmetz & Willower, p. 77).

Finn agrees with the Kmetz and Willower observations and concluded this problem of conflicting roles and lack of proper time management may be actually what separates the ineffective principal from the effective instructional leader. He strongly believes principals are more in control of their day and the instructional leadership in their schools than they care to believe (Finn, 1983).

Some researchers have gone so far as to suggest principals prefer those behaviors; i.e., managerial behaviors excluding instructional leadership, which are less ambiguous and require less personal risk (Hallinger, 1983). Fallon (1979) agrees many principals find security in concentrating on "countables" and tangibles and go out of their way to avoid the difficult job of assessing the teaching-learning process. Many principals feel teachers are trained in curriculum and instruction; and, unless there are major problems in their classrooms, teachers should be left alone to teach. Interestingly enough, there are teachers who are as content with this method of instructional leadership as are the principals who demonstrate this behavior (Rallis & Highsmith, 1986).

Rallis and Highsmith (1986) feel the major reason principals are not performing instructional leadership behaviors is the fact they were trained as managers. Most administrators hold degrees in administration, not curriculum and instruction or philosophy of education. Principals have not been trained to deal with the instructional leadership issues in their schools.

Ploghoft and Perkins (1988) reviewed several studies which examined the leadership functions of principals. Instructional leadership behaviors such as supervision, evaluation of teacher performance, and curriculum development are ranked as the most important facets of the principal's job. Yet, principal preparation programs have traditionally included little, if any training in instructional techniques.

The Ohio State Board of Education adopted certification standards in 1985 which called for the "successful completion of an approved program of preparation for the certification which shall include 45 hours well distributed over administration, curriculum and instructional leadership. . ."; yet, in response to this certification standard, Ohio University adopted a principal preparation program which did not include supervision of instruction (Ploghoft & Perkins, 1988).

The University of Iowa, however, took a rather different approach to the updated training of principals. Twelve of 14 courses from which future elementary principals can select deal with curriculum and instruction. All candidates must study supervision of instruction in addition to the administrative courses (Ploghoft & Perkins, 1988).

Most principals believe the instructional role influences student achievement more than the managerial role (Valentine, 1981). If indeed, instructional leadership does influence student achievement, principal preparation programs should re-examine their requirements. Practicing principals must also examine their job behavior, implement time management techniques, and take more control of their day.

Several important changes must occur if principals are to be the strong instructional leaders necessary for school success. As earlier discussed, principal preparation should include effective curriculum and instruction training.

Specific instructional leadership behaviors must be identified in order for those behaviors to be taught and implemented. Basic time management techniques need to be taught to prospective and practicing principals. The managerial role of the principalship should be reduced with many of those responsibilities given to others; e.g., office staff and paraprofessionals. One of the best ways principals can accomplish the many instructional behaviors is to use their assistant principals as co-instructional leaders. Not only does this assist the principal, but this practice provides an excellent training ground for the assistant principal in instructional leadership.

Principal's Instructional Leadership and Student Achievement

The relationship between the principal's instructional leadership and student achievement has been examined in a number of studies over the years. This relationship has been addressed through many case studies, correlational studies and through only a few structural equations model analyses. The most important and representative studies which have investigated this relationship will be discussed.

Much of the earlier research on effective schools was based on case studies. These case studies attempted to determine those variables affecting student achievement. The most cited examples of this early research include Edmonds (1979), Weber (1971), Brookover and Lezotte (1977), Rutter and

others (1979), and Brookover and others (1979). Figure 2.1 presents an overall review of these early studies and the leadership behaviors reported in those studies to be positively associated with school outcomes (Sweeney, 1982).

The results of these studies pointed to the leadership behaviors of the principal as one important factor in school effectiveness. Weber identified several school factors contributing to student success. Those factors involving the principal were the tone the principal sets for the school; high expectations; quiet, pleasant learning atmosphere; and monitoring the instructional program (Weber, 1971). Brookover and Lezotte recognized several additional characteristics associated with improved student achievement. In the six Michigan schools they examined, parent-initiated contact was higher; staff emphasized basic skills in reading and mathematics more often; principals demonstrated more instructional leadership skills; and staff accepted responsibility for student achievement (Steller, 1988).

In 1979, Brookover and others examined the difference between high- and low-achieving schools, controlling for the socioeconomic background of the students. The results again confirmed the earlier work of Brookover and Weber (Steller, 1988).

Rutter and others (1979) conducted a longitudinal analysis of school effects on junior high students in London. They examined over 70 variables, controlling for SES. They studied the effects of these variables on four student

Supervisory Behavior	Weber	New York State Performance Review	Madden	Wellisch	Edmonds	Brookover	School Improvement Project	Rutter
Coordinates Instructional Program				X	X	X	X	
Emphasizes Achievement	X	X	X	X	X	X	X	X
Frequently Evaluates Pupil Progress	X	X	X		X	X		
Provides Orderly Atmosphere	X	X	X		X	X	X	X
Sets Instructional Strategies	X	X	X	X	X	X	X	X
Supports Teachers			X			X	X	

Taken from Sweeney, J. (1982). Research synthesis on effective school leadership, Educational Leadership, 39(4), 351.

Figure 2.1. Leadership Behaviors Positively Associated with School Outcomes

outcomes; achievement, attendance, behavior, and delinquency. The combined effect of these variables was greater than that of any one variable. The influence of the head teacher, or supervisor, in affecting school success was significant. More successful schools were those where student expectations were high, curriculum and discipline decisions were agreed upon by the entire staff, and where the school worked as a whole (Sweeney, 1982).

Edmonds has been one of strongest contributors to the effective schools research. In his School Improvement Project, Edmonds found certain administrative behaviors evident in the effective schools in New York City. Regular administrative response to teacher difficulties, opportunities for staff interaction on curriculum matters, an orderly school atmosphere, and effective teacher-principal communications were some of the behaviors shown by principals in the effective schools (Sweeney, 1982).

When Edmonds reanalyzed the Coleman study and disaggregated the data, he concluded the differences in student performance between the effective and ineffective schools could not be attributed to the family background of the student. Edmonds felt those who supported Coleman's results might too readily accept the notion that schools could not be instructionally effective if a large proportion of its students came from a low-SES background (Edmonds, 1979).

There are educators who agree with Edmonds but also recognize the need to consider the effects of student family background on student achievement. Scott and Walberg (1979) admit they:

> . . . share Edmond's interest in promoting more effective schools and his belief that the quality of teaching declines if educators assume that home background factors foredoom poor children to unsuccessful classroom performance. On the other hand, educators alone are insufficient to increase learning productivity dramatically, and they need the cooperation of parents and students themselves (p. 12).

More recent research examining the relationship between principal leadership and student achievement tends to be more statistical in nature. A number of correlational studies have been completed and several causal models of effective instructional leadership have been developed and analyzed over the past 10 years.

Larsen (1987) conducted a study to identify principal instructional leadership behaviors and their impact on academic achievement. Twenty-nine instructional leadership behaviors were identified through a review of the literature and validated by a panel of national educational experts. Principals and teachers in schools where students scored above or below their comparison bands in reading and mathematics participated in the study. The teachers and administrators completed the Instructional Activity Questionnaire

which measured the degree to which instructional leadership behaviors were demonstrated in their schools.

Larsen examined the difference between implementation of the principal behaviors as rated by teachers in high-achieving (HAS) and low-achieving (LAS) schools. Principals in HAS were rated by their teachers as having demonstrated instructional leadership behaviors significantly more often than principals in LAS schools ($p < .05$).

The discrepancies between teacher and principal ratings at HAS or LAS also were tested. Again, a significant difference was found between teacher and principal ratings at LAS more often than between HAS teacher and principal ratings regarding the implementation of instructional leadership behaviors by the principal ($p < .05$). There was a greater discrepancy in the LAS teacher and principal ratings than the HAS teacher and principal ratings which was significant at $p < .01$ (Larsen, 1987).

Those behaviors identified by teachers in Larsen's study as being implemented more often in HAS than LAS were:

1. The principal ensures that school instructional goals are developed congruent with district policies.
2. The principal ensures that instructional goals are clearly communicated to everyone.

3. The principal communicates high expectations for student academic performance to staff.
4. The principal participates in formal and/or informal discussions concerning instruction as it impacts student achievement.
5. The principal ensures that systematic procedures for monitoring student progress are utilized by staff.
6. The principal assists teachers in securing available resources for program implementation.
7. The principal makes regular visits to the classrooms.
8. The principal evaluates curricular programs.
9. The principal observes innovative curricular programs.
10. The principal establishes a safe/orderly school environment with a clear discipline code (Larsen, 1987).

Larsen made several recommendations for further study based on his research. More analysis needs to be completed to examine how the principals in LAS actually spend their time due to the discrepancy between their self-ratings and teacher perceptions. These ten behaviors should be further validated to examine how they are actually implemented. The instructional leadership behaviors deemed most essential should be included in preservice and inservice training for principals. Finally, studies should be conducted in schools where academic achievement is sustained over at least a three-year

period to validate the ten most significant instructional leadership behaviors (Larsen, 1987).

Andrews and Soder (1987) reported results of a study which examined the correlation of teacher perceptions of their principals with higher student achievement. A portion of a questionnaire, The Staff Assessment Questionnaire, was used which measured 19 critical principal-teacher interactions. Four general dimensions of instructional leadership behavior were identified; resource provider, instructional resource, communicator, and visible presence.

Individual NCE gain scores on the California Achievement Test were used as the measure of student achievement. Student achievement was measured as the difference between NCE gain scores on total reading and total math achievement from spring 1982 to spring 1984. Student achievement was controlled for ethnicity and free-lunch status as measures of SES. Sufficient information was gathered from 33 schools to make reliable conclusions on the instructional behavior of the principals. Based on the results of the teacher questionnaire, the eleven highest-scoring principals were classified as strong-leader schools, (SLS), schools with the eleven lowest-scoring principals were identified as the weak-leader schools, (WLS), and the middle eleven schools were categorized as average-leader schools, (ALS).

An analysis of variance, ANOVA, was conducted on the results of the Staff Assessment Questionnaire measuring the instructional leadership of principals and the NCE gain scores. Using aggregated data for all students and their total reading and math gain scores, 1982-84, there was a significant difference in student achievement between strong-, average-, and weak-leader schools ($p < .05$).

Disaggregated data also were analyzed using an ANOVA. Ethnicity, white and black, and SES, free-lunch status and no free-lunch status, were examined. White students showed a 2.87 point gain ($p = .104$) in reading in SLS over WLS. Black students also demonstrated a total reading achievement gain of 2.88 points ($p = .055$) in schools with strong leaders over weak-leader schools. These gains were important, but F-tests did not show them statistically significant at either the .05 or .01 alpha levels of significance. When SES was examined, students with free-lunch status had statistically significant different total reading gain scores in SLS, ALS, and WLS ($p = .03$, $p < .01$).

Disaggregated data were analyzed by student ethnicity and SES for total math gain and differences in SLS, ALS, and WLS. All of these analyses showed statistically significant differences in total math achievement between the three types of schools. The white students in the SLS demonstrated a 1.97 point higher gain score than students in the WLS ($p = .039$, $p < .05$). Black students in SLS showed a 6.77 point higher gain score than black students in

WLS ($p = .009$, $p < .01$). Students receiving free-lunch showed a 6.06 point higher gain score in SLS over WLS ($p = .005$, $p < .01$).

Andrews and Soder felt their results suggest teachers' perceptions of the instructional leadership behavior of their principals are important to the reading and math achievement of students. The researchers believe, however, additional research needs to be conducted. Qualitative analyses need to be conducted to further specify the behaviors within each of the four general areas; i.e., resource provider, communicator, instructional resource, and visible presence. They felt their findings should assist in general policy development in preservice training, selection, continuing education, and evaluation of principals (Andrews & Soder, 1987).

Hallinger (1983) conducted a study to describe the specific instructional management behaviors of elementary principals in a California school system. He also wanted to determine if there were factors which might account for the variation in the instructional behavior of principals. He used a model of instructional management which identified the principals as having both direct and indirect effects on students. Three general dimensions encompass his model of instructional management behavior: 1) defining the school's mission; 2) managing the instructional program; and 3) promoting a positive school learning climate.

A rating instrument of 71 instructional management behaviors was developed and validated around these dimensions. The superintendent, deputy superintendent, and instructional supervisors of the school district used in this study, as well as principals, teachers, and the director of instruction completed this instrument entitled the Instructional Management Rating Scale, or IMRS. Ten schools/principals, 104 teachers, and 30 supervisors completed the IMRS measuring the behavior of principals in each of the ten schools. Each instructional behavior was to be rated on a Likert-type scale of almost always to almost never with a final category, ?, for behaviors for which respondents had insufficient information. School documents, such as staff meeting minutes, newsletters, and handbooks were examined to add additional validity to the IMRS results.

The teacher appraisals were used to rate the principal for several reasons. Principal self-reports were found to be inconsistent with, and higher than the teacher ratings. The infrequent visits of supervisors in the district prevented the use of those ratings in the final analyses.

Examples of behaviors within the dimension, defining the school mission, were developing goals that seek improvement over current levels of academic performance, framing academic goals with target dates, referring to the school's academic goals at faculty meetings, and ensuring that the school's academic goals were reflected in highly visible displays in the school. When

examining the behavior of the principal having the lowest, mean score on the IMRS, communication of goals generally took place only at the beginning of the school year. Infrequent and vague references were made to goals throughout the remainder of the school year. The highest-rated principal on the IMRS was very active in defining the mission of the school. The principal included the input of teachers, paraprofessionals, and parents in goal-setting and decision making. Student performance data were used to develop the goals. This principal constantly reminded staff of the school goals throughout the year and often reviewed progress towards those goals. The goals were clearly communicated to parents and students and were referred to when making instructional decisions.

The dimension of managing the instructional program included such behaviors as reviewing student work products when evaluating teachers, pointing out specific strengths and weaknesses of the teacher's instructional practices in post-observation conferences and discussing the item analysis of district-wide tests with the faculty in order to identify strengths and weaknesses in the school instructional program. Frequent classroom observations and feedback given to teachers on those observations were made by the principal with the highest IMRS score. This principal went beyond the state-mandated requirements for formal evaluation of staff and evaluated them each year rather than every other year. She reviewed with every teacher their classroom goals/

objectives and completed between three and six formal observations to ensure those goals and objectives were being met. This principal made it her responsibility to see there was continuity in instruction across grade levels. She closely monitored student progress. Instructional time also was carefully protected by this principal. She used her assistant as an important part of the leadership team to monitor the instructional program.

In contrast, the lowest-rated principal relied on the assistant principal to complete many of the instructional management behaviors in his school. He made few informal visits to classrooms and reviewed student work products less often than the highest-rated principal. This principal was less systematic in monitoring teacher and student progress. Results of the IMRS also indicated an absence of specific policies which allowed for uninterrupted instructional time and insured learning was taking place.

The third instructional management dimension was promoting a positive school learning climate. This dimension included behaviors such as reinforcing superior performance by teachers publicly in newsletters or bulletins, providing time to meet individually with teachers to discuss instructional issues, supporting teachers when they enforce school academic policies, and acknowledging student improvement by contacting parents.

The highest-rated principal in Hallinger's study was a strong, visible presence to students, teachers, and parents. This visibility communicated her

concern for the instructional program at her school. Interestingly enough, she rarely used public recognition of superior efforts or performance. She used written notes to staff and letters to be placed in personnel files and gave additional opportunities for staff development as rewards for outstanding work. Students were given numerous opportunities to be recognized for good citizenship, academic achievement, academic improvement, or for just being the unique student of the week. Hallinger concluded many of the behaviors are in place at most schools in the district; however, the extent and consistency to which the behaviors were performed in the schools was the major difference in principals.

Hallinger developed a rating instrument to measure the implementation of specific instructional management behaviors of elementary principals. He cautions those who may use the IMRS that principal observation by researchers and documentation of information should be gathered to add validity to the teacher observations. He feels the results of this instrument could be correlated with student achievement scores to add to the relationship between the instructional management behavior of principals and student achievement.

Hallinger made several additional recommendations regarding further research on this relationship. He feels research should be conducted identifying those instructional behaviors which have the greatest impact on student achievement. He also feels further study needs to be completed on the

influence of school size on the performance of instructional management and leadership behavior. Finally, Hallinger feels additional research should be conducted which examines the instructional management role of the principal in relation to all other school process variables. His study explored principal behavior as if it were an independent process within the school. Investigating how principal instructional management behavior links with other school processes would be very useful information (Hallinger, 1983).

Leitner (1990) presented results of research he completed on principal instructional management behaviors and school effectiveness examined from an organizational perspective. He sought to extend Hallinger's work by answering three basic research questions: 1) Do instructional management behaviors predict student achievement?; 2) What specific instructional management behaviors are identified with principals in effective schools?; and 3) Are the linkages that principals use to influence teacher behavior and instruction related to student achievement?

Leitner felt the school organization has two environments; institutional, and technical. The institutional environment includes rules, roles, and programs maintained by the schools. Teacher accreditation, graded schools, and curriculum scope and sequence are all part of this institutional environment. The technical environment includes goal setting and attainment. Leitner stated the technical environment includes the relationship between students as input

and student outcomes as output, mediated by the teaching process. He referred to three within-school linkages through which principals can influence this relationship; cultural, structural, and interpersonal linkages.

Cultural linkages are formed in the school organization through the development of clearly defined, shared goals. Structural linkages are created when principals exercise formal authority over staff. Interpersonal linkages occur when staff are given the opportunity to share ideas with one another or observe each other at work. Leitner related these linkages to Hallinger's three general dimensions of instructional management behavior. The cultural linkages are the framing and communicating of the school's goals. Structural linkages would include the management of the instructional program, while the promotion of a positive school learning climate would be identified as Hallinger's interpersonal linkage (Leitner, 1990).

This study was conducted in Portland, Oregon which Leitner describes as an urban district with approximately 53,000 students. In order to be eligible to participate in the study, principals must have been at their present schools for at least the past two years. This requirement was deemed necessary for principals to have had the opportunity to demonstrate instructional management behavior which might influence student achievement. There were 29 principals who met this criteria and agreed to participate. Teachers in these

29 schools were asked to participate also. They had to have taught for at least one year at the school to be eligible.

Finally, schools determined to be effective, which was determined by student achievement being at least one standard deviation above predicted achievement, were chosen to participate. Through this process, five of the 29 schools were deemed eligible, with four agreeing to participate within a prescribed time frame. Two of these schools were considered high-SES schools, one was a low-SES school, and the last school was regarded as middle-SES.

Hallinger's Instructional Management Rating Scale was modified by Leitner for use in this study. Twenty of the IMRS questions were reversed to avoid the response bias of teachers simply marking all items on one side of the response sheet. Teachers in each of the four participating schools completed the Instructional Management Questionnaire, IMQ, which measured the teachers' observations of their principals.

Leitner conducted structured observations of each of these principals, as well as two-hour reflective interviews. These interviews were scheduled to allow principals to clarify or add meaning to the observed events.

When the standardized residuals of student achievement were regressed on the principals' total IMQ score, controlling for student SES, the principals' IMQ score did not significantly explain any of the variance in reading, language,

or math achievement. Leitner concluded the results of his study showed there is little relationship between the instructional management of the principal and student achievement.

Results regarding the linkages and student achievement offered little new information about instructional management. Cultural linkages were used more often by principals in higher-achieving schools than other schools (M = 3.66 and M = 3.42, respectively); however, the difference was not statistically significant. Leitner found all participating principals used each of the three linkages, but no one linkage was used any more often than another.

Leitner suggested areas for further research. Researchers should use his framework to better examine the complex relationship between instructional management, teacher behavior, and student achievement. He adds there needs to be a distinction between instructional management and instructional leadership. Leitner (1990) stated:

> . . . the power of the linkages as advice to understand how principals influence teacher behavior calls attention to the definitions and relationship between instructional management and instructional leadership. The results suggest that the important relationship for principals is with teachers, not students. Since the relationship between a principal and a teacher necessarily implies a situation regarding social influence, the results imply that what principals do [instructional

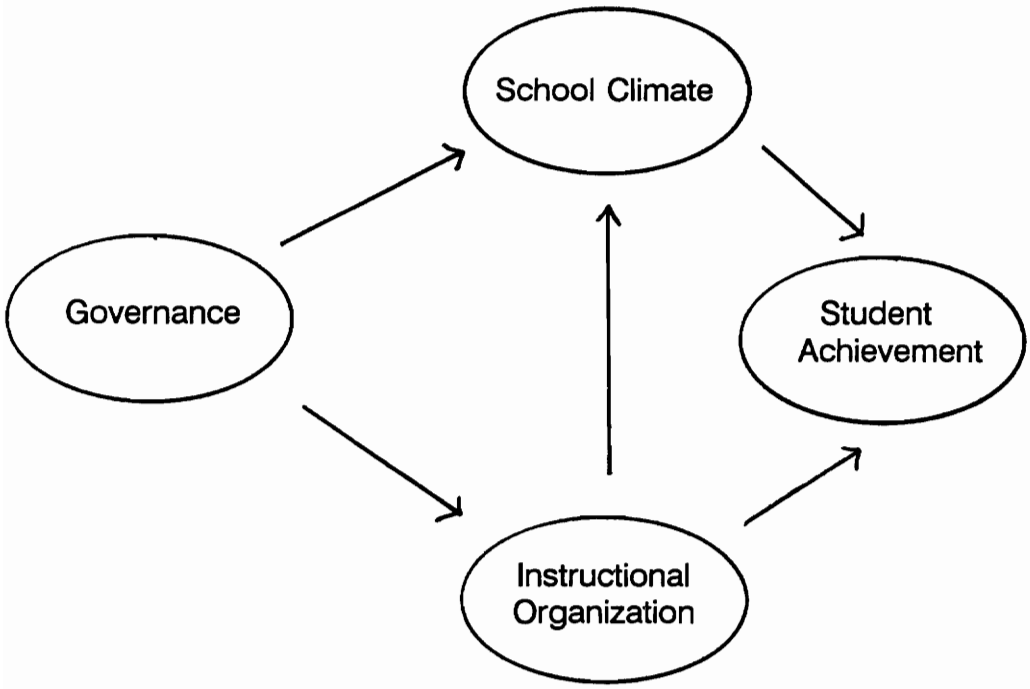
management behaviors] may not be as important as the art of using these behaviors, mechanisms, or linkages to influence teacher behavior. The art of using these behaviors, mechanisms is instructional leadership . . . (p. 48).

Leitner concluded by stating we must look beyond the identification of effective behaviors. Prospective principals should, not only learn and practice those effective instructional behaviors, but also be trained how best to use those behaviors to influence teachers toward the accomplishment of organizational goals (Leitner, 1988; 1990).

Causal Models of Principal Instructional Leadership and Student Achievement

Heck, Larsen, and Marcoulides (1990) conducted one of the few studies which also examined the relationship between instructional leadership and student achievement using a causal model. They developed a proposed causal model of administrator effects as shown in Figure 2.2. This model used linear structural equations to estimate the power of instructional leadership in predicting student achievement.

Heck et al. viewed the principal as having more indirect than direct effects on students. They note the works by Bossert et al. (1982), Boyan (1988), Glasman & Heck (1987), Larsen (1987), and Pitner (1988) as others indicating this indirect impact of principalship. The model shows how these



Taken from Heck, R. H., Larsen, T. J., & Marcoulides, G. A. (1990). Instructional leadership and school achievement: Validation of a causal model. Paper presented at the annual meeting of the American Educational Research Association, Boston, MA.

Figure 2.2. Predictive Model of Principal Instructional Leadership Variables Influencing Student Achievement

researchers regarded principal governance of the school's internal and external political environments will affect the principal's implementation of instructional leadership behavior. This leadership behavior includes both school climate and school instruction organizational activities. These variables would then directly affect student achievement.

Elementary and secondary schools in California with students scoring above or below their comparison band scores on the California Achievement Program tests at the third, sixth, and twelfth grades for three consecutive years were included in this study. Only 85 elementary and 33 high schools out of more than 5,000 schools met this criteria. The SES and language background of students were controlled due to the importance other researchers have given these variables when examining the effectiveness of schools (Wimpelberg, Teddlie, & Stringfield, 1989).

Additional criteria were set for principals in these schools. They must have served for at least three years in order for teachers to have had adequate opportunity to observe their instructional leadership. The three years also allowed the instructional leadership behaviors of the current principal to actually make a difference in student achievement if any relationship could be found. The final population in the sample included 30 schools with 57 percent elementary and 43 percent high school principals, and included 40 percent low-achieving and 60 percent high-achieving schools.

An instrument developed, validated, and used in an earlier Larsen (1985) study was completed by the teachers and principals in the research. A confirmatory factor analysis of the results was conducted to develop factor models of the proposed observed variables and their relationship to the hypothesized constructs of governance, school climate, and instructional organization.

This study used structural equation modeling to estimate and test the proposed model of instructional leadership and student achievement. LISREL, LInear Structural RELationships:

> . . . is specifically designed to estimate parameters and test the validity of a wide variety of causal models including those that contain measurement errors, reciprocal causation, variables measured at several points in time, and latent variables (Heck et al., 1990, p. 19).

For a more detailed explanation of structural equation models, see Duncan (1975) and Kenny (1979).

The model proposed for this study examined four latent variables; governance, school climate, instructional organization, and student achievement. Governance measured the perceptions of teachers and principals on such behaviors as the extent to which the principal involved staff in making crucial decisions affecting instruction, and the extent to which the principal protected the faculty from undue pressures so they could focus on

instruction. School climate represented instructional leadership behaviors geared toward improving the school educational environment. Such behaviors as recognizing the academic accomplishments of students, communicating high expectations for student performance to staff, and encouraging the formal and informal discussion of instructional issues were included in school climate.

The instructional organization construct reflected principal behaviors such as coordinating the school instructional program across grade levels with the help of teachers, evaluating curricular programs, using test results for program improvement, and making regular visits to the classroom. Student achievement was measured by the consistent performance of students above or below the school's comparison band test score for a three-year period, controlling for SES and language background.

A goodness-of-fit test was conducted and the results revealed the observed variables reliably measured the latent constructs both at the individual, or disaggregated level, and at the school, or aggregated level. The results of the LISREL analysis showed the role of the principal in establishing a strong instructional organization as the behavior most affecting student achievement, although behaviors within both the instructional organization and school climate constructs significantly impacted on student achievement.

Heck et al. noted caution should be taken when generalizing the results of their study. Since no average-achieving schools were used in their research,

future studies should include all levels of student achievement, not just high and low achievement.

This research confirmed the results of many of the correlational studies which stated the positive effects of principal instructional leadership were associated with student achievement (Larsen, 1987; Andrews & Soder, 1987). The results of this study further show the principal as one "school effects" variable directly affecting student achievement. They conclude by saying:

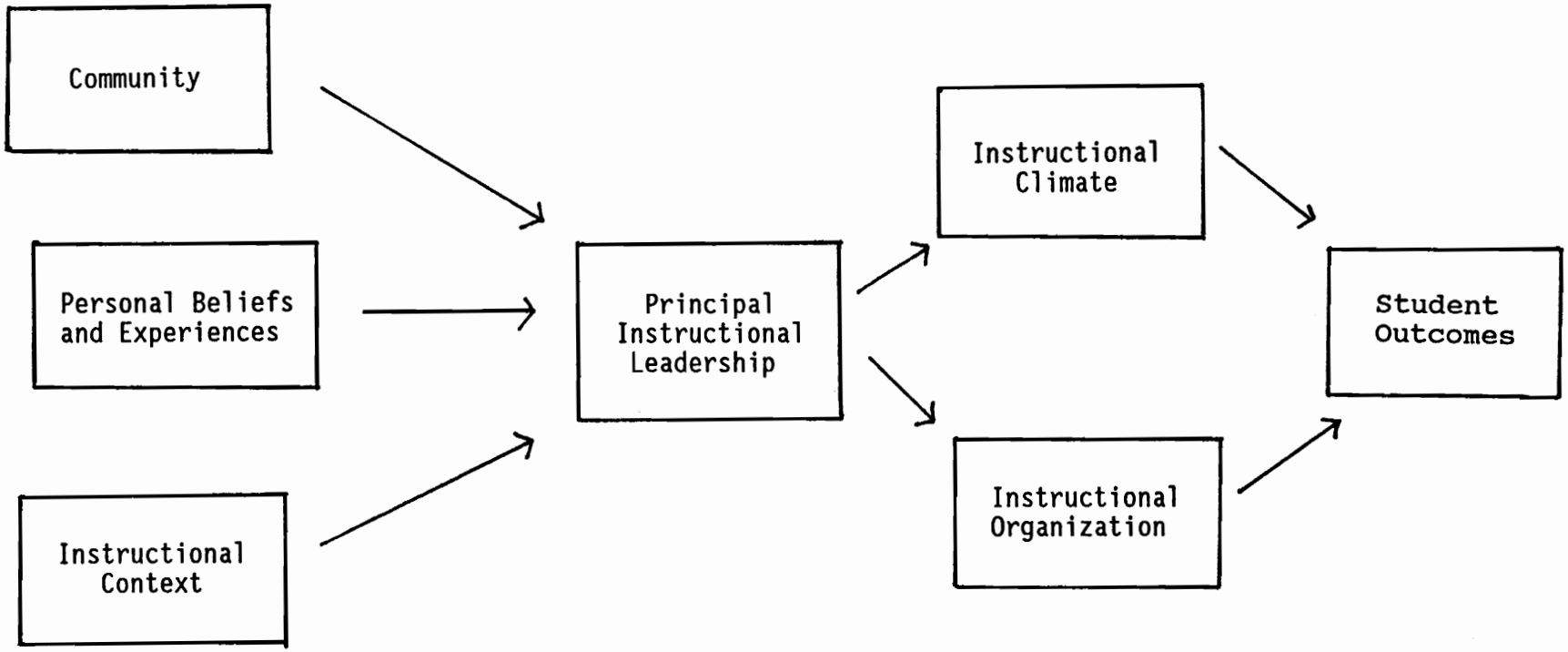
> . . . Clearly, instructional leadership is a multidimensional construct. How the principal and teachers are able to organize and coordinate the work life of the school shapes not only the learning experiences and achievement of students, but also the environment in which this work is carried out. The identification of a set of principal instructional leadership behaviors that are directly associated with school achievement outcomes should serve as the basis for developing criteria to evaluate the effectiveness of principal performance and lead to more effective preparation programs for school administrators (Heck et al., 1990, p. 37).

Hallinger, Bickman, and Davis (1989) explored the impact of principal leadership on student reading achievement through the use of EQS, a structural equations model. They used the model of instructional leadership shown in Figure 2.3 developed by researchers at the Far West Lab (FWL) for Educational Research and Development. This model examined the direct

effects of three exogenous variables on principal leadership; community variables as measured by the percentage of students receiving free and reduced meals, parental involvement, and personal characteristics of the principal. Hallinger et al. included the gender and prior teaching experience of the principal since previous studies indicated certain principal characteristics may influence how the principal leads the school.

This study was a secondary analysis of data from 87 elementary schools in Tennessee. Data examined included a measure of principal leadership, certain contextual and demographic information, and achievement gain scores. Principal leadership was measured by teacher ratings of their principals on the Connecticut School Effectiveness Questionnaire. Information was gathered from teacher questionnaires which measured principal instructional leadership, school mission, opportunity to learn - time on task, parental involvement, teacher expectations for student academic achievement, and reading grouping practices.

Hallinger et al. reported the results of the data analysis using EQS did not support the original FWL model as shown in Figure 2.3. A second analysis was conducted which sought to investigate the nonlinear relationship between the exogenous variables and instructional climate. Principal teaching experience was excluded from this analysis model after it was discovered



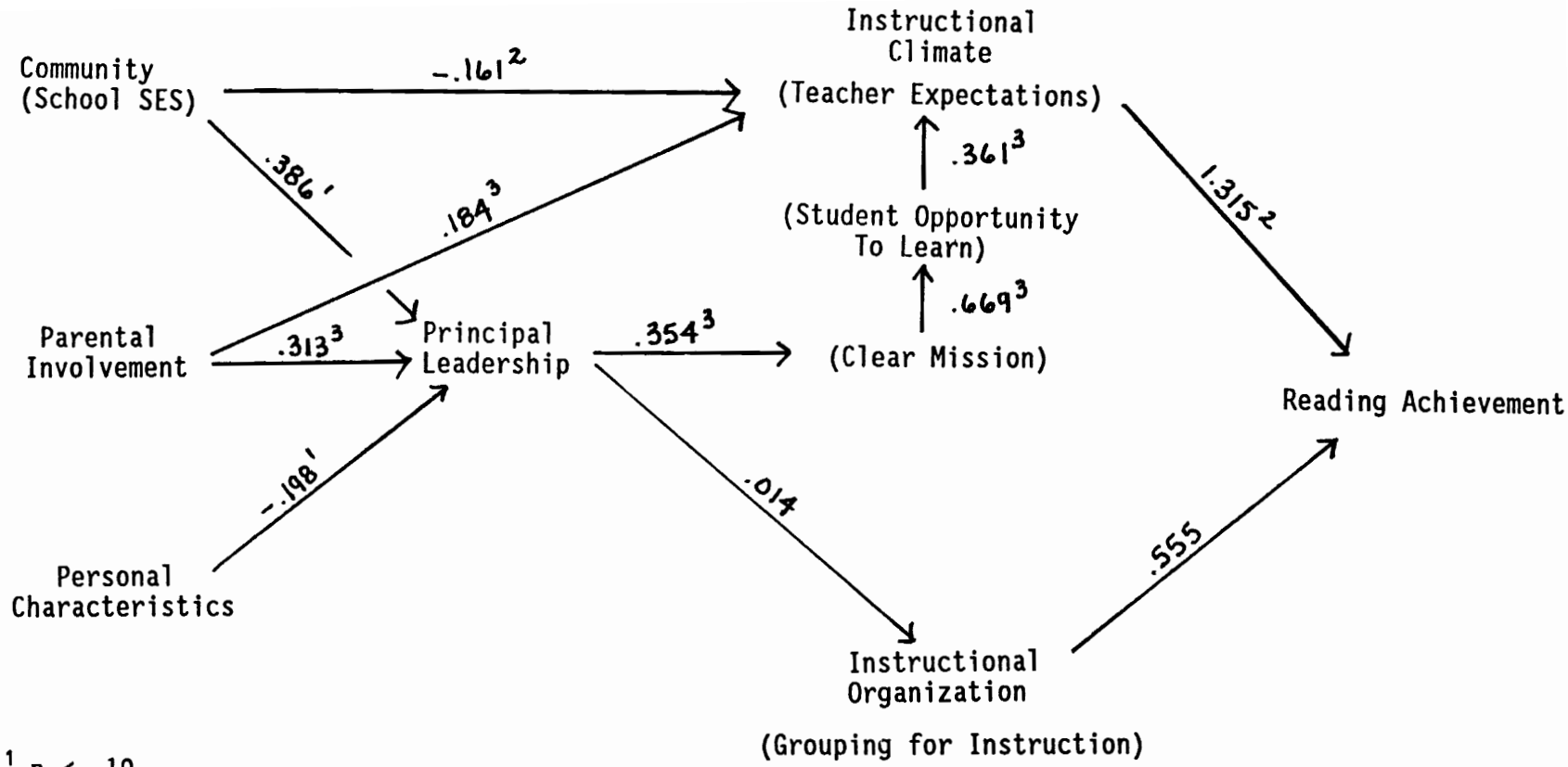
Taken from Hallinger, P., Bickman, L., & Davis, K. (1989). What makes a difference? School context, principal leadership, and student achievement. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA.

Figure 2.3. Far West Lab Instructional Leadership Model

teaching experience did not contribute to the model. With these changes, the final model showed the effect of principal instructional leadership on student achievement was mainly through behaviors shaping school instructional climate and was primarily indirect. The indirect effect of principal leadership through instructional climate on student reading achievement was .11242 (.354 X .669 X .361 X 1.315). Figure 2.4 shows the model with the beta weights for direct effects on variables.

All of the exogenous variables had statistically significant direct effects on principal instructional leadership; SES (B = .386, p <. 10), parent involvement (B = .313, p < .01), and gender of principal (B = -.198, p < .10). Two of these variables, SES and parent involvement, had significant direct effects on principal leadership and instructional climate. The indirect effects of principal leadership on instructional organization and the direct effects of instructional organization on student reading achievement were not significant. This may be due to the limited measure of instructional organization; 0 = teachers grouping students within grade by achievement level or 1 = teachers did not use this type of grouping.

This causal model demonstrated the interactive nature of the variables in the study. Hallinger suggested further study needs to be conducted to develop a more accurate model of these variable interactions. Conceptualizing and analyzing models other than linear ones would aid in measuring the complex



[1] $p < .10$
[2] $p < .05$
[3] $p < .01$

Taken from Hallinger, P., Bickman, L., & Davis, K. (1989). What makes a difference? School context, principal leadership, and student achievement. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA.

Figure 2.4. Final Model of Principal Instructional Leadership and Student Achievement

relationship of school context variables, principal leadership, and student learning (Hallinger et al., 1989).

Limitations of Past Research

Numerous conceptual and methodological problems are evident in the research which has been conducted on effective schools and on the instructional leadership of principals and their effect on student achievement. Use of principal self-ratings of their actual leadership behavior has not proven successful. Principals' self-perceptions generally have not been consistent with their teachers' observations (O'Day, 1984; Hallinger, 1983; Larsen, 1987; and Khoury, 1981). Many of these studies have examined only low- and/or high-achieving students (Jackson, 1982; Ayres, 1984; Wimpelberg, 1986; and Rowan et al., 1983). Too few schools have been identified in which students with similar socioeconomic backgrounds have had noticeably better or worse achievement scores (Rasmussen, 1976).

Upon their review of the school effectiveness literature, Purkey and Smith (1982) and Zirkel and Greenwood (1987) determined few longitudinal studies have been conducted. Most of these studies examined only one year of student achievement. Often, studies failed to control for the socioeconomic impact on student achievement when examining the relationship of the principal's instructional leadership and student performance (Fishman, 1986;

and Stedman, 1988). Much research has been limited to general descriptors of effective principal leadership rather than specific instructional leadership behaviors (Hallinger, 1983; Heck, Larsen & Marcoulides, 1990; Leitner, 1990). For example, many of the earlier studies encouraged principals who wanted effective schools to "emphasize achievement" rather than "suggesting principals meet individually with teachers to discuss results of tests", or "establish specific goals for increasing achievement scores in basic skills with each teacher". All of these factors have limited the generalizability of the research studies on the effectiveness of principal behavior.

O'Day (1984) examined the relationships between principal and teacher perceptions of principal instructional management behavior. Her study involved nineteen principals, 137 teachers and 760 students from a suburban, middle-class elementary school district. She hypothesized there would be a positive relationship between principal role behavior and student achievement. Discrepancy scores were calculated as the difference between actual and expected achievement test scores. A rating instrument of principal instructional management behaviors was administered to principals and teachers and the scores on both scales were correlated with discrepancy scores.

The results of O'Day's research showed: 1) higher principal self-ratings were associated with lower student achievement, 2) higher median teacher perceptions of principal behavior were related to higher student achievement,

and 3) where congruence existed between median teacher and principal ratings, student achievement scores were higher. Based on these results, no correlation existed between principals' self-ratings and achievement discrepancy scores. These results demonstrate the methodological problem in using principal self-reports. Additionally, two of the four correlation coefficients between the median teacher ratings and the discrepancy scores were positive and significant at the .10 alpha level. O'Day suggested further studies need to address the interaction of all variables affecting achievement rather than examining each variable separately.

In his study to assess the instructional management behavior of principals, Hallinger used several sources to measure these management behaviors. Teachers, district office supervisors, and principals rated the frequency of principal instructional behavior on the IMRS. The IMRS was a researcher-developed instrument designed to identify and measure instructional management behaviors. Hallinger reported his study proved what others also had shown. Principal self-reports were consistently higher than both the teacher and supervisory ratings on the IMRS and were difficult to use. A more detailed synopsis of Hallinger's research is given in the review of research on principal instructional leadership behavior (Hallinger, 1983).

Larsen examined the instructional leadership of selected elementary principals in California as viewed by their teachers and self-reports. He sought

to identify the most important instructional leadership behaviors through a review of the literature and expert opinions. The results of his study showed teachers in high-achieving schools rated their principals as demonstrating certain instructional leadership behaviors more often than teachers in low-achieving schools. The mean responses of principal self-reports were greater than the mean teacher perceptions in both types of schools in the study. In the low- and high-achieving schools, teachers perceived their principals as demonstrating instructional leadership behaviors less often than the principals reported their implementation of the behaviors. The discrepancy between principal self-reports and teacher perceptions was significantly greater in the low-achieving than in the high-achieving schools ($p < .05$) (Larsen, 1987).

Khoury (1981) conducted a study using the Leader Behavior Description Questionnaire - XII with principals and teachers. The results again confirm the discrepancy in principal and teacher perceptions of principal behavior. In this study, principals perceived they exhibited significantly more "consideration" and "initiating structure" behavior than their teachers believed they demonstrated.

Jackson (1982) examined the relationship between principal instructional leadership and student achievement in eight low-income public schools in Washington, D. C. The mean California Test of Basic Skills percentile scores were calculated to identify two of the schools as effective and two to be ineffective. A School Instructional Climate Survey, SICS, was developed and

used to assess teacher and administrator perceptions of the instructional climate of the school. Jackson concluded the SICS accurately differentiated between schools classified as effective and ineffective. Three areas appear to account for those differences; 1) leadership style and support of the principal, 2) the teachers' role in instruction, and 3) inservice programs based on student needs and staff use. Jackson's final analysis was limited to only four low-income, urban, elementary schools. She concluded further study is needed to describe and explore the instructional leadership of principals in effective schools also.

Ayres (1984) studied the correlation between principal effectiveness and student achievement in Missouri middle schools. He examined the principal's overall effectiveness score on the "Audit of Principal Effectiveness" and found no statistically significant difference between the principal audit scores in schools with the highest average student gain scores and those schools with lowest gain scores. Ayres did find certain dimension subscores of the audit instrument, such as instructional management, affective involvement and directional leadership, were significant. He examined only high- and low-achieving schools, and, as a result, more study is required (Zirkel & Greenwood, 1987).

Other studies which examined only high- and low-achieving schools include Wimpelberg's Louisiana School Effectiveness Study and Madden,

Lawson and Sweet's study of forty-two elementary schools in California which included twenty-one high-achieving and twenty-one low-achieving schools (Zirkel & Greenwood, 1987). Again, by not including all achievement levels, the generalizability of the results is limited. Rowan et al. (1983) agree that:

> . . . in our view, future research needs to replicate the findings of outliers studies by using multiple regression analyses that include schools from the full range of effectiveness categories (p. 29).

A study by Andrews and Soder examined the relationship between principal instructional leadership behaviors and academic performance of students in thirty-three elementary schools in the Seattle School District and classified them into eleven strong-leader schools, eleven average-leader schools, and eleven weak-leader schools. This classification was based on instructional staff perceptions of their principal as an instructional leader on a Staff Assessment Questionnaire consisting of 167 Likert-type items. Academic performance was measured by normal curve equivalent gain scores for a three-year period. Socio-economic status and ethnicity were controlled in all schools (Andrews & Soder, 1987).

Using an analysis of variance technique, the researchers found total student reading and mathematics achievement scores were significantly better in strong-leader schools than either the average- or weak-leader schools. When student reading gains were examined individually by ethnic group, white

or black, the strong leader schools had 3.9 months greater gains than the weak-leader schools for blacks and 2.8 months greater gain scores for whites. The F-tests of significance, however, did not show these gains as statistically significant. Strong-leader schools showed a 2-month higher math gain score for whites and a 6.7 month higher gain score for blacks over the weak-leader schools. The difference in math scores for whites was statistically significant at $p < .05$, while the almost 7 months higher gain score for blacks was significant at $p < .01$ (Andrews & Soder, 1987).

Using the number of students with free-meal status as a surrogate for socioeconomic status, the students on free lunch achieved significantly better at strong-leader schools than at average- or weak-leader schools. F-tests showed these scores significant at the .01 level. The results of the Andrews and Soder study demonstrate the importance of the instructional leadership of the principals, particularly as the leadership relates to the low-achiever.

There have been many studies of principal behavior and student achievement which involved such a small sample size as to render the results not generalizable. One such study was conducted by Weber in which he contended inner-city children in schools headed by principals who displayed strong leadership could be successful. Only four schools were in the population (Weber, 1971). The State of New York, Office of Educational Performance Review conducted a case study of two inner-city schools, one

high-achieving and one low-achieving. The results identified student achievement differences in the two schools which reinforced previous findings of the impact of administrative leadership on student achievement. The administrator's behavior, policies, and practices had significant effects on the school's student success. The impact of school practices and the administrative team were considered to have a positive effect on reading achievement (Edmonds, 1979). Reference often is made to both of these studies in discussing those variables contributing to effective schools; yet, together, they examined only six schools.

Rasmussen conducted a study for the Rand Corporation to analyze how student performance can be affected by the principal's leadership behavior. He sought to identify unusually effective and ineffective elementary schools in California. Of the original group of 996 schools from 19 districts representing 18 percent of the total California elementary schools, Rasmussen found only 25 of those schools usable for the study. He found 86 percent of the between-school variance in achievement was associated with the socio-economic status of students; therefore, only 25 schools had students achieving significantly better or worse than students with similar SES at other schools. Rasmussen admitted one should consider the low power of the statistical analyses based on only 25 schools before rejecting the hypothesis that there is a positive correlation between the principal's behavior and student achievement. He

added, however, if at least fifty schools could be found where student achievement is significantly better or worse for students with the same SES, the multiple regression result would be statistically significant (Rasmussen, 1976).

Purkey and Smith (1982) also pointed to the narrow and relatively small sample sizes used in many of the effective schools studies. They contended two major problems result. First, there were not enough schools to clearly discriminate between the high and low outliers, and the differences may very well have been due to chance. Secondly, lack of representativeness of the samples raised a question about the studies' generalizability.

Most of the effective schools research has been conducted over a rather limited period of time. Many studies measured the instructional leadership of the principal based on one survey instrument completed either by teachers and/or principals. Studies which used test scores as the measure of student achievement usually used one-year's data on one grade level. This is unfortunate for the school where students performed exceptionally poorly one year. Using only one year of test data also does not consider those schools where students are slowly, but surely progressing, measured by their test scores. The limited time frame also allows the school where students performed very well one year but quite poorly the years before and after to be identified as a high-achieving school.

The current study strengthens many of the limitations in past research on the relationship between principals' instructional leadership and student achievement. These modifications are as follows:

1. Actual teacher observations of specific instructional leadership behavior of principals were included. Neither perceptions of principals nor teachers were used.
2. A systematic and proportional sample of principals was required for this research. No previous requirements for either high- or low-achieving schools was used. As a result, schools of all academic achievement levels were included.
3. Seventy-two schools from three states, Arizona, Iowa, and Virginia were involved in this study. This sample included 72 elementary principals, with 8 teachers from each school, for a total of 576 elementary teachers.
4. The achievement of students was examined over a three-year period rather than one year as in many previous studies.
5. Although one test score for each year was analyzed for every school, the complete composite normal curve equivalent score was examined. This complete composite score includes student achievement, not only in reading and total mathematics, but also in vocabulary, total language and total work study skills. This composite score is a more accurate measure of the students' overall achievement.

6. The impact of the socioeconomic background of students in the model was examined and controlled for in this study.

7. This study sought to determine the specific instructional leadership behaviors of principals. Certain behaviors will be identified which may be associated with higher student achievement.

The methodological changes made in this study combine to present stronger results on the relationship between student achievement and the principals' instructional leadership behavior.

Summary

In Chapter 2, a brief review of the effective schools research was given. The importance of the principal in school success was addressed. The conflicting roles of the principalship, managerial v. instructional, was reviewed, as well as studies regarding the work behavior of principals.

Past research on the relationship between elementary principal instructional leadership and student achievement and the limitations of much of this research were examined. The corrections of those limitations in the current study were discussed.

The methodology used in the study is presented in Chapter 3. Included are the description of variables, populations, samples, and instruments as

addressed in this study. Data collection and analysis procedures are discussed also.

CHAPTER 3

METHODOLOGY

The purpose of this chapter is to outline the methods and procedures used in the research study. The variables and model, populations and samples, selection and construction of the survey instruments, data collection and analysis procedures are discussed.

Variables

This study examined one independent variable:

1. The instructional leadership behavior of the principal, controlling for:
   a. The socioeconomic status of students;
   b. The level of parental involvement; and
   c. The per pupil expenditure of districts.

One dependent variable was explored in this study:

1. Student achievement as measured by students' mean normal curve equivalent (NCE) score on the Iowa Test of Basic Skills.

The model for this study is shown in Figure 3.0.

Model for Study

Independent Variable	Dependent Variable
Principal's Instructional Leadership Behavior (Principal's total score on MEPILB)	Student Achievement (Mean 4th grade ITBS complete composite NCE score for each school, 1987-88 and 1989-90)

Controlling for:

Socioeconomic Status of Students (Percentage of students receiving free and reduced meals)

Level of Parental Involvement (Percentage of PTA or parent organization membership)

Per Pupil Expenditure of District (Per pupil expenditure figures of each district from State Department)

Figure 3.0. Independent and Dependent Variables in the Study

Populations and Samples

The design of this study required comparable student test scores and principal behaviors from various states. Since the study was limited to elementary schools, a population from that age range was needed. States that use the same test, the Iowa Test of Basic Skills, or ITBS, on a statewide basis in the fourth grade were identified through communication with Riverside Publishing Company located in Chicago, Illinois. The ITBS was selected due to its general usage throughout the country.

States fulfilling these requirements which also report a complete composite score including reading, language, vocabulary, mathematics and study skills are Arizona, Iowa and Virginia. Of the 2450 elementary schools with fourth grade in these states, one hundred were systematically and proportionally selected for this study. One hundred schools were selected based on the number of schools chosen for previous similar studies. Eight teachers were included from each of the one hundred schools for a total of 800 teachers to be sampled, far exceeding previous sample sizes in most of the research completed to date.

The number of schools selected from each state was calculated on the percentage obtained when the number of usable schools in each state was divided by the total number of usable schools in all three states. Each state's percentage of one hundred determined the actual number of schools to be surveyed in that state.

Schools were selected from the 1990 Educational Directory of the three states. The number of usable schools in each state was divided by the number of schools to be surveyed to compute an interval number. For example, in Virginia, there are 1015 usable schools which represent 41 percent of the total survey population. This percentage represented 41 schools to be selected from that state. One thousand fifteen was divided by 41 for an interval number of 25. Beginning with the first usable school listed, every 25th school in the Virginia Educational Directory was selected. The same process was used to determine the sample size for the other two states. An additional number of schools, equal to 25 percent, was selected to replace the schools choosing not to participate. For Virginia, there were ten additional schools available, or 25 percent of the 41 schools selected. The results of this process are displayed in Table 3.0.

Instrumentation

Data needed for this study were gathered through teacher observations of principal behavior and directly from principals. Due to the lack of a suitable instrument for measurement of the principal's instructional leadership, an existing instrument previously used with secondary schools was modified to fit this study.

Table 3.0.

Results of School Process Selection for Study

States	Total Usable Schools*	Percentage/Total Schools in Sample	Replacements	Total Schools in Sample
Arizona	629	25.67% (26)	7	33
Iowa	806	32.89% (33)	8	41
Virginia	1015	41.42% (41)	10	51
Total	2450	100% (100)	25	125

* Elementary schools containing 4th grade

Measure of Elementary Principals' Instructional Leadership

The Thomason Measure of Secondary Instructional Leadership (Thomason, 1988) is an instrument developed to identify the instructional leadership behaviors of secondary principals. For that research effort, 190 original principal behaviors were identified through a review of the literature, staff development conferences and seminars, personal instructional supervisory experience, and interviews with experts and practitioners. After a second review by a group of principals, assistant principals and supervisors, this list was reduced to 78 behaviors identified as those most indicative of effective secondary instructional leadership.

Construction. For this study, the original principal behaviors in that instrument were reexamined and revised to fit the role of the elementary principal. Items were added, deleted or reworded and grouped according to major instructional leadership dimensions as indicated by a review of the literature, discussions with practitioners and experts and personal supervisory and administrative experience.

Validation. The revised measure of elementary instructional leadership was forwarded to a field group of fourteen experts and practitioners across the United States for validation purposes (Appendix I). The persons selected for this process were individuals who have researched and written in the field of

principal preparation and instructional leadership or who select and evaluate principals. Currently practicing elementary principals also were included in this review process. The group reviewed the instrument and rated each behavior as to whether or not the item was indicative of effective instructional leadership. These persons were able to add any additional behaviors they felt reflected effective instructional leadership.

With the suggestions to the instrument by the experts and practitioners, all behaviors were rank ordered from the highest mean/lowest standard deviation to the lowest mean/highest standard deviation. Upon review of the means and standard deviations, the first sixty items were chosen due to their representativeness of instructional leadership and high means and lower standard deviations. One item was eliminated when it was discovered it duplicated another behavior. Another item was dropped because there was a rather low correlation between that item and most items on the list. With those items eliminated, two additional behaviors were selected which had high means and also contributed additional weight to the protection of instructional time dimension. Three behaviors were reworded when it was determined correlational problems existed due to the wording of items. The results of the validation process are shown in Appendix J.

Means and standard deviations derived from the validation of Thomason's Measure of Secondary Principals' Instructional Leadership were compared to the validation results of this measure of elementary instructional

leadership. As shown in Appendix K, most of the items selected for the final elementary principal rating instrument had means and standard deviations quite comparable to Thomason's instrument.

Scoring. Eight teachers from each school were selected to identify the behaviors they had actually observed their principal demonstrating over the past three years. The responses were coded yes or no on optical scanning forms. The means of the teachers' responses for each behavior were averaged for a total MEPILB score for each principal. The total possible instructional leadership behavior score was 120 (yes = 2 X 60 behaviors).

The Principal and School Demographic Data

In order to collect data for the population of the study and provide a description of participating schools and principals, the principal survey was developed (Appendix D). All information for this survey was for the 1989-90 school year except one set of test data. Data were gathered on the following variables:

1. Personal information; age, gender, race, total years as an elementary principal, total years as principal of this school, and educational level;
2. School information; total student enrollment, racial/ethnic composition of students, percentage of students receiving free

and reduced meals, school system classification, percentage of PTA membership, and number of full-time equivalent assistant principals;

3. Student count and ITBS complete composite national percentile rank and mean normal curve equivalent (NCE) for fourth grade - 1987-88 and 1989-90;

4. Any significant instructional, physical and social factors to impact on the school; and

5. Any significant changes in the school over the past three years.

This survey was administered to five elementary principals in a Virginia district to determine the availability of the required data and the time needed to complete the information. Data were readily available for all principals and the survey took approximately twenty minutes to complete.

Data Collection Procedures

Letters were sent to a total of 125 school superintendents of selected elementary principals in Arizona, Iowa, and Virginia requesting their participation in the study (Appendix A). If the superintendents agreed to participate and the school principals met the requirements that they had served at their present school for at least the past three years, had at least eight qualifying classroom teachers, and agreed to participate, the superintendents were asked to return a postcard indicating this (Appendix B). Principal surveys and cover letters

(Appendices C and D) were forwarded to the qualifying principals by the superintendents. A list of teachers also was requested from the principal designating those who had served with this administrator for at least the past three years at that school and agreed to participate. This three-year service was deemed necessary for teachers to have adequately observed the instructional leadership of their principal. Follow-up postcards (Appendix E) were sent two and four weeks after the initial mailing to each superintendent who failed to respond on the first mailing. Telephone calls were made within six weeks of the initial mailing to all superintendents who did not respond.

If either superintendents or principals did not agree to participate or the principal did not qualify, a replacement procedure was initiated. Telephone calls were made to superintendents to determine the next qualifying principal using the list in the Educational Directory. Whenever possible, this procedure provided replacements. In districts where there were no other qualifying principals, the superintendent of the next district in the directory was contacted for participation.

Eight teachers from each school were systemically selected from the list supplied from the principal. Where more than eight teachers were listed, every second teacher was selected to participate. For each school, one of the teachers was designated to serve as the contact teacher to receive, distribute and return the Measure of Elementary Principals' Instructional Leadership Behavior, or MEPILB. These surveys, which measured the observed

instructional leadership behavior of principals, were sent to each teacher through the contact person (Appendices F and G). Follow-up letters were mailed two weeks after the initial mailing to all contact persons requesting their assistance in having the teachers in their schools complete the survey instruments (Appendix H). Additional periodic follow-up telephone contacts were made to hasten survey return and to clarify certain responses.

In several cases, all eight surveys were not returned. Telephone calls were made to the contact persons and additional surveys were sent for completion by teachers other than the original eight selected to meet the criteria. This procedure eliminated the possibility of duplicate surveys and ensured eight surveys from each school.

All principal and teacher surveys were coded for follow-up purposes. Teachers and principals were informed of this coding process.

Seventy-two principal surveys were returned and 576 teachers, 8 per principal, completed the MEPILB for their principals. These totals amounted to 72 percent of the original 100 schools surveyed. The data were collected from October 5, 1990 to February 19, 1991.

Table 3.1 shows, by state, the number of principal surveys and MEPILB's mailed, returned and usable.

Table 3.1.

Principal Surveys Mailed, Returned, and Usable

State	Mailed	Returned		Usable	
	N	N	%	N	%
Arizona					
Principal Surveys	26[2]	17	65.3	17	65.3
Teacher MEPILB's[1]		136	65.3	136	65.3
Iowa					
Principal Surveys	33[2]	24	72.7	24	72.7
Teacher MEPILB's[1]		192	72.7	192	72.7
Virginia					
Principal Surveys	41[2]	31	75.6	52	75.6
Teacher MEPILB's[1]		248	75.6	248	75.6
Total					
Principal Surveys	100[2]	72	72.0	72	72.0
Teacher MEPILB's[1]		576	72.0	576	72.0

[1] Measure of Elementary Principal Instructional Leadership Behavior

[2] An additional 25 percent was sent to each state which amounted to 7 more schools/principal surveys for Arizona, 8 for Iowa, and 10 for Virginia.

Data Analysis Procedures

The principal and school demographic variables for each school were entered individually into the computer using Number Cruncher Statistical System, or NCSS. A factor analysis was conducted on the teacher ratings of the principals on the MEPILB. Through multiple regression analyses of the total instructional leadership scores of principals and the mean NCE scores, controlling for student SES, parental involvement, and district per pupil expenditure, the contribution of the principal's instructional leadership behavior to student outcomes was measured.

Summary

The model and variables, selection of the populations and samples for this research study were discussed in Chapter 3. Also included was the selection and construction of the survey and questionnaire and the validation and scoring of the MEPILB. The data collection and analysis procedures were summarized. In Chapter 4, the results and analyses of both instruments are presented.

CHAPTER 4

ANALYSES AND RESULTS

This chapter contains the results and analyses of data obtained from the administration of the principal and school demographic data survey and the Measure of Principal Instructional Leadership Behavior.

Descriptive Data

A summary of the principal demographic data as obtained through the principal survey is shown in Tables 4.0 and 4.1. Table 4.2 presents a summary of the school demographic variables which also were gathered through the principal survey.

Principal Demographic Data

Most of the responding principals in this study were males (55 or 76.4 percent). Almost 92 percent of the principals were white. Three principals were black, and three were of Hispanic origin. The principal mean age was 49, with a range from 34 to 60 years of age. Their experience as administrators was considerably varied. Length of experience ranged from a low of 3 years, the minimum required for the study, to a high of 38 years. The mean total experience as a principal was 14.88 years. In examining the total years at their

Table 4.0

Descriptive Data on Elementary Principals

Variable	Total	Responses
	n	%
Gender		
Male	55	76.4
Female	17	23.6
Total	72	100.0
Ethnic/Racial Composition		
White	66	91.7
Black	3	4.2
Indian/Alaskan	0	0.0
Hispanic	3	4.2
Asian	0	0.0
Total	72	100.0
Highest Degree		
Master's	49	68.1
Specialist	18	25.0
Doctorate	5	6.9
Total	72	100.0

Table 4.1

Descriptive Data on Elementary Principals

Variable	N	M	SD	Min	Max
Age	71	49.20	6.75	34	60
Years Experience as a Principal	72	14.88	8.36	3	38
Years Experience at this School	72	10.44	6.89	3	28

Table 4.2

Descriptive Data on Schools

Variable	N	M	SD	Min	Max
Ethnic/Racial Composition Percentage					
White		79.15	27.77	0	100
Black		10.62	20.57	0	99
Indian/Alaskan		3.15	15.27	0	96
Hispanic		5.58	15.93	0	95
Asian		1.34	2.11	0	10
Total School Enrollment	72	462.5	210.57	124	980.0
Percentage Students on Free/Reduced Price Meals	72	69.55	20.58	1	99.0
Percentage PTA/Parent Organization Membership (excluding 12 districts with no measure)	60	49.73	37.23	1	195.0
Percentage PTA/Parent Organization Membership (using imputed means)	72	49.73	33.94	1	195.0
Percentage PTA/Parent Organization Membership (using 0 as missing value in districts with no measure)	72	41.44	38.73	1	195.0
Mean NCE (1987-88 + 1989-90 ÷ 2)	72	56.47	11.53	16	88.5
District Per Pupil Expenditure	72	$3967.28	$933.45	$2798	$7668

present school, range of experience varied. This experience ranged from 3 to 28 years, with an average of 10.44 years. Sixty percent of the principals had 10 or less years of administrative experience.

As anticipated, all responding principals had at least a Master's degree. There were 49 principals, or 68.1 percent, with only a Master's degree; 18, or 25 percent, with a specialist's degree; and 5 principals, or 6.9 percent, either with a doctorate or currently completing their doctoral work.

Based on the results of the demographic data, the typical principal in this study was a white male, 49 years of age, holding a Master's degree, with 14.8 years of experience as a principal and 10.4 years as the administrator at his present school.

Descriptive Data on Schools

As shown in Table 4.2, the mean school enrollment for participating schools was 462.5, with a range of 124 to 980 students. In general, the schools were of average size, with 60 percent of them having enrollments below 490.

Seventy-nine percent of the student population was white. Approximately half of the schools in the study (48.6 percent) had 93 to 100 percent white students. Nine schools had less than 50 percent white population. Fifty schools, or 69.4 percent, had 7 percent black students. Black students represented 10.62 percent of the total student population. The total

percentage of Hispanic students in the school population was 5.58 percent. The majority of the schools, 83.3 percent, had less than 7 percent students of Hispanic origin. Indian/Alaskan students represented 3.15 percent of the total student population, while there were 1.34 percent Asian students in the schools used in this study.

There were few schools, 16.7 percent, with at least one full-time equivalent assistant principal. One school had an assistant principal who worked half-time at the school and half-time at another school which was not included in the study. One school had two assistant principals. Fifty-nine schools, or 81.9 percent, had no full-time equivalent assistant principals, a fact which may have some influence on the ability or need of the principal to practice instructional leadership. Principals with assistants may delegate more of those responsibilities to their assistant principals or the reverse could be true. Together, a principal and assistant principal may be allowed more opportunity to work as an instructional team and provide more instructional leader opportunities.

The percentage of students receiving free- and reduced-price meals was used as a proxy measure of the student SES of each school. The mean percentage of the sample population was 69.55, with a range of 1 to 99 percent. The percentage of Parent-Teacher Association, PTA, or parent organization membership was gathered to serve as a surrogate measure of parental involvement. The mean percentage membership of those schools

having a parent organization was 49.73. Twelve schools had no parent organization within their buildings or affiliation with the national PTA. Imputed means (the mean of the total group) were used for those twelve schools when the data were entered in the regression analyses (Cohen & Cohen, 1983). Two additional methods were used to accommodate for the twelve schools with missing values. First, deletion of those data from the calculation of means and standard deviations was used. The resulting mean was the same as when the imputed means method was conducted. The standard deviation was 37.23 as compared with 33.94 using imputed means. Secondly, missing values were replaced with 0's. The resulting mean was 41.44 with a standard deviation of 38.73. Regression analyses were conducted using all three calculations of parent organization membership and, as a result, no significant differences were noted.

The percentages of PTA/parent organization membership ranged from a low of 1 in one school to a high of 195 percent in another school. These percentages were either the actual percentage of PTA membership at each school or the percentage resulting by dividing the given number of members by the total student enrollment. Two schools had higher percentages than 100 percent due to more than one family member belonging to parent organizations.

Per pupil expenditure of districts was used to measure the amount of funds spent educating each pupil. The per pupil expenditure for districts of

participating schools ranged from $2798 to $7668. Over half of the school districts in the study had per pupil expenditure figures less than $3800. The average expenditure figure was $3967.28, with a standard deviation of $933.45.

The mean normal curve equivalent, NCE, Iowa Test of Basic Skills scores for 1987-88 and 1989-90 were averaged to obtain an overall mean NCE for each school. The average NCE score for all participating schools was 56.47. The average scores ranged from a low of 16 to a high of 88.5, with a standard deviation of 11.53.

Results of the Measure of Elementary Principal's Instructional Leadership Behavior

Validation. A factor analysis was conducted on the results of the teachers' responses on the MEPILB. Four factors were revealed when the structure of the instrument was assessed with a principal components analysis with varimax rotation. The rotated factor loadings were grouped to create the four subscales using the following steps:

1. The overall largest factor loading for each behavior was identified.
2. If the factor loading was $\geq$ .40 and the difference between that loading and the next highest loading factor was $\geq$ .10, the behavior was grouped within that dimension.
3. If two or more factor loadings were close to or < .40, the behavior was not included in the creation of the subscales.

Behaviors were grouped, as shown in Table 4.3, in an attempt to develop subscales of instructional leadership. This method for creating subscales was used since it preserves the identity of the specific behaviors for further analyses. The four factors represented the following general dimensions of instructional leadership: 1) providing general communication; 2) monitoring instruction and testing; 3) planning; and 4) providing instructional feedback. The factors were named after reviewing the behaviors loading on the factors. The item loadings on each factor are shown in Table 4.4.

Eigenvalues, communalities, and percentages of variance accounted for by the four factors appear in Table 4.5. As indicated in this table, the total amount of variance represented by the four factors was 41.62 percent. The general communication factor accounted for 12.08 percent of the variance in the items. The next highest factor, monitoring instruction and testing, accounted for only 2.53 percent of the variance in the items on the MEPILB instrument. This indicates the MEPILB can be treated as a unidimensional instrument for measuring the instructional leadership of the principal.

Further evidence of validation was provided by a comparison of the MEPILB to Thomason's (1988) secondary instrument. Factor analysis of Thomason's instrument revealed seven factors which, together, served to explain 39.3 percent of the variance in the items. The highest dimension which described principal behaviors using praise, rewards and feedback in instructional leadership, explained 19 percent of the variance in the items.

Table 4.3

Groupings of MEPILB Behaviors for Creation of Subscales

Subscale	MEPILB Behavior Number
1. Providing General Communication	5,11,19,21,23,27,29,30,31,32,33,34, 35,39,41,43,45,50,53,54,55
2. Monitoring Instruction and Testing	1,2,13,18,37,38,44,56,59
3. Planning	6,14,24,40,42,46,47,49
4. Providing Instructional Feedback	26,48,51

Table 4.4

Factor Structure of Instructional Leadership Behaviors of Elementary Principals

Items		Factors*			
		1	2	3	4
1.	Observed a lesson in each teacher's classroom during the first semester	.16	.46	-.02	.32
2.	Provided diagnostic information on student achievement to teachers	.35	.49	.10	.19
3.	Enforced rules that discourage classroom interruptions	.42	.12	.09	.36
4.	Assessed the effectiveness of remedial programs	.32	.25	.35	.29
5.	Encouraged teachers to use the most recent research for instruction in reading	.43	.14	.33	.00
6.	Explained the school's test results at a community meeting	-.14	.30	.47	.17
7.	Periodically reviewed daily lesson plans with teachers	-.07	.40	.16	.53
8.	Commended a teacher for positive, time-on-task classroom atmosphere	.58	.00	.05	.42
9.	Provided group test scores to teachers	.51	.51	-.03	-.12
10.	Preplanned intercom interruptions	.18	.22	.06	.28
11.	Been visible in all parts of the building	.68	.18	.05	.09

*Key to Factors:
1. Providing General Communication
2. Monitoring Instruction and Planning
3. Planning
4. Providing Instructional Feedback

Items		Factors			
		1	2	3	4
12.	Surveyed teacher needs in identifying resources necessary to reach instructional objectives	.44	.18	.40	.14
13.	Provided an inservice for the faculty explaining how the test data are to be used to improve student performance	.08	.61	.26	.13
14.	Developed partnerships with outside organizations to improve school conditions	.26	.17	.44	.03
15.	Used the school's test results to modify an instructional program	.21	.50	.44	.08
16.	Evaluated the plan for improvement of instruction	.37	.28	.43	.20
17.	Provided opportunities for peer coaching	.24	.09	.32	.24
18.	Explained the school's test results at a faculty meeting	.35	.65	.08	.09
19.	Acknowledged students' academic accomplishments in informal settings	.48	.23	.20	.24
20.	Analyzed test results at each grade level	.40	.61	.06	.00
21.	Praised students who are trying but not being outstanding academically	.49	.07	.13	.32
22.	Developed counseling program for troubled students	.31	.36	.22	.15
23.	Participated in eligibility and IEP meetings	.44	.26	.14	-.04
24.	Involved parents and community members in development of plan for improvement of instruction	.35	.01	.61	.03

Items		Factors			
		1	2	3	4
25.	Explained the policy at a faculty meeting regarding classroom interruptions	.14	.35	.24	.38
26.	Reinforced the excellent quality of a teacher's lesson presentation with a handwritten note	.12	.17	.13	.62
27.	Visited each teacher's class at least once each school year	.66	.18	-.09	.15
28.	Assisted a teacher in developing a plan for improvement	.41	.04	.42	.29
29.	Made teachers aware of additional available resources	.61	.10	.24	.09
30.	Involved teachers in development of a plan for the improvement of instruction	.57	.10	.37	.07
31.	Requested financial support for teachers' requests to attend instructional conferences, workshops and seminars	.49	-.04	.30	-.08
32.	Attempted to meet each teacher's needs for instructional supplies	.74	.04	.03	-.02
33.	Spoken to the teachers about the goals of the school	.69	.18	.13	-.03
34.	Talked with students in corridors	.73	.12	-.02	-.02
35.	Assisted teachers in the identification and placement of special education pupils	.59	.16	.12	.01
36.	Assigned an effective teacher to another teacher who needs help	.01	.14	.36	.44
37.	Distributed a summary of the school's test results to all faculty members	.19	.64	.14	.06

Items		Factors			
		1	2	3	4
38.	Discussed with the faculty the school's current achievement results and the school's achievement goals	.35	.60	.20	.19
39.	Worked with teachers to develop a list of goals for the school	.41	.36	.39	-.04
40.	Involved teachers in budgeting for instructional materials	.24	.03	.49	.06
41.	Provided needed instructional support services (i.e., child study, psychological services, home visitation of students, remedial services) for at-risk students	.59	.21	.11	-.01
42.	Worked with a teacher to improve instructional objectives	.34	.18	.43	.35
43.	Encouraged varied means of student evaluation	.51	.18	.38	.12
44.	Reviewed the components of an effective instructional lesson at a faculty meeting	.11	.39	.28	.25
45.	Followed through on teacher suggestions and reported back to them	.48	.08	.27	.29
46.	Conducted an annual survey to get feedback on instruction from parents	-.10	.17	.54	.24
47.	Monitored implementation of the plan for improvement of instruction	.22	.27	.55	.24
48.	Checked to assess the quality of lesson plans	.23	.38	.10	.47
49.	Created the staff development plan	.19	.31	.50	.10
50.	Scheduled a definite time to talk with parents of students having problems	.50	.06	.13	.30

Items		Factors			
		1	2	3	4
51.	Commended a teacher in writing for correlating instructional objectives	.13	.05	.24	.65
52.	Worked with teachers to prepare a list by the end of the first semester of students who are not meeting their objectives	-.01	.40	.37	.35
53.	Scheduled specific times for parents to visit teachers	.49	.23	.05	.15
54.	Given each teacher written feedback on each class observed	.49	.11	.01	.24
55.	Provided time for teachers to visit the principal to discuss instructional problems	.63	.05	.05	.21
56.	Established, together with staff, achievement goals for the school for students' mastery of basic skills	.27	.50	.36	.17
57.	Established with each teacher specific goals for increasing achievement scores in basic skills	-.07	.46	.41	.26
58.	Personally reviewed annual instructional plans with teachers	-.05	.46	.42	.31
59.	Provided an inservice for the faculty describing the testing instruments	.03	.54	.27	.25
60.	Asked staff to list students who are improving in basic skills	-.18	.39	.43	.24

Key to Factors:

1. Providing General Communication
2. Monitoring Instruction and Planning
3. Planning
4. Providing Instructional Feedback

Table 4.5

Communalities, Eigenvalues, and Percentages of Variance Accounted for by Factors Comprising the MEPILB

Factor	Eigenvalue	Percentage of Variance	Cumulative Percentage
1	16.66	27.8	27.8
2	4.58	7.6	35.4
3	2.05	3.4	38.8
4	1.6734	2.8	41.6

Variable	Communality
1	.336
2	.409
3	.325
4	.374
5	.318
6	.365
7	.466
8	.520
9	.532
10	.162
11	.509
12	.401
13	.460
14	.289
15	.488

Variable	Communality
16	.440
17	.226
18	.564
19	.379
20	.539
21	.358
22	.293
23	.280
24	.499
25	.345
26	.443
27	.505
28	.430
29	.448
30	.474
31	.344
32	.544
33	.526
34	.552
35	.384
36	.384
37	.466
38	.555
39	.452
40	.299
41	.448

Variable	Communality
42	.448
43	.454
44	.305
45	.393
46	.387
47	.480
48	.430
49	.392
50	.357
51	.507
52	.417
53	.320
54	.303
55	.448
56	.489
57	.454
58	.486
59	.426
60	.422

Thomason's instrument and the current MEPILB are both considered to be unidimensional measures of principal instructional leadership as perceived by teachers.

Reliability. Cronbach's (1951) alpha was used to determine the internal reliability of the subscales revealed in the analysis. Table 4.6 shows the reliability coefficient for the whole scale was .95. In an attempt to create subscales to measure the instructional leadership of principals, four additional dimensions were revealed. These subscales are identified as providing general communication, monitoring instruction and testing, planning, and providing instructional feedback. The reliabilities of these subscales also are shown in Table 4.6.

Reliability coefficients for the secondary instrument were very similar to the coefficients found for the subscales in the present study. The whole scale coefficient was .94 as compared to .95 in the current research.

Scoring. For each principal, the total yes responses and total no responses of the eight teachers were totaled and averaged. The responses were scored 2 = yes and 1 = no. These responses were summed for each respondent. The total possible score for principals on the MEPILB was 120 (yes = 2 X 60 behaviors). The mean score for all principals on the entire instrument in the study was 102.05 with a standard deviation of 13.66. Principals in the study

Table 4.6

Alpha Reliability Coefficients for the Leadership Behavior Scales Created from the Factor Analysis (N = 72)

Scale	Number of Items	Alpha
Whole Scale (All Items)	60	.95
Providing General Communication	21	.91
Monitoring Instruction and Testing	9	.84
Planning	8	.77
Providing Instructional Feedback	3	.67

also scored fairly high within each of the subscales. The summated scale scores for each of the factors are shown in Table 4.7.

The general communication subscale included such behaviors as being visible in all parts of the building, acknowledging students' academic accomplishments in informal settings, and speaking to the teachers about the goals of the school. The mean general communication score for all principals in this study was 38.12 out of a possible 42.

The creation of subscales identified another dimension of instructional leadership as measured by the results of the MEPILB. The monitoring of instruction and testing subscale of instructional leadership included behaviors such as observing a lesson in each teacher's classroom during the first semester, giving each teacher written feedback on classes observed, and providing an inservice for the faculty explaining how the test data are to be used to improve student performance. The overall principal mean score for this dimension was 15.07 out of a possible score of 18.

The next subscale, planning, involved such behaviors as developing partnerships with outside organizations to improve school conditions, involving parents and community members in development of a plan for improvement of instruction, and conducting an annual survey to receive feedback on instruction from parents. The total possible score for this dimension was 16 and the principals in the study scored an overall mean of 12.82.

Table 4.7

Summated Scale Scores for Respondents from MEPILB (N = 72)

	Subscales				
	1	2	3	4	5
M	102.047	38.123	15.073	12.821	4.802
SD	13.662	4.906	2.782	2.389	1.130
Highest Mean	116.875	42.000	18.000	15.625	5.875
Lowest Mean	81.0	30.250	10.125	9.625	3.250
Maximum Possible	120	42	18	16	6

Key to Subscales:

1. Whole Scale (All Items)
2. Providing General Communication
3. Monitoring Instruction and Testing
4. Planning
5. Providing Instructional Feedback

The final subscale involved three behaviors regarding the provision of instructional feedback. This dimension included reinforcing the excellent quality of a teacher's lesson presentation with a handwritten note, commending a teacher in writing for correlating instructional objectives, and checking to assess the quality of lesson plans. The total score possible for this subfactor was 6, with principals scoring an overall mean of 4.80.

All the subscale scores indicated principals in this study were perceived by their teachers as demonstrating high levels of instructional leadership. The rather low standard deviations also appeared to indicate there was little variance in the principal instructional leadership on the overall behavior scale and within the four dimensions which were revealed.

A matrix of intercorrelations among summated scale scores for all respondents is shown in Table 4.8. The correlations of all subscales to the whole scale were relatively high, ranging from .43 to .84. Due to the rather high intercorrelations, it was decided the whole scale factor accounts for a larger proportion in the variance of the instructional leadership items.

The Prediction of Variation in Student Achievement from the Instructional Leadership Behavior of Principals

Correlation coefficients among and between four independent variables and one dependent variable were calculated. The factors derived from the principal components analysis also were correlated with each other and

Table 4.8

Intercorrelations Among Summated Scale Scores from MEPILB (N = 72)

	Scales				
	1	2	3	4	5
1. Whole Scale (All Items)					
2. Providing General Communication	.84				
3. Monitoring Instruction and Testing	.84	.58			
4. Planning	.80	.55	.61		
5. Providing Instructional Feedback	.64	.43	.52	.48	

between the other four independent variables and student achievement. All coefficients are low to moderate with a range of .02 to .54 except among the MEPILB and the four factors of instructional leadership. The correlation coefficients are shown in Table 4.9. The largest correlation between independent variables used in the regression analyses is between the measure of parental involvement and district per pupil expenditure (.33). The conclusion can be made that there is no multicollinearity. Each independent variable appears to be explaining unique associations with the dependent variable, student achievement.

Two major multiple regression analyses were conducted. In the first model, the instructional leadership scores of the principals were entered as the independent variable plus the controlling variables of student socioeconomic status, parental involvement, and per pupil expenditure. The mean NCE scores were entered as the dependent variable. The R-squared resulting from this analysis was .3042 and was significant at $p < .01$ level.

The second multiple regression model included measures of SES, parental involvement, and per pupil expenditure as independent variables and the mean NCE scores as the dependent variable. The resulting R-squared of .2975 in the restricted model was significant at the $p < .01$ level of significance.

The formula given by Pedhazur (1982) was used to test the significance of an increment in the proportion of variance accounted for by the restricted model. The results of this calculation showed that $F = .6504$ with 1 and 67

Table 4.

Pearson Correlation Coefficients Among and Between the Independent and Dependent Variables (N = 72)

	1	2	3	4	5	6	7	8
1. Student SES								
2. Parent Involvement	.12							
3. Per Pupil Expenditure	.05	.33						
4. MEPILB	.20	.17	.20					
5. Providing General Communication	-.13	.19	.24	.89				
6. Monitoring Instruction and Testing	-.30	.12	.07	.89	.69			
7. Planning	-.03	.16	.23	.87	.72	.71		
8. Providing Instructional Feedback	-.30	.02	.07	.79	.69	.66	.61	
9. Student Achievement	.54[1]	.11	.03	-.18	-.06	-.25[2]	-.10	-.22[3]

[1] $p < .01$
[2] $p < .05$
[3] $p < .10$

Key to Variables:

Independent Variables
4. Measure of Elementary Principals' Instructional Leadership Behavior
5. Providing General Communication
6. Monitoring Instruction and Testing
7. Planning
8. Providing Instructional Feedback

Control Variables
1. Student Socioeconomic Status
2. Parental Involvement
3. Per Pupil Expenditure

Dependent Variable
9. Student Achievement

degrees of freedom. Considering the obtained F was .6504, the conclusion was drawn that there is no significant difference in the two regression models. The increment of explained variance due to instructional leadership is not significant. The results of these regression analyses are shown in Tables 4.10 and 4.11.

Additional regression analyses were conducted using each of the factors obtained from the factor analysis as independent variables and student achievement as the dependent variable. Each individual factor was regressed on student achievement. The dimensions of providing general communication and planning were found not to be significantly associated with student achievement. In the bivariate regression models, two dimensions, monitoring instruction and testing ($p < .05$) and providing instructional feedback ($p < .10$) significantly explained the variance in student achievement. When these factors were individually entered into multiple regression models, their R-squared contributions were not significant. This is explained by the fact that the R-squared of SES is so significant in the equation. The significant, but small, R-squares of each of the factors become insignificant contributions. The results of these analyses are shown in Appendix L.

A t-test of independent sample means was conducted on the lowest 27 percent of schools based on socioeconomic status. This analysis was completed to determine if student achievement was higher in schools where principals had higher MEPILB scores. These eighteen schools were divided

Table 4.10

Results of Regression Model 1 with Four Independent Variables and One Dependent Variable

Source	df	Sums of Squares	Mean Square	F-Ratio	Prob.
Constant	1	229604.8	229604.8	7.32	0.000
Model	4	2871.239	717.8047		
Error	67	6566.833	98.00492		
Total	71	9437.568	132.9235		
Root Mean Square Error			9.899744		
Mean of Dependent Variable			56.47083		
Coefficient of Variation			.1753072		
R Squared			0.3042		
Adjusted R Squared			0.2627		

Table 4.11

Regression Model 2 with Three Independent Variables and One Dependent Variable

Source	df	Sums of Squares	Mean Square	F-Ratio	Prob.
Constant	1	229604.8	229604.8	9.60	0.000
Model	3	2807.744	935.9147		
Error	68	6629.825	97.49742		
Total	71	9437.568	132.9235		
Root Mean Square Error			9.87407		
Mean of Dependent Variable			56.47083		
Coefficient of Variation			.1748527		
R Squared			0.2975		
Adjusted R Squared			0.2665		

into three subgroups; one group of eight schools with the highest principal MEPILB scores within this group; one group of eight schools with the lowest principal measures of MEPILB within this group; and one group of two schools with mean principal scores which fell between the other two groups. This last small group was used to provide, as much as possible, two distinct groups of instructional leadership within schools with the lowest measures of SES. Within the two groups of eight schools, the student achievement scores were compared with a t-test analysis. There was a significant difference in these means. Interestingly enough, the mean student achievement was significantly higher in the schools where principals scored lower on the MEPILB. Conversely, those principals with the highest MEPILB scores were significantly associated with lower student achievement. Table 4.12 shows the results of this analysis.

An analysis of variance was conducted to determine if there were any differences in the instructional leadership behavior of principals in high-achieving, average-achieving, and low-achieving schools. As shown in Table 4.13, no statistically significant differences existed in the MEPILB scores in these three groups of schools.

Summary

The results and analyses of data obtained from the principal survey and the administration of the MEPILB were given in Chapter 4. The principal and

Table 4.12

Results of T-Test Analysis on Student Achievement within Bottom 27 Percent SES Schools

Groups	N	M	SD	F-Ratio	Prob.
Student Achievement in Schools Where Principals Had Highest MEPILB Scores	8	44.125	6.151	5.910	.0319
Student Achievement in Schools Where Principals Had Lowest MEPILB Scores	8	47.75	14.955		

Table 4.13

Results of ANOVA on Principal Instructional Leadership Scores Within High-Achieving, Moderate-Achieving, and Low-Achieving Schools

Groups	N	M	SD	F-Ratio	Prob.
Principal Scores in High-Achieving Schools	23	104.45	1.96	1.11	.3348
Principal Scores in Average-Achieving Schools	24	100.77	1.92		
Principal Scores in Low-Achieving Schools	25	101.06	1.88		

school demographics were presented. The validity, reliability, and scoring of the MEPILB also were shown. The results of the two multiple regression models to examine the relationship between certain independent variables and student achievement were presented in this chapter. The results of a t-test analysis of student achievement scores within schools with the lowest measures of SES also were reported. ANOVA results were shown supporting the finding that no significant differences in student achievement exist between schools in the study based on principal instructional leadership.

Chapter 5 includes a summary of the study with conclusions, discussion and recommendations for future research.

CHAPTER 5

SUMMARY, CONCLUSIONS, DISCUSSION, AND RECOMMENDATIONS FOR FUTURE RESEARCH

Chapter 5 contains a summary of the study, conclusions drawn from analyses of the data and multiple regression models, discussion of these findings, and recommendations for future research.

Summary

The purpose of this study was to determine the amount of variance in student achievement which could be attributed to the instructional leadership behavior of the elementary principal. Three variables previously shown in the research to be highly correlated to student achievement were controlled for in the analyses: student socioeconomic status, level of parental involvement, and district per pupil expenditure.

A survey instrument was developed to collect principal and school demographic data. The survey was mailed to the superintendents of a systematic and proportional sample of 100 elementary principals plus 25 replacements in Arizona, Iowa, and Virginia. Most of the information on this survey was used to describe the population of principals and schools in the study. The survey results showed the percentage of students receiving free

and reduced-price meals, percentage of parent organization involvement, and the mean NCE scores for fourth graders during the school years of 1987-88 and 1989-90. This information, together with data collected from each state's Department of Education on the per pupil expenditure of participating districts, was used in the multiple regression analyses.

The Measure of Elementary Principal Instructional Leadership Behavior, MEPILB, was developed to assess the instructional leadership of the principals in the study. Both the principal survey and MEPILB were mailed to the systematically-chosen sample of elementary principals. Seventy-two (72 percent) principal surveys and 576 MEPILB were returned.

A principal components analysis with varimax rotation was conducted on the results of the MEPILB. Four factors were revealed: 1) providing general communication; 2) monitoring instruction and testing; 3) planning; and 4) providing instructional feedback.

Four subscales were created from the four factors. The general communication scale score for instructional leadership explained most of the variance in teacher responses on the MEPILB. The principals in the study scored an overall mean score of 102.05, out of a possible score of 120, which indicates teachers observed their principals demonstrating high levels of instructional leadership.

The analyses of data were performed primarily through the use of multiple regression models. The overall MEPILB scores, student socioeconomic

status, level of parental involvement, and district per pupil expenditures, were entered into the first regression model to examine their relationship with student achievement. A second analysis examined the relationships between SES, parent involvement, per pupil expenditure and student achievement.

The results of the first regression analysis revealed SES accounted for 30.42 percent of the total variance in student achievement ($p < .01$); t-value = 4.92. When parent involvement was added to the regression model, the R-squared only increased 1.15 percent ($p = .6092$); t-value = .51. The third factor, district per pupil expenditure, was added to the model. This additional factor added only .11 percent to the model ($p = .9420$); t-value = .07. The MEPILB scores were entered as the last independent variable. The addition of this factor added 3.18 percent to the total variance in student achievement ($p = .4237$); t-value = -.80. No variation of factor entry changed any explained variances.

In the second regression analysis, SES, parent involvement, and per pupil expenditure were entered as the independent variables and the mean NCE scores were added as the dependent variable. T-values were as follows: t-value for SES was 5.26; .40 for parental involvement; and -.06 for per pupil expenditure. The variance explained by this model was 29.75 percent ($p < .01$).

The only significant t-value found in the two models was for student SES. An F-test of significance was conducted to analyze the increment of variance

contributed by the MEPILB scores. This contribution, which measured the instructional leadership of the principal, was found not to be significant.

Eight additional regression analyses were conducted. Student achievement was regressed on each of the factor scores measuring principal instructional leadership. Two of these factors were found to be significantly associated with student achievement. Monitoring instruction and testing explained 6.1 percent of the variance in student achievement ($p < .05$), while providing instructional feedback contributed 5 percent of the explained variance ($p < .10$). When these factors were entered individually as independent variables in a regression model with SES, parental involvement, and per pupil expenditure, the highly significant R-squared of SES eliminated the previously significant contribution of the two factors to the variance in student achievement.

Conclusions

The research question in this study was:

What proportion of the variance in student achievement can be attributed to the instructional leadership behavior of the elementary principal, controlling for student socioeconomic status, parental involvement, and district per pupil expenditure?

No significant relationship was found to exist between principal instructional leadership activities, as measured on the MEPILB, and student

achievement scores, as measured by the NCE of the ITBS. The overall results of the current study do not support the effective schools research regarding the significant relationship between the instructional leadership of elementary principals and student achievement. The results of the more recent work completed by Hallinger, Bickman, and Davis (1989); Andrews and Soder (1987); and Heck, Larsen, and Marcoulides (1990) were not supported by the overall results.

The results of this study supports the earlier work of Leitner (1990) who concluded there was not a statistically significant relationship between instructional management and student achievement. This study also supports one of Larsen's (1985) conclusions which stated no differences existed between the instructional leadership scores of elementary principals in high-achieving and low-achieving schools.

Discussion

Most of the past effective schools research indicated a significant, positive relationship exists between the instructional leadership of elementary principals and student achievement. The results of a representative sampling of these studies was reviewed in Chapter 2. All but one of those research studies showed a positive and significant relationship existed between these two variables.

Some methodological variation exists between those studies and the present research which may explain a portion of the differences in results. These differences include the examination of indirect, as well as direct effects, of instructional leadership on student achievement; use of advanced statistical analyses, such as LISREL and EQS; variances in measures of student achievement; use of different instruments to measure instructional leadership; and the use of differing sample populations.

As Heck et al. (1990) and Lange (1988) discussed, the indirect effects of the instructional leadership of principals on student achievement are generally more significant than the direct effects. The 1989 study by Hallinger et al. demonstrated the measurement and magnitude of indirect instructional leadership effects through instructional climate and organization on student achievement. Indirectly, the principal influences the instructional climate involving teachers, who in turn influence students and student achievement. These indirect effects are more difficult to identify and capture for analysis; however, these effects are present, nevertheless.

Heck et al. (1990), Leitner (1990), and Lange (1988) agree further research needs to be conducted to examine this complex, indirect relationship. Heck et al. also feel the use of more advanced analyses of this indirect relationship, such as LISREL, may yield stronger, more definable results. In both of the studies cited in Chapter 2 which used causal models, the indirect impact of principal instructional leadership on student achievement was found

to be both positive and significant (Hallinger, Bickman, & Davis, 1989; Heck, Larsen, & Marcoulides, 1990).

Different student assessments were used as measures of student achievement. Most studies cited in Chapter 2 conducted over the past five to eight years used either local or state criterion-based assessment while the Iowa Test of Basic Skills, a nationally-developed and administered test, was used in the current study. The inference might be drawn that closer congruence between instruction and testing would be found where local or state assessments are administered. This closer congruence could extend to the entire instructional program managed by the principal. The management of instructional services more closely aligned with testing may provide more significant, positive associations between instruction and testing in those particular schools. This fact may not be a significant contributing factor, however, since Leitner (1988) used local assessments and found a weak relationship existed between instructional leadership and student achievement. The other studies incorporated either local or state assessment tools and found significant, positive associations between the two variables.

The present research and each of the more recent studies used different instruments to measure the instructional leadership of the elementary principal. A similar validation method was used to develop the instruments. Although each instrument was somewhat different, all appeared to center around similar instructional leadership behaviors of elementary principals. No evidence exists,

however, which demonstrates a statistical relationship between these instruments.

Although statistically significant, the direct effects of principal instructional leadership on student achievement were rather small in each of these previous studies. Since several of these were outlier studies, the effects would be even smaller when a more normally distributed population was examined (Heck, Larsen, and Marcoulides, 1990). The current study used a sample of principals from three states; Arizona, Iowa, and Virginia. No prior restrictions for achievement or SES levels were dictated. As a result, all levels of achievement and SES are represented in the current research.

The present study not only fails to support most of the past effective schools research but also indicates a negative relationship existed between the overall instructional leadership of principals, the four factors of instructional leadership, and student achievement. The correlation coefficients, as shown in Table 4.9, indicate the overall MEPILB score correlated -.18 with student achievement. This result may lead one to conclude the instructional leadership of principals is negatively associated with student achievement. The negative correlation may be suggesting high-scoring principals recognized the greater instructional needs of the lower-achieving students and, in response to those needs, are demonstrating high levels of instructional leadership behavior.

Upon examining the individual factors of instructional leadership resulting from the principal components analysis and student achievement, two factors

were found to be significantly, but negatively, associated with student achievement; monitoring instruction and testing and providing instructional feedback. The twelve behaviors comprising these two dimensions of leadership are shown in Table 5.0.

The behaviors most associated with higher student achievement appear to center around testing issues. Seven of the nine behaviors within the monitoring instruction and testing dimension deal specifically with testing and increasing achievement. Currently, increased emphasis on improving student achievement and test scores is being placed on principal and teacher performance in many school districts across the United States. Based on the negative found between principal scores and student achievement, the assumption is made that principals in schools with lower student achievement are directing much of their energies to increasing test scores. Examination of the validation process of the original instructional leadership instrument (Appendix J) for this study shows approximately thirty percent of the behaviors are test-related items. Instructional leadership appears to be dominated by the issues of the time in which it is being measured.

An inference drawn from the analysis of this research data indicates there were no specific instructional leadership behaviors of principals identified by teachers. The factor analysis revealed the overall dimension of providing general communication accounted for 41.6 percent of the total variance in student achievement. No other group of behaviors explained such a significant

Table 5.0

MEPILB Behaviors Found To Be Significantly Associated with Student Achievement

Monitoring Instruction and Testing[1]

1	Observed a lesson in each teacher's classroom during the first semester
2	Provided diagnostic information on student achievement to teachers
13	Provided an inservice for the faculty explaining how the test data are to be used to improve student performance
18	Explained the school's test results at a faculty meeting
37	Distributed a summary of the school's test results to all faculty members
38	Discussed with the faculty the school's current achievement results and the schools achievement goals
44	Reviewed the components of an effective instructional lesson at a faculty meeting
56	Established, together with staff, achievement goals for the school for students' mastery of basic skills
59	Provided an inservice for the faculty describing the testing instruments

Providing Instructional Feedback[2]

26	Reinforced the excellent quality of a teacher's lesson presentation with a handwritten note
48	Checked to assess the quality of lesson plans
51	Commended a teacher in writing for correlating instructional objectives

[1] $p < .05$
[2] $p < .10$

proportion of the variance in the achievement of students. Possibly, surveyed teachers were not discriminating among the specific behaviors, but were giving overall ratings of their principals. Whether a principal cares about and supports the staff may be more important than the demonstration of certain instructional behaviors. Teachers may have reported principal behaviors based on "a halo effect" of leadership rather than behavior discrimination.

The possibility also exists teachers may not have actually discriminated among the principal behaviors because they did not categorize behaviors according to their function or purpose. Teachers are caught up in the complexity of their own job and may see the principal, primarily, as a support or not a support to their instructional program. As such, all principal behaviors may be viewed as instructional in nature.

The principal may have been exercising instructional leadership differently with each teacher. This may help to explain why no particular characteristics were identified. Leitner (1990) concluded the identification of specific instructional leadership behaviors and their relationship to student achievement was not enough for researchers to study. He contended principals must know when and with whom to use these behaviors. It is not as important for principals to know what to do as it is to know how to use these behaviors to influence teacher behaviors and, ultimately, student behavior and achievement. Possibly, given research which identifies and examines the

situational leadership styles of instructional leadership, the impact of instructional leadership on student achievement may be pinpointed.

The significant impact which SES had on student achievement should be addressed. Both Coleman (1966), and Averch (1971) contended the home and family variables associated with SES had stronger, more significant relationships with student performance than dollars spent, staff preparation, availability of instructional materials, and many other school variables. The current study concluded SES, as measured by this research, had a much greater impact on student achievement than per pupil expenditure, parent involvement, and the instructional leadership of the principal.

In an attempt to counter the conclusions of Coleman and others, many researchers may have too hastily conducted research to identify other variables having an effect on student performance. The significant impact of SES must be recognized. All students do not come to school equally ready to learn. Elementary principals must help teachers quickly identify the strengths and weaknesses of all students and incorporate proper instructional techniques for students to reach their potential. School boards and superintendents should carefully review the implications of this study; primarily, the lack of a significant relationship between principal instructional leadership and student achievement and the quite significant association between student socioeconomic status and student achievement. Using the results of student achievement testing as the evaluative tool for principals and teachers has become rather popular recently

tool for principals and teachers has become rather popular recently in many states across the nation. Certainly, student success is the major goal of education and test results are one measure of student progress. School district personnel should be certain adjustments are made for the diversity of student SES among and between schools when considering the use of achievement results as a major portion of administrative and teacher evaluation. Yearly student gains should be examined with evaluations based upon the academic goals set by principal and staff and the progress towards or mastery of those goals.

Recommendations for Future Research

This study has revealed the lack of a significant association between the instructional leadership of the elementary principal and student achievement. Recommendations for future research include suggestions for methodological refinements and other improvements in examining this relationship.

1. Examine the results of this study in a path or structural equations analysis model to measure the indirect, as well as the direct, principal causal effects on student achievement.
2. Incorporate the use of multiple years of student achievement data across multiple grade levels.
3. Use a broader measure of elementary student success than student achievement data, such as achievement on curriculum-based

instruments, measures of attendance, and percentages of students at age-appropriate grade levels.

4. Develop and examine a model to better measure the complex interrelationship of the principal and teachers and the indirect effects on student performance.

5. Include a measure of student ability in the regression model. Student ability and student achievement have been shown to be highly correlated and should be controlled for in models explaining the predictors of student achievement.

6. Incorporate measures of school and teacher variables and evaluate their association with student achievement.

7. Include a measure of quality and frequency to the MEPILB to better capture the differences in the instructional leadership of principals.

8. Conduct a meta-analysis of all of the more recent research completed on the relationship between principal instructional leadership and student achievement.

9. Compare all instruments used to measure instructional leadership/ management to determine similarities, differences, and common factor structures.

10. Examine studies which show the significant impact of SES on student achievement to determine the proper proportion of school dollars which

should be spent "within" schools and how much should be spent "outside" the school to reduce the impact SES has on school outcomes.

11. Compare the results of research conducted on the relationship between instructional leadership and student achievement where achievement is measured by 1) local criterion-referenced measurements or 2) nationally-normed assessments.

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Appendix A

Letter to Superintendents Requesting Participation

October 5, 1990

Superintendent
School District
Address
City, State Zip Code

Dear Superintendent,

Much recent research in education has focused attention on effective schools. Effective schools have strong instructional leaders. How these leaders work with teachers, parents, and students to create the conditions for increasing student achievement is still an open question. The study proposed here has been designed to investigate further the processes by which principals convert their efforts into higher student achievement.

At least one school in your district was randomly selected as one of a hundred elementary schools in Arizona, Iowa, and Virginia to participate in this study. These states were chosen because the Iowa Test of Basic Skills is used statewide at the fourth grade level.

We realize that your staff's time is limited to assist in the completion of extensive surveys; therefore, we have developed two brief questionnaires, one for each of your participating principals and one for eight of their teachers. No individual or school will be identified in the report of the study.

If you agree to participate in the study, please do the following:

Insure selected principals meet the following criteria:

- have been principal at current school for at least the past 3 years, 1987-90, and have at least 8 classroom teachers.
- Obtain agreement of principals to participate.
- Forward the enclosed survey to principals.
- Complete and return the enclosed postcard.

Your participation in this study is greatly appreciated.

Sincerely,

Judy R. Pantelides
Researcher
Enclosures

Glen I. Earthman
Associate Professor

Appendix B

Superintendent Postcard

Schools/Principals Selected for Study

(#1) (#2)

#1 #2

___ ___ Our district agrees to participate. Principals indicated with a check: have served at the designated schools for at least the past 3 years, have at least 8 classroom teachers, and have agreed to participate.

___ The enclosed questionnaires have been forwarded to the principals.

___ We do not wish to participate in this study.

___ Please send us a copy of the results.

Appendix C

Letter to Principals

October 5, 1990

Principal
Elementary School
City, State Zip Code

Dear Principal,

Much recent research in education has focused attention on effective schools. Effective schools have strong instructional leaders. How these leaders work with teachers, parents, and students to create the conditions for increasing student achievement is still an open question. The study proposed here has been designed to investigate further the processes by which principals convert their efforts into higher student achievement.

Your school was randomly selected as one of a hundred elementary schools in Arizona, Iowa, and Virginia to participate in this study. These states were chosen because the Iowa Test of Basic Skills is used statewide at the fourth grade level.

We realize your time is limited to assist in the completion of extensive surveys; therefore, we have developed two brief questionnaires, one for you and one for eight of your teachers. Much of the information requested will be used to describe the school and principal population being surveyed, but no individual or school will be identified in the report of the study.

To participate in the study, please do the following:

- Complete the attached survey.
- Send us a list of your 1990-91 classroom teachers, designating those who have been with you for at least the past three years, 1987-90, and who agree to participate.

Your participation in this study is greatly appreciated.

Sincerely,

Judy R. Pantelides
Researcher
Enclosure

Glen I. Earthman
Associate Professor

Appendix D

Principal and School Demographic Data

Please answer each question in the space provided. Surveys have been coded for follow-up purposes; however, all responses will be kept strictly confidential.

Gender: Male___ Female___

Age: ___

Race:
White, not of Hispanic origin ___
Black, not of Hispanic origin ___
American Indian or Native Alaskan ___
Hispanic ___
Asian or Pacific Islander origin ___

Total years at this school as principal: (through 1989-90) ___

Total years as an elementary principal: (through 1989-90) ___

Highest degree earned:
Bachelor's ___
Master's ___
CAGS, Ed. Specialist ___
Doctorate ___

Total student enrollment as of September 30, 1989: _____

Racial/ethnic composition of school as of September 30, 1989:
White, not of Hispanic origin ___%
Black, not of Hispanic origin ___%
American Indian or Native Alaskan ___%
Hispanic ___%
Asian or Pacific Islander origin ___%

Percent of students receiving free or reduced-price meals as of September 30, 1989: ___%

School system classification:

Large - (general population > 500,000) ___
Medium - (general population between 150,000 - 499,999) ___
Small - (general population < 149,999) ___
Suburban ___
Rural - (general population < 2,500 or < 1,000 people per square mile) ___

Is your school affiliated with the National Parent/Teacher Association (NPTA)?
___Yes ___No

Percentage of membership in NPTA based on student enrollment as of December 31, 1989: ___%

If your school is not affiliated with the NPTA, does your school have a parent/teacher organization? ___Yes ___No

If yes, what was the total number of members as of December 31, 1989?

_____

Number of full-time equivalent assistant principals on September 30, 1989:

_____

Please provide the following information for your **fourth grade** students on the Iowa Test of Basic Skills given in the **spring** for the school years indicated. See attached printout.

	1987-88	1989-90
Student count	_____	_____
National percentile rank for the **total complete composite score** * (i.e., the national percentile rank of your school's averages with regards to **national pupil norms**)	_____	_____
Mean normal curve equivalent (NCE)	_____	_____

* This score includes the scores for vocabulary, reading, total language, total work study, and total mathematics.

Are there any other significant instructional, physical or social factors that impact on this school? (e.g., school serves a large special education population--fourth grade student count and scores include 39 learning disabled students)

Have there been any significant changes in this school over the past three years? (e.g., returned to neighborhood schooling in 1989-90, rezoning, new school, elimination of certain services)

Thank you for completing this questionnaire. Please return the survey and list of teachers by October 26, 1990. Thank you.

Appendix E

Follow-up Postcard to Superintendents

Dear Superintendent,

A packet of information was mailed to you on _____ requesting your participation in a study regarding elementary principals' instructional leadership. You were requested to obtain the permission of one or more pre-selected principals and forward a letter and survey to those who met prescribed criteria and agreed to participate.

If you have already forwarded this information to the principals and mailed the postcard to us indicating your participation, thank you. If you have not, please consider participating and return the postcard. If you need any further information, please contact us at (703) 231-5111.

Judy R. Pantelides, Researcher
Glen I. Earthman, Associate Professor
Virginia Tech University

Appendix F

Letter to Contact Teachers

(703) 231-5111

October 27, 1990

Contact Person
Elementary School
City, State Zip Code

Dear Contact Person,

Your principal is participating in our study of elementary school principals and their instructional leadership behavior. You and seven other teachers at your school were selected at random from a list of 1990-91 teaching staff provided by your principal.

We would appreciate your participation in this study. We are asking that you serve as our contact person to receive, distribute, collect, and return the eight teacher surveys. A self-addressed, stamped envelope is provided for you.

Your responses will be kept strictly confidential. Surveys have been coded for follow-up purposes; however, no schools or individuals will be identified in the report of the study.

Your participation and cooperation are greatly appreciated.

Sincerely,

Judy R. Pantelides
Researcher

Glen I. Earthman
Associate Professor

Enclosures

Teachers Selected

Appendix G

Measure of Elementary Principals' Instructional Leadership Behavior

The 60 behaviors below represent instructional leadership behaviors of elementary principals. Indicate those behaviors you have personally observed your current principal demonstrating. Use a #2 pencil to darken in circle 1 = no, 2 = yes.

My principal has:

1. Observed a lesson in each teacher's classroom during the first semester.

2. Provided diagnostic information on student achievement to teachers.

3. Enforced rules that discourage classroom interruptions.

4. Assessed effectiveness of remedial programs.

5. Encouraged teachers to use the most recent research for instruction in reading.

6. Explained the school's test results at a community meeting.

7. Periodically reviewed daily lesson plans with teachers.

8. Commended a teacher for positive, time-on-task classroom atmosphere.

9. Provided group test scores to teachers.

10. Preplanned intercom interruptions.

11. Been visible in all parts of the building.

12. Surveyed teacher needs in identifying resources necessary to reach instructional objectives.

13. Provided an inservice for the faculty explaining how the test data are to be used to improve student performance.

14. Developed partnerships with outside organizations to improve school conditions.

15. Used the school's test results to modify an instructional program.

16. Evaluated the plan for improvement of instruction.

17. Provided opportunities for peer coaching.

18. Explained the school's test results at a faculty meeting.

19. Acknowledged students' academic accomplishments in informal settings.

20. Analyzed test results at each grade level.

21. Praised students who are trying but no being outstanding academically.

22. Developed counseling program for troubled students.

23. Participated in eligibility and IEP meetings.

24. Involved parents and community members in development of plan for improvement of instruction.

25. Explained the policy at a faculty meeting regarding classroom interruptions.

26. Reinforced the excellent quality of a teacher's lesson presentation with a handwritten note.

27. Visited each teacher's class at least once each school year.

28. Assisted a teacher in developing a plan for improvement.

29. Made teachers aware of additional available resources.

30. Involved teachers in development of a plan for the improvement of instruction.

31. Requested financial support for teachers' requests to attend instructional conferences, workshops, and seminars.

32. Attempted to meet each teacher's needs for instructional supplies.

33. Spoken to the teachers about the goals of the school.

34. Talked with students in corridors.

35. Assisted teachers in the identification and placement of special education pupils.

36. Assigned an effective teacher to another teacher who needs help.

37. Distributed a summary of the school's test results to all faculty members.

38. Discussed with the faculty the school's current achievement results and the school's achievement goals.

39. Worked with teachers to develop a list of goals for the school.

40. Involved teachers in budgeting for instructional materials.

41. Provided needed instructional support services (i.e., child study, psychological services, home visitation of students, remedial services) for at-risk students.

42. Worked with a teacher to improve instructional objectives.

43. Encouraged varied means of student evaluation.

44. Reviewed the components of an effective instructional lesson at a faculty meeting.

45. Followed through on teacher suggestions and reported back to them.

46. Conducted an annual survey to get feedback on instruction from parents.

47. Monitored implementation of the plan for improvement of instruction.

48. Checked to assess the quality of lesson plans.

49. Created the staff development plan.

50. Scheduled a definite time to talk with parents of students having problems.

51. Commended a teacher in writing for correlating instructional activities.

52. Worked with teachers to prepare a list by the end of the first semester of students who are not meeting their objectives.

53. Scheduled specific times for parents to visit teachers.

54. Given each teacher written feedback on each class observed.

55. Provided time for teachers to visit the principal to discuss instructional problems.

56. Established, together with staff, achievement goals for the school for students' mastery of basic skills.

57. Established with each teacher specific goals for increasing achievement scores in basic skills.

58. Personally reviewed annual instructional plans with teachers.

59. Provided an inservice for the faculty describing the testing instruments.

60. Asked staff to list students who are improving in basic skills.

Appendix H

Follow-up Letter to Contact Person

November 15, 1990

Contact Person
Elementary School
City, State Zip Code

Dear Contact Teacher,

A packet of surveys was mailed to you on _____ regarding the instructional leadership behavior of elementary principals. If you or any of your teachers have not completed it, please take just a few moments to do so. Your participation is needed to successfully complete this study.

You were selected as the contact teacher for your school. Seven others were selected at random to complete the survey. These surveys were mailed to you for distribution, collection, and return.

If you have already returned the surveys, thank you. If you and the other teachers have recently completed the surveys, please return them as soon as possible in the self-addressed, stamped envelope that was provided.

If there are any questions, please call us at (703) 231-5111. Your participation in this study is greatly appreciated.

Sincerely,

Judy R. Pantelides
Researcher

Glen I. Earthman
Associate Professor

Appendix I

Initial Survey Completed by Experts and Practitioners

MEASURE OF ELEMENTARY PRINCIPALS' INSTRUCTIONAL LEADERSHIP BEHAVIOR

Directions:

Each of the following items is a behavior that may be exhibited by an elementary school principal. Review each behavior and, using the following scale, **indicate the extent to which you believe the behavior reflects effective instructional leadership of a principal**. List any other behaviors that you believe may have been omitted.

1 = not at all
2 = some
3 = much
4 = a great deal

In making your selection, use the following definition of an effective instructional leader:

An effective instructional leader is one who holds high expectations for teacher and student performance, provides instructional assistance to teachers, emphasizes academic goals, evaluates academic achievement, protects instructional time, creates an orderly environment and positive school climate, and emphasizes instruction in the allocation of resources.

Write the number of your selection on the line preceding the item:

____ Supports a teacher in a dispute with parents

____ Supports a teacher having student discipline problems

____ Explains rules of student conduct to students

____ Explains rules of student conduct to parents

____ Is visible in all parts of the building

____ Occasionally eats lunch with students in the cafeteria

1 = not at all
2 = some
3 = much
4 = a great deal

____ Personally confronts students who are misbehaving

____ Talks with students in corridors

____ Distributes the code of conduct handbook to students

____ Distributes the code of conduct handbook to parents

____ Posts the attendance policy on bulletin boards

____ Insures that the home of every absent student is called each day

____ Provides a consultant inservice for school staff on how to deal with disruptive students

____ Develops counseling program for troubled students

____ Enforces the rules of the school with in-school suspension

____ Assigns clerical assistance to teachers for administrative tasks

____ Makes teachers aware of additional available resources

____ Hosts a yearly party for staff and spouses

____ Attends faculty functions outside of school

____ Prepares a report comparing this school's achievement with national norms for current year

____ Prepares a report comparing this school's achievement with national norms for past years

____ Asks staff to name students who are improving in basic skills

____ Uses standardized tests in all grades to determine student academic performance

1 = not at all
2 = some
3 = much
4 = a great deal

____ Prepares a report comparing the school's test scores with the state's test scores

____ Provides diagnostic information on student achievement to teachers

____ Provides group test scores to teachers

____ Works with teachers to prepare a list by the end of the first semester of students who are not meeting their objectives

____ Prepares a grade distribution report after each evaluation period

____ Arranges for advanced work or special experiences for outstanding students

____ Establishes with each teacher specific goals for increasing achievement scores in basic skills

____ Monitors student performance in classrooms to determine level of mastery

____ Prepares a report of test scores by socioeconomic status

____ Distributes a summary of the school's test results to all faculty members

____ Explains the school's test results at a faculty meeting

____ Uses the school's test results to modify an instructional program

____ Explains the school's test results at a community meeting

____ Evaluates student progress on instructional objectives using criterion-referenced tests

____ Analyzes test results at each grade level

1 = not at all
2 = some
3 = much
4 = a great deal

____ Compares the school's test scores with the division's

____ Uses item analysis of testing program to analyze strengths and weaknesses of teachers' instruction

____ Uses item analysis of testing program to analyze strengths and weaknesses of students by class

____ Uses item analysis of testing program to analyze strengths and weaknesses of individual students

____ Distributes the school's testing schedule to all students

____ Distributes the school's testing schedule to all parents

____ Checks all students' progress on grade-level skills at end of year

____ Supervises a test preparation activity for all students

____ Collects a sample of each student's written work for evaluation

____ Provides an inservice for the faculty describing the testing instruments

____ Provides an inservice for the faculty explaining how the test data are to be used to improve student performance

____ Assists a teacher in scoring criterion-referenced achievement tests

____ Assesses effectiveness of remedial programs

____ Assists teachers in developing criteria for retention/promotion

____ Provides a report to parents showing the school's achievement scores

____ Observes a lesson in each teacher's classroom during the first semester

1 = not at all
2 = some
3 = much
4 = a great deal

____ Checks with each teacher to assess whether homework is being reviewed by the teacher

____ Reviews the circulation records of the library to determine how much library material is being used

____ Checks to assess the quality of lesson plans

____ Requires long-term planning by teachers

____ Checks to assess the quality of teachers' annual plans

____ Encourages teachers to use most recent research for instruction in reading

____ Checks to assess whether grades are assigned by teachers on the basis of level of mastery

____ Monitors student progress of basic skills

____ Checks each teacher's system of recording student progress

____ Encourages varied means of student evaluation

____ Personally reviews annual instructional plans with teachers

____ Periodically reviews daily lesson plans with teachers

____ Visits each teacher's class at least once each school year

____ Visits every teacher's class during each major subject (i.e., reading, language arts, and math) at least once during the school year

____ Commends a teacher on the excellent quality of lesson plans

____ Recognizes the excellent quality of a teacher's lesson presentation with a handwritten note

1 = not at all
2 = some
3 = much
4 = a great deal

____ Gives each teacher written feedback on each class visited

____ Reviews all report cards every grading period

____ Counsels with parents regarding helping pupils at home

____ Assists teachers in developing units of instruction to teach objectives

____ Assists teachers in sequencing objectives

____ Involves parents and community members in development of a plan for improvement of instruction

____ Surveys teacher needs in identifying resources necessary to reach instructional objectives

____ Schedules time for teachers to share ideas from conferences and meetings

____ Involves teachers in creating the staff development plan

____ Distributes a copy of the homework policy to teachers

____ Mails suggestions to parents on how to help their children academically

____ Evaluates teachers using student achievement as one criterion

____ Assists media specialist in identifying needs and priorities for materials and equipment

____ Attends all inservice programs conducted for teachers

____ Assigns an effective teacher to another teacher who needs help

____ Plans a model lesson for a teacher's class

1 = not at all
2 = some
3 = much
4 = a great deal

____ Works with a teacher to improve instructional objectives

____ Works in new teacher's class to organize learning activities

____ Works in a teacher's class to improve student time-on-task

____ Works in a teacher's classroom to improve differentiated instructional techniques

____ Requests a teacher take a particular course to improve instructional performance

____ Assists a teacher in developing a plan for improvement

____ Arranges for a consultant to give individual attention to a teacher needing help

____ Hires a consultant to provide a specific program of inservice for teachers

____ Advises a new teacher about how the community feels about discussing social problems in class

____ Publishes an instructional bulletin to staff

____ Disseminates school instructional information to parents

____ Assists teachers in development of criterion-referenced tests

____ Assists teachers in the identification and placement of special education pupils

____ Participates in meetings of child study committees

____ Participates in eligibility and IEP meetings

____ Meets with teachers at grade level-departmental level meetings

1 = not at all
2 = some
3 = much
4 = a great deal

____ Assists teachers in correlating objectives of textbooks, norm-referenced tests and mandated objectives

____ Assists teachers in developing courses of study

____ Demonstrates a teaching strategy at one or more faculty meeting

____ Reviews the components of an effective instructional lesson at a faculty meeting

____ Teaches a lesson using a particular teaching technique

____ Teaches a demonstration lesson for a teacher

____ Works in a teacher's class to demonstrate examples of improved guided practice

____ Demonstrates a technique for a teacher on how to engage a student in learning

____ Demonstrates a classroom management technique for a new teacher

____ Presents at an inservice meeting one characteristic of the effective schools' research

____ Demonstrates examples of meaningful homework assignments for a new teacher

____ Demonstrates a motivational technique for a teacher

____ Demonstrates a technique for a teacher to adjust instruction

____ Demonstrates for a teacher how to provide closure to a lesson

____ Conducts an annual survey to get feedback on instruction from parents

1 = not at all
2 = some
3 = much
4 = a great deal

____ Distributes a guide for parents to help students with studies at home

____ Follows through on teacher suggestions and reports back to them

____ Distributes to parents a list of questions to ask teachers at the parent/teacher conference

____ Reviews cumulative records

____ Establishes a steering committee to plan the school calendar

____ Supports a teacher's request for an inservice program

____ Sends a teacher a specific article on instructional improvement

____ Involves teachers in development of a plan for the improvement of instruction

____ Monitors implementation of the plan for improvement of instruction

____ Evaluates the plan for improvement of instruction

____ Involves teachers in the selection of new teaching staff

____ Provides opportunities for peer coaching

____ Recognizes specific students for their academic achievements at a general assembly

____ Places academic awards in the school trophy case

____ Arranges for speakers for an honor's program

____ Starts or helps to maintain an academic honor's club

____ Announces academic achievement awards in letters to parents

1 = not at all
2 = some
3 = much
4 = a great deal

____ Gets television reporters to cover at least one academic event

____ Writes an article on academic successes of students for the student newspaper

____ Sends a list of high performing students (e.g., honor roll) to the newspaper for publication

____ Announces student academic successes over the school PA system

____ Receives a trophy for outstanding school achievements

____ Writes to parents recognizing students for outstanding academic achievements

____ Calls students to the office for personal congratulations on academic achievements

____ Praises students who are trying but not being outstanding academically

____ Acknowledges students' academic accomplishments in informal settings

____ Writes letters to students who performed well academically

____ Visits special education classes to encourage the success of the students

____ Encourages establishing a PTA scholarship

____ Personally awards a PTA scholarship

____ Personally presents certificates of award for achievement at the end of a grading period

____ Encourages students to compete in academic contests

1 = not at all
2 = some
3 = much
4 = a great deal

____ Addresses the student body about the high academic standing of the school

____ Publishes the school's test scores in the local newspaper

____ Compliments a teacher on his/her knowledge of subject matter

____ Commends a teacher for an excellent demonstration of teaching to objectives

____ Commends a teacher for positive, time-on-task classroom atmosphere

____ Commends a teacher in writing for correlating instructional activities

____ Commends a teacher publicly for positive support of the student evaluation system

____ Commends students in school newsletter for desirable behavior at a school assembly

____ Attends at least one function held by local organizations (e.g., churches, community groups) to honor students for academic achievement

____ Delivers a talk to teachers on students' expected achievement in basic skills

____ Delivers a talk to students on expectations for their achievement in basic skills

____ Speaks to the teachers about the goals of the school

____ Works with teachers to develop a list of goals for the school

____ Conducts a follow-up of previous year's graduates (e.g., last year's 5th graders in a K-5 school)

1 = not at all
2 = some
3 = much
4 = a great deal

____ Establishes, together with staff, achievement goals for the school for students' mastery of basic skills

____ Discusses with the faculty the school's current achievement results and the school's achievement goals

____ Conducts a special assembly for students to announce the school's achievement goals

____ Conducts a special meeting for parents to announce the school's achievement goals

____ Schedules assemblies that meet the goals of the school

____ Is a member of a local civic club

____ Communicates results of division meetings to the staff

____ Visits students' homes to talk with parents

____ Publishes an instructional bulletin to parents

____ Explains the policy for allocation of instructional resources to teachers

____ Distributes a copy of the policy for allocation of instructional resources to all teachers

____ Provides an allotment for each teacher to purchase needed instructional supplies

____ Involves teachers in budgeting for instructional materials

____ Attempts to meet each teacher's needs for instructional supplies

____ Provides needed instructional support services (i.e., child study, psychological services, home visitation of students, remedial services) for at-risk students

1 = not at all
2 = some
3 = much
4 = a great deal

____ Encourages teachers to develop "creative-financing" for needs

____ Requests PTA support for teachers' instructional needs

____ Develops partnerships with outside organizations to improve school conditions

____ Requests financial support for teachers' requests to attend instructional conferences, workshops and seminars

____ Provides time for teachers to visit the principal to discuss instructional problems

____ Establishes a committee of teachers to evaluate classroom interruptions

____ Preplans intercom interruptions

____ Enforces rules that discourage classroom interruptions

____ Explains the policy at a faculty meeting regarding classroom interruptions

____ Distributes a copy of the policy to students regarding classroom interruptions

____ Distributes a copy of the policy to parents regarding classroom interruptions

____ Schedules specific times for parents to visit teachers

____ Schedules a definite time to talk with parents of students having problems

List any other behaviors that you believe may have been omitted.

Appendix J

Results of Validation on Measure of Elementary Principals' Instructional Leadership Behavior

Directions:

Each of the following items is a behavior that may be exhibited by an elementary school principal. Review each behavior and, using the following scale, indicate the extent to which you believe the behavior reflects effective instructional leadership of a principal.

1 = not at all
2 = some
3 = much
4 = a great deal

In making your selection, use the following definition of an effective instructional leader:

An effective instructional leader is one who holds high expectations for teacher and student performance, provides instructional assistance to teachers, emphasizes academic goals, evaluates academic achievement, protects instructional time, creates an orderly environment, and emphasizes instruction in the allocation of resources.

Write the number of your selection on the line preceding the item:

	M	SD
Observes a lesson in each teacher's classroom during the first semester	3.92	.277
Is visible in all parts of the building	3.77	.439
Provides an inservice for the faculty explaining how the test data are to be used to improve student performance	3.77	.439

	M	SD
Recognizes the excellent quality of a teacher's lesson presentation with a handwritten note	3.77	.439
Discusses with the faculty the school's current achievement results and the school's achievement goals	3.77	.439
Provides time for teachers to visit the principal to discuss instructional problems	3.77	.599
Gives each teacher written feedback on each class visited	3.69	.480
Works with teachers to develop a list of goals for the school	3.69	.630
Provides diagnostic information on student achievement to teachers	3.69	.630
Visits each teacher's class at least once each school year	3.69	.855
Surveys teacher needs in identifying resources necessary to reach instructional objectives	3.62	.506
Assesses effectiveness of remedial programs	3.62	.506
Uses the school's test results to modify an instructional program	3.62	.506
Assists a teacher in developing a plan for improvement	3.62	.506
Provides needed instructional support services (i.e., child study, psychological services, home visitation of students, remedial services) for at-risk students	3.62	.650
Involves teachers in budgeting for instructional materials	3.62	.650

	M	SD
Makes teachers aware of additional available resources	3.62	.650
Develops partnerships with outside organizations to improve school conditions	3.62	.650
Enforces rules that discourage classroom interruptions	3.62	.650
Visits every teacher's class during each major subject (i.e., reading, language arts, and math) at least once during the school year	3.54	.519
Explains the school's test results at a community meeting	3.54	.519
Evaluates the plan for improvement of instruction	3.54	.519
Involves teachers in development of a plan for the improvement of instruction	3.54	.519
Reviews the components of an effective instructional lesson at a faculty meeting	3.54	.660
Follows through on teacher suggestions and reports back to them	3.54	.660
Conducts an annual survey to get feedback on instruction from parents	3.46	.519
Encourages varied means of student evaluation	3.46	.519
Works with a teacher to improve instructional objectives	3.46	.519
Establishes, together with staff, achievement goals for the school for students' mastery of basic skills	3.46	.519

	M	SD
Requests financial support for teachers' requests to attend instructional conferences, workshops and seminars	3.46	.660
Provides opportunities for peer coaching	3.46	.660
Encourages teachers to use most recent research for instruction in reading	3.46	.660
Explains the school's test results at faculty meeting	3.46	.660
Analyzes test results at each grade level	3.46	.660
Attempts to meet each teacher's needs for instructional supplies	3.46	.776
Talks with students in corridors	3.46	.776
Monitors implementation of the plan for improvement of instruction	3.38	.506
Involves teachers in creating the staff development plan	3.38	.506
Commends a teacher in writing for correlating instructional activities	3.38	.506
Establishes with each teacher specific goals for increasing achievement scores in basic skills	3.38	.650
Personally reviews annual instructional plans with teachers	3.38	.650
Schedules a definite time to talk with parents of students having problems	3.38	.650
Checks to assess the quality of lesson plans	3.38	.650

	M	SD
Speaks to the teachers about the goals of the school	3.38	.768
Praises students who are trying but not being outstanding academically	3.38	.768
Acknowledges students' academic accomplishments in informal settings	3.38	.768
Periodically reviews daily lesson plans with teachers	3.38	.768
Commends a teacher for positive, time-on-task classroom atmosphere	3.31	.630
Participates in eligibility and IEP meetings	3.31	.630
Assists teachers in the identification and placement of special education pupils	3.31	.630
Distributes a summary of the school's test results to all faculty members	3.31	.630
Schedules specific times for parents to visit teachers	3.31	.630
Provides an inservice for the faculty describing the testing instruments	3.31	.630
Asks staff to name students who are improving in basic skills	3.31	.630
Assigns an effective teacher to another teacher who needs help	3.31	.751
Recognizes specific students for their academic achievements at a general assembly	3.31	.751
Works with teachers to prepare a list by the end of the first semester of students who are not meeting their objectives	3.31	.751

	M	SD
Involves parents and community members in development of a plan for improvement of instruction	3.31	.751
Develops counseling program for troubled students	3.31	.751
Provides group test scores to teachers	3.31	.751
Preplans intercom interruptions	3.31	.855
Explains the policy at a faculty meeting regarding classroom interruptions	3.31	.855
Requires long-term planning by teachers	3.23	.599
Participates in meetings of child study committees	3.23	.599
Compares the school's test scores with the division's	3.23	.599
Commends a teacher on the excellent quality of lesson plans	3.23	.599
Assists teachers in developing criteria for retention/promotion	3.23	.599
Explains rules of student conduct to parents	3.23	.725
Establishes a committee of teachers to evaluate classroom interruptions	3.23	.725
Visits special education classes to encourage the success of the students	3.23	.725
Commends a teacher for an excellent demonstration of teaching to objectives	3.23	.725
Demonstrates a motivational technique for a teacher	3.23	.725

	M	SD
Prepares a report comparing this school's achievement with national norms for current year	3.23	.725
Prepares a report comparing this school's achievement with national norms for past years	3.23	.725
Calls students to the office for personal congratulations on academic achievements	3.23	.832
Monitors student performance in classrooms to determine level of mastery	3.23	.832
Provides an allotment for each teacher to purchase needed instructional supplies	3.23	.832
Work's in a teacher's class to improve student time-on-task	3.23	1.013
Schedules time for teachers to share ideas from conferences and meetings	3.15	.555
Presents at an inservice meeting one characteristic of the effective schools' research	3.15	.555
Requests PTA support for teachers' instructional needs	3.15	.689
Commends a teacher publicly for positive support of the student evaluation system	3.15	.689
Checks to assess the quality of teachers' annual plans	3.15	.689
Provides a report to parents showing the school's achievement scores	3.15	.689
Demonstrates for a teacher how to provide closure to a lesson	3.15	.801
Explains the policy for allocation of instructional resources to teachers	3.15	.899

	M	SD
Monitors student progress of basic skills	3.15	.987
Evaluates student progress on instructional objectives using criterion-referenced tests	3.15	.987
Works in a teacher's classroom to improve differentiated instructional techniques	3.15	1.068
Checks to assess whether grades are assigned by teachers on the basis of level of mastery	3.08	.760
Checks with each teacher to assess whether homework is being reviewed by the teacher	3.08	.760
Demonstrates a technique for a teacher to adjust instruction	3.08	.760
Encourages students to compete in academic contests	3.08	.760
Distributes a copy of the policy to parents regarding classroom interruptions	3.08	.760
Writes letters to students who performed well academically	3.08	.760
Announces student academic successes over the school PA system	3.08	.760
Assists teachers in correlating objectives of textbooks, norm-referenced tests and mandated objectives	3.08	.862
Writes to parents recognizing students for outstanding academic achievements	3.08	.862
Supports a teacher having student discipline problems	3.08	.954
Works in new teacher's class to organize learning activities	3.08	.954

	M	SD
Arranges for advanced work or special experiences for outstanding students	3.08	.954
Announces academic achievement awards in letters to parents	3.00	.707
Teaches a lesson using a particular teaching technique	3.00	.816
Distributes a copy of the policy for allocation of instructional resources to all teachers	3.00	.816
Demonstrates a teaching strategy at one or more faculty meeting	3.00	.816
Prepares a report comparing the school's test scores with the state's test scores	3.00	.816
Arranges for a consultant to give individual attention to a teacher needing help	3.00	.816
Disseminates school instructional information to parents	3.00	.816
Distributes a guide for parents to help students with studies at home	3.00	.816
Compliments a teacher on his/her knowledge of subject matter	3.00	.816
Delivers a talk to teachers on students' expected achievement in basic skills	3.00	.816
Teaches a demonstration lesson for a teacher	3.00	.816
Publishes an instructional bulletin to parents	3.00	1.913
Delivers a talk to students on expectations for their achievement in basic skills	3.00	.913

	M	SD
Checks all students' progress on grade-level skills at end of year	3.00	.913
Schedules assemblies that meet the goals of the school	2.92	.641
Demonstrates examples of meaningful homework assignments for a new teacher	2.92	.664
Evaluates teachers using student achievement as one criterion	2.92	.760
Explains rules of student conduct to students	2.92	.760
Sends a list of high performing students (e.g., honor roll) to the newspaper for publication	2.92	.760
Distributes the school's testing schedule to all parents	2.92	.760
Supports a teacher's request for an inservice program	2.92	.862
Personally presents certificates of award for achievement at the end of a grading period	2.92	.862
Meets with teachers at grade level-departmental level meetings	2.92	.862
Distributes a copy of the policy to students regarding classroom interruptions	2.92	.862
Uses item analysis of testing program to analyze strengths and weaknesses of teachers' instruction	2.92	1.038
Attends all inservice programs conducted for teachers	2.92	1.038
Involves teachers in the selection of new teaching staff	2.92	1.115

	M	SD
Uses item analysis of testing program to analyze strengths and weaknesses of individual students	2.92	1.188
Uses standardized tests in all grades to determine student academic performance	2.85	.689
Gets television reporters to cover at least one academic event	2.85	.689
Occasionally eats lunch with students in the cafeteria	2.85	.689
Provides a consultant inservice for school staff on how to deal with disruptive students	2.85	.689
Prepares a grade distribution report after each evaluation period	2.85	.801
Communicates results of division meetings to the staff	2.85	.801
Demonstrates a classroom management technique for a new teacher	2.85	.801
Writes an article on academic successes of students for the student newspaper	2.85	.801
Demonstrates a technique for a teacher on how to engage a student in learning	2.85	.899
Conducts a follow-up of previous year's graduates (e.g., last year's 5th graders in a K-5 school)	2.85	.899
Distributes the code of conduct handbook to parents	2.85	1.068
Supports a teacher in a dispute with parents	2.85	1.068
Insures that the home of every absent student is called each day	2.85	1.068

	M	SD
Uses item analysis of testing program to analyze strengths and weaknesses of students by class	2.85	1.144
Conducts a special meeting for parents to announce the school's achievement goals	2.77	.599
Attends at least one function held by local organizations (e.g., churches, community groups) to honor students for academic achievement	2.77	.599
Assists teacher in developing units of instruction to teach objectives	2.77	.599
Requests a teacher take a particular course to improve instructional performance	2.77	.725
Mails suggestions to parents on how to help their children academically	2.77	.725
Enforces the rules of the school with in-school suspension	2.77	.725
Assists teacher in developing courses of study	2.77	.725
Hires a consultant to provide a specific program of inservice for teachers	2.77	.832
Assists teachers in development of criterion-referenced tests	2.77	.832
Works in teacher's class to demonstrate examples of improved guided practice	2.77	.927
Addresses the student body about the high academic standing of the school	2.77	.927
Places academic awards in the school trophy case	2.77	1.013
Checks each teacher's system of recording student progress	2.77	1.013

	M	SD
Collects a sample of each student's written work for evaluation	2.77	1.166
Assists media specialist in identifying needs and priorities for materials and equipment	2.69	.630
Conducts a special assembly for students to announce the school's achievement goals	2.69	.630
Counsels with parents regarding helping pupils at home	2.69	.630
Reviews cumulative records	2.69	.751
Starts or helps to maintain an academic honor's club	2.69	.751
Publishes an instructional bulletin to staff	2.69	.855
Commends students in school newsletter for desirable behavior at a school assembly	2.69	.947
Supervises a test preparation activity for all students	2.69	1.182
Sends a teacher a specific article on instructional improvement	2.62	.506
Assists teachers in sequencing objectives	2.62	.768
Establishing a steering committee to plan the school calendar	2.62	.870
Plans a model lesson for a teacher's class	2.62	.961
Reviews the circulation records of the library to determine how much library material is being used	2.62	1.044
Prepares a report of test scores by socio-economic status	2.62	1.044

	M	SD
Advises a new teacher about how the community feels about discussing social problems in class	2.54	.776
Encourages teachers to develop "creative-financing" for needs	2.54	.877
Visits student's homes to talk with parents	2.54	.877
Attends faculty functions outside of school	2.54	.877
Assigns clerical assistance to teachers for administrative tasks	2.54	.877
Distributes a copy of the homework policy to teachers	2.54	.967
Reviews all report cards every grading period	2.46	.660
Receives a trophy for outstanding school achievements	2.46	.660
Arranges for speakers for an honor's program	2.46	.776
Distributes the code of conduct handbook to students	2.46	1.050
Encourages establishing a PTA scholarship	2.38	.870
Personally awards a PTA scholarship	2.38	.870
Distributes the school's testing schedule to all students	2.31	.947
Is a member of a local civic club	2.23	.832
Posts the attendance policy on bulletin boards	2.23	.832
Distributes to parents a list of questions to ask teachers at the paren/teacher conference	2.23	.832
Hosts a yearly party for staff and spouses	2.23	1.091

	M	SD
Publishes the school's test scores in the local newspaper	2.08	.760
Assists a teacher in scoring criterion-referenced achievement tests	1.77	.725

Appendix K

Comparison of Elementary and Secondary Measures of Instructional Leadership Behaviors of Principals

	Elementary		Secondary	
	$\bar{x}$	SD	$\bar{x}$	SD
Observes a lesson in each teacher's classroom during the first semester	3.92	.28	3.79	.54
Is visible in all parts of the building	3.77	.44	3.68	.58
Provides an inservice for the faculty explaining how the test data are to be used to improve student performance	3.77	.44	3.74	.56
Reinforces the excellent quality of a teacher's lesson presentation with a handwritten note	3.77	.44	3.58	.61
Discusses with the faculty the school's current achievement results and the school's achievement goals	3.77	.44	3.90	.32
Provides time for teacher to visit the principal to discuss instructional problems	3.77	.60	3.53	.77
Gives each teacher written feedback on each class visited	3.69	.48	3.74	.65
Works with teachers to develop a list of goals for the school	3.69	.63	3.79	.54
Provides diagnostic information on student achievement to teachers	3.69	.63	3.63	.60
Visits each teacher's class at least once each school year	3.69	.85	3.42	.96
Surveys teacher needs in identifying resources necessary to reach instructional objectives	3.62	.51	3.63	.50
Assesses effectiveness of remedial programs	3.62	.51	3.84	.38

Uses the school's test results to modify an instructional program	3.62	.51	3.79	.54
Assists a teacher in developing a plan for improvement	3.62	.51	3.84	.38
Provides needed instructional support services (i.e., child study, psychological services, home visitation of students, remedial services) for at-risk students	3.62	.65	*	*
Involves teachers in budgeting for instructional materials	3.62	.65	3.68	.48
Makes teachers aware of additional available resources	3.62	.65	*	*
Develops partnerships with outside organizations to improve school conditions	3.62	.65	*	*
Enforces rules that discourage classroom interruptions	3.62	.65	3.79	.54
Explains the school's test results at a community meeting	3.54	.52	3.11	.66
Evaluates the plan for improvement of instruction	3.54	.52	3.95	.23
Involves teachers in development of a plan for the improvement of instruction	3.54	.52	3.95	.23
Reviews the components of an effective instructional lesson at a faculty meeting	3.54	.66	3.58	.61
Follows through on teacher suggestions and reports back to them	3.54	.66	3.74	.45
Conducts an annual survey to get feedback on instruction from parents	3.46	.52	3.10	.81
Encourages varied means of student evaluation	3.46	.52	*	*
Works with a teacher to improve instructional objectives	3.46	.52	4.00	.00

Establishes, together with staff, achievement goals for the school for student's mastery of basic skills	3.46	.52	3.84	.38
Requests financial support for teachers' requests to attend instructional conferences, workshops and seminars	3.46	.66	*	*
Provides opportunities for peer coaching	3.46	.66	*	*
Encourages teachers to use most recent research for instruction in reading	3.46	.66	2.71	.77
Explains the school's test results at a faculty meeting	3.46	.66	3.47	.70
Analyzes test results at each grade level	3.46	.66	3.53	.70
Attempts to meet each teacher's needs for instructional supplies	3.46	.78	3.58	.69
Talks with students in corridors	3.46	.78	3.37	.68
Monitors implementation of the plan for improvement of instruction	3.38	.51	3.95	.23
Involves teachers in creating the staff development plan	3.38	.51	3.79	.42
Commends a teacher in writing for correlating instructional activities	3.38	.51	*	*
Establishes with each teacher specific goals for increasing achievement scores in basic skills	3.38	.65	3.84	.38
Personally review annual instructional plans with teachers	3.38	.65	3.95	.23
Schedules a definite time to talk with parents of students having problems	3.38	.65	3.58	.61
Checks to assess the quality of lesson plans	3.38	.65	3.79	.56
Speaks to the teachers about the goals of the school	3.38	.77	3.74	.56
Praises students who are trying but not being outstanding academically	3.38	.77	3.53	.61

Acknowledges students' academic accomplishments in informal settings	3.38	.77	3.37	.49
Periodically reviews daily lesson plans with teachers	3.38	.77	3.58	.61
Commends a teacher for positive, time-on task classroom atmosphere	3.31	.63	3.68	.58
Participates in eligibility and IEP meetings	3.31	.63	3.42	.61
Assists teachers in the identification and placement of special education pupils	3.31	.63	3.37	.60
Distributes a summary of the school's test results to all faculty members	3.31	.63	3.16	.77
Schedules specific times for parents to visit teachers	3.31	.63	3.47	.70
Provides an inservice for the faculty describing the testing instruments	3.31	.63	3.32	.67
Asks staff to list students who are improving in basic skills	3.31	.63	3.16	.60
Assigns an effective teacher to another teacher who needs help	3.31	.75	3.32	.67
Works with teachers to prepare a list by the end of the first semester of students who are not meeting their objectives	3.31	.75	3.47	.70
Involves parents and community members in development of a plan for improvement of instruction	3.31	.75	3.74	.45
Develops counseling program for troubled students	3.30	.75	3.53	.51
Provides group test scores to teachers	3.31	.75	3.26	.87
Preplans intercom interruptions	3.31	.85	3.37	.83
Explains the policy at a faculty meeting regarding classroom interruptions	3.31	.44	3.63	.68

* These items were not measured on the secondary instrument.

Appendix L

Analysis of Variance Results for Factors Regressed on Student Achievement

	Factors			
	1	2	3	4
Mean Square Regression	31.23	576.27	94.80	448.80
Mean Square Residual	134.38	126.60	133.47	128.41
DF Regression	1	1	1	1
DF Residual	70	70	70	70
F	.23	4.55	.71	3.50
R-Squared	.003	.06[1]	.01	.05[2]

[1] $p < .05$
[2] $p < .10$

Key to Factors:

1. Providing General Communication
2. Monitoring Instruction and Testing
3. Planning
4. Providing Instructional Feedback

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Experience

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1989	Superivsor of Student Teachers, Old Dominion University, Norfolk, VA
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1982-89	Assistant Principal - Westhaven Elementary School, Portsmouth Public Schools, Portsmouth, VA
1978-82	Mathematics Specialist/Lead Teacher, Portsmouth Public Schools, Portsmouth Public Schools
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