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A Study of the Relationship Among Instructional Leadership  
Behaviors of the School Principal  
and Selected School-Level Characteristics

by  
L. Bruce Sheppard

Thesis presented to the School of Graduate Studies and  
Research in partial fulfillment of the requirements  
for the degree of  
Doctor of Philosophy in Education

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## Abstract

This study examined the relationship among instructional leadership behaviors of the school principal and selected school-level characteristics. Instructional leadership was considered from a "broad" perspective to include behaviors that have been identified through research primarily based on a goal attainment model of effectiveness. In such a model school effectiveness is measured by student achievement on standardized tests. The selected school-level characteristics were Teacher Commitment, Professional Involvement, and Innovativeness. These have been identified as characteristics of an effective school by those adhering to a systems resource perspective.

The study was conducted in the Province of Newfoundland and Labrador. Data were collected from a random sample of teachers in elementary and high schools in that province. Usable data were received from 624 teachers. The instrument employed to measure instructional leadership was the Principal Instructional Management Rating Scale (PIMRS) (Hallinger, 1992). The school-level characteristics were measured by selected scales of the School Organizational Climate Questionnaire (Giddings & Dellar, 1990).

The hypotheses were as follows:

Hypothesis 1. There is a positive relationship among instructional leadership behaviors exhibited by principals and the level of teacher commitment to and support of the school.

Hypothesis 2. There is a positive relationship among instructional leadership behaviors exhibited by principals and the level of teacher professional involvement.

Hypothesis 3. There is a positive relationship among instructional leadership behaviors exhibited by principals and the level of innovativeness in the school.

Hypothesis 4 (A). School type (elementary or high) does not affect the relationship among instructional leadership behaviors exhibited by principals and teacher commitment.

Hypothesis 4 (B). School type (elementary or high) does not affect the relationship among instructional leadership behaviors exhibited by principals and teacher professional involvement.

Hypothesis 4 (C). School type (elementary or high) does not affect the relationship among instructional leadership behaviors exhibited by principals and teacher innovativeness.

These hypotheses were tested using Multiple Regression Analysis. Only two of these hypotheses were not supported. These were hypothesis 4(B) and hypothesis 4(C). The relationship among instructional leadership behaviors of principals and the school-level characteristics of

Innovativeness and professional involvement were found to be statistically different for each school type.

In addition to hypothesis testing, a process of modelling was employed. This process resulted in the development of five separate models. One model for Teacher Commitment for both elementary and high schools, and separate models for Innovativeness and Professional Involvement for each school type. While the instructional leadership behaviors for each model differ, all 10 behaviors of the Hallinger-Murphy conceptualization are included in at least one model.

The results of this study reinforce the validity of the "broad" conceptualization of instructional leadership in the development of effective schools. It suggests that such a conceptualization is compatible with both the goal attainment and systems resource perspectives of organizational effectiveness. The findings bring into question arguments that instructional leadership is negatively related to Teacher Commitment, Professional Involvement, and Innovativeness. Finally, the developed models should be of value to practitioners and researchers as they attempt to determine leadership practices that will lead to new levels of school effectiveness.

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## INTRODUCTION

Organizations have become ubiquitous and essential in modern life (Miles, 1980). As a consequence of their prominence, organizations have been the subject of considerable theorizing and research, and there exists a multiplicity of conceptualizations of organizations ranging from rational entities in pursuit of goals to organized anarchies. Given the primary importance of organizations in modern society, it is not surprising that the question of organizational effectiveness has received much attention. In spite of such emphasis, the construct of organizational effectiveness remains enigmatic (Cameron & Whetten, 1983; Miles, 1980); however, despite the ambiguity, there appears to be a general consensus that the diversity results from differing organizational views. The two dominant views that form the basis of research on organizational effectiveness are the goal attainment model and the systems resource model (Miles, 1980; Steers, 1976).

The effectiveness of schools, one type of organization, has been studied primarily from a goal attainment perspective. Most of the effective schools research has been dependent upon student performance on standardized achievement tests (Bosker & Scheerens, 1989; Cuban, 1984;

Murphy, Hallinger, & Mesa, 1985; Pltner, 1988a). Like other effectiveness research based solely upon goal achievement, the school effectiveness research has been criticized as overly narrow. Ginsberg (1988a) opines that such a narrow approach to effectiveness in schools may be the major obstacle to the determination of a plan of action. Glickman (1987) suggests that "effective" schools determined through such a narrow definition may not be "good" schools.

Related to the effectiveness research is the study of leadership, as researchers and theorists attempt to ascertain the role of leadership in organizational effectiveness. While there is general acceptance of the idea that strong leadership is of primary importance to most organizations, there is considerable debate concerning the nature of such leadership (Bass, 1981).

As a consequence of the inconclusiveness of the general leadership research and the findings of effective schools research of the importance of strong instructional leaders, leadership studies in education have narrowed from a focus on general leadership orientations such as style, decision-making, and group leadership, to a focus on the specifics of behaviors of school principals as instructional leaders (Boyan, 1988). Research based on this narrowed focus has led to a cautious, but widespread acceptance that there are specific instructional leadership behaviors related to school effectiveness. Analysis of the research literature

Indicates that the functions most noted are consistent with the conceptualization proposed by Hallinger and Murphy (1985) that consists of 11 behavioral functions. However, since such conceptualizations have been formulated on the basis of a goal oriented approach to effectiveness, there is considerable skepticism in the field, accompanied by caveats that such behaviors are inherently rational and bureaucratic and may negatively impact upon other essential aspects of the organization as defined by those adhering to the systems resource or the process perspective. For example, Griffiths, Stout, and Forsyth (1988) note that "many of those who study modern successful organizations say that administrators should be quite the opposite of the [instructional leader]" (p. 287). They contend that behaviors that are consistent with instructional leadership are indicative of the type of leadership that, increasingly, organizational theorists and researchers are suggesting meddle, over-manage, and get in the way (Astuto & Clarke, 1986).

If we consider both perspectives as holding valued characteristics of effectiveness, it becomes important that efforts attempting to bring about one are not negatively related to the other (Sergiovanni 1991). While there are suggestions in the literature that a "broad" conceptualization such as proposed by Hallinger and Murphy (1985) may be compatible with both schools of thought (Firestone & Wilson, 1985; Hanson, 1991), little research has been conducted to address this issue. It is in reference

to this identified need for research that this study was conducted.

The purpose of this study was to determine the nature of the relationships among instructional leadership behaviors derived through the goal attainment perspective and specific school-level process characteristics that have been identified as essential to an effective organization. It was hoped that the findings of this research would contribute to the development of a conceptualization of instructional leadership that is consistent with both major perspectives of organizational effectiveness. Additionally, the data were analyzed to identify models that best describe the relationship among instructional leadership behaviors and selected school-level effectiveness characteristics. It was the intent that the findings would provide guidelines for future research and prove useful to practitioners in providing guidelines for practice, training and professional development of principals.

The first chapter in this study is a review of literature which includes a discussion of organizational and school effectiveness, instructional leadership, differing perspectives of the relationship between instructional leadership and school effectiveness, the statement of the problem, the research questions and the hypotheses. The second chapter is the design of the study, the third chapter is the presentation of results and the development of

models, the fourth chapter is the discussion of the results and implications for research and practice. The final chapter is the summary, conclusions, and recommendations for further research.

## REVIEW OF LITERATURE

In this chapter, the background to this study is presented and a rationale is developed. The chapter begins with a discussion of the difficulties related to the study of organizational effectiveness as a consequence of differing organizational perspectives. This is followed by a review of the major findings of school effectiveness research which highlights the importance of the school principal as an instructional leader. Subsequent sections relate specifically to instructional leadership. Firstly, a review of research identifying instructional leadership as essential is conducted. This is followed by an analysis of the problems of definition that have contributed to inconsistencies in the literature. This analysis results in the determination of a generally supported conceptualization of instructional leadership which is accepted for this particular study. The chapter is concluded by a review of differing perspectives of the relationship of instructional leadership with school effectiveness, a summary of the need for further research in the field, the statement of the problem, the research questions, and the hypotheses.

## Organizational Effectiveness

As a consequence of the central importance of organizations in our lives, considerable attention has been given to the study of organizational effectiveness. Indeed, Lewin and Minton (1986) comment that organizational effectiveness has been a subject of study for over a century. In spite of the emphasis that has been placed on the construct of effectiveness, considerable ambiguity and conceptual disarray surround it (Cameron and Whetten, 1983). Miles (1980) illustrates the range of disagreement as he cites definitions from eight writers in the field. For example, Etzioni defines effectiveness as "the ability of an organization to achieve its goals" (Miles, 1980, p.355), while Yuchtman and Seashore define it as "the ability of the organization...to exploit its environment in the acquisition of scarce and valued resources" (Miles, 1980, p. 355).

Such disagreement in the understanding of the construct has caused some writers to advocate abandoning this field of study (Goodman, Atkin, & Schoorman, 1983; Hannan & Freeman, 1977). However, others, like Miles (1980), argue that the variety of definitions and differing criteria associated with the term effectiveness indicate the complexity of the concept, but knowledge of such complexity does not diminish its importance in organizational studies.

Cameron and Whetten (1983) contend that the construct of organizational effectiveness is central to all organizational theory, research, and practice, and thus cannot be abandoned. They argue that it is the variety in conceptualizations of organizations that has led to the multiplicity of definitions of effectiveness: "Organizations have been called networks of objects, rational entities in pursuit of goals, coalitions of powerful constituencies, individual need-meeting cooperatives, meaning-producing systems, information processing units, open systems, collegiums, garbage cans, language games, psychic prisons, machines, social contracts, and so on" (Cameron & Whetten, 1983, p. 4). Since each conceptualization highlights a different aspect of organizations, it becomes quite evident that in the absence of a universally accepted conceptualization of organizations there can be no universal model of effectiveness. Goodman and Pennings (1977) concur with this assessment that underlying the differences in definition of organizational effectiveness are the differing views of organizations.

Miles (1980) describes five views of organizations, and discusses how their criteria for effectiveness differ inherently. He states, "Each of the major schools of management thought has had its own view of the nature of organizations, its own definition of organizational effectiveness, and its own preferred set of assessment

criteria" (p. 360). He notes that the scientific-management view is one of a closed system in which workers are relatively passive. The effectiveness indicator concentrates on the throughput process. The human-relations school of thought emphasizes the human aspect of the organization, and concentrates on improving work conditions and work satisfaction as measures of effectiveness. The socio-technical school defines organizational effectiveness in terms of optimization of both the technical and social systems. Those adhering to the organizational-development perspective concentrate on internal processes such as employee self development and the improvement of interpersonal and intergroup linkages as indicators of effectiveness. Finally, those in the microeconomic school of thought attend to economic concerns, and judge effectiveness on cost-profit margins.

Cameron and Whetten (1983) note the diversity of models of organizational effectiveness in the following summary:

The most widely used models of effectiveness are the goal model (Bluedorn, 1980; Price, 1972), the systems resource model (Seashore & Yuchtman, 1967), the internal processes or maintenance model (Bennis, 1966; Nadler & Lushman, 1980); the strategic constituencies model (Connolly, Conlon, & Deutsh, 1980; Keeley, 1978; Pfeffer & Salancik, 1978), and the legitimacy model (Miles & Cameron, 1982; Zammuto, 1982) (p. 7).

Quinn and Rohrbaugh (1981) suggest that research by Campbell (1977) supports the argument that effectiveness criteria are contingent on the organizational perspective purported. Campbell (1977) reviewed the literature on organizations, and determined that there were 30 criteria used to define effectiveness. He concludes that no definitive definition of organizational effectiveness is possible, and that "the meaning of organizational effectiveness is not a truth that is buried somewhere waiting to be discovered if only our concepts and data collection methods were good enough" (p. 15). Similarly, after analysis of Campbell's criteria listing, Miles (1980) formulates a similar conclusion that no organization could, or should, attempt to maximize all these criteria simultaneously since contradictions are inherent among them. In a like manner, Cameron and Whetten (1983) conclude that there cannot be one universal model of organizational effectiveness since the construct space is too broad. They suggest that it appears more appropriate "to concentrate on measuring limited domains of the construct. This requires making informed choices about what criteria to include and what aspect of the organizational effectiveness construct space to focus on.... Multiple indicators of effectiveness are essential" (p. 268). Measurement of effectiveness in such a focused manner requires an understanding that this is just one of several possibilities and that a multiplicity of

other viewpoints may be equally legitimate under different circumstances and with different types of organizations.

Scott (1977) summarizes his position on organizational effectiveness by saying: "the search for universal criteria of organizational effectiveness would appear to be in difficulty because the many parties associated with organizations assess effectiveness by means of different and potentially conflicting criteria and because organizational analysts employ assessment criteria generated by differing and somewhat conflicting models" (p. 74). Scott recommends that since effectiveness cannot be determined through an objective process, and since it must be normative, and related to particular features of organizations, choices must be defended with respect to constituency support or opposition.

Both Miles (1980) and Steers (1976) attempt to simplify the issue of organizational effectiveness. They suggest that there are two major views of organizational effectiveness, the goal-attainment model and the systems resource model. They contend that the construct of effectiveness can be better served through an integrated approach since both models provide valuable, but only partial insights into the question of effectiveness. Sergiovanni (1991) suggests a similar approach to the study of school effectiveness as he distinguishes between a goal attainment approach and a process approach. He suggests, like Miles and Steers, that

both perspectives are essential to providing a more accurate assessment of effectiveness.

This conceptualization of organizational effectiveness (Miles, 1980; Sergiovanni, 1991; Steers, 1976) was accepted for this study. Both the goal attainment model and the process model present valued characteristics of effectiveness, and it is important that efforts attempting to bring about one are not negatively related to the other. The literature review of school effectiveness and instructional leadership that follows is assessed on the basis of this accepted perspective of organizational effectiveness.

### School Effectiveness

As with organizational effectiveness generally, a primary difficulty with school effectiveness research has been the measurement of effectiveness. The complexity of this issue is explicated by Madaus, Alrasian, and Kellaghan (1980) as they note that there are no well-developed theories or models of schooling to which the contemporary researcher can turn, and "there is no general agreement on what the purposes of schooling should be; indeed, such agreement may not be possible in a pluralist democratic society" (p. 18). Further, they state,

It is impossible to enumerate all the possible outcomes which schools can produce.... When a researcher sets out to study a process as complicated as schooling, he or she is faced immediately with constraints which necessitate simplifying the process in order to make research possible. In practice, these constraints usually dictate the investigation of a limited number of important characteristics and the omission of others which may also be relevant. Research studies can never represent the richness and complexity of reality, but instead must abstract or simplify it by selecting a small number of variables for study (p. 15).

Essentially, the effective schools research has been dependent on the goal-attainment model, using student performance on standardized achievement tests as the primary measure of effectiveness. It is argued that this overly narrow perspective of effectiveness is the major weakness of this field of research (Bosker & Screevens, 1989; Cuban, 1984; Glickman, 1987; Murphy, Hallinger, & Mesa, 1985; Pltner, 1988). The current status of effective schools research can be described accurately through several major reviews that have been conducted.

Edmonds (1979) reviewed five effective schools studies using the definition that an effective school is "one in which the children of the poor are at least as well prepared in basic school skills as the children of the middle class"

(p. 28). The first of the studies he reviewed is Weber's (1971) study of four effective inner-city schools in which characteristics of effectiveness identified were strong leadership, high expectations, orderly environment, emphasis on basic skills, regular monitoring of student progress, and pleasant climate. The other studies reviewed by Edmonds are the New York State Office of Education Performance Review of 1974; the Madden, Lawson, and Sweet (1976) study of 21 pairs of high and low achieving schools; and a study conducted by Brookover and Lezotte (1977). While there were some differences in findings, the characteristics identified are, remarkably and consistently, similar to those of Weber, noted above.

Edmonds (1979) refers briefly to his own research. In a study of 20 elementary schools which served predominantly poor and minority children in inner-city Detroit, Edmonds and his colleagues, while controlling for 11 social factors, identified significant differences in school effectiveness. Using the analysis of his own research data and the findings of the aforementioned research literature review, Edmonds concludes that the distinguishing characteristics of effective schools are high expectations for student achievement, strong leadership, orderly atmosphere, healthy climate conducive to learning, emphasis on basic skills, and frequent monitoring of student progress.

Purkey and Smith (1983) conducted an extensive critical review of the school effectiveness literature. The review consisted of various summations of the research, outlier studies, case studies, program evaluations, and other miscellaneous studies. While the authors caution that there are weaknesses in the research, they note that the variety of approaches to research, with differing weaknesses, all point to the characteristics of effective schools as being high staff expectations and morale, a considerable degree of control by the staff over instructional and training decisions in the school, clear leadership from the principal or other instructional figure, clear goals for the school, and a sense of order in the school.

Murphy, Hallinger, and Mesa (1985) conducted a review of school effectiveness research and noted that "although there are weaknesses with the school effectiveness literature, there is enough internal consistency and overlap with the conclusions from other research fields to...implement results where applicable" (p. 622). They argue that it has become quite apparent that certain major factors of effectiveness have become basic assumptions in the development of conceptual frameworks and in model building. Their school effectiveness model includes tightly coupled curriculum, opportunity to learn, direct instruction, clear academic focus and mission, instructional leadership, frequent monitoring of student progress,

structured staff development, high expectations, collaborative organizational processes, student and staff cohesion and support, opportunity for meaningful student involvement, widespread rewards and recognition, orderly environment, and home-school cooperation and support.

Downer (1989) identifies nine key school effectiveness studies that appear to be representative of the period from 1971 to 1986. Each of these nine studies was based on one of three definitions of effectiveness related to either student achievement only; student achievement, attendance rates, delinquency rates, general behavior and attitudes of students; or student character development. On the basis of a comprehensive literature review, with the assistance of eleven experts who were collectively familiar with the factors of effective schools, 10 school effectiveness characteristics were derived. Using these common factors, Downer developed an instrument to measure school effectiveness attitudes of primary constituents (those who have a stake in the operations of a school: students, parents, teachers, principals, and superintendents). These constituents identified seven characteristics as essential for an effective school: distinctive school culture; clearly articulated goals, objectives, and mission; high student expectations; decentralized decision making and collaboration; strong supportive leadership; academic

emphasis; positive supportive external relationships with Board and Board office personnel.

Scheerens and Creemers (1989) and Lezotte (1989) summarize the findings of the effective schools research. Lezotte (1989) reviewed the 20 year history of the effective schools movement in the United States. He notes that while some more recent studies add additional factors, and others attempt to make the original factors more explicit, the five characteristics described by Edmonds (1979) remain the most robust. Scheerens and Creemers (1989) conducted an extensive review of the school effectiveness research from an international perspective. They note that while multilevel conceptual models of school effectiveness are being developed, and study findings are inconsistent, the effectiveness characteristics that are most frequently mentioned are those identified by Edmonds (1979). These are strong educational leadership, high expectations for student achievement, orderly atmosphere, a safe orderly climate, emphasis on basic skills, and frequent evaluation of student progress.

Since a major conclusion of the effective schools research is that successful schools have strong school leaders who promote instruction, it is not surprising that instructional leadership has been emphasized. Griffiths (1979) suggests that the specific focus on instructional leadership came about as a consequence of the social ferment

of the 1960's and the resulting effective schools research. Similarly, Culbertson (1988) remarks that during the same decade, society demanded accountability in educational processes and called for improvements. Such demands resulted in the movement from an emphasis on developing a general theory, to policy research designed to determine the primary means to effective schools. In addition to specifically identifying the school leader as essential, this field of research identified specific characteristics to be emphasized, thus giving rise to the concept of "Instructional" leadership. In order to understand the shift described by Culbertson, and to gain a perspective on the impact of the effective schools research on the study of educational leadership, an overview of the historical development of leadership studies is provided.

#### The Historical Development of Leadership Studies

The study of leadership is a universal phenomenon. It has been observed by anthropologists who have studied the most primitive groups on earth, and discussions of the subject have been traced to the classical era through the Chinese, Egyptian, and Greek classics (Bass, 1981). Such historical prominence, notwithstanding, leadership is not well understood. Burns (cited in Bass, 1981) avows that "leadership is one of the most observed and least understood

phenomena on earth" (p. 5). Bennis (1959) states, "Ironically, probably more has been written and less known about leadership than about any other topic in the behavioral sciences" (p. 259). McCall (1983) laments, "After over forty years of empirical investigation, leadership remains an enigma" (p. 476). McCall (1983) suggests that the inconsistencies and inconclusiveness associated with leadership are related to the lack of a clear definition and the differing theoretical approaches that have been researched. The problem of definition is highlighted by Lorsch (1983) as he refers to leadership literature as the "Tower of Babel". He complains that each scholar has developed his or her own language which forms the basis for values, assumptions, and research. He contends that such differences hamper the progress toward potentially important theoretical results. Stogdill, in his extensive review of leadership research, notes that, "there are almost as many definitions of leadership as there are persons who have attempted to define the concept" (Bass, 1981, p. 7).

In respect to the development of leadership theory, Bennis (1959) points out that "we spot the wreckage of 'trait theory', the 'great man' theory, the 'situationist critique', leadership styles, functional leadership, and finally, leaderless leadership; to say nothing of bureaucratic leadership, charismatic leadership, democratic-autocratic-laissez-faire leadership,

group-centered leadership, leadership by objective, and so on" (p. 260). Obviously, the study of leadership has been far from static. McCall (1983) states,

The search for invariant truth--the-one-best-way approach--may not hold answers, even when the model includes situational moderators.... Researchers are still a long way from an integrated understanding of leadership processes, and equally far from providing organizational leaders with integrated and validated models of leadership (pp. 477-478).

Such inconclusiveness has caused some researchers to question the validity of continuing such broad ranged leadership research. If leadership is indeed situational as suggested by contingency theory (Silver, 1983), it appears potentially more beneficial to focus upon particular organizations with their unique situations, and attempt the development of a middle range theory of leadership that is related to a particular type of organization.

In this context, at the beginning of the 1970's, Burlingame (1973) and Stogdill (1974) were critical of the lack of research in the field of educational leadership, and suggested that research in education had not kept pace with leadership studies in other fields. More recently, but consistent with these observations, Boyan (1988) suggests that one problem with the study of administrative behavior in education is that there has been an overdependence on

conceptual perspectives developed outside schools which underestimate the unique characteristics of educational organizations. However, he notes that in the last 25 years there has been a conceptual shift that has changed the direction of leadership research in education. For example, in 1957, Halpin advocated focusing on decision making and group leadership, whereas, in contrast, in 1982, Bossert, Dwyer, Rowan, and Lee narrowed their research to the specifics of behaviors of school principals as instructional managers.

This movement by researchers to study school leadership specifically has been noted by other researchers as well (Al-Khalifa, 1986; Hall & Hord, 1987; Hoyle, 1986). Hoyle (1986) states that while in the 1960's there was a trend to reject the adjectival view of management, and to argue for management that was applicable universally, educational management is now generally recognized as of a different order. Al-Khalifa (1986) argues that training for management should not be regarded as a matter of direct transfer from one organization to the other. Concurring with Handy (cited in Al-Khalifa, 1986), he contends that school leaders can learn from experiences in industry, but that they would be wise to be different. In like manner, Hall and Hord (1987) state that, "very little leadership research has been conducted in the school setting or been focused on school leaders. To the extent that schools are like other

organizations, this deficiency does not matter, but to the extent that they are different, it matters a great deal" (p. 28).

The inconclusiveness and apparent inadequacy of prevailing leadership research, and the general acceptance that such research had to be more organizationally specific, led educational researchers to focus directly on schools. As these researchers attempted to respond to social demands for school improvement, and more effective schools, they consistently identified the school principal as being critical to school effectiveness. It is the purpose of this next section to review the literature related to the development of this field of research which resulted in an increased emphasis placed upon the importance of the role of the school principal as an instructional leader.

### Instructional Leadership Effects

The issue of the effects of instructional leadership upon school effectiveness has been a subject of considerable research (Leithwood, Begley, Cousins, 1990). Since the 1970's, extensive research on effective schools and related fields such as school improvement, innovation, change, implementation, and instructional leadership has been conducted. Because of the interrelatedness of these fields of research, instructional leadership has been impacted by

findings of the other fields. Shoemaker and Fraser (1981), having reviewed the effective schools studies conducted in the 1970's, comment that "although none of the studies set out to study the role of the principal, most concluded that principals were clearly important in determining the effectiveness of schools" (p. 178). Hall and Hord (1987) maintain that "clearly, the studies of principals, whether in the leadership studies, the studies of effective principals, or the studies of principals as change facilitators, show that the principal is considered to be a prime factor in the process of change and school improvement" (pp. 50-51).

Examples of research that have led to conclusions emphasizing the importance of instructional leadership are provided in Table 1. These research examples are listed according to the primary field of study that was explored. For example, from the field of effective schools research, Gezi (1990), after having reviewed effective schools studies conducted in inner city schools, concludes that all these studies identify the importance of principal leadership in respect to instruction. In their research on school improvement, Cox (1983) and Crandell (1983), in separate reports on the Study of Dissemination Efforts Supporting School Improvement, emphasize that clear, direct leadership from the principal and central office administration leads to successful school improvement efforts. Research related

Table 1

Frequently Cited Studies that Recognize the Importance  
of Instructional Leadership of School Principals

Field of Research	Effective Schools	School Improvement	Change & Innovation	Leadership
Study by	Edmonds (1979)	Cox & Crandell (1983)	Berman & McLaughlin (1976)	Sweeney (1982)
Author	Sergiovanni (1987)	Leithwood & Montgomery (1986)	Fullan (1985)	Ogawa & Hart (1985)
and Year	Cedja (1987)	Louis & Miles (1990)	Hall & Hord, 1987)	
	Gezi (1990)	Hallinger & McCarty (1990)		Heck, Larson, & Marcoulides (1990)

to school change has shown similar support for the necessity of strong leadership. Berman and McLaughlin (1976), in reviewing and synthesizing findings of the first year of the Rand change agent study, note that the active support of the principal is a significant factor in the success of instructional innovation. The importance of instructional leadership becomes more explicit as studies specific to the area are examined. Heck, Larsen, and Marcoulides (1990) developed a theoretical model to determine a causal link between instructional leadership and student achievement using a modeling procedure based on linear structural equations. The sample included all public elementary and high schools in California that had scored above or below the average on standardized tests in reading or mathematics for three consecutive years. The results indicate clearly a direct causal relationship among the principals' behaviors directed toward establishing strong school climate and instructional organization, and the schools' student outcomes.

A review of doctoral dissertations that have studied the relationship between student achievement and instructional leadership as conceptualized by Hallinger and Murphy (1985) indicates general support that the relationship is positive (Dilworth, 1987; Grier, 1989; Jones, 1987; Krug, 1986; Leithner, 1990; O'Day, 1984; Orange, 1990; Parker, 1990; Reid, 1989; Ruzicska, 1989;

Stroud, 1989; Zeanah, 1986). Eleven of these studies were conducted in elementary schools. Nine of them found significant positive relationships among the instructional leadership behaviors of principals and student achievement on standardized tests. The single high school study did not find a significant relationship. This study was conducted in British Columbia by Jones (1987). It used achievement of Grade 12 students on a provincial criterion-referenced English examination as the measure of effectiveness. While primarily positive correlations were found, when control factors were included in the analysis, the principal instructional leadership behaviors had no significant impact. Jones suggests that the research model used was inadequate in that it assumed a direct relationship between the principal behavior and student achievement which might be applicable to the elementary level, but of questionable validity at the high school level. Such a conclusion is supported by other research at the high school level.

Blank (1987) studied the activities of 32 urban high school principals. The principals differed considerably in the degree of leadership shown, and generally, findings did not support a direct relationship among principal behaviors and student performance in mathematics, reading or student attendance. However, the principals' involvement in decision making in curriculum issues and in increasing academic time contributed to improved mathematics scores. Blank suggests

that there were weaknesses in the measures of student performance, and affirms that the findings suggest that principals may have more indirect input through the creation of conditions conducive to good teaching and learning.

The findings of a study by Courtney (1987) support Blank's speculation of indirect effects. Courtney studied the relationship between instructional leadership and teacher stress using a sample of 267 elementary, middle, and high school teachers from two school districts. Significant positive relationships were found between teacher stress (lower stress levels) and specific instructional leadership functions related to promoting a conducive climate to learning.

Hoy, Tarter, and Bliss (1990) reach a similar conclusion in a study relating to effective schools and organizational health. While the behavior of the principal was not found to be directly related to instructional effectiveness, the researchers note the complexity of the links between administrative behavior and student achievement, and further note that the findings support the contention that the principal's influence is indirect through the nurturing of a climate of academic achievement, strong academic press, and high student expectations.

In summary, research reports show a relation among leadership behaviors and student outcomes, school climate, innovation, change, and school improvement. However, even

though the importance of instructional leadership is supported by specific leadership research and a variety of related fields, caution must be exercised in the interpretation of the findings. Murphy, Hallinger and Mesa (1985) warn that the blending of research findings from other fields is not without problems in that the perspective of the researcher may influence conclusions, and the weaknesses of one field is transferred to the other.

In a comprehensive review of the problems associated with the study of instructional leadership, Murphy (1988) identifies methodological, measurement, and conceptual weaknesses. In the area of methodology, the lack of longitudinal research, and the limited nature of research design have prevented researchers from establishing causal relationships among leadership behaviors and other school outcomes. Also, the findings are not generalizable because most studies have been conducted in urban elementary schools in low income communities. Hallinger and Murphy (1987) suggest that there is, "growing concern over the tendency to generalize findings on principals gleaned from studies of elementary schools to their counterparts in secondary school" (p. 18). The conceptual problems referred to by Murphy (1988) relate to the repeated failure of researchers to consider the contextual aspects of leadership and the complexity of schools as formal organizations. Problems of measurement relate to the lack of an adequate definition.

Leithwood, Begley, and Cousins (1990) conclude from their review of the literature on the principalship that further study is required in respect to effective practices since present findings are based on studies limited to urban elementary schools. The growing concern over the tendency to apply findings from elementary to secondary schools is becoming increasingly recognized; however, research findings of studies attempting to determine differences have not been consistent ( Daresh & Liu, 1985; Farrar, Neufeld, & Miles, 1983; Lee, 1987; Little & Bird, 1987).

Zirkei and Greenwood (1987) recognize the limitations associated with instructional leadership research and suggest that the lack of a clear definition causes discrepancies in the research findings. They note that terminology such as "instructional leadership" often becomes mere incantations that mask different perceptions of what the particular concept really is. They argue, therefore, that a clear definition must be established before broad, prescriptive conclusions can be pronounced.

Avila (1990) and Ginsberg (1988b) concur with these concerns as they contend that the lack of definition is a major constraint in the development of instructional leadership. They argue that adequate training and staff development programs cannot be developed until the question of definition is settled.

The following section is a review of the inconsistencies of definition that exist in the literature. It concludes with the definition of instructional leadership that is employed in this study.

#### A Definition of Instructional Leadership

In spite of the support for the necessity of strong leadership for effective schools, there are inconsistencies and conflicting findings (Zirke & Greenwood, 1987). As noted above, a primary source of these discrepancies is the absence of a single clear definition of instructional leadership. It is the purpose of this section to present the differing conceptualizations, and to define clearly the construct of instructional leadership as employed in this study.

The literature appears to support two general concepts of instructional leadership. For the purpose of clarification, these will be classified as "narrow" and "broad" on the basis of scope. The "narrow" definition focuses on instructional leadership as a separate entity from administration (Murphy, 1988). In the "narrow" view, instructional leadership is defined as those actions that are directly related to teaching and learning--observable behaviors such as classroom supervision. In the "broad" view, instructional leadership entails all leadership

activities that impact upon student learning. Those who subscribe to the "broad" view contend that routine managerial behaviors contribute as much to improved teaching and learning as direct instructional behaviors ( Donmoyer & Wagstaff, 1990; Murphy, 1988).

Many researchers who subscribe to Edmonds' (1979) definition of an instructional leader, appear to adhere to the "narrow" perspective. From his studies on effective schools, he determined that strong instructional leaders spend a great deal of time in classrooms and regularly offer suggestions to improve teaching.

Firestone and Harriott (1982) accept the narrow definition in a study which compares characteristics of effective elementary schools with those of secondary schools. They conclude that instructional leadership is not appropriate for high schools since they conform more to the loosely coupled concept of organizations due to subject specialization. They argue that since instructional leadership is based on "expert" power, it is not appropriate in such a setting.

Adhering to a comparable definition, Glatthorn and Newberg (1984) reach similar conclusions in support of a position against the importance of the principal as an instructional leader at the high school level. They contend that a team approach to school improvement, rather than strengthening instructional leadership is more appropriate

In the secondary school. They argue that secondary schools are "loosely coupled", that the teachers are subject matter specialists, and that in such a setting, principals cannot be instructional leaders. Instructional leaders give feedback about instruction, provide incentives for implementing programs, demonstrate a visible commitment to the program, and monitor the progress of all students. The principal, they maintain, can serve a more useful role in providing general management functions.

Other researchers who have maintained this "narrow" definition of instructional leadership are those who equate it with a narrow perspective of supervision. Bruss (1985) presents a model of the principal and other school personnel as instructional leaders trained in the clinical supervision model of Madeleine Hunter. Smyth (1983) views supervision of instruction through a "reflective" clinical supervision approach as the objective of instructional leadership. His "narrow" view is explicit in his statement that "it would seem that the principal's role as an instructional leader, knowledgeable in pedagogy and classroom processes, is very much subservient to his or her role as plant manager" (p. 55). Correspondingly, Bailey and Wicks (1990) contend that supervision is the vehicle that allows the principal to practice instructional leadership. They define supervision as monitoring and analyzing curriculum implementation, teacher effectiveness, and student learning outcomes.

This "narrow" definition has been a basic assumption underlying instructional leadership studies that have modeled the Mintzberg (1979) approach to the study of management. These studies generally conclude that principals are not actively involved as instructional leaders, and that they spend the greatest portion of time in management activities (Kmetz & Willower, 1982; Martin & Willower, 1981). From a review of a number of these Mintzberg type studies, Murphy (1987) concludes that, "most principals do not act as instructional leaders. Rather in most districts and schools, curriculum and instruction are managed by default" (p. 2). As a result of such a distinction between instructional and management concerns, both practitioners and researchers have questioned the viability of the concept of instructional leadership. It is in this respect that Anderson and Pigford (1987) question whether principals have adequate time to complete the necessary tasks required of an instructional leader. To overcome this problem, they suggest that principals who wish to be instructional leaders must delegate as many non-instructional responsibilities as possible and create an expectation that they will be in teachers' classrooms rather than in the office.

Proponents of the "broad" view insist that instructional leadership cannot take place in isolation from other administrative responsibilities. Kroeze (1982), in summarizing his research findings, notes two kinds of

Instructional activities in which instructional leaders are involved: direct activities such as visiting classrooms, and indirect activities such as setting schedules. Similarly, De Bevoise (1984) broadly interprets the concept of instructional leadership as all those actions of the principal, or those delegated by the principal to promote student learning. The actions focus on setting school-wide goals, defining school purpose, providing needed resources, supervising and evaluating teachers, conducting staff development programs, and creating collegial relationships within the school.

After completing an ethnographic study of 12 elementary and junior high school principals, Dwyer (1986c) asserts, "Much of the confusion over the principals' role... stems from overly narrow conceptions of instructional leadership that allow only for the examination of behaviors formally and directly associated with instruction.... We envision the instructional process as involving much more than didactic interactions between teacher and student.... Instructional processes are affected directly and indirectly by the social and organizational features of the school...[which is] in turn affected by its larger context" (p. 67).

In like manner, following an extensive analysis of time spent by principals, Smith and Andrews (1989) conclude that "it is a false dichotomy to draw the distinction between

being a strong building manager and a strong instructional leader" (p. 37).

Further support for the claim that an inappropriate distinction has been made between the manager and the instructional leader is provided by Bartell (1990). She conducted a study of high school principals that had been previously chosen as "outstanding principals of the year" by their state chapters of the National Association of Secondary School Principals. The purpose of this study was to determine how selected effective principals perceived their roles as instructional leaders in their schools. She cautions that in most studies instructional leadership is defined as those actions that are directly connected to teaching and learning, and that other tasks not directly related to instruction are labelled as administrative or management. Her findings support the conclusion that such a "narrow" perspective is a simplistic approach which denies a more holistic understanding of the role of principals as they react to situational contingencies.

In his study of urban high school principals, Blank (1987) conducted interviews with teachers and principals in a national sample of urban comprehensive schools. He found that leadership in successful schools was not differentiated between management and instruction, but that it was multidimensional, in that principals placed emphasis on differing categories of behaviors. He maintains that the

research of the 1980's has crosscut the distinction between educator and administrator.

Pitner and Hocevar (1987) applied confirmatory factor analysis to a multidimensional model developed by Yukl (1982) that identified 14 leadership behaviors. The results of their research confirm the usefulness of such a model in assessing instructional leadership. Similarly, Heck, Larson, and Marcoulides (1990), investigating the validity of an instructional leadership model based on the "broad" perspective, conclude that many important instructional leadership variables that influence student achievement are not related to in-class activities such as clinical supervision.

Support for this "broad" perspective has appeared in the literature throughout the last decade. At the commencement of the decade, Alfonso, Firth, and Neville (1981), while paraphrasing Talcott Parsons, affirm the significance of a broad application of leadership: "The efforts of the organization in working toward its goals cannot continue unless the ongoing demands of maintaining the organization are also satisfied" (p. 61). Sergiovanni and Starratt (1983) state that "realism requires that the [instructional leader] not ignore the organizational context of schools" (p. 44). Toward the end of the decade, Bossert (1988) supports the broad interpretation of instructional leadership as he contends that "a single decision at one

organizational level can have a large effect on student learning" (p. 350).

Murphy (1988) contends that the "narrow" definition underestimates the instructional leadership activities performed by school administration and ignores valuable aspects of the instructional leader's role. He states that "a few rather widely applicable policy initiatives or highly visible facilitative actions may be much more indicative of instructional leadership than a plethora of more concrete and directly observable behaviors" (p. 123).

It is apparent that current research in the field of instructional leadership is not limited by a "narrow" or simplistic approach which defines instructional leaders as principals who spend a significant proportion of their time in classrooms. There is a general recognition that instructional leadership is interrelated with other organizational complexities that determine school effectiveness within the context of an open systems approach. In this study, the "broad" definition of instructional leadership is accepted. From that perspective, a general definition is, "those actions that a principal takes, or delegates to others to promote growth in student learning" (De Bevoise, 1984, p. 15). Within the context of such a "broad" definition, there is considerable consensus in the literature regarding the specific instructional leadership behaviors of principals.

### Instructional Leadership Behaviors

While the absence of a consistent definition has caused inconsistencies in research findings, researchers who adhere to the "broad" definition of instructional leadership and to the goal-attainment model of school effectiveness have reached general agreement in respect to those behaviors that are common to effective instructional leaders. For example, De Bevoise (1984) concludes from a review of the research on the principal as instructional leader that there is agreement about what the functions of instructional leadership are. She notes that "researchers' lists, all include communicating a vision of the school's purposes and standards, monitoring student and teacher performance, recognizing and rewarding good work, and providing effective staff development programs" (p, 20).

After extensive review of the literature relating to instructional leadership, it was determined that 12 major research studies or reviews conducted since 1980 accurately portray the behaviors of instructional leaders. A listing of the instructional behaviors identified by each study can be seen in Table 2. Of the lists identified in Table 2, the list provided by Hallinger and Murphy (1985) contains behaviors similar to the others more consistently than any other. The behavior categories that are noted, but not included in the Hallinger and Murphy listing, generally, are

Table 2  
 Instructional Leadership Behaviors for  
 Effective Schools--A synthesis of Research Findings

Behaviors	Study Identified by Author, Year and School Type											
	Hallinger Murphy 1985 Elem.	Larsen 1987 Elem.	Krug 1990 Elem. High	Rutherford 1985 Elem. High	Dwyer 1986 Elem. J.High	Niece 1989 High	Smith Andrews 1989 Elem. High	Bartell 1990 High	Cotton Savard 1980 Elem. High	Persell Cookson 1982 Not Stated	De Bevoise 1984 Elem. High	Leithwood Begley, Cousins 1990 Elem. High
Forming Goals...	*	*	*	*	?	*	*	*	*	*		*
Communicating Goals...	*	*		*	*	*	*	*	*	*	*	*
Supervising and Evaluating Instruction...	*	*	*	*	*	*	*	*	*	*	*	*
Coordinating the Curriculum...	*	*	*	*		*	*		*			*
Protecting Instructional time...	*	(*)	(*)	(*)		(*)	*	*	*			(*)
Maintaining High Visibility...	*	(*)	(*)	(*)		(*)		(*)	*			(*)
Providing Incentives For Teachers...	*	(*)	(*)	(*)		*	*	(*)		*		(*)
Promoting Professional Development...	*	*	(*)	(*)			*	(*)		*		*
Developing and Enforcing Academic Standards...	*	(*)	(*)	(*)		(*)	*	*	*			*
Providing Incentives For Learning...	*	(*)	(*)	(*)		*	*	(*)		*		(*)
Monitoring Student Progress...	*		*	*	*	*	*	*	*	*	*	*
Knowledgeable in Instructional Matters...						*						*
Marshalling and Allocating Resources...		*			*		*		*			*
Scheduling...					*							*
Modeling...					*							*
Staffing...					*			*				*
Substituting for Staff Members...					*							*
Responding to Community Expectations...								*				*
Accepting Responsibility for Student Behavior		*						*		*		*
Consults Effectively With Others...							*	*	*			*
Developing good working relationships...												*

Note: "\*" indicates that this behavior category is included.

"(\*)" indicates that the behavior category is listed under the general heading of "a climate conducive to learning".

not supported with any consistency by others. Responding to Community Expectations (Bartell, 1990) is unique to the Bartell list. Similarly, Substituting for Staff Members (Dwyer, 1986), Knowledgeable in Instructional Matters (Niece, 1989) and Developing Good Working Relationships (Leithwood, Begley, & Cousins) are noted in only one study. Modeling (Dwyer, 1986a; Leithwood, Begley, & Cousins, 1990), and Staffing (Bartell, 1990; Dwyer, 1986) are identified by two studies. Only one function, Consults Effectively with Others (Bartell, 1990; Persell & Cookson, 1982; Smith & Andrews, 1989), is identified in three studies. Accepting Responsibility for Student Behavior (Bartell, 1990; Larsen, 1987; Leithwood, Begley, & Cousins, 1990; Persell & Cookson, 1982) is identified in four lists. Finally, Marshalling and Allocating Resources (Dwyer, 1986a; Larsen, 1987; Leithwood, Begley, & Cousins, 1990; Persell & Cookson, 1982; Smith & Andrews, 1989) is identified by five researchers other than Hallinger and Murphy (1985).

In respect to the category of Accepting Responsibility for Student Behavior, only one of the four lists that include it as an instructional leadership function is an original study. However, in the Leithwood, Begley, and Cousin (1990) review this category was identified in at least three studies. While it is not explicitly noted in the Hallinger and Murphy conceptualization, it is not entirely ignored. Promoting a Positive School Climate is a major

category in the conceptualization. This category refers to "norms and attitudes of staff and students that influence learning in the school" (Hallinger & Murphy, 1985, p. 222). Hallinger and Murphy (1985) contend that the principal can influence student and teacher attitudes through a reward structure that reinforces productive effort, through the development of high expectations that are clearly communicated and embody what the school expects from students, and through the protection of instructional time by the implementation of policies that limit interruptions of classroom time. With the inclusion of such functions, it is apparent that control of student behavior as noted in the Hallinger and Murphy model is more normative, rather than coercive or remunerative (Etzioni, 1975). It is therefore, implicit through the manipulation of symbolic rewards, rather than stated explicitly as a necessary leadership behavior.

As noted above, Marshaling and Allocating Resources is identified by five researchers other than Hallinger and Murphy. Of the five lists, only two were original studies. In the review conducted by Leithwood, Begley, and Cousins (1990), this function was found to be identified in only two of the 64 studies, conducted between 1974 and 1988, that were found to deal with effective principal practices. While it may be an important function for the principal, it has

not been supported by research to be an essential instructional leadership behavior.

The Hallinger and Murphy (1985) list is comprised of the components of a conceptual framework of instructional leadership that consists of three broad categories of behaviors--defines the mission, manages instructional program, and promotes school climate (Hallinger & Murphy, 1985, 1987; Hallinger, Murphy, Weil, Mesa, & Mitman, 1983; Murphy & Hallinger, 1985, 1986). These broad categories are subdivided into more narrowly defined behaviors as follows: framing school goals, communicating school goals, supervising and evaluating instruction, coordinating curriculum, monitoring student progress, protecting instructional time, promoting professional development, maintaining high visibility, providing incentives for teachers, enforcing academic standards, and providing incentives for students. Considering that this list forms the basis of a conceptual model, and that its categories are concurrent with others more consistently than any other noted, it was accepted in this study to provide an operational definition of instructional leadership.

Since the analysis of the lists in Table 2 form the basis of the accepted definition of instructional leadership for this study, a brief discussion of each list follows. Each list was developed from either a review and synthesis of the literature, original research, or a combination of

these in the development of instrumentation to measure instructional leadership. To facilitate the discussion of the lists, they have been arranged in Table 2 according to the method or purpose of development and are presented in that order below. The first three lists, discussed, arise from instrument development. This is followed by five original studies, then four literature reviews.

Hallinger and Murphy (1985) developed their list through extensive review of research on educational leadership and school effectiveness. From this review, they developed a list of general functions, but found a lack of specific behaviors and practices that could be tested. In an attempt to operationalize their listing, they availed of both research reviews and original research. Their own research was conducted in one school district with 10 elementary schools. Expert opinion of a superintendent, a staff assistant, and several principals was sought in the development of the list of specific behaviors. The resulting list of behaviors was administered to principals and teachers in 10 elementary schools, and three supervisors from district office. Also, school documents were reviewed to determine construct validity. The literature reviewed in the development of this list was limited in generalizability since a majority of the studies were limited to elementary schools serving poor children in urban settings, and most often, effectiveness was determined through student

achievement on tests of basic skills in reading and mathematics. While the literature review conducted by Hallinger and Murphy was not deliberately restricted to these limitations, they are inherent to the effective schools research that has been conducted (Murphy, 1988).

The Larsen (1987) list forms the basis of an instrument developed to assess the instructional leadership behaviors of principals as perceived by principals and their teachers. The behaviors were included in the questionnaire on the basis of an extensive literature review. The original list contained all behaviors noted as important by two or more writers. This original list was sent to nine experts who were selected on the basis of criteria such as their publications in the field of instructional leadership, an advanced degree, and responsibility for instructional leadership in their current position. The revised list arising from that process consisted of 29 essential behaviors that could be categorized into six functions. Field testing of the instrument was conducted in selected elementary schools. The effectiveness of the schools was measured by standardized achievement tests in mathematics and reading. On the basis of data received from questionnaires completed by 89 principals and 421 teachers, behaviors representing these six functions were found to be significant in distinguishing less effective schools from more effective schools. Furthermore, these distinctions

remained significant irrespective of the sex of the principal or years of experience. Similar to the Murphy and Hallinger (1985) list, this list is subject to the limitations of the effective schools research, noted above.

In an attempt to develop instrumentation related to instructional leadership, Krug (1990) and Krug, Ahadi, and Scott (1990) followed a similar pattern to those noted above. The preliminary instrument, resulting from a review of the literature, contained 76 items related to specific behaviors. This instrument was piloted with a random sample of 600 principals of differing school types and sizes. The principals varied in respect to gender, age, ethnicity, and experience. Results demonstrated that principals who had previously received awards for instructional leadership scored significantly higher on the specific behavior categories in the developed list. Through factor and cluster analysis of the data gathered from 242 principals, the researchers determined that the instructional leadership behaviors could be placed into five categories.

The similarities of the leadership behaviors included in these three instruments is supportive of the content validity of each instrument; however, the development of each instrument was dependent upon reviews of the same research base related to effective schools and instructional leadership. Therefore, all three lists are subject to the

weaknesses and limitations of the research on which they are based (Murphy, 1988).

The five original studies included in Table 2 are representative of the research completed in the field that have attempted to identify typical behaviors or functions of instructional leaders. Additionally, these studies represent attempts to overcome some of the aforementioned limitations of restricted school type and school location.

Rutherford (1985) reports on a five-year study of elementary and secondary principals. The sample was taken from schools across the United States and included rural, urban, large, and small schools. Data were collected from interviews with principals, teachers, and selected central office personnel, as well as from observations of principals. While the criteria of effectiveness is not clearly stated, the research to which Rutherford refers is related to school change (Hall, Hord, Rutherford, & Huling, 1984). Effectiveness of the leader appears to be related to the ability and willingness of the school to change. Within the context of his definition of leader effectiveness, Rutherford states that the findings show clearly that effective principals differ from less-effective ones in five general behavior categories.

Dwyer (1986a, 1986b, 1986c), as part of a three year study, conducted a year long ethnographic study of 12 successful elementary and junior high schools. The

procedures included interviews with the principals, principal shadowing followed by reflective interviews, general observations of school activities, classroom observations and reflective interviews with teachers, structured interviews with teachers, student interviews, and an instrument guided analysis of instructional organization within the school. The schools that were studied were labeled as successful on the basis of nominations by district personnel. These schools were reputed to have achievement scores that were stable or had risen over successive years. The sample included a range of urban, suburban, and rural districts. The principals, teachers and students varied in gender, ethnicity, and age. While Dwyer notes that there was no single image for a successful instructional leader, he identifies nine leadership commonalities that were apparent. These are listed in Table 2. While some of the typical limitations of earlier effective schools research were overcome, high schools were not included, and school effectiveness was still measured by student achievement scores. There was no attempt to determine if these leadership behaviors also were exhibited by principals in less effective schools.

The list generated by Niece (1989) was the result of a study of the instructional leadership behaviors of secondary school principals. To develop his list of instructional leadership functions, he visited four high schools that had

been awarded special recognition by the United States Department of Education. To increase the sample size, principals in these four schools were asked to nominate four other principals who they perceived as effective instructional leaders. From classroom observations, conferences with school personnel, and interviews with the principals, a list of essential functions was developed. This list was analyzed in a conference format with the participation of the particular principals, the investigator, and outside auditors. Information gathered through a review of effective schools and instructional leadership research was used as reference in these conferences. A second major source of data came from 15 nationwide instructional leadership authorities selected on the basis of their extensive research in the field. Five categories of behaviors emerged from the authorities. These categories have a correlation of .70 with the list generated through the school studies. A strength of this study is that it focused on high schools that generally have been neglected in this field. However, the method of school selection is suspect, in that the criteria for the award of special recognition is not made explicit. Also, since other studies indicate that principals are generally isolated from one another (Blumberg & Greenfield, 1980), their ability to nominate other principals as effective leaders is questionable. Since 50 percent of their sample was based on

such nominations, reliability of the findings are a concern. Also, the use of the literature reviews in the post conferences with principals may have influenced the process, and therefore, the comparison of the separately generated lists appears tautological. This provides reasonable grounds to question Nlece's contention that the validity of his list is strengthened as a result of the high correlation between the separately generated lists.

Smith and Andrews (1989) compiled a list of instructional leadership behaviors that were found to be consistently performed by principals that had been nominated as instructional leaders by other principals and superintendents. The criteria for nomination were that they were principals of schools which showed student gains in achievement in standardized mathematics and reading tests. The list was compiled on the basis of several studies that were either qualitative or quantitative in approach. Data were collected on approximately 1200 principals of elementary, middle, and high schools. School sizes ranged from 2600 to 125. While there were differences in the degree to which certain behaviors were performed in the various settings, all principals, identified as instructional leaders, exhibited certain behaviors more frequently than average principals. Specifically, Smith and Andrews (1989) identified 10 behaviors that they list in four categories: resource provider, instructional resource, communicator, and

visible presence. Since the basis for the identification of instructional leaders was student gain scores in achievement in reading and mathematics, these studies are limited by a narrow perspective of effectiveness.

Bartell (1990) conducted quantitative research using principals that were nominees for the National Association of Secondary School Principals (NASSP) "Principal of the Year" awards. The 64 secondary principals selected for the study were asked to complete a questionnaire and to submit to a telephone interview. Ten of these principals were subjected to follow-up, in-depth interviews. The intent of the study was to determine how this select group of principals perceived their roles as instructional leaders. From this study, Bartell compiled a list of 12 areas of responsibilities that principals felt were required for instructional leaders. A primary weakness of this research is that it assesses what principals perceive to be their role as instructional leaders. There is no attempt to determine if they perform these behaviors or if they are perceived by others to perform them. These leadership behaviors may be a result of what these principals perceive to be politically correct rhetoric in view of the current literature, rather than a result of their actual practice.

The four reviews of literature noted in Table 2 include studies that span two decades, from the beginning of the instructional leadership studies in the early 1970s. Cotton

and Savard (1980) (cited in Hall & Hord, 1987) reviewed 27 documents related to instructional leadership. They judged only seven (six elementary and one high school) to be both relevant and valid investigations. From this review, they conclude that effective instructional leadership behaviors can be classified into the six categories that have significant influence on student achievement.

Persell and Cookson (1982) reviewed more than 75 research studies and reports to determine why some principals were more effective than others. They identify nine recurrent behaviors of those principals that are most effective. Even though this study refers to instructional leadership as one of the specific behavior categories, the entire list is applicable to instructional leadership from a broad perspective. As can be observed from Table 2, the behaviors noted are compatible with other listings. Only two categories, consulting effectively with others and marshalling resources, are outside of the model proposed by Hallinger and Murphy. Since no reference is made of restricting the review in respect to school type or size, or to the gender of the principal, it is assumed that the studies reviewed were varied in these respects. However, as noted by (Murphy, 1988), it is recognized that much of the research in the field of effective schools and instructional leadership has been focused primarily at the elementary level in urban settings where effectiveness has been defined

In terms of student achievement on standardized tests. The generalizability of a list generated from such research is limited.

De Bevoise (1984) reviewed research on instructional leadership beginning with research that had been conducted in the 1960s. She notes that the early work concentrated on demographic characteristics of principals, such as race, sex, age, formal education, and years of teaching experience. She concludes that these yielded little valuable information about the instructional leadership process. Later research, she notes, examined the principal as a person in terms of leadership style and capacity for personal interaction. The studies on which she focused dealt with both elementary and secondary schools, and included male and female principals. Consistently, the findings of these studies indicate that effective principals have a clear sense of mission, test the limits in providing needed resources, are committed to high standards, use a participatory style, and are not content to maintain the status quo. However, De Bevoise notes that these studies did not establish that the traits were exclusive to effective leaders. Finally, De Bevoise reviewed studies that attempted to determine common leadership functions that must be satisfied if the school is to be effective. While these studies did not agree who should perform the functions, there was general agreement about what those functions are.

It is these functions that are listed in Table 2. De Bevoise cautions that such a list includes functions that are ideal; they do not reflect what most principals do or feel that they can do; and moreover, in the studies that she reviewed, they were not correlated with any criterion reflecting the outcomes of schooling, such as student achievement, absenteeism, staff morale, or organizational climate.

Leithwood, Begley, and Cousins (1990) conducted a review of research related to the principalship between 1974 and 1988. The intent of this review was to determine which areas were well supported by relatively solid research, and those areas that needed further investigation. This review included analysis of the results of three selected reviews of literature concerned with research reported between 1974 and 1984, and analysis of 60 original studies reported from 1985 to 1988. The three reviews incorporated 75 published studies from a number of countries. The original studies reviewed were taken from a list of more than 1100 titles. The 60 studies were chosen for analysis if they met two criteria. In order to be selected the study had to be based on systematically collected empirical evidence and include sufficient detail related to the research methods used. From analysis of the studies related to the determination of effective behaviors of school principals, Leithwood, Begley, and Cousins identified 22 strategies. Ten of these strategies were identified in just one study, and dismissed

for lack of support. Those strategies identified in more than one study were listed and compose the list reported in Table 2. While this list is based on studies that differ in design, instrumentation, and sample size, and vary in respect to school type, size, and location, the authors caution that much of the data have been generated from research in urban elementary school. Generalizability to other contexts is limited.

While such listing of specific behaviors can serve as a useful framework for a general model of leadership, the weaknesses and limitations of the research on which such lists are based require cautious acceptance. Leithwood, Begley, and Cousins (1990) state, "Further studies of effective practices in diverse contexts are essential if results are to be used with confidence as guides to practice in a broad array of settings" (p. 17). Since much of the research on effective schools and instructional leadership is dependent upon student achievement as a measure of effectiveness, a critical question is whether all of the behavior categories are positively related to school characteristics that are viewed from other perspectives as essential to school effectiveness. It is in respect to those who adhere to the systems resource perspective to school effectiveness, in addition to those that maintain a "narrow" definition of instructional leadership, that many of the questions arise regarding the appropriateness of such

categories of effective leader behaviors. These differing and conflicting perspectives of school effectiveness and instructional leadership are the subject of discussion in the next section.

#### Differing Perspectives on Instructional Leadership

There is considerable support for the existence of the construct of instructional leadership, and some convergence on the characteristics that define it operationally; however, there are skeptics who contend that instructional leadership behaviors, as determined through the goal attainment perspective of the effective schools research, may negatively impact on school effectiveness (Navarro, Berkey, Minnick (1986). Deal (1987a) laments that school effectiveness research emphasizes the rational aspects of the school and stresses productivity. He argues that such an approach ignores the human, political, and cultural aspects of schools that must be attended to by the leader if success is to be assured. Similarly, Burlingame (1987) argues that instructional leadership that has been conceptualized through the effective schools research, requires docile followers who accept the rationality of the principal and convert easily to goals established at the top of the hierarchy. Glickman (1991) contends that such an approach is not effective, and that "the principal of a successful

school is not the instructional leader but the coordinator of teachers as instructional leaders" (p. 7). He argues that the principal must be the educational leader who acts as a facilitator of empowered teachers. Fullan (1992) concurs with Glickman as he states that the development of a vision by a charismatic leader is inhibiting in that it restricts consideration of alternatives and suppresses the voices of teachers. He states that the instructional leader "must be responsible for making vision-building a collective exercise" (p. 20). While Sergiovanni (1991) lauds the role of the school principal, he concurs with the above arguments, and posits that instructional leadership is not appropriate in circumstances in which teachers are committed, well trained and competent. He states, "The development of generic lists of correlates or indicators that are subsequently applied uniformly to schools pose serious questions about the proper use of research and can result in negative, unanticipated consequences for teaching and learning" (p. 91). Further, he posits that "the more leadership is emphasized, the less likely it is that professionalism will develop" (Sergiovanni, 1992, p. 42).

Poplin (1992) argues that as a result of new instructional approaches, administrators are "called on to shed the role of the instructional leader and define new roles more like those of entrepreneurs" (p. 10). She contends that the instructional leadership model looks at

the growth of students, and works to the detriment of teachers.

In like manner, Barth (1986) condemns what he calls "list logic" of instructional leadership researchers as he suggests that they are a suffocating description of a principal's job, and that they limit creativity and innovation. He recommends that the primary focus for school improvement must be on improving the interactions among teachers and principals. He declares, "I have found no characteristic of a good school more pervasive than a healthy teacher-principal relationship--and no characteristic of a troubled school more common than a troubled, embattled administrator-teacher relationship" (p. 19).

Griffiths, Stout, and Forsyth (1988) contend that "many of those who study modern successful organizations say that administrators should be quite the opposite of the [instructional leader]" (p. 287). This argument is consistent with that of Astuto and Clarke (1986) who maintain that, increasingly, organizational theorists and researchers are accumulating evidence that suggest "managers meddle, over-manage, and get in the way" (p.66). They contend that effective organizations cannot be managed with a heavy hand. Effective schools require facilitative managerial actions which demonstrate trust in teachers to be

productive and show confidence in teachers' technical expertise.

Slater and Dolg (1988) contend that instructional leadership implies one person, face-to-face contact, and overlooks remote effects. They argue that the leader must be more concerned with creating an atmosphere where teachers are encouraged to pursue new ideas and create new options. Clearly, they are suggesting that instructional leadership behaviors are incompatible with such directions.

Similar conclusions can be deduced from findings of a study conducted by DeCotlis and Summers (1987). They determined that closeness of supervision exercised by the leader was found to be negatively related to organizational commitment of the workers, a factor positively related to morale, motivation, satisfaction, and productivity.

Street and Licata (1989) refer to a well documented dilemma between bureaucratic control and teachers' sense of professional autonomy (feelings of independence in making instructional decisions within the classroom). They conducted a quantitative study of 1761 teachers in 62 schools in rural and small towns in three Louisiana districts to determine the effects of teachers' perceptions of instructional leadership expertise (instructional supervision) upon teacher feelings of autonomy, and a positive school climate. The findings lend support to the idea that supervisory expertise may be related to overcoming

the concerns of bureaucratization. The concerns noted in this study, however, highlight the potential that behaviors purported as necessary for effectiveness in respect to one criterion may have a negative relationship with other aspects.

Others contend that contextual factors may substitute for leadership, thus questioning the necessity of emphasizing specific behaviors that should be performed by an instructional leader (Kerr, 1977; Pitner, 1986). Pitner, Oregon, and Charters (1988) investigated the relationship among elementary principal leadership behaviors and teacher commitment to determine if specific non-leader sources of influence mediate or lessen the importance of leadership. Questionnaires were sent to 57 schools in 13 districts. Returns were received from 47 schools, a response rate of only 41 percent which weakened the study. The findings suggest that leadership (both task and consideration oriented) was significantly related to commitment irrespective of other contextual factors. The only contextual factor found to significantly influence this relationship was teacher professionalism. As with concerns noted by Street and Licata (1989), the findings do not relate negatively to the concept of instructional leadership, but the study is indicative of serious questions that are posed in reference to it.

These above noted caveats highlight the general concern of whether specific instructional leadership behaviors are consistent with present organizational theory. Griffiths (1988), in a review of administrative theory, maintains that present administrative practices can be placed on a continuum from traditional to emergent. He suggests that the emergent leadership practices which are the most effective for modern organizations are of the type purported by Peters and Waterman (1982) and Kanter (1983). These researchers emphasize the necessity of a holistic approach to leadership, such that the leader and followers are necessary and integral to the entire organization.

Kanter (1979, 1983) contends that successful leaders must encourage integrative thinking to foster innovativeness that is necessary for survival of the organization. Problems must be treated as "wholes", conflict must be reduced between units as there is developed a global sense of cooperation directed toward an overall mission.

Peters and Waterman (1982) place a similar emphasis upon fostering an organizational climate that places an emphasis upon a cooperative sense of belonging and a strong desire to attend to the established goals. Successful organizations must be concerned with building on talents of people, and developing a sense of unity and group spirit that encourage innovation.

Buffle (1989) contends that the new instructional leader in schools is "one who commits people into action, who works hard to develop latent leadership qualities in others, and who converts these new leaders into agents of change" (p. 6). He quotes Naisbitt (1982) who states that "in the reinvested corporation, we are shifting from 'manager as order giver' to 'manager as facilitator'" (Buffle, 1989).

This trend away from the technological, rational planning models for school improvement, toward cultural, collaborative approaches in which teachers are viewed as partners is receiving increasing support (Blase, 1987; Laroque & Coleman, 1991; March, 1988; Pellicer, Anderson, Keefe, Kelley, & McCleary, 1990; Weber, 1989). LaRocque and Coleman (1991) observe that more recent work tends to focus on the ability of the administrator to contribute to the creation of a school ethos of collaboration, professionalism, and shared vision. While their own research focuses upon the work of chief executive officers in nine school districts in British Columbia, it provides support for, what they call, transformational leadership in schools.

In respect to arguments contrary to the positive value of instructional leadership, there are others who suggest that such arguments are based on false assumptions that instructional leadership is inherently rational and bureaucratic. They contend that such a perspective ignores

the capacity of the instructional leader to influence instruction through the culture of the school as well as through the use of routine activities. Pellicer, Anderson, Keefe, Kelley, and McCleary (1990), having completed an extensive qualitative research study of eight selected schools, conclude that instructional leadership is not a discrete set of behaviors or activities, an attitude, nor a philosophy. Rather, it implies strong leadership that encourages teamwork, cooperation, a spirit of professional development and innovativeness, and a general commitment toward the overall purpose of improving instructional opportunities for students. Similarly, Hanson (1991) notes that "some critics argue that from the beginning, the effective-schools literature has emphasized cultural variables" (p. 43). Similarly, Owens and Steinhoff (1989) remark that from the beginning, the effective schools literature has emphasized cultural rather than structural characteristics. They cite, as examples, lists that include a safe orderly climate, high expectations for students, time on task, and clearly stated objectives. These are characteristics that are included as functions of the instructional leader in the Murphy and Hallinger conceptualization.

Firestone and Wilson (1985) recognize that a contradiction exists among researchers regarding the role of the principal as an instructional leader. They focus on the

controversy between researchers who suggest that schools are loosely coupled organizations that provide limited means for principals to influence instruction, and researchers on effective schools who suggest that the principal is critical to effectiveness. Firestone and Wilson propose that discrepancies between these two bodies of research are resolvable by viewing instructional leadership from a "broad" perspective. In that way, the instructional leader can be seen to attend to both bureaucratic and cultural linkages that serve to coordinate the activities of the workers.

Lee (1987) concurs with Firestone and Wilson (1985). She suggests that concerns are raised about instructional leadership because researchers conceptualize it as rational and bureaucratic. Such a perspective ignores the capacity of the principal to influence instruction through the culture of the school as well as through the use of routine activities. In a like manner, Wimpelberg (1987) proposes that the instructional leader must develop both a technical and cultural conscience of the school. In this way the instructional leader has the potential to change current negative school practices that exist in schools, such as teacher isolation from one another, lack of school vision, and lack of desire or support for improvement.

McEvoy's (1987) research provides evidence that broader influences of instructional leadership activities are often

overlooked. She conducted follow up analysis of the data from a five year ethnographic study reported by Dwyer (1986), to determine the role of the principal in affecting the professional growth of teachers. Data supported the findings that 60 to 70 percent of a principal's daily activities involved communicating, and that interactions were generally informal, brief, and fragmented. McEvoy notes that closer analysis of the content of those exchanges revealed their instructional focus. She concludes that, "principals, through their daily interactions, were able to exercise instructional leadership and to promote the professional development of their staffs" (p. 77).

Lord and Maher (1990) support a similar thesis as they contend that subordinate perceptions that specific leadership behaviors are appropriate to the leadership role leads to acceptance of the leader and internalization of the leader's vision. They speculate that, "leadership perceptions reflect one of the primary processes by which symbolic management of culture is maintained" (Lord & Maher, 1990, p. 148). This suggests that both the bureaucratic and cultural linkages can be provided through instructional leadership if teachers perceive the behaviors as appropriate. Lord and Maher posit that this is consistent with the concept of transformational leadership as subordinates internalize the esteemed leadership values,

accept the organizational culture, and exhibit self-leadership behaviors.

Research support for the Lord and Maher thesis is provided by Meyer (1990) who conducted a study to determine the relationship between perceived leader authenticity and perceived instructional leadership behaviors. Instructional leadership was defined using a "broad" perspective as conceptualized by Hallinger and Murphy (1985). The study was conducted in 10 middle-level schools, and involved 247 teachers, 10 principals, and 10 supervisors. Significant positive correlations were found between the global perceptions of teachers on the two measures.

Further evidence of the validity of such an argument is provided by Maxson (1990). He surveyed 400 high school teachers in five high schools to determine if a relationship exists between teachers' perceptions of strong leadership and collegial peer relations. The findings support the hypothesis that principals who promote a positive learning environment and are supportive of teachers are positively associated with the existence of collegial peer relations. A weakness of this research is that specific leadership behaviors are not assessed. While there is a general discussion that perceptions of support may be related to behaviors such as setting clear goals, developing a good learning environment, and accessibility to teachers, there is no attempt to measure them.

Consistent with this thesis, Conger (1989) argues that charismatic leadership is not just dependent upon the leader, but also upon the subordinates through attribution. In order for behaviors to be perceived by subordinates as charismatic, they have to be seen as relevant to their situation. Conger does not recommend that leaders should be trained as charismatics; however, he suggests that leaders should be trained to avail of the positive behaviors that are exhibited by them. He lists four critical stages of behaviors of the charismatic leader: formulating goals; communicating and interpreting goals in ways that are meaningful; building trust through success, expertise, risk taking, self sacrifice, and unconventional behavior; and building commitment and trust in him-or herself and his or her goals through modeling, empowerment, and unconventional tactics. While instructional leaders are not inherently charismatic, it is apparent that the first two stages noted by Conger are consistent with instructional leadership behaviors. Also, it is possible that other behaviors may build subordinate trust as teachers accept the behaviors as indicative of the leader's expertise which will lead to success. Additionally, in that studies conducted to determine the most common practices of principals have reported disproportionate emphasis on managerial routines (Leithwood, Begley, & Cousins, 1990), behaviors which emphasize instruction may be recognized as unconventional or

risk taking. Within Conger's conceptualization, these conditions lead to subordinate transformation as they internalize the organizational goals and work toward their attainment with commitment.

Leithwood (1992) states that transformational leadership "ought to subsume instructional leadership as the dominant image of school administration, at least during the 90's" (p. 8). He contends that the term instructional leadership focuses attention on "improving the technical, instructional activities of the school through close monitoring of teachers' and students' classroom work. Yet instructional leaders often make such important 'second-order change' as building a shared vision, improving communication, and developing collaborative decision-making processes" (p. 9). On the basis of three studies that Leithwood and his colleagues have conducted, he summarizes the role of the transformational leader as one that entails the pursuit of three fundamental goals: helping teachers develop and maintain a collaborative, professional school climate; helping them solve problems together more effectively; and fostering teacher development (Leithwood & Jantzi, 1990). The case studies revealed that these goals were achieved through the facilitation of teacher collaboration in goal setting and problem solving within the framework of bureaucratic mechanisms which supported the cultural changes. Examples of behaviors that were stressed

were leaders actively communicated the school's cultural norms and values, ensured that the school's goals were clear and challenging, ensured that feedback was provided about discrepancies between goals and current practices, encouraged team problem solving and collaborative efforts to school improvement. These practices are similar to those performed by the instructional leader as defined in this study. Perhaps, the one critical difference is the emphasis placed on collaboration and team work. This work suggests that instructional leadership behaviors contribute to the attainment of the fundamental goals of the transformational leader.

Sagor's (1992) observations of three principals in exemplary schools led him to conclude that the one major determinant of these schools was transformational leadership of the principal. This type of leadership is not related to style. The principals in Sagor's study varied from opinionated and assertive, nurturing and supportive, to high-energy and charismatic. All were classified as transformational as they had a transformational effect on the professionals within their schools. The three key common features of these principals' behaviors which Sagor refers to as "the building blocks" of transformational leadership are a clear and unified focus, a common cultural perspective, and a common push for improvement. Without these elements, he argues, shared decision making or teacher

empowerment are ineffective. As with Leithwood's discussion of transformational leadership, these "building blocks" of transformational leadership appear to be remarkably similar to the functions noted to be essential to instructional leadership. The added factor is the follow-up consideration of the transformational effect on the teachers that results from the acceptance of these leadership behaviors.

From their studies of principal and superintendent effectiveness, Mitchell and Tucker (1992) conclude that the appropriateness of transactional leadership with emphasis on supervision and management, or transformational leadership with emphasis on administration and leadership is dependent upon the environmental culture and the degree to which current educational practices are valued. However, they argue that while one aspect can be emphasized in a particular environment, a balanced approach must be maintained. Given that instructional leadership emphasizes the importance of supervision, the use of incentives, the coordination of the curriculum, and student achievement, it is consistent with the Mitchell and Tucker transactional categories of supervision and management. To the extent that it gives priority to the development and communication of clear goals, it is consistent with their transformational category of administration. Its relationship with the second transformational category, leadership, is not quite as explicit. The leadership category is dependent upon

transforming teacher and student attitudes and beliefs through the redefining of educational goals. It is dependent upon establishing an atmosphere of collaboration and commitment. As noted above, this is a potential aspect of instructional leadership that has not been explored. Perhaps, it is through instructional leadership that the balanced approach advocated by Mitchell and Tucker can be achieved.

In summary, it should be noted that while there is general consistency in the findings of instructional leadership research related to a goal-oriented effectiveness (where there is agreement on the specific goal of achievement), others suggest that leadership behavior derived from such research narrowly restricts the goals of education and is contrary to present organizational theory. They contend that either the principal cannot have any influence on the instruction in the school since it is a loosely coupled organization, or that instructional leadership behaviors negatively impact upon critical school characteristics. The critical characteristics that are most consistently noted are good principal-teacher relations, and a collaborative climate where the teachers are professionally involved, committed to innovation and school improvement, and where there exists a shared sense of school purpose (Barth, 1986, 1990; Griffiths, 1988; Kanter, 1979, 1983; Leithwood & Jantzi, 1990). Others suggest that

these apparent contradictions are resolvable when instructional leadership functions are perceived in a "broad" perspective such as the Hallinger and Murphy conceptualization, and recommend that the question requires intensive study (Adkins, 1990; Courtney, 1987; Firestone & Wilson, 1985).

### Summary

Research has generally supported the importance of the instructional leader in respect to school effectiveness, innovation, and change (Leithwood, Begley, & Cousins, 1990; Hall & Hord, 1987). Increasingly, there appears to be a convergence of evidence to support that the school administrator, as an effective instructional leader, must have both a direct and indirect impact upon improved learning, and that a primary role is to engage in behaviors that create a school climate or ethos that is conducive to such improvement (Blank, 1987; Murphy, 1988). In spite of this apparent consensus, there has been limited research on educational leadership with respect to the determination of the relationship of specific leadership behaviors to critical school process variables that may potentially impact upon the organizational effectiveness of a particular school (Ball, 1987; Greenfield, 1982, 1987; Zirkei & Greenwood, 1989). Most studies have been limited to

assessing effectiveness by measurement of student achievement on standardized tests. Increasingly, educators are beginning to question the validity of instructional leadership as a construct as they recognize the weaknesses and incompleteness of the research (Burlingame, 1987; Deal, 1987a; Glickman, 1991).

The need for continued research in this field is supported widely (Krug, Ahadi, & Scott, 1990; Leithwood, Begley, & Cousins, 1990; Immegart, 1988; Willower, 1988). Krug, Ahadi, and Scott (1990) observe that what is known about instructional leadership is largely based on descriptive studies of a highly individualized nature. They suggest that while the results of such qualitative research are useful, an attempt must be made to design research and appropriate quantitative research instrumentation that will allow this accumulated knowledge to be further analyzed and to become generalizable. Such an approach that attempts to avail of the strength of both the qualitative and quantitative research paradigms appears to have considerable support in current literature (Bifino, 1989; Culbertson, 1988; Everhart, 1988; Griffiths, 1988; Tatsuoka and Silver, 1988). Willower (1986, 1988) contends that qualitative research can provide valuable information that could be applied to formulate hypotheses for further quantitative inquiry.

Leithwood, Begley, and Cousins (1990) conducted a comprehensive literature review of the empirical studies of the principalship. From this analysis, they concluded that one aspect requiring further study is the determination of effective practices of principals.

Immegart (1988), in a review of research on educational leadership, emphasizes the importance of renewed interest in this field on the part of those in education. He states that greater priority must be placed on building upon existing work, that future research must increase the number of aspects, dynamics, and variables that are examined, that the linkages of variables must be systematically explored, and that variations across leaders and situations must not continue to be ignored. Immegart comments, "The decline in such activity [leadership research] over the past decade or so...is hard to fathom, much less explain, given the impact of decline on education in the 1970's and the challenges to education in the 1980's.... Concern about educational leadership ought to be a matter of greater import to researchers and the profession at large" (p. 275).

Similarly, Willower (1987, 1988) has supported the need for further research in the field. In 1979, Willower called for more research in the area of school administration as he argued that there were not enough studies related to the processes and work at the level of either the school principal or superintendent. Over a decade later, he

continues to recognize that the research in these area remains scant and inconclusive (Willower, 1987; 1988).

While there has been progress in the study of instructional leadership at the school level, there exists no substantive theory which connects instructional leadership functions with any criteria reflecting school effectiveness, other than student achievement (De Bevoise, 1984; Pitner, 1988). Even studies that have found a relationship between specific leadership functions and student achievement have primarily focused on urban elementary schools (Leithwood, Begley, & Cousins, 1990). The absence of a single definition or conceptualization of the concept itself continues to contribute to contradictions and confusion in the field (Murphy, 1988). The need for further study which attempts to deal with these issues is widely supported (Greenfield, 1988; Immegart, 1988; Willower, 1987).

#### Statement of the Problem

A major conclusion of the effective schools research has been that successful schools have strong instructional leaders. Researchers in the field of instructional leadership appear to have reached a general consensus regarding the general behaviors of such leaders. In spite of this general consistency, others contend that the research

base for these findings is subject to conceptual, methodological, and measurement weaknesses (Murphy, 1988). These weaknesses appear to relate primarily to the lack of a definitive conceptualization of instructional leadership, dependence upon the goal-attainment model of effectiveness, and the general exclusion of schools other than elementary schools that have been identified as outliers in respect to effectiveness.

Those who adhere to the systems resource or process model of school effectiveness contend that instructional leadership research has been overly narrow and restrictive. They argue that in a pluralistic democratic society it is impossible to agree on the goal of schooling. They posit that instructional leadership is negatively related to organizational characteristics that are essential to successful schools (Griffiths, Stout, & Forsyth, 1988; Sergiovanni, 1991).

While there are suggestions in the literature that the "broad" perspective of instructional leadership may be compatible with both schools of thought (Adkins, 1990; Lee, 1987), little research has been conducted to address this issue. It is in the context of this controversy and the lack of research related to it that this study was proposed. The primary purpose was to determine whether instructional leadership behaviors of school principals is incongruous

with selected school-level characteristics that have been identified as essential for successful schools.

Greenfield (1987) states that "criticism and controversy are essential both to the growth of knowledge and to the improvement of practice" (p. xlii). It was hoped that, through study of the current controversy regarding instructional leadership, the findings of this proposed research would contribute to the development of a conceptualization of instructional leadership that is consistent with both major perspectives of organizational effectiveness. Further, it was hoped that analysis of the data would allow for the identification of models that best describe the relationship among instructional leadership behaviors and the selected school-level effectiveness characteristics thus contributing to the building of theory in the area of instructional leadership. Also, it was felt that the determination of such models would prove useful to practitioners as it would lead to further clarification of the role of the school principal as an instructional leader, and provide additional guidelines for training and staff development programs.

### Research Questions

The specific questions of this study are as follows:

1. What is the relationship among identified instructional leadership behaviors of the school principal, or any combination of these behaviors, with the school-level characteristics of teacher support of and commitment to the school, professional involvement, and innovativeness?
2. Do relationships among identified instructional leadership behaviors of the school principal and school-level characteristics vary according to school type (elementary or high school)?

### Hypotheses

The hypotheses of the study are as follows:

1. There is a positive relationship among instructional leadership behaviors exhibited by principals and the level of teacher commitment to and support of the school.
2. There is a positive relationship among instructional leadership behaviors exhibited by principals and the level of professional involvement by teachers.
3. There is a positive relationship among instructional leadership behaviors exhibited by principals and the level of innovativeness in the school.

4. School type (elementary or high school) does not affect the relationship among instructional leadership behaviors exhibited by principals and the specified school-level characteristics.

## METHODOLOGY

In this chapter, the methodology of the study is discussed. Firstly, the description of the sample is presented. This is followed by a description of the instruments that were used to gather the data and a description of the method of analysis. The chapter concludes with a presentation of the delimitations of the study and a discussion of the study limitations.

### Methodological Approach and Sample

The study was a survey, non-experimental type of investigation. It was conducted in one province in Canada, Newfoundland and Labrador. The study was restricted to one province in order to provide for control of variances that exist among provinces. The educational system in Newfoundland and Labrador is under the control of a central Department of Education. The allocation of units for school personnel is standardized such that district personnel, principals, department heads, and teachers are allocated according to consistent formulae. Since these formulae vary among the provinces, and potentially influence the variables to be studied, it was determined that limiting the study to

one province would reduce the number of intervening variables.

The unit of analysis was the individual teacher. This approach appeared to be more appropriate than averaging across teachers of each school which would have eliminated individual teacher variability and reduced sample size. The data were collected from all teachers in randomly selected elementary and secondary schools of a minimum size in the province. The minimum size of 100 students was chosen for both school types so that the principal had some class time free of teaching duties to perform administrative work. Superintendents of the 27 school districts were written, to obtain their permission to contact schools in their district (Appendix A). After a waiting period of three weeks, all but three superintendents had responded affirmatively to the request. A follow-up letter (Appendix B) was sent to solicit a response from those three superintendents who had not acknowledged the request. As a result, favorable responses were received from all superintendents.

Using the Department of Education Directory (1992), schools were randomly selected such that the target sample size was 1200 teachers, equally representing both school types. Teachers of grades K-6 were classified as elementary, those teaching 7-12 were considered high school. These divisions were viewed as appropriate since it is generally accepted that beginning at the Grade 7 level, subject

specialization is introduced as teachers are assigned to a subject area rather than a class. Since women are under represented in school administration in Newfoundland and Labrador schools--10 percent of secondary principals and 22 percent of the elementary principals are women (Department of Education Directory, 1992)--the sample was stratified to insure at least 25 percent of the teachers were responding to female principals at both levels.

Principals of 72 randomly selected schools were contacted to solicit their approval and assistance in distribution of the questionnaires. The principal of each school was sent a package which included a personalized letter to the principal requesting the school's participation in the study with attached inventory list of the package contents; an instruction sheet outlining the distribution and collection procedures; a school-principal demographic data questionnaire to be completed by the principal; an adequate supply of letters of request to teachers and teacher questionnaires; and a stamped, self-addressed envelope to facilitate the return of the questionnaires (Appendix C). Principals were requested to distribute the questionnaires and to solicit the support of a teacher or secretary to collect the completed questionnaires since the involvement of the administration in the collection had the potential to influence responses. After a waiting period of approximately one month,

principals of schools from which no questionnaires had been received were contacted either by follow-up letter (Appendix D), by telephone, or by a school visit. Principals of 58 schools agreed to participate. This provided for a total possible sample of 1059 teachers. Sixty percent (638) of the questionnaires were returned. Of these, 624 questionnaires, 317 elementary and 307 high school, were usable. Darlington (1990) suggests that 10 subjects for each variable is a minimum ratio to account for error. With 13 variables to be included in the analysis, the actual sample of 317 elementary teachers and 307 high school teachers provide a ratio of over 1:20 for each school level.

Analysis of schools that chose not to participate revealed no obvious pattern that, potentially, might influence the study findings. Principals who were contacted in follow-up by telephone or in person cited various reasons for not participating. Some of the reasons noted were personal problems unrelated to school, difficulties related to individual teachers that made the distribution of this questionnaire inappropriate at the particular time, and the fact that they held the position as a term appointment only and felt that the questionnaire was not suitable in such circumstance.

## Instruments

Both data gathering instruments used in this study are measures of teacher perceptions. Teacher perceptions of school-level characteristics were measured through the appropriate scales of The School Organizational Climate Questionnaire (Gliddings & Dellar, 1990). Hallinger's Principal Instructional Management Rating Scale (Hallinger & Murphy, 1985) was employed to measure instructional leadership behaviors of the principal. These instruments were combined into one data gathering instrument for the purpose of this study (Appendix E).

### Hallinger's Principal Instructional Management Rating Scale

An extensive review of the research related to instructional leadership resulted in a conclusion that the categories of instructional leadership behaviors delineated in the Hallinger and Murphy model was the most comprehensive of compiled lists (Table 2). The Principal Instructional Management Rating Scale (PIMRS) was developed from this model and appeared to be the most appropriate instrument to measure instructional leadership behaviors consistent with the "broad" definition accepted for this study. The instrument has been found to provide valid and reliable data

at both the elementary and secondary school levels (Courtney, 1987; Jones, 1987; Krug, 1986; Meyer, 1990; O'Day, 1984; Pavan & Reid, 1990; Trout, 1985).

The PIMRS was developed and field tested by Hallinger (1983). The questionnaire was administered to principals, teachers, and central office personnel in a California school district of approximately 12,000 students attending 10 schools. The PIMRS is being used in over 60 studies in Australia, Austria, Canada, England, Holland, Indonesia, Puerto Rico, the Philippines, Saudi Arabia, Singapore, and the United States (P. Hallinger, personal communication, January 21, 1992). As a result of the author's continued research (Hallinger, 1983; Hallinger & Murphy, 1985, 1987; Murphy & Hallinger, 1985, 1986; Murphy, Hallinger, & Mesa, 1985; Murphy, Hallinger, & Mitman, 1983; Murphy, Peterson, & Hallinger, 1986), and as a consequence of its widespread use in other studies, the instrument has undergone several revisions. Items have been eliminated that have been shown to reduce reliability and validity (P. Hallinger, personal communication, March 16, 1992). The revised version contains 50 behavioral items measuring 10 subscales of principal instructional leadership. The general subscales or categories of behaviors measured by this instrument are listed in Table 3.

Table 3

## PIMRS Subscales

SUBSCALE	TITLE
I	Frame the School Goals
II	Communicate the School Goals
III	Supervise and Evaluate Instruction
IV	Coordinate the Curriculum
V	Monitor Student Progress
VI	Protect Instructional Time
VII	Maintain High Visibility
VIII	Provide Incentives for Teachers
IX	Promote Professional Development
X	Provide Incentives for Learning

Source: Hallinger, P. (1992). Principal Instructional Management Rating Scale: Teacher Form 1.3. (Available from P. Hallinger, Center for Advanced Study of Educational Leadership, Vanderbilt University, Nashville, TN 37203)

In developing the Instrument, Hallinger was guided by the following goals:

- 1) The Instrument would focus on specific job related behaviors.
- 2) The behavioral components of the Instrument would be drawn from research related to principal effectiveness as well as from current practice.
- 3) The Instrument would be useful for a variety of purposes including principal evaluation, staff development, research, and district policy analysis (Hallinger, 1984, p. 10)

The methodology used to develop the Instrument generally followed steps outlined by Latham and Wexley (1981) for constructing behaviorally anchored rating scales. The items of the Instrument are "behaviorally anchored" in that they are statements of critical job related behaviors on which raters can assess the principals performance within a given dimension (Hallinger, 1984).

The Instrument was developed from an extensive review of the research conducted on instructionally effective schools and instructional leadership, and "expert opinion" of a superintendent, his staff assistant, and several principals. The list that was generated from this process was rewritten as discrete behavioral functions for use as questionnaire items. Each statement was adjusted grammatically to fit the same stem and response category on

a likert scale ranging from 1, "almost never" to 5, "almost always". This instrument was piloted with 10 elementary school principals from one school district. The raters were 104 teachers, 10 principals, and 3 supervisors (Hallinger, 1984).

Five main criteria were used to judge the reliability and validity of the instrument: content validity, construct validity (subscale intercorrelation), construct validity (documentary support), discriminant validity, and reliability. Content validity was achieved by accepting only items that achieved a minimum average agreement of .80 among a group of raters. Each rater was given a randomly ordered list of items and a sheet of paper with eleven columns and asked to place the items in the appropriate columns, leaving unassigned those that did not fit a category (Hallinger, 1984). See Table 4 for the average agreement among raters.

Construct validity (subscale intercorrelation) was determined by ensuring that groups of items within each subscale correlated more strongly with each other than with other subscales. All subscale reliability coefficients are larger than the intercorrelations in all cases. See Table 5. Construct validity (documentary support) was established by comparing the profiles developed through data collected using the PIMRS with profiles developed from school files.

Table 4

Content Validation: Average Agreement  
on Items Among Judges

Subscale	Average Agreement
Frames Goals	91%
Communicates Goals	96%
Supervision/Evaluation	80%
Curriculum Coordination	80%
Monitors Progress	88%
Protects Time	85%
Visibility	80%
Incentives for Teachers	100%
Professional Development	80%
Incentives for Learning	94%

Source: Hallinger, P. (1992). Resource Manual: The Principal Instructional Management Rating Scale: Version 1.3. (Available from P. Hallinger, Center for Advanced Study of Educational Leadership, Vanderbilt University, Nashville, TN 37203)

TABLE 5

## PIMRS Subscale Inter-correlation Matrix

SUBSCALE	Fr Goal	Comm Goal	Eval Inst	Coor Curr	Mon Prog	Prot Time	Visi ble	Ince Teac	Prof Dev	Acad Stan	Ince lear
Frame Goal	(.89)*	.85	.47	.60	.54	.43	.39	.28	.45	.43	.46
Comm Goals		(.89)	.55	.71	.63	.49	.52	.41	.57	.54	.57
Eval Instr			(.90)	.57	.65	.51	.60	.37	.69	.59	.47
Coor Curr				(.90)	.73	.52	.60	.43	.64	.53	.58
Monit Prog					(.90)	.65	.57	.40	.67	.60	.49
Prot Time						(.84)	.57	.37	.57	.65	.39
Visible							(.61)	.47	.69	.60	.57
Incen Teac								(.78)	.61	.53	.39
Prof Devel									(.86)	.69	.57
Acad Stand										(.83)	.54
Incen Lear											(.87)

\* All coefficients in parentheses are reliability estimates (Cronback's alpha).

Source: Hallinger, P. (1992). Resource Manual: The Principal Instructional Management Rating Scale: Version 1.3. (Available from P. Hallinger, Center for Advanced Study of Educational Leadership, Vanderbilt University, Nashville, TN 37203)

Sufficient documentary data were available for six of the subscales. The strength of the validation varied across the six scales; however, the document analysis provides general support for the construct validity of those subscales (Hallinger, 1992). See Table 6.

A discriminant validity check was conducted by analysis of variance to determine if the subscales discriminated among principals. Nine of the 11 subscales measured greater variance in principals' ratings between schools than the variance in ratings within schools (significance level of .05). However, the variance in the subscales of Professional Development and Academic Standards were not statistically significant ( $p < .05$ ). Finally, in respect to reliability of the instrument, the reliability coefficients (Cronbach Alpha) for each subscale were found to be a minimum of .78. Reliability coefficients for each subscale are provided in Table 5.

Given the information related to the development of the instrument, the data supporting its validity and reliability, and support provided by other studies (Jones, 1987), it appears reasonable to accept the author's claims that "commonly applied standards for the use of questionnaires for research are generally exceeded by the PIMRS" (Hallinger, 1992, p. 1). See Table 7 for a summary of the criteria used to assess the adequacy of the instructional management rating subscales.

Table 6

Construct Validity  
(School Document Analysis)

Subscale	Document Support
Frames Goals	Yes
Communicates Goals	Yes
Monitors Student Progress	Yes
Supervision/Evaluation	Mixed
Professional Development	Mixed
Incentives for Learning	Yes

Source: Hallinger, P. (1992). Resource Manual: The Principal Instructional Management Rating Scale: Version 1.3. (Available from P. Hallinger, Center for Advanced Study of Educational Leadership, Vanderbilt University, Nashville, TN 37203)

Table 7

Summary of Criteria Used to Assess  
Subscale Adequacy of the PIMRS

Subscale	Content Validity	Reliability	Discriminant Validity	Construct Validity Intercorrelations	Construct Validity Document Analysis
Frames Goals	Yes	Yes	Yes	Yes	Yes
Communicates Goals	Yes	Yes	Yes	Yes	Yes
Monitors Progress	Yes	Yes	Yes	Yes	Yes
Supervision/Evaluation	Yes	Yes	Mixed	Yes	Yes
Curriculum Coordination	Yes	Yes	Yes	Yes	---
Protects Time	Yes	Yes	Yes	Yes	---
Visibility	Yes	Yes	Yes	Yes	---
Incentives for Teachers	Yes	Mixed	Yes	Yes	---
Professional Development	Yes	Yes	No	Yes	Mixed
Academic Standards	Yes	Yes	No	Yes	---
Incentives for Learning	Yes	Yes	Yes	Yes	Yes

Source: Hallinger, P. (1992). Resource Manual: The Principal Instructional Management Rating Scale: Version 1.3. (Available from P. Hallinger, Center for Advanced Study of Educational Leadership, Vanderbilt University, Nashville, TN 37203)

### The School Organizational Climate Questionnaire

This instrument was developed primarily to gather data to describe and analyze school characteristics that impact upon the implementation of school improvement initiatives. The categories of this instrument were designed with the intention of improving upon two instruments that were developed to modernize and improve the Organizational Climate Description Questionnaire designed by Halpin and Croft (1963). These two instruments are the Organizational Climate of Secondary Schools Questionnaire (OCSS) (Deer, 1980), and the School-Level Environment Questionnaire (SLEQ) (Rentoul & Fraser, 1983). Validation was contingent on the validity of these instruments, the SLEQ and the OCSS, since the baseline items for each scale were selected from these instruments. Since some items were reworded and some new items were added in each scale, each set of items was reviewed by a number of researchers who had previous experience with the development and use of climate assessment instruments. The draft instrument was field-tested by a sample of 56 secondary school teachers from 11 different schools. Internal consistency and discriminant validity of each scale was assessed using a sample of 234 teachers. The three categories of this instrument that are of interest for this study are Teacher Professional Involvement, Teacher Commitment, and Innovativeness. See Table 8. The reliability coefficient for the Teacher Professional Involvement scale was .79 (Cronbach Alpha). For

Table 8

## School-Level Characteristics

Scale	Description
Commitment	The degree to which teachers are supportive of and committed to the school and their colleagues
Professional Involvement	The degree to which teachers are concerned about their work, are keen to learn from one another, and committed to professional development
Innovativeness	The degree to which variety, change, and new approaches are emphasized in the school

Source: Adapted from Giddings, G., & Dellar, G. (1990, April). The development and use of an instrument for assessing the organizational climate of schools. Paper presented at the annual meeting of the American Educational Research Association, Boston, MA.

Innovativeness, the reliability coefficient was .90 (Cronbach Alpha). The scale, Teacher Commitment is an addition resulting from instrument improvements based on findings from the original sample.

Since figures on validity and reliability related to the use of this instruments in North America were not available, the researcher used pilot samples to gather the necessary data. Content validity of the three scales used in this study was determined by two groups of raters using a process consistent with procedures outlined by Latham and Wexley (1981). The first group consisted of eight graduate students at the University of Ottawa, all of whom were teachers or school administrators. The second group consisted of two school administrators, a guidance counsellor and two teachers from two schools in Newfoundland. Individual raters were given a randomly ordered list of items and a clear definition of each category. Raters were asked to identify in which category each item belonged. If an item did not belong in any category, the raters were asked to indicate it. A copy of the instrument used in this process is included in Appendix F. As shown in Table 9, the assignment of items to appropriate categories through this process met the minimum standard of 80 percent agreement among judges, suggested by Latham and Waxley as necessary for items to be considered valid indicators of a particular category.

Table 9

Content Validity  
Average Agreement Among Judges for Each Item's  
Categorization

(N=15)

Item	% of Judges selecting Category	Item	% of judges selecting category
1.....	100%	2.....	100%
3.....	80%	4.....	100%
5.....	100%	6.....	87%
7.....	100%	8.....	100%
9.....	93%	10.....	80%
11.....	87%	12.....	87%
13.....	87%	14.....	100%
15.....	100%	16.....	93%
17.....	93%	18.....	93%
19.....	100%	20.....	93%
21.....	93%	22.....	93%
23.....	93%	24.....	100%

Reliability of each scale was determined by administering the questionnaire to one class of graduate students in Educational Administration at the University of Ottawa, a total of 17 students. Reliability coefficients (Cronbach Alpha) were calculated for each of the three scales. The results are shown in Table 10. All three categories have reliability coefficients above .70, noted by Fraenke! and Wallen (1990) as acceptable in educational studies. Test-retest reliability to assess the stability of the questionnaire over time was computed as well. The questionnaire was administered to the same 17 graduate students at the University of Ottawa after 4 weeks had elapsed. The Pearson product moment correlations for each category are shown in Table 11 with the lowest coefficient being .91 which is significant at the .001 level.

#### Data Analysis

Data were analyzed using multiple regression analysis. Using such an analysis allowed the researcher to determine if there is a linear combination of instructional leadership behaviors that is significantly related to variance in the specified school-level characteristics. This was examined through the F test of linearity to determine if the linear relationship was statistically significant, and through a measure of accounted variance, Multiple R Square.

Table 10

Reliability Coefficients for Three  
Categories of the  
School Organizational Climate Questionnaire  
(N=17)

Category	Reliability
Commitment.....	.7632
Professional Involvement.....	.8564
Innovation.....	.7648

Table 11

Test-Retest Reliability  
School Organizational Climate Questionnaire

(N=17)

---

Correlations:	Commitment(T1)	Involvement(T1)	Innovation(T1)
Commitment(T2)	.9689*		
Involvement(T2)		.9103*	
Innovation(T2)			.9421*

\* Significant at .001 level

T1 First Administration of the Questionnaire

T2 Second Administration of the Questionnaire

Additionally, it was necessary to check for violations of the assumptions of regression analysis to determine if any transformations were needed due to some form of nonlinearity. This was followed by a model building process whereby the three school-level characteristics were treated separately to determine the combinations of instructional leadership behaviors that best represent the relationship among the variables. This process of analyzing all possible subsets was completed by manual manipulation of the computer analysis. The determination of which variables were to be included in the "best-fitting" model was based on the consideration of the R Square change. Also, the developed models were assessed in respect to appropriateness through analysis of the standard error of each coefficient, the 95 percent confidence intervals, and the Adjusted R Square. Initially, all analyses were completed for elementary teachers only.

To address question 2, whether the relationships among the variables vary according to school type, a "cross validation" procedure was employed. This was determined by assessment of the R Squared change when school type was included in the analysis with either all ten independent variables or with the models developed at the elementary school level. In this way, it was determined whether the relationship between the instructional leadership behaviors of the school principal and the selected school-level

characteristics differed according to school type and whether each of the models developed at the elementary school level were applicable to the high school setting.

#### Delimitations

Data were collected from a sample of 317 elementary school teachers and 307 high school teachers in the Province of Newfoundland and Labrador. The elementary school sample included 100 teachers (32 percent) responding to female principals and 217 teachers (68 percent) responding to male principals. In the high schools, there were 49 teachers (16 percent) responding to female principals and 258 teachers (84 percent) responding to male principals. Of the sample, 76 percent of the elementary teachers and 24 percent of the high school teachers were female. In respect to teaching experience, both elementary and high school teachers ranged from one year to more than 15 years; however, 65 percent of both groups had more than 15 years experience. Experience with their present principal was also quite similar among both groups of teachers, with the largest percentage falling in the range of 2-4 years. All elementary principals had more than 10 years of teaching experience and 84 percent of them had more than 15 years experience. Experience as principal ranged from 1 year to more than 15 years. High school principals were similar to their elementary

counterparts in respect to both teaching and principal experience. Ninety-five percent of them had more than 15 years teaching experience, while the range of principal experience was identical to elementary principals with similar percentages in each category. The mean school size from which the sample of teachers was drawn was 437 students. High schools ranged in size from 110 students to 900 students. Elementary schools ranged from 118 students to 697 students.

#### Limitations of the Study

Both concepts that are to be measured, instructional leadership and school-level characteristics of effectiveness, are subject to limitations of definition and are far too complex to be measured in their entirety (Madaus, Alraslan, & Kellaghan, 1980). With such complex issues considered from an open-systems perspective, the researcher was faced with constraints that dictate that the number of possible characteristics to be investigated must be limited. This imposes the inherent limitation that important elements may be omitted, or that there are other confounding variables that have not been considered. While the study gave consideration to variables such as gender of the principal and of the teacher, principal and teacher experience, school size, and school district, these were

considered in a sampling procedure rather than in the actual analysis. This may have affected the study findings.

Both instruments are subject to limitations of validity and reliability. Also, this was a cross-sectional correlational design, rather than a longitudinal or experimental study; and therefore, is subject to all the limitations that are inherent in such an approach.

The necessity of a large sample size required that the data be collected through mail survey. While there was a 60 percent return rate and 80 percent of those schools contacted consented to participate in the study, and while there were no apparent peculiar characteristics in those not responding, one must be aware that those not responding may have differing perspectives that could have altered the findings. Also, while the unit of analysis was the individual teacher, these teachers were drawn from a sample of 58 schools. The resulting lack of independence of responses must be noted even though the acceptance of the low Alpha of .01 as the level of significance should account for any weakness that this might cause (Cohen, 1992).

Finally, in order to draw inferences about relationships of variables in the population from which the sample was drawn, standard assumptions of regression theory must be presumed to exist. The existence of normality, linearity, and homoscedasticity were assessed during the analysis, and it appeared reasonable to accept these

assumptions; however, it must be recognized that acceptance of these assumptions is critical to any interpretation of the findings.

The purpose of this chapter was to present the methodology of the study. This includes a description of the sample, the data gathering instruments, the method of analysis, delimitations, and limitations of the study. The following chapter includes the presentation of the results of the statistical analysis and a detailed discussion of the model building process which resulted in the development of five parsimonious models of instructional leadership.

## PRESENTATION OF RESULTS

The purpose of this chapter is to present and discuss the results of the data analysis. It begins with additional reliability data and descriptive statistics for each of the subscales that measure both the dependent and independent variables. This is followed by a discussion of the basic assumptions of multiple regression applied to this particular analysis. Finally, the results of the hypotheses tests are presented, followed by a discussion of the model building process and presentation of the most parsimonious models.

### Reliability

Internal consistency reliability of each of the scales used to measure the dependent and independent variables was determined using the entire sample of 624 teachers. The results of this reliability check are provided in Table 12. The lowest coefficient is .8151 which meets the minimum standard of .70 set by Fraenkel and Wallen (1990) and the .80 set by Latham and Wexley (1981).

Table 12

Internal Consistency Reliability  
of Subscales

Scale	Reliability Coefficient
Commitment	.8905
Involvement	.8354
Innovation	.8641
Framing School Goals	.9345
Communicating School Goals	.8971
Supervision and Evaluation	.8932
Coordinating the Curriculum	.9158
Monitoring Student Progress	.8639
Protecting Instructional time	.8151
Visibility	.8402
Providing Incentives for Teachers	.9018
Promoting Professional Development	.8848
Providing Incentives for Learning	.8585

### Descriptive Statistics

The subscales of the Principal Instructional Management Rating Scale each consist of five items scored one to five. Each subscale is scored by summing the scores on the five items providing for a possible total of 25 points. For each school-level characteristics, each subscale consists of eight items scored one to five. The score is a total sum after transforming specific negative scores to positive. The mean, median, mode, standard deviation, and range for each subscale by school type are presented in Table 13. Analysis of this data indicates that the differences between the two school types (elementary and high school) on these scales are generally slight. In respect to instructional leadership behaviors, the highest scores for each school type is for the subscale of Promoting Professional Development. The lowest score for elementary schools is for Providing Incentives for Teachers; this is the second lowest score for high schools. The lowest subscale for high schools is Supervision and Evaluation which ranks third from the lowest for elementary schools. The second lowest for elementary schools is Monitoring Student Learning. This is the third lowest for high schools. The school-level characteristics indicate the same consistency in respect to the ranking of each subscale, with the level of Teacher Professional Involvement being highest and Commitment the lowest for each

Table 13

Descriptive Statistics for the Subscales  
of PIMRS and School-Level Characteristics  
by School Level

Variable	Mean		Standard Deviation		Median		Mode		Range	
	Elem	High	Elem	High	Elem	High	Elem	High	Elem	High
FGOALS*	18.21	18.39	5.32	4.51	19	19	25	25	5-25	5-25
CGOALS	18.04	18.18	4.99	4.58	19	19	22	19	5-25	5-25
SUPEVAL	16.25	15.44	5.11	5.08	19	16	17	19	5-25	5-25
CURR	16.81	16.71	5.17	4.79	17	17	20	17	5-25	5-25
MONIT	15.86	16.01	5.06	4.87	16	16	17	18	5-25	5-25
PROTEC	18.28	17.16	4.49	4.29	19	17	21	16	5-25	5-25
VIS	18.08	17.51	5.27	4.50	19	18	25	18	6-25	6-25
INCTEAC	15.29	15.81	5.35	5.26	16	16	14	18	5-25	5-25
PDEV	20.10	19.75	4.21	4.34	21	20	25	20	7-25	5-25
INLEARN	17.02	18.60	5.24	4.30	17	19	25	17	5-25	6-25
COM	29.70	28.69	6.69	6.53	31	29	32	31	11-40	11-40
INVOL	31.67	30.52	5.40	5.20	32	31	32	32	16-40	14-40
INNOV	30.55	29.18	6.34	5.83	31	30	32	30	12-40	9-40

\* In this table, and all remaining tables, the independent and dependent variables will be abbreviated as follows:

FGOALS	Framing School Goals
CGOALS	Communicating School Goals
SUPEVAL	Supervising and Evaluating Instruction
CURR	Coordinating the Curriculum
MONIT	Monitoring Student Progress
PROTEC	Protecting Instructional Time
VIS	Maintaining High Visibility
INCTEAC	Providing Incentives for Teachers
PDEV	Promoting Professional Development
INLEARN	Providing Incentives for Learning
COM	Teacher Commitment
INVOL	Professional Involvement
INNOV	Innovativeness

school type. T-tests of the differences between the means on each subscale indicate that only two scales of the PIMRS, Protecting Instructional Time and Providing Incentives for Learning are statistically, significantly different for each grade level ( $p < .01$ ). The subscales of Teacher Professional Involvement and Innovativeness of the School-Level Characteristics are statistically different for the two school levels ( $p < .01$ ). Results of the t-test analysis are reported in Table 14.

### Regression Analysis

The hypotheses tests and the model building process of this study were conducted through Multiple Regression Analysis. The hypotheses were tested separately for elementary schools and high schools. In the model building process, only the elementary data were used in the primary analysis. Following the determination of "best-fitting" models for elementary schools, data from high schools were analyzed in reference to hypotheses 4 to determine if school type affected the relationship between instructional leadership behaviors of principals and the school-level characteristics. Where statistical differences were found between elementary and high schools, the high school data were used to build models for that specific level. The level of statistical significance was set at  $p < .01$ , rather than  $p$

Table 14

T-Tests of Differences between the Means  
of Elementary Schools and High Schools  
for Each Subscale

Variable	t value	Degrees of Freedom	2-tail Probability
PGOALS	-.45	622	.656
CGOALS	-.35	622	.725
SUPEVAL	1.98	622	.049
CURR	.28	622	.783
MONIT	-.36	622	.721
PROTEC	3.20	622	.001
VIS	1.47	622	.142
INCTEAC	-1.24	622	.215
PDEV	1.03	622	.304
INLEARN	-4.11	622	.000
COM	1.92	622	.055
INVOL	2.73	622	.007
INNOV	2.81	622	.005

<.05 that is normally accepted for educational studies. This more stringent level was set in an attempt to account for weaknesses resulting from the lack of independence of the sample which is discussed in the following section.

### Assumptions

In order to draw inferences about relationships of variables in the population from which the sample was drawn, four standard assumptions of regression theory must be assumed. These assumptions are linearity, normality, homoscedasticity, and independence of the sample (Darlington, 1990).

#### Linearity

To determine whether it was appropriate to assume that the dependent variables and the independent variables were linearly related, bivariate scatterplots of each dependent and independent variable were plotted and graphically analyzed. In all plots the points appeared to scatter around a straight line which indicates that a positive linear relationship exists in each case. See Figure 1 for examples of these scatterplots. Additionally, analysis of scatterplots of the residuals against predicted values and the residuals against the values of the independent variables was completed. Essentially, the pattern forms a horizontal band for each plot indicating that there exists a linear relationship. Figure 2 provides an example of these

Figure 1

Bivariate Scatterplots

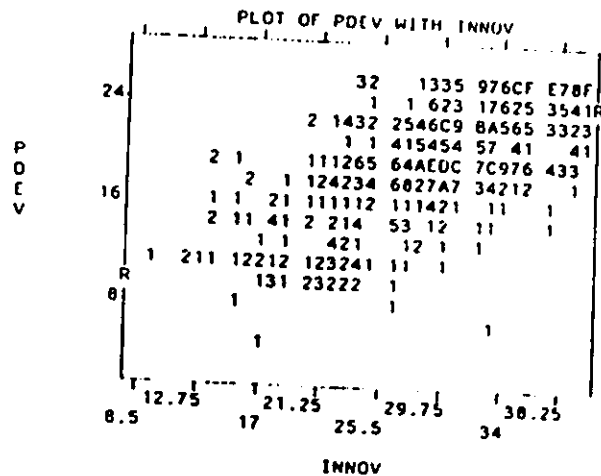
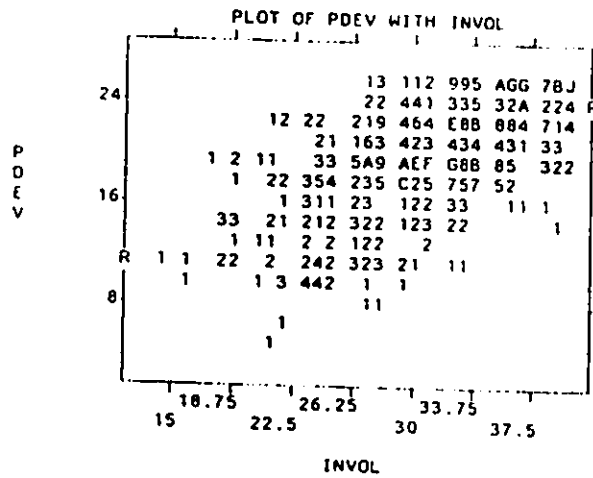
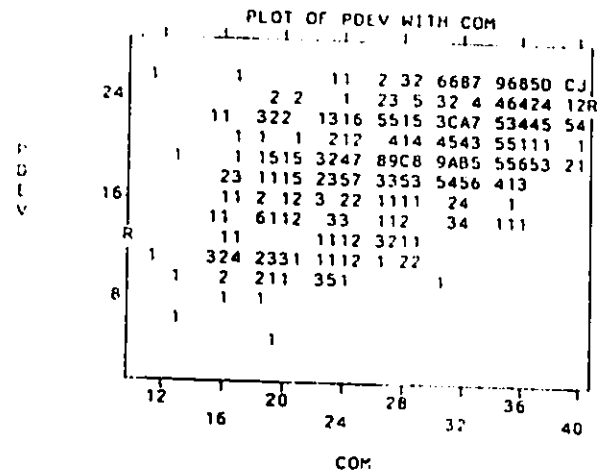
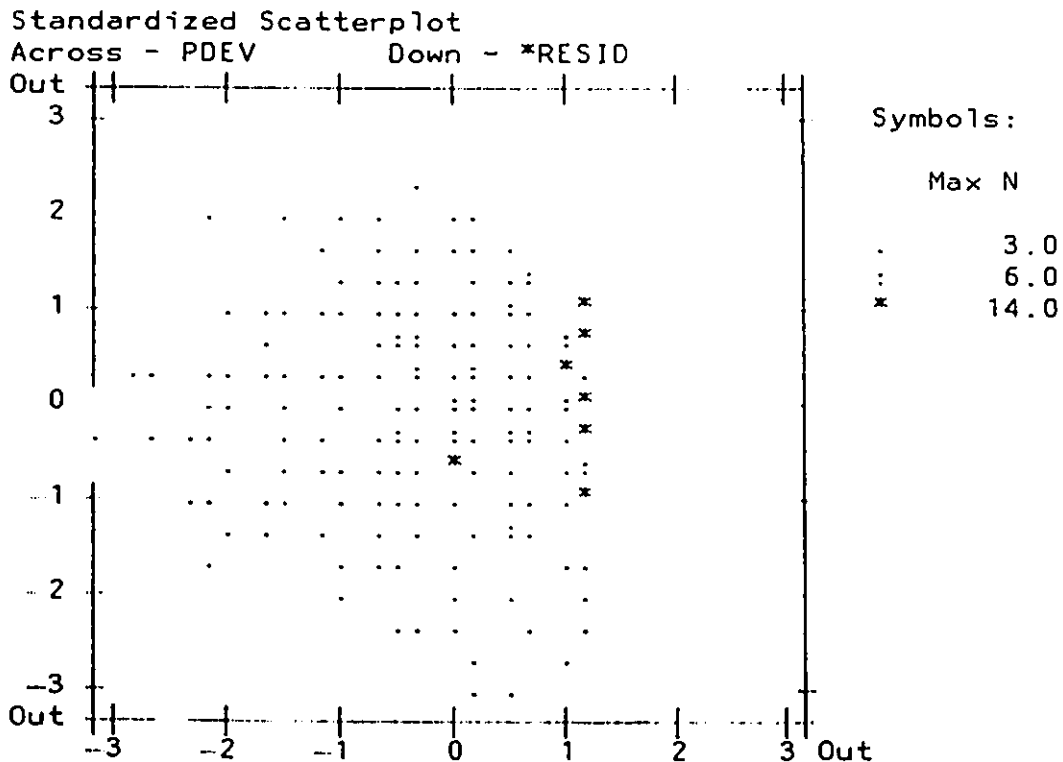
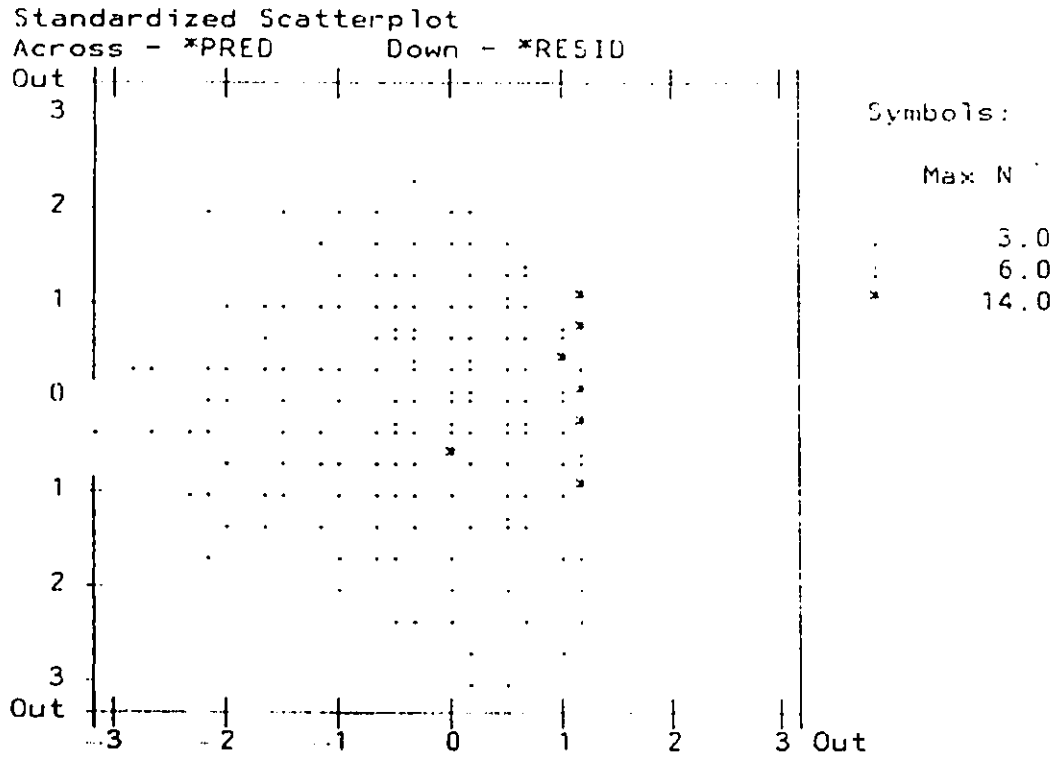


Figure 2

Scatterplots of Residuals



scatterplots. This process was completed using three sample divisions: the entire sample which included 317 elementary teachers and 307 high school teachers, the elementary sample only, and the high school sample only.

### Normality

Norusis (1990) states, "If in the population the relationship is linear and the dependent variable is normally distributed for each value of the independent variable, then the distribution of the residuals should also be approximately normal" (p.372). In order to determine normality, histograms of the standardized residuals were produced for each independent variable with the three dependent variables of Teacher Commitment, Professional Involvement, and Innovativeness. In each case the distribution of the residuals appears to be fairly normal with some slight skewedness and a small number of outliers (maximum of three outliers identified in any histogram). Figure 3 shows histograms plotted for two independent variables regressed on Innovativeness at the elementary level.

### Homoscedasticity

In order to check whether the variance appears to be constant, residuals were plotted against the predicted values, and also against the values of the independent variables. The scatterplots that were produced show no

Figure 3

Histograms

Histogram - Standardized Residual

(\* = 7 Cases, . : = Normal Curve)

N	Exp N		
1	.24	Out	*
0	.49	3.00	
0	1.24	2.67	.
3	2.83	2.33	:*
1	5.78	2.00	*
13	10.60	1.67	*****,*
10	17.39	1.33	*****
29	25.57	1.00	*****,*
46	33.67	.67	*****,*
34	39.71	.33	*****
66	41.96	.00	*****,*
26	39.71	-.33	*****
35	33.67	-.67	*****,*
22	25.57	-1.00	*****
7	17.39	-1.33	***
7	10.60	-1.67	***
3	5.78	-2.00	**
9	2.83	-2.33	:***
3	1.24	-2.67	:*
0	.49	-3.00	
2	.24	Out	*

Histogram - Standardized Residual

(\* = 1 Cases, . : = Normal Curve)

N	Exp N		
0	.24	Out	
2	.49	3.00	**
2	1.24	2.67	:*
2	2.83	2.33	**
5	5.78	2.00	*****
3	10.60	1.67	***
16	17.39	1.33	*****
23	25.57	1.00	*****
50	33.67	.67	*****,*
37	39.71	.33	*****
51	41.96	.00	*****,*
44	39.71	-.33	*****,*
27	33.67	-.67	*****
16	25.57	-1.00	*****
13	17.39	-1.33	*****
8	10.60	-1.67	*****
9	5.78	-2.00	*****,*
4	2.83	-2.33	**,*
4	1.24	-2.67	:***
1	.49	-3.00	*
0	.24	Out	

obvious pattern to the spread of the residuals in relation to the increase or decrease of the values of the independent variables, or with the predicted values. In all plots, the residuals form somewhat of a horizontal band which is indicative of equal variance. Examples of these plots are provided in Figure 2.

### Independence.

For independence to exist, it is assumed that one subject's values are not influenced by another. In this study, this assumption is violated in that the sample of teachers is taken from 58 schools. It is assumed that because a group of teachers are responding to the same principal and to issues within the same school, responses are more related than they are to teacher responses between schools. In such a study as this, where the principal and staff behavior are an issue, independence cannot be insured without severely limiting the sample size, in that, if independence were to be guaranteed, only one teacher could respond to each principal. Since lack of independence is a secondary violation, "the damage done by violation of these assumptions can always be lessened by collecting a larger or more representative sample" (Darlington 1990, p.110). This lack of independence is further accounted for by lowering the accepted level of statistical significance to .01. Cohen (1992) suggests that to lower the risk of committing a type I

error, the selection of such an alpha is recommended in such studies as this where several hypotheses are tested.

In addition to these four standard assumptions, another issue of concern is collinearity. Pearson correlation coefficients of the independent variables in this study indicate quite clearly that they are not independent of each other. As indicated in Table 15 (A) and Table 15 (B), all correlations are quite high. The lowest coefficients are .44 for the elementary sample and .39 for the high school sample. All are statistically significant at the .001 level. Hallinger (1992) states that these high correlations among the subscales are to be expected since a relatively narrow job area, instructional leadership, is being appraised. Such a relationship between variables is referred to by Darlington (1990) as a partial redundancy. He suggests that such a configuration is the most common, and therefore, he refers to it as the "standard configuration".

The degree of collinearity is assessed through the measure of tolerance. Tolerance is the measure of the independence of each regressor from the other. Tolerance of "1" indicates perfect independence, while tolerance of "0" denotes perfect dependence. In SPSS statistical analysis, tolerance below .01 is considered critical (Norusis, 1990). To determine tolerance levels, all independent variables were regressed on each dependent variable. The tolerance

Table 15 (A)

Correlations of Independent Variables  
(Elementary School)

Variables	FGOALS	CGOALS	SUPEVAL	CURR	MONIT	PROTEC	VIS	INCTEAC	PDEV	INLEARN	COM	INVOL	INNOV
FGOALS	1.0	.86*	.64	.71	.63	.46	.46	.59	.64	.59	.52	.49	.58
CGOALS	.86	1.0	.72	.77	.68	.51	.52	.67	.70	.66	.57	.57	.60
SUPEVAL	.64	.72	1.0	.78	.72	.55	.59	.68	.68	.58	.50	.52	.56
CURR	.71	.77	.78	1.0	.81	.47	.53	.67	.68	.63	.52	.55	.61
MONIT	.63	.68	.72	.81	1.0	.49	.50	.65	.65	.61	.47	.48	.53
PROTEC	.46	.51	.55	.47	.49	1.0	.57	.48	.64	.47	.49	.48	.52
VIS	.46	.52	.59	.53	.50	.57	1.0	.61	.71	.44	.66	.53	.55
INCTEAC	.59	.67	.68	.67	.65	.48	.61	1.0	.62	.63	.52	.52	.58
PDEV	.64	.70	.68	.68	.65	.64	.71	.62	1.0	.58	.72	.69	.67
INLEARN	.59	.66	.58	.63	.61	.47	.44	.63	.58	1.0	.50	.49	.53
COM	.52	.57	.50	.52	.47	.49	.66	.52	.72	.50	1.0	.75	.69
INVOL	.49	.57	.52	.55	.48	.48	.53	.52	.69	.47	.75	1.0	.77
INNOV	.58	.60	.56	.61	.53	.52	.55	.58	.67	.53	.69	.77	1.0

\* All coefficients are statistically significant at the .001 level.

TABLE 15 (B)

Correlations of Independent Variables  
(High School)

Variables	FGOALS	CGOALS	SUPEVAL	CURR	MONIT	PROTEC	VIS	INTEAC	PDEV	INLEARN	CON	INVOL	INNOV
FGOALS	1.0	.83*	.72	.78	.65	.49	.58	.66	.71	.60	.53	.57	.71
CGOALS	.83	1.0	.73	.75	.67	.43	.56	.69	.71	.61	.52	.56	.69
SUPEVAL	.72	.73	1.0	.80	.72	.49	.58	.69	.63	.52	.45	.47	.58
CURR	.78	.75	.80	1.0	.75	.48	.62	.68	.72	.56	.47	.52	.64
MONIT	.65	.67	.72	.75	1.0	.44	.63	.68	.59	.59	.43	.46	.56
PROTEC	.49	.43	.49	.48	.44	1.0	.42	.51	.46	.39	.35	.32	.38
VIS	.58	.56	.58	.62	.63	.42	1.0	.62	.60	.58	.48	.46	.52
INTEAC	.66	.69	.69	.68	.68	.51	.62	1.0	.63	.66	.41	.43	.57
PDEV	.71	.71	.63	.72	.59	.46	.60	.63	1.0	.52	.46	.59	.67
INLEARN	.60	.61	.52	.56	.59	.39	.58	.66	.52	1.0	.43	.37	.51
CON	.53	.52	.45	.47	.43	.35	.48	.41	.46	.43	1.0	.75	.74
INVOL	.57	.56	.47	.52	.46	.32	.46	.43	.59	.37	.75	1.0	.79
INNOV	.71	.69	.58	.64	.56	.38	.52	.57	.67	.51	.74	.79	1.0

\* All coefficients are statistically significant at the .001 level.

levels remained well above the critical level of .01 with the lowest observed being .19. Also, the sample size in this study, 317 elementary teachers and 307 high school teachers, provides enough power to alleviate any concern that exists with collinearity. Darlington (1990) states that collinearity affects only the power of the test on the regression slopes, not the validity. It is harder to find significance, but if it is found it is just as conclusive.

### Hypotheses

#### Hypothesis 1

There is a positive relationship among instructional leadership behaviors exhibited by principals and the level of teacher commitment to and support of the school.

As indicated in Table 15 (A) and Table 15 (B), all independent variables correlate positively with Teacher Commitment at the significance level of  $p < .001$  for both school types. Regression analysis, with all 10 independent variables regressed on Teacher Commitment at the elementary school level revealed an R Square of .5789 (Adjusted R Square .5652). The direction of the relationship was positive. Only three b weights were negative and none of these were significant. The total positive direction of the b coefficients was 7.61 including the constant of 6.15, while the negative total was -.271. The F test of linearity

yielded an F-ratio of 42.07 with 10 and 306 degrees of freedom which is statistically significant ( $p < .0005$ ).

At the high school level, the R Square was .3506 (Adjusted R Square .3287). Similar to the elementary level, the direction was positive. Only the b weights of two variables, Providing Incentives for Teachers and Coordinating the Curriculum were negative and neither was significant. The F-ratio is 15.98 with 10 and 296 degrees of freedom which is statistically significant ( $p < .0005$ ). The hypothesis was supported.

### Hypothesis 2

There is a positive relationship among instructional leadership behaviors exhibited by principals and the level of teacher professional involvement.

Table 15 (A) and Table 15 (B) show that all independent variables correlate positively with Professional Involvement ( $p < .001$ ). When all 10 independent variables were regressed on the dependent variable of Teacher Professional Involvement at the elementary level, the R Square was .5055 (Adjusted R Square of .4893). The direction of the relationship was positive, and only three b weights were negative, none of which were significant. The positive direction of the b coefficients was 14.722 with a constant of 13.51 included, while the negative total was  $-.368$ . The F test of linearity yielded an F-ratio of 31.27 with 10 and

306 degrees of freedom which is statistically significant ( $p < .0005$ ).

At the high school level, the R Square was .4112 (Adjusted R Square .3913). The direction of the relationship was similarly positive. The F-ratio was 20.67 with 10 and 296 degrees of freedom which is statistically significant ( $p < .0005$ ). The hypothesis was supported.

### Hypothesis 3

There is a positive relationship among instructional leadership behaviors exhibited by principals and the level of innovativeness in the school.

As with the other school-level characteristics, all independent variables independently correlate positively with Innovativeness ( $p < .001$ ). See Table 15 (A) and 15 (B). The R Square resulting from the regression equation containing all 10 independent variables was .5312 (Adjusted R Square of .5159). The direction of the relationship was positive. There were three negative b weights, but they were not significant. The total positive direction of the b coefficients was 10.53 with a constant of 9.19 included, while the negative total was .181. The F test of linearity yielded an F-ratio of 34.68 with 10 and 306 degrees of freedom which is statistically significant. At the high school level the relationship was significantly positive as well. The F-ratio was 40.80 with 10 and 296 degrees of

freedom which is statistically significant ( $p < .0005$ ). The R square was .5796 (Adjusted R square .5654). The hypothesis was supported.

#### Hypothesis 4

School type (elementary or high school) does not affect the relationship among instructional leadership behaviors exhibited by principals and the specified school-level characteristics: (A) Teacher Commitment, (B) Professional Involvement, and (C) Innovativeness.

This hypothesis was treated as three independent hypotheses, 4 (A), 4 (B), 4 (C). For each of these hypothesis, two tests were conducted. Firstly, all variables were regressed on the entire sample, then School Type was added to the regression model to determine if there was a significant R Square change. Secondly, after "best-fitting" models were developed from the elementary school data, these models were applied to the entire sample, once again to determine if School Type significantly changed the R Square. If the results of either test showed a statistically significant R Square change, the hypothesis was rejected.

Hypothesis 4 (A). School type does not affect the relationship among instructional leadership behaviors exhibited by principals and Teacher Commitment.

When all variables were regressed on Commitment, the R Square change resulting from the addition of School Type was .00347 ( $F = 3.850$ ,  $DF = 11/612$ ,  $p = .0502$ ). When School Type was regressed on the developed model, shown in Table 16, the

Table 16

Model for Commitment  
(Elementary School)

Coef./Var	Coefficient Statistics						Model Statistics				
	R Sq	Ch	B	F of B	Sig F	SE B	95 C. Int.	R Sq	SE	F	Sig F
b2/CGOALS	.00728	.692	5.36	.0213	.083	.03 to .35	.58	4.39	84.98	.0000	
b3/SUPEVAL	.00841	-.190	6.19	.0134	.077	-.34 to -.03					
b7/VIS	.04657	.398	34.27	.0000	.068	.26 to .53					
b9/PDEV	.06227	.692	45.82	.0000	.102	.49 to .89					
b10/INLEARN	.00499	.124	3.67	.0562	.065	-.003 to .25					
a/CONSTANT		6.08	25.01	.0000	1.22	4.7 to 8.5					

R Square change was .00457 ( $F = 5.055$ ,  $DF = 6/617$ ,  $p = .0249$ ). In both tests, the R Square change was not statistically significant ( $p < .01$ ). The hypothesis was accepted.

Hypothesis 4 (B). School type does not affect the relationship among instructional leadership behaviors exhibited by principals and Teacher Professional Involvement.

When School Type was entered in the equation containing all ten variables, the R Square change was .00730 ( $F = 8.12$ ,  $DF = 11/612$ ,  $p = .0045$ ). When School Type was applied to the developed model, shown in Table 17, the resulting R Square change was .00912 ( $F = 10.12$ ,  $DF = 6/617$ ,  $p = .0015$ ). In both tests the R Square change was statistically significant ( $p < .01$ ). The hypothesis was rejected.

Hypothesis 4 (C). School type does not affect the relationship among instructional leadership behaviors exhibited by principals and teacher innovativeness.

When all ten variables were regressed on Innovativeness, the R Square change that resulted from the addition of School Type to the equation was .01085 ( $F = 14.58$ ,  $DF = 11/612$ ,  $p = .0001$ ). The application of School Type to the developed model, shown in Table 18, resulted in an R Square change of .00999 ( $F = 13.35$ ,  $DF = 6/617$ ,  $p = .0003$ ). The R Square change in both cases was statistically significant ( $p < .01$ ). The hypothesis was rejected.

Table 17

Model for Involvement  
(Elementary School)

Coef/Var	Coefficient Statistics						Model Statistics			
	R Sq	ch B	F of B	Sig F	SE B	95 C. Int.	R Sq	SE	F	Sig F
b4/CJRR	.00866	.180	5.36	.0212	.078	.03 to.33	.50	3.85	76.80	.0000
b5/MONIT	.00379	-.116	2.35	.1264	.076	-.27 to.03				
b8/INCTEAC	.00877	.136	5.43	.0204	.058	.02 to.25				
b9/PDEV	.14638	.713	90.64	.0000	.075	.57 to.86				
a/Constant		14.07	176.52	.0000	1.06	12 to 16				

Table 18

Model for Innovativeness  
(Elementary School)

Coef/Va	Coefficient Statistics						Model Statistics			
	R Sq Change	B	F of B	Sig F	SE B	95 C. Int.	R Sq	SE	F	Sig F
b1/PGOALS	.00656	.146	4.30	.0391	.071	.007 to.29	.52	4.41	68.68	.0000
b4/CURR	.00694	.170	4.55	.0338	.080	.01 to.33				
b6/PROTEC	.00680	.153	4.45	.0357	.073	.01 to.30				
b8/INCTEAC	.01302	.194	8.52	.0038	.066	.06 to.32				
b9/PDEV	.03941	.492	25.78	.0000	.097	.30 to.68				
a/CONSTANT		.9.38	55.16	.0000	1.26	.07 to 12				

### Model Building

In the assessment of the "best-fitting" model, each school type (elementary and high school) was separately analyzed beginning with elementary school. Since the unique contribution of each of the instructional leadership variables to each school-level characteristic was found to be statistically significant ( $p < .0005$ ), determination of a "best-fitting" model required analysis of each variable in the context of all other sets of variables. This process of analyzing all possible subsets was completed by manual manipulation of the computer analysis. The robustness of a particular variable as it was entered in the equation was considered through the R Square change. To assist in the model building process, R Square changes that were significant at the .05 level are discussed. Since this process did not include hypothesis testing, it was determined appropriate to set the level of significance at a higher level ( $p < .05$ ) to allow for a broader analysis of each variable and to insure that important variables were not overlooked. Darlington (1990) notes that with variables that are highly correlated, as is the case in this study, deleting one variable lowers the R square very little. He states that it is possible to have "a situation where no individual member of a set is statistically significant, even though the set as a whole is significant" (p. 125). This suggests that even in the absence of making a

significant R square change to the model, a particular variable may be important. As a consequence, in the model building process, the decision to exclude any variable from the model was based on its lack of general robustness as it was used with various variables in differing sets. The subsets of variables to which each variable contributes significantly as indicated by the R Square change are reported in Appendix G (elementary school) and Appendix H (high school).

Each model that was developed at the elementary level was applied across levels. If controlling for Grade level resulted in a significant R Square change, the modeling process was repeated for the high school level. As noted above in the presentation of the results of the hypothesis tests, statistically significant differences were found between school levels for Teacher Professional Involvement and for Innovativeness. Consequently, models for these two school-level characteristics were developed separately. The "best-fitting" model for Teacher Commitment was determined to be applicable to both levels since hypothesis 4 (A) was supported.

#### Model Building at the Elementary School Level

Commitment. The unique contribution of each of the instructional leadership variables to the level of Teacher Commitment is statistically significant. As indicated in Table 19, the range of R Squares is from .2201 for

Table 19

Unique Contribution of Each Independent Variable  
to the School-Level Characteristics  
(Elementary School)

Variables	R Square Commitment	R Square Involvement	R Square Innovativeness
PGOALS	.2668*	.2439	.3329
CGOALS	.3297	.3226	.3641
SUPEVAL	.2451	.2667	.3118
CURR	.2669	.3071	.3708
MONIT	.2201	.2276	.2824
PROTEC	.2394	.2331	.2661
VIS	.4299	.2762	.2970
INCTEAC	.2717	.2735	.3388
PDEV	.5145	.4720	.4490
INLEARN	.2464	.2380	.2768

\*All R Squares in this Table are statistically significant ( $p < .01$ ).

Monitoring Student Progress to .5145 for Promoting Professional Development. Since each variable explains a significant proportion of the variance in respect to Commitment, determination of a regression model required analysis of each variable in the context of all other combinations of variables.

Framing School Goals explains independently 27 percent of the variance of Commitment. It continues to contribute significantly to the regression equation when all variables except Promoting Professional Development or Communicating School Goals are included. See Appendix G.

Communicating School Goals explains uniquely 33 percent of the variance of Commitment. When it is combined with all variables other than Promoting Professional Development, it continues to make a statistically significant R Square change when added to the equation ( $P=.019$ ). When Promoting Professional Development is part of the equation with either Providing Incentives for Learning, Providing Incentives for Teachers, or Framing School Goals, combined with all other variables, Communicating School Goals contributes significantly. Generally, Communicating School Goals is a robust variable that continues to contribute significantly to Commitment when combined with other variables.

Supervision and Evaluation as a unique variable explains 34 percent of the variance of commitment. It contributes significantly when entered with any single variable. It continues to contribute significantly, in a

negative direction, with various combinations of six to eight variables even though it does not contribute significantly with most sets of three variables. When it is added to two variables or less, it makes a significant positive contribution to the explained variance. When Communicating School Goals is combined with any combination of variables excluding Monitoring Student Progress, Supervision and Evaluation remains significant. When all variables are entered in the equation excluding any two of Protecting Instructional Time, Monitoring Student Progress, or Coordinating the Curriculum, Supervision and Evaluation contributes significant additional variance. The statistically significant negative contribution of this variable to the model as the explained variance increases makes its inclusion in the "best-fitting" model essential.

Coordinating the Curriculum contributes 27 percent to Commitment when used alone. It contributes significantly to equations with one other variable with the exception of Promoting Professional Development. When it is added to an equation in which Communicating School Goals is included, it ceases to contribute significantly if any other variable is entered. Similarly, the R Square change that results from its addition to Framing School Goals and various combinations of not more than one or two other variables is statistically significant. When Framing School Goals, Communicating School Goals, and Promoting Professional

Development are excluded, Coordinating the Curriculum significantly contributes to any set of five variables.

Monitoring Student Progress explains 22 percent of the variance of Commitment when regressed on it as a unique variable. Its addition to all single variables, except Coordinating the Curriculum and Promoting Professional Development, results in a statistically significant R Square change. It contributes significantly to only one set of three variables, Visibility, Protecting Instructional Time, and Supervision and Evaluation. Otherwise, Monitoring Student Progress contributes significantly to equations with a maximum of two other variables.

Protecting Instructional Time explains uniquely 23 percent of the variance of Commitment. It contributes significantly to all single variables with the exception of Promoting Professional Development. When Visibility is included in the equation, Protecting Instructional Time contributes significantly with Supervision and Evaluation, Coordinating the Curriculum, Monitoring Student Progress, and Providing Incentives for Teachers. If Communicating School Goals or Providing Incentives for Learning are employed with Visibility, Protecting Instructional Time does not account for significant additional variance. Also, it ceases to contribute significantly when Framing School Goals is combined with any variable except Supervision and Evaluation. When Visibility and Promoting Professional Development are not included in the equation, all other

variables can be combined, and Protecting Instructional Time contributes significantly.

Visibility accounts for 43 percent of the variance of Commitment when it is used alone. It contributes significantly with all combinations of variables.

Providing Incentives for Teachers explains uniquely 27 percent of the variance of Commitment. It contributes significantly to the explained variance when combined with all individual variables. When Communicating School Goals and Promoting Professional Development are combined, this variable does not contribute significantly; however, when either Supervision and Evaluation or Monitoring Student Progress are included in the equation, it contributes significantly once again. Similarly, it does not contribute significantly to the set of Providing Incentives for Learning and Promoting Professional Development unless Monitoring Student Progress is included. The inclusion of Visibility in the equation affects the robustness of this variable. It contributes significantly to a combination of Visibility and either Supervision and Evaluation or Monitoring Student Progress. The addition of any other variable with Visibility results in a non significant contribution of Providing Incentives for Teachers. When Visibility and Promoting Professional Development are not included in the equation Providing Incentives for Learning contributes significantly with all other variable combinations. When Communicating School Goals, Providing

Incentives for Learning, and Promoting Professional Development are combined, Providing Incentives for Teachers does not explain additional statistically significant variance.

Promoting Professional Development accounts uniquely for 52 percent of the variance of Commitment. It continues to contribute significantly with all variables in all possible subsets.

Providing Incentive for Learning, as a single variable, explains 25 percent of the variance of Commitment. It continues to contribute significantly when employed with any combination of eight variables providing that Monitoring Student Progress, Protecting Instructional Time, and Visibility are included in the equation.

The conclusion related to the analysis of all variables and subsets of variables, is represented by the determination of the "best-fitting" model. Aside from being the variables that uniquely account for most variance, Visibility and Promoting Professional Development are the only variables that continue to account for significant additional variance when all other variables have been entered in the equation. This can be seen in Table 20. When these two variables are combined they explain 56 percent of the variance of Commitment. When other variables are added to the equation, the R Square change is significant for two variables only, Providing Incentives for Learning ( $p = .015$ )

Table 20

Model of All Independent Variables  
Regressed on Commitment  
(Elementary School)

Variables	R square (Change)	Adjusted R Square	DF	F	Signif F	B
b1/FGOALS	(.00007)			.051	.8217	.021
b2/CGOALS	(.00346)			2.52	.1137	.182
b3/SUPEVAL	(.00489)			3.56	.0603	-.168
b4/CURR	(.00004)			.030	.8635	.018
b5/MONIT	(.00128)			.928	.3361	-.086
b6/PROTEC	(.00007)			.048	.8262	-.017
b7/VIS	(.04090)			29.72	.0000	.396
b8/INCTEAC	(.00008)			.058	.8095	.010
b9/PDEV	(.05869)			42.65	.0000	.711
b10/INLEARN	(.00512)			3.72	.0546	.133
CONSTANT				23.32	.0000	6.15
MODEL	.57892	.56516	10/306	42.07	.0000	

and Communicating School Goals ( $p = .018$ ). When these variables are entered as a set, the R Square change is .01126 ( $F$  change = 4.075,  $p = .018$ ). Table 21 (A) shows the R Square changes when variables are added to the set of Promoting Professional Development and Visibility. When other variables are entered in the equation with these four variables, only the R Square change resulting from Supervision and Evaluation is significant ( $p = .0134$ ). This can be seen in Table 21 (B). If these three variables, Providing Incentives for Learning, Communicating School Goals, and Supervision and Evaluation, are added as a set to Promoting Professional Development and Visibility, the R Square change is .01967 ( $F$  change = 4.824,  $p = .003$ ). When all other variables are added to the new equation of five variables, none of the R Square changes are statistically significant. See Table 21 (C). It is apparent that the most appropriate model contains the variables Communicating School Goals (b2), Supervision and Evaluation (b3), Visibility (b7), Promoting Professional Development (b9), and Providing Incentives for Learning (b10). The model is shown below in two formats, b weights and beta (standardized) weights.

b weights:

$$.1933b2 - .1904b3 + .3983b7 + .6924b9 + .1242b10 + 6.080a = \text{Commitment.}$$

Table 21 (A)

R Square Changes with  
Promoting Professional Development and Visibility  
for Commitment  
(Elementary School)

Variables	R Square Changes	F Changes	Significance
FGOALS	.00500	3.58057	.0594
CGOALS	.00789	5.68595	.0177
SUPEVAL	.00102	.72016	.3967
CURR	.00039	.27621	.5996
MONIT	.00007	.05031	.8227
PROTEC	.00002	.01277	.9101
INCTEAC	.00135	.95479	.3293
INLEARN	.00828	5.97386	.0151
FGOALS, PROTEC, MONIT, CURR, INCTEAC, SUPEVAL	.01101	1.31005	.2522
CGOALS, INLEARN	.01126	4.07548	.0179
CGOALS INLEARN SUPEVAL	.01967	4.82409	.0030

Table 21 (B)

R Square Changes with  
Promoting Professional Development, Visibility,  
Providing Incentives for Learning,  
and Communicating School Goals  
for Commitment  
(Elementary School)

Variables	R Square Changes	F Changes	Significance
PGOALS	.00002	.01437	.9047
SUPEVAL	.00841	6.1658	.0134
CURR	.00222	1.6069	.2059
MONIT	.00441	3.2182	.0738
PROTEC	.00042	.30035	.5841
INTEAC	.00036	.25646	.6129
PGOALS, CURR MONIT, PROTEC, INTEAC	.00505	.72734	.6034

Table 21 (C)

R Square Changes with  
 Promoting Professional Development, Visibility  
 Providing Incentives for Learning, Communicating  
 School Goals, and Supervision and Evaluation  
 for Commitment  
 (Elementary School)

Variables	R Square Changes	F Changes	Significance
FGOALS	.00005	.03527	.8511
CURR	.00006	.04292	.8360
MONIT	.00124	.91025	.3408
PROTEC	.00010	.07065	.7906
INCTEAC	.00001	.00829	.9275

beta weights:

.1441b2 - .1453b3 + .3139b7 + .4357b9 + .0973b10 + 6.080a =  
Commitment.

In this equation, as indicated in Table 16, all variables contribute significantly with the exception of Providing Incentives for Learning. Since the addition of this variable resulted in a statistically significant R Square change when added to Promoting Professional Development and Visibility before the introduction of Supervision and Evaluation, and as a result of its general robustness with all variables, it was determined that it should be included.

The amount of variance explained by this model is 58 percent (F=84.98, DF = 5/311, p < .0005). The relatively small standard error of each coefficient, and the small 95 percent confidence intervals that can be seen in Table 16 provide support for the appropriateness of the model. The little change from the R square (.577) to the Adjusted R Square (.570) which gives a more nearly unbiased estimate of explained variance (Darlington, 1990) provides further support for the accuracy of the model.

Professional Involvement. As with the dependent variable Commitment, above, all individual variables explain a statistically significant amount of the variance of Professional Involvement. As indicated in Table 19, the R Square ranges from .23 with Protecting Instructional Time and Monitoring Student Progress to .47 with Promoting

Professional Development. Similar to the process of determining an appropriate model for Commitment, all subsets analysis was used to determine which variables should be included in the "best-fitting" model. Appendix G provides a summary of the models to which each variable contributes significantly.

Framing School Goals explains 24 percent of the variance of Involvement when regressed on it as a unique variable. When either Communicating School Goals or Promoting Professional Development is employed in the equation, Framing School Goals does not make a statistically significant R Square change. If neither of these variables is in the equation, Framing School Goals contributes significantly with Supervision and Evaluation, Coordinating the Curriculum, Monitoring Student Progress, and any other single variable. When Coordinating the Curriculum, Promoting Professional Development, and Communicating School Goals are eliminated, Framing School Goals contributes to the equation when all other variables have been entered.

Communicating School Goals uniquely explains 32 percent of the variance of Involvement. When Promoting Professional Development, Providing Incentives for Learning, Visibility, Protecting Instructional Time, Framing School Goals, and Monitoring Student Progress are combined, Communicating School Goals continues to contribute significantly. However, when Coordinating the Curriculum or Providing Incentives for

Teachers is included in the equation with Promoting Professional Development, the addition of Communicating School Goals does not change the R Square significantly. If Promoting Professional Development is not included, Communicating School Goals contributes significantly to a set of all other variables.

Supervision and Evaluation as a single variable accounts for 27 percent of the variance of Involvement. If Promoting Professional Development is regressed on Involvement, Supervision and Evaluation does not account for any significant new variance. Similarly, when Communicating School Goals and either Coordinating the Curriculum or Visibility are in a set, the R Square change resulting from the addition of Supervision and Evaluation is not significant. When these variables are separated, Supervision and Evaluation does contribute significantly to the variance explained by various combinations of three or four variables. For example, Visibility, Protecting Instructional Time, Providing Incentives for Teachers, Monitoring Student Progress, and Providing Incentives for Learning can be combined in any set of three, and the addition of Supervision and Evaluation accounts for significant additional variance. Generally, this variable does not explain significant variance beyond that which is explained by any combination of three variables. Therefore, it is not

considered to be a robust variable that should be included in the "best-fitting" model.

Coordinating the Curriculum singly accounts for 31 percent of the variance of Involvement. It continues to contribute significantly when all variables are entered in the equation.

Monitoring Student Progress Independently accounts for 23 percent of the variance of Involvement. When Coordinating the Curriculum or Promoting Professional Development are included in an equation the contribution of Monitoring Student Progress becomes non significant. Otherwise, when added to sets of two or three variables, it results in a statistically significant R Square change. For example, it contributes significantly to the variance explained by a set of Visibility, Protecting Instructional Time, and Framing School Goals; and to Visibility, and either Providing Incentives for Teachers or Providing Incentives for Learning. When the latter variables, Providing Incentives for Teachers and Providing Incentives for Learning, are in a set with any other variable, Monitoring Student Progress does not add to the explained variance. It is apparent that this variable is not robust when other variables are considered, and therefore, would explain little additional variance in a model for Professional Involvement when other, more robust variables have been considered.

Protecting Instructional Time uniquely accounts for 23 percent of the variance of Involvement. When Promoting Professional Development is in the equation, Protecting Instructional Time does not account for additional variance. It continues to contribute significantly with combinations of all other variables.

Visibility as an independent variable accounts for 28 percent of the variance of Involvement. Similar to Protecting Instructional Time, it does not explain additional variance beyond that accounted for by Promoting Professional Development; however, it brings about a significant R Square change when added to a set of all other variables.

Providing Incentives for Teachers explains 27 percent of the variance of Involvement when regressed on it as a separate variable. It continues to contribute significantly to the explained variance when employed with a set of all variables, with the exception of Promoting Professional development and Visibility. When Promoting Professional Development is included in the model, all variables except Communicating School Goals and Providing Incentives for Learning can be entered, and Providing Incentives for Teachers continues to contribute significantly. When Communicating School Goals is employed with Promoting Professional Development, Framing School Goals, Supervision and Evaluation, and Monitoring Student Progress, the

addition of Providing Incentives for Teachers augments the R Square significantly; however, the addition of any other single variable to this set results in its non significant contribution. When Visibility and Incentives for Learning are combined, only two variables, Protecting Instructional Time and Monitoring Student Progress, can compose a set to which this variable accounts for significant additional variance.

Promoting Professional Development uniquely accounts for 47 percent of the variance of Involvement. It continues to contribute significantly when all variables are entered in the equation.

Providing Incentives for Learning as a unique variable explains 24 percent of the variance of Involvement. If Promoting Professional Development and Providing Incentives for Teachers are not included, all other variables combine with either Protecting Instructional Time or Coordinating the Curriculum to form a set to which the addition of Providing Incentives for Learning accounts for a statistically significant R Square change. When Providing Incentives for Teachers and Promoting Professional Development are included in a model, Providing Incentives for Learning does not account for further statistically significant variance.

When all the variables are entered in the equation, only Promoting Professional Development and Coordinating the

Curriculum contribute significantly to Involvement. See Table 22. The set of these two variables account for 49 percent of the variance of Involvement. As can be observed from Table 23 (A), when other variables are added to this set, only Providing Incentives for Teachers makes a significant R Square change (R Square = .00679, F = 4.184, P = .0416). When individual variables are combined with the largest single contributor, Promoting Professional Development, Providing Incentives for Teachers, Communicating School Goals, Coordinating the Curriculum, and Providing Incentives for Learning individually contribute significantly to the variance explained. As can be seen in Table 23 (B), the addition of Providing Incentives for Teachers results in the largest R Square change (.01531). When other variables are added to the set of Promoting Professional Development and Providing Incentives for Teachers, no variable or set of variables results in a statistically significant R Square change. See Table 23 (C). In spite of this, it was determined that two other variable, Coordinating the Curriculum and Monitoring Student Progress should be included in the model. The addition of either of these variables or both combined to the above noted two variable model does not result in a significant R Square change; however, as indicated in Table 23 (D), when Monitoring Student Progress is included, the addition of Coordinating the Curriculum or Communicating School Goals

Table 22

Model of All Independent Variables  
Regressed on Involvement  
(Elementary School)

Variables	R square (Change)	Adjusted R Square	DF	F	Signif F	B
b1/FGOALS	(.00158)			.975	.3241	-.0711
b2/CGOALS	(.00350)			2.164	.1423	.148
b3/SUPEVAL	(.00096)			.595	.4410	-.160
b4/CURR	(.00608)			3.763	.0533	.173
b5/MONIT	(.00445)			2.755	.0979	-.129
b6/PROTEC	(.00158)			.977	.3238	.065
b7/VIS	(.00039)			.238	.5258	.031
b8/INCTEAC	(.00348)			2.154	.1433	.096
b9/PDEV	(.07120)			44.05	.0000	.632
b10/INLEARN	(.00198)			1.225	.2693	.067
CONSTANT				147.29	.0000	13.51
MODEL	.50545	.48929	10/306	31.27	.0000	

Table 23 (A)

R Square Changes with Promoting Professional Development  
and Coordinating the Curriculum  
for Involvement  
(Elementary School)

Variables	R Square Changes	F Changes	Significance
PGOALS	.00020	.11942	.7299
CGOALS	.00463	2.8406	.0929
SUPEVAL	.00000	.00033	.9856
MONIT	.00181	1.1050	.2940
PROTEC	.00255	1.5616	.2124
VIS	.00197	1.2031	.2736
INTEAC	.00679	4.1845	.0416
INLEARN	.00526	3.2335	.0731
CGOALS INLEARN	.00766	2.3590	.0962

Table 23 (B)

R Square Changes with  
Promoting Professional Development  
for Involvement  
(Elementary School)

Variables	R Square Changes	F Changes	Significance
FGOALS	.00483	2.89685	.0897
CGOALS	.01460	8.92812	.0030
SUPEVAL	.00481	2.88737	.0903
CURR	.01348	8.22739	.0044
MONIT	.00192	1.14339	.2858
PROTEC	.00334	1.99746	.1586
VIS	.00287	1.71378	.1915
INTEAC	.01531	9.37835	.0024
INLEARN	.01253	7.63226	.0061
CGOALS CURR INTEAC			
INLEARN	.02425	3.74287	.0054
FGOALS SUPEVAL VIS			
PROTEC MONIT	.01033	1.23728	.2914

Table 23 (C)

R Square Changes with  
Promoting Professional Development and  
Providing Incentives for Teachers  
for Involvement  
(Elementary School)

Variables	R Square Changes	F Changes	Significance
FGOALS	.00099	.60356	.4378
CGOALS	.00578	3.5669	.0599
SUPEVAL	.00024	.14725	.7014
MONIT	.00009	.05487	.8150
VIS	.00029	.17605	.6751
PROTEC	.00170	1.0409	.3084
INLEARN	.00439	2.7007	.1013

Table 23 (D)

R Square Changes with  
 Promoting Professional Development, Monitoring Student  
 Progress, and Providing Incentives for Teachers  
 for Involvement  
 (Elementary School)

Variables	R Square Changes	F Changes	Significance
FGOALS	.00124	.75557	.3854
CGOALS	.00685	4.2234	.0407
SUPEVAL	.00044	.26899	.6044
CURR	.00866	5.3618	.0212
VIS	.00027	.16498	.6804
PROTEC	.00178	1.0855	.6649
INLEARN	.00500	3.0758	.0804

results in a significant R Square change. Since Communicating School Goals does not account for as much variance as Coordinating the Curriculum, and does not significantly account for additional variance beyond that accounted for by Promoting Professional Development, Providing Incentives for Teachers, Coordinating the Curriculum, and Monitoring Student Progress, it was not included in the model. The statistics provided in Table 23 (E), indicate that no other variable or sets of variables contribute to the variance of Involvement beyond these four variables. The "best-fitting" model is composed of Coordinating the Curriculum (b4), Monitoring Student Progress (b5), Providing Incentives for Teachers (b8), and Promoting Professional Development (b9). The model is presented below in both b weight and beta weight format.

b weights:

$$.1802b4 - .1164b5 + .1362b8 + .7133b9 + 14.07a = \text{Involvement}$$

beta weights:

$$.1724b4 - .1092b5 + .1348b8 + .5562b9 + 14.07a = \text{Involvement}$$

The amount of variance explained by this model is 50 percent ( $F = 76.80$ ,  $DF = 4/312$ ,  $P < .0005$ ). While the 95 percent confidence interval ranges over the zero mark for Monitoring Student Progress because of the non significance of the b weight, the relatively small range and the small standard error of each coefficient provides support for the accuracy of the model. The little change from the R Square

Table 23 (E)

R Square Changes with  
 Promoting Professional Development, Monitoring Student  
 Progress, Coordinating the Curriculum, and Providing  
 Incentives for Teachers  
 for Involvement  
 (Elementary School)

Variables	R Square Changes	F Changes	Significance
FGOALS	.00002	.00114	.9152
CGOALS	.00277	1.7219	.1904
SUPEVAL	.00017	.10615	.7448
VIS	.00036	.22195	.6379
PROTEC	.00221	1.3729	.2422
INLEARN	.00335	2.0812	.1501

of .496 to the Adjusted R Square of .490, which, as previously noted, gives a more nearly unbiased estimate of explained variance, provides additional support for its accuracy. See Table 17 for a summary of the statistics related to the model.

Innovativeness. As with both Commitment and Professional Involvement, all variables uniquely account for variance of Innovativeness that is statistically significant. As shown in Table 19, the amount of explained variance ranges from 26 percent accounted for by Protecting Instructional Time to 45 percent by Promoting Professional Development. As a consequence of the unique strength of each variable, and as a result of the high correlation of each variable, the process of selecting the most appropriate model was conducted in a similar manner to the development of the models for the other dependent variables through all subsets analysis. The largest subsets to which each variable contributes significantly are listed in Appendix G.

Framing School Goals uniquely accounts for 33 percent of the variance of Innovativeness. When Framing School Goals is used with Coordinating the Curriculum and Communicating School Goals, it does not make a significant change to the explained variance. With the exclusion of Communicating School Goals from the equation, Framing School Goals remains significant with all combinations of other variables.

Communicating School Goals as an independent variable explains 36 percent of the variance of Innovativeness. It contributes significantly when added to a combination of Supervision and Evaluation, Monitoring Student Progress, Protecting Instructional Time, Visibility, Providing Incentives for Learning, Providing Incentives for Teaching, and either Promoting Professional Development or Coordinating the Curriculum. When Framing School Goals is included, it is not so robust, and significantly contributes to combinations of only three variables unless Supervision and Evaluation is included, whereupon, it accounts for additional variance with sets of four variables.

Supervision and Evaluation separately accounts for 31 percent of the variance of Innovativeness. It remains significant with all single variables; however, it is not robust with other combinations of variables. It continues to make a significant R Square change with a maximum of four other variables, and when Promoting Professional Development is included, it continues to contribute significantly with only Instructional Time and Visibility, or with any other single variable. Also, when Providing Incentives for Learning and Providing Incentives for Teachers are combined, no other variables can be added if Supervision and Evaluation is to make a significant R Square change.

Coordinating the Curriculum uniquely accounts for 37 percent of the variance of Innovativeness. It continues to

be robust with all variables and significantly contributes to Innovativeness when all variables are entered.

Monitoring Student Progress, as a single variable, accounts for 28 percent of the variance of Innovativeness. It contributes significantly to Innovativeness with all single variables except Coordinating the Curriculum. It is not particularly robust as its addition to only one equation with more than three variables results in a significant R Square change.

Protecting Instructional Time uniquely accounts for 27 percent of the variance. This variable is significant in its contribution to Innovativeness when all variables are combined. While, uniquely, it accounts for less variance than any other single variable, it is quite robust when combined with other variables.

Visibility accounts for 30 percent of the variance of Innovativeness when regressed on it without the control of other variables. It adds significantly to the amount of variance explained when all variables, with the exception of Promoting Professional Development, are included in the equation. When Promoting Professional Development is included, Visibility contributes significantly to a combination of Framing School Goals, Communicating School Goals, Providing Incentives for Learning, and Monitoring Student Progress; however, it ceases to make a significant R Square change if Promoting Professional development is

combined with either Supervision and Evaluation, Coordinating the Curriculum, Protecting Instructional Time, or Providing Incentives for Teachers.

Providing Incentives for Teachers accounts for 34 percent of the variance of Innovativeness when regressed on it as a unique variable. It continues to explain a significant amount of additional variance when added to all variables.

Promoting Professional Development uniquely explains 45 percent of the variance of Innovativeness. It is quite robust and contributes significantly to the explained variance with all combinations of variables.

Providing Incentives for Learning uniquely accounts for 28 percent of the variance of Innovativeness. Its addition to all single variables results in a significant R Square change. When all variables except Promoting Professional Development and Providing Incentives for Teachers are combined, it continues to contribute significantly. If these latter variables are included, it contributes significantly with various sets of three or four variables.

When all variables are included in the model, four of them contribute significantly. These are Promoting Professional Development, Protecting Instructional Time, Providing Incentives for Teachers, and Coordinating the Curriculum. Of these variables, Promoting Professional Development remains the most robust when added to all other

variables, in that, its addition to the equation results in a .027 R Square change ( $F = 17.85, p < .0005$ ). This can be observed in Table 24. After having chosen Promoting Professional Development as the primary variable, the R Square change resulting from the entry of other variables was assessed. As indicated in Table 25 (A), all variables contribute significantly. The largest R Square change results from the addition of Incentives for Teachers, followed by Coordinating the Curriculum, Framing School Goals, and Communicating School Goals. When these variables are combined in a set the R Square change is .069 which is statistically significant. However, analysis of the various sets of variables that contribute most to the explanation of the variance of Innovativeness, revealed that Protecting Instructional time, Promoting Professional Development, Providing Incentives for Teachers, Framing School Goals, and Coordinating the Curriculum explain more variance than any other combination of variables, resulting in an R Square change of .07579. The addition of Communicating School Goals, which as a unique variable ranked third in the amount of explained variance, makes no change to the R Square accounted for by this set. Similarly, neither Supervision and Evaluation, Monitoring Student Progress, Visibility, nor Providing Incentives for Learning, individually or in sets, add any significant change to the R Square beyond that explained by that combination. See Table 25 (B).

Table 24

Model of All Independent Variables  
Regressed on Innovativeness  
(Elementary School)

Variabies	R Square (Change)	Adjusted R Square	DF	F	Signif F	B
b1/FGOALS	(.00387)			2.53	.1129	.146
b2/CGOALS	(.0000)			.001	.9743	-.004
b3/SUPEVAL	(.00095)			.622	.4308	-.070
b4/CURR	(.00931)			6.08	.0142	.251
b5/MONIT	(.00224)			1.46	.2275	-.107
b6/PROTEC	(.00588)			3.84	.0509	.148
b7/VIS	(.00153)			1.00	.3179	.073
b8/INTEAC	(.00900)			5.88	.0159	.182
b9/PDEV	(.02734)			17.85	.0000	.460
b10/INLEARN	(.00200)			1.30	.2537	.079
CONSTANT				52.14	.0000	9.19
MODEL	.53124	.51592	10/306	34.68	.0000	

Table 25 (A)

R Square Changes with  
Promoting Professional Development  
for Innovativeness  
(Elementary School)

Variables	R Square Changes	F Changes	Significance
PGOALS	.03682	22.48	.0000
CGOALS	.03509	21.36	.0000
SUPEVAL	.02019	11.94	.0006
CURR	.04286	26.48	.0000
MONIT	.01672	9.824	.0019
PROTEC	.01219	7.692	.0059
VIS	.00967	5.610	.0185
INCTEAC	.04515	28.02	.0000
INLEARN	.02917	17.55	.0000

Table 25 (B)

R Square Changes  
with Promoting Professional Development, Providing Incentives for Teachers, Framing  
School Goals, Protecting Instructional Time, and Coordinating the Curriculum  
for Innovativeness  
(Elementary School)

Variables	R Square Changes	F Changes	Significance
CGOALS	.0000	.00097	.9752
SUPEVAL	.00113	.74007	.3903
MONIT	.00245	1.6046	.2662
VIS	.00119	.77531	.3793
INLEARN	.00131	.85984	.3545

Since most of the variance accounted for by the variables, Communicating School Goals, Supervision and Evaluation, Monitoring Student Progress, Visibility, and Providing Incentives for Learning appears to be explained by other more robust variables, it was determined that they should not be included in the selected model for Innovativeness. The "best-fitting" model includes Framing School Goals (b1), Coordinating The Curriculum (b4), Protecting Instructional Time (b6), Providing Incentives for Teachers (b8), and Promoting Professional Development (b9). The model is presented below in both b weight and beta weight format:

b weights:

$$.1464b1 + .1701b4 + .1530b6 + .1936b8 + .4918b9 + 9.378a = \text{Innovativeness}$$

beta weights:

$$.1227b1 + .1385b4 + 1082b6 + .1632b8 + .3265b9 + 9.378a = \text{Innovativeness}$$

The amount of variance explained by this model is 52 percent ( $F = 68.68$ ,  $DF = 5/311$ ,  $p < .0005$ ). The appropriateness of the model is supported by the relatively small standard error of the b weights, the small 95 percent confidence intervals and the small difference in the R Square and the Adjusted R Square .00764. This model and related statistics are presented in Table 18.

### Model Building at The High School Level

As noted above, the models developed at the elementary level for Teacher Professional Involvement and Innovativeness were determined not to be applicable at the high school level. This section summarizes the process of developing the "best-fitting" models at the high school level for these two school-level characteristics.

Professional Involvement. Similar to the elementary school level, all individual variables explain a statistically significant amount of variance of Professional Involvement. As shown in Table 26, the R Square resulting from the regression of each variable uniquely on Professional Involvement ranges from .10 with Protecting Instructional Time to .35 with Promoting Professional Development. To determine which variables should be included in the most appropriate model, the contribution of each variable to all possible sets of variables was assessed through analysis of the R Square change. A summary of the models to which the addition of each variable results in a statistically significant R Square change ( $p < .05$ ) is provided in Appendix H.

Framing School Goals uniquely explains 32 percent of the variance of Professional Involvement. When all other variables are included in a model to explain Professional Involvement, Framing School Goals continues to account for

Table 26

Unique Contribution of Each Independent Variable  
to the School-Level Characteristics  
(High School)

Variables	R Square Invoivement	R Square Innovativeness
PGOALS	.3217	.5019
CGOALS	.3091	.4758
SUPEVAL	.2244	.3325
CURR	.2711	.4049
MONIT	.2108	.3099
PROTEC	.1031	.1427
VIS	.2159	.2689
INTEAC	.1811	.3263
PDEV	.3489	.4544
INLEARN	.1352	.2606

statistically significant additional variance (R Square change = .01,  $F = 5.25$ ,  $p = .02$ ).

Communicating School Goals independently accounts for 31 percent of the variance of Professional Involvement. The addition of this variable to all other variables, including either Framing School Goals or Promoting Professional Development, results in a statistically significant R Square change. When Promoting Professional Development and Framing School Goals are employed as a set, the addition of Communicating School Goals is not significant.

Supervision and Evaluation, as a single variable, accounts for 22 percent of the variance of Professional Involvement. It contributes significant additional variance to that explained by a combination of Monitoring Student Progress, Protecting Instructional Time, Visibility, Providing Incentives for Teachers, and Providing Incentives for Learning. The inclusion of either Framing School Goals, Communicating School Goals, Coordinating the Curriculum, or Promoting Professional Development to the above combination results in a non significant R Square change with the addition of Supervision and Evaluation. When either of these latter variables is included, Supervision and Evaluation contributes significantly to models with only three or four variables.

Coordinating the Curriculum explains 27 percent of the variance of Professional Involvement when regressed on it

with no other controlling variables. When added to any other single variable, it explains additional variance at a statistically significant level, with the smallest R Square change (.02) resulting from its addition to Framing School Goals, Communicating School Goals, and Promoting Professional Development. When neither of these variables are included in the equation, Coordinating the Curriculum explains significant variance beyond that explained by all other variables. As can be determined from the lists in Appendix H, if either Framing School Goals, Communicating School Goals, or Promoting Professional Development is included, Coordinating the Curriculum contributes significantly to explained variance with various combinations of four or five variables.

Monitoring Student Progress uniquely explains 21 percent of the variance of Professional Involvement, and contributes significant additional variance to that explained by each variable. When Framing School Goals, Communicating School Goals, Supervision and Evaluation, and Coordinating the Curriculum are not included, it accounts for additional variance beyond that explained by any combination of the other five variables. If Coordinating the Curriculum is regressed on Professional Involvement, Monitoring Student Progress does not explain additional variance to that explained by the addition of any other single variable. When either Framing School Goals,

Communicating School Goals, or Supervision and Evaluation are combined with either Providing Incentives for Learning, Providing Incentives for Teachers, or Protecting Instructional Time, the addition of Monitoring Student Progress results in a statistically significant R Square change.

Protecting Instructional Time independently accounts for 10 percent of the variance of Professional Involvement. When added to other single variables, it accounts for significant additional variance with only Communicating School Goals, Supervision and Evaluation, Monitoring Student Progress, Visibility, Providing Incentives for Teachers, and Providing Incentives for Learning. The only variable that can be included with either of these variables, to which Protecting Instructional Time adds significant additional variance is Providing Incentives for Learning. Since it does not explain significant variance beyond that accounted for by a maximum of two variables, it is not considered to be important in a model for Professional Involvement.

Visibility, as a unique variable, accounts for 22 percent of the variance of Professional Involvement, and it continues to contribute significantly when all variables are combined with either Monitoring Student Progress or Promoting Professional Development. Its significant contribution, however, is dependent upon the presence of Providing Incentives for Teachers in the equation. For

example, it does not contribute beyond variance explained by Framing School Goals and Promoting Professional Development, if Providing Incentives for Teachers is not included.

Providing Incentives for Teachers accounts for 18 percent of the variance of Professional Involvement. If Framing School Goals, Communicating School Goals, or Promoting Professional Development have been previously entered in the equation, it does not contribute significant additional variance. Generally, this variable does not contribute significantly beyond variance accounted for by any two variables; however, it appears to contribute to the equation as a suppressor variable (Darlington, 1990). As a consequence of its inclusion in the model, the addition of Visibility results in a significant R Square change.

Promoting Professional Development uniquely accounts for 35 percent of the variance of Professional Involvement. Of all the single variables, it explains the greatest amount of variance. Also, when all variables are included in a model, its addition results in an R Square change that is greater than any other. This R Square change (.04) is statistically significant ( $F = 19.59, p < .0005$ ).

Providing Incentives for Learning accounts for 14 percent of the variance of Professional Involvement when regressed on it as a unique variable. When it is added to other single variables that have been regressed on Professional Involvement, it explains additional variance

with all but Framing School Goals, Communicating School Goals, and Promoting Professional Development. Beyond that, it accounts for little additional significant variance. Only when Protecting Instructional Time is combined with either Supervision and Evaluation, Monitoring Student Progress, or Providing Incentives for Teachers does it account for additional variance with two other variables.

From the assessment of the contribution of each of these variables, a "best-fitting" model was derived. In a model of all ten variables, only two variables continue to account for significant variance beyond that explained by the other variables. These variables are Framing School Goals and Promoting Professional Development. See Table 27. As noted above, the variable that contributes most variance beyond that explained by all other variables is Promoting Professional Development. As well, this same variable accounts for the most variance when regressed uniquely on Professional Involvement. See Table 26. When this variable is entered first in the equation, the only variables that do not make a significant R Square change when added are Protecting Instructional Time, Providing Incentives for Teachers, and Providing Incentives for Learning. The variable that contributes most additional variance is Framing School Goals. These statistics are found in Table 28 (A). Since this variable is second to Promoting Professional Development in accounting for unique variance and in

Table 27

Model of All Independent Variables  
Regressed on Involvement  
(High School)

Variables	R square (Change)	Adjusted R Sq	DF	F	Signif F	B
PGOALS	(.01044)			5.248	.0227	.24
CGOALS	(.00583)			2.932	.0879	.18
SUPEVAL	(.00004)			.0200	.8877	-.01
CURR	(.00005)			.0270	.8692	-.02
MONIT	(.00147)			.7380	.3911	.07
PROTEC	(.00000)			.0010	.9801	.002
VIS	(.00712)			3.580	.0595	.14
INTEAC	(.00246)			1.239	.2666	-.08
PDEV	(.03896)			19.59	.0000	.39
INLEARN	(.00159)			.8010	.3716	-.07
CONSTANT				118.7	.0000	14.7
MODEL	.41116	.39127	10/296	20.67	.0000	

Table 28 (A)

R Square Changes with  
Promoting Professional Development  
for Involvement  
(High School)

Variables	R Square Changes	F Changes	Significance
FGOALS	.04487	22.50	.0000
CGOALS	.03726	18.45	.0000
CURR	.01966	9.463	.0023
MONIT	.01960	9.435	.0023
PROTEC	.00282	1.324	.2508
VIS	.01825	8.767	.0033
INCTEAC	.00475	2.232	.1362
INLEARN	.00520	2.446	.1189
ALL	.05182	3.210	.0016

accounting for variance beyond that explained by all other variables, it was deemed essential to the model. When it is entered first in the equation, the same variables that account for significant additional variance with Promoting Professional Development continue to contribute significantly. See Table 28 (B). When both variables, Framing School Goals and Promoting Professional Development, are entered in the equation, no other variables contribute significant additional variance. See Table 28 (C). Using Stepwise regression (not recommended for the determination of the "best-fitting" by Darlington, 1990, or Norusis, 1990), these two variables are the only two included in the model. However, comprehensive analysis, such as was completed with each variable, indicates that Providing Incentives for Teachers and Visibility should be included in the model. The inclusion of Providing Incentives for Teachers in the model, while not contributing significant additional variance itself, provides for a significant contribution by Visibility. This can be seen in Table 28 (D). While as a unique variable, Providing Incentives for Teachers correlates positively with Professional Involvement, in this model it has a negative regression weight which provides for the significant contribution of Visibility to the model. When Providing Incentives for Teachers exists with Framing School Goals and Promoting Professional Development, the addition of Visibility

Table 28 (B)

R Square Changes with  
Framing School Goals  
for Involvement  
(High School)

Variables	R Square Changes	F Changes	Significance
CGOALS	.02395	11.13	.0010
SUPEVAL	.00851	3.612	.0503
CURR	.01628	7.476	.0066
MONIT	.01443	6.605	.0106
PROTEC	.00225	1.013	.3150
VIS	.02833	13.25	.0003
INTEAC	.00512	2.314	.1295
PDEV	.07208	36.14	.0000
INLEARN	.00131	.5885	.4436

Table 26 (C)

R Square Changes with  
Promoting Professional Development and Framing School  
Goals  
for Involvement  
(High School)

Variables	R Square Changes	F Changes	Significance
CGOALS	.00526	2.653	.1044
SUPEVAL	.00067	.3373	.5618
CURR	.00084	.4209	.5170
MONIT	.00341	1.715	.1914
PROTEC	.00001	.0043	.9481
VIS	.00668	3.377	.0671
INCTEAC	.00017	.0849	.7709
INLEARN	.00009	.0449	.8322
ALL	.01740	1.093	.3677

Table 28 (D)

R Square Changes with  
Framing School Goals, Promoting Professional Development,  
and Providing Incentives for Teachers  
for Involvement  
(High School)

Variables	R Square Changes	F Changes	Significance
CGOALS	.00635	3.195	.0749
SUPEVAL	.00109	.5465	.4603
CURR	.00116	.5775	.4479
MONIT	.00478	2.401	.1223
PROTEC	.00000	.0000	.9964
VIS	.00817	4.124	.0431
INLEARN	.00002	.0098	.9214

accounts for statistically significant additional variance. As indicated in Table 28 (E), when all variables and all possible sets of variables are added to these four variables, no R Square change is significant. The variables included in the "best-fitting" model are Framing School Goals (b1), Visibility (b7), Providing Incentives for Teachers (b8), and Promoting Professional Development (b9). The model is presented below in both b weight and beta weight format.

b weights:

$$.3314b1 + .1433b7 - .0590b8 + .4202b9 + 14.55a = \text{Involvement}$$

beta weights:

$$.2872b1 + .1239b7 - .0596b8 + .3505b9 + 14.55a = \text{Involvement}$$

This model accounts for 40 percent of the variance of Professional Involvement ( $F = 50.78$ ,  $DF = 4/302$ ,  $p < .0005$ ). Statistics related to this model are presented in Table 29. All variables that are included in the model, with the exception of Providing Incentives for Teachers, make a statistically significant contribution to the model as indicated by the statistical significance of all b weights and the R Square changes resulting from the addition of each variable to the model. The Adjusted R Square is .394, which is a small change from the R Square (.402). Since this is a more nearly unbiased estimate of the explained variance it attests to the accuracy of the model. Also, the small

Table 28 (E)

R Square Changes with  
 Framing School Goals, Promoting Professional Development,  
 Visibility, and Providing Incentives for Teachers  
 for Involvement  
 (High School)

Variables	R Square Changes	F Changes	Significance
CGOALS	.00631	3.211	.0741
SUPEVAL	.00049	.2451	.6209
CURR	.00035	.1778	.6736
NONIT	.00215	1.086	.2981
PROTEC	.00004	.0181	.8932

Table 29

Model for Involvement  
(High School)

Coef/Va	Coefficient Statistics						Model Statistics				
	R Square	Ch	B	F of B	Sig F	SE B	95 C. Int.	R Sq	SE	F	Sig F
b1/FGOALS	.03459		.33	17.47	.0000	.08	.18 to.49	.402	4.05	50.8	.0000
b7/VIS	.00817		.14	4.12	.0431	.07	.004 to.28				
b8/INTEAC	.00165		-.06	.835	.3616	.06	-.19 to.07				
b9/PDEV	.05203		.42	26.28	.0000	.08	.26 to.58				
CONSTANT			14.5	158.0	.0000	1.2	12 to.17				

standard error of each b weight and the small 95 percent confidence interval for each, provides further support for the model. The 95 percent confidence level for Providing Incentives for Teachers spans the zero level since the b coefficient is not significant. Since the importance of this variable is contingent on its acting as a suppressor variable, the non significant b weight of the variable itself is not considered critical.

Innovativeness. As presented in Table 26, the R Square that results from the regression of each unique variable on Innovativeness is statistically significant. The range of the R Squares is from .14 resulting from Protecting Instructional Time to .50 with Framing School Goals. When all variables are modelled on Innovativeness, the variables that continue to make a significant R Square change are Promoting Professional Development, Framing School Goals, and Communicating School Goals in descending order of additional variance explained. See Table 30.

Framing School Goals uniquely accounts for 50 percent of the variance of Innovativeness. When all variables are regressed on Innovativeness, the addition of Framing School Goals accounts for statistically significant variance beyond that previously explained (R Square Change .027,  $F = 16.52$ ,  $p = .0001$ ).

Communicating School Goals, as a separate variable, accounts for 48 percent of the variance of Innovativeness.

Table 30

Model of All Independent Variables  
Regressed on Innovativeness  
(High School)

Variables	R square (Change)	Adjusted R Sq	DF	F	Signif F	B
FGOALS	(.02347)			16.52	.0001	.40
CGOALS	(.00746)			5.250	.0227	.23
SUPEVAL	(.00043)			.3020	.5829	-.04
CURR	(.00010)			.0730	.7871	.03
MONIT	(.00060)			.4240	.5156	.05
PROTEC	(.00052)			.3690	.5440	-.04
VIS	(.00051)			.3560	.5510	.04
INTEAC	(.00034)			.2400	.6242	.04
PDEV	(.02748)			19.34	.0000	.36
INLEARN	(.00045)			.3160	.5746	.04
CONSTANT				44.21	.0000	8.5
MODEL	.57955	.56535	10/296	40.80	.0000	

Similar to Framing School Goals, when all other variables are modelled on Innovativeness, the addition of Communicating School Goals explains statistically significant additional variance (R Square change = .00746,  $F = 5.250$ ,  $p = .0227$ ).

Supervision and Evaluation explains 33 percent of the variance of Innovativeness when regressed on it as a separate variable. When added to any other single variable, it continues to contribute to the explanation of additional variance at a statistically significant level. When Communicating School Goals or Framing School Goals are included in the regression equation, this variable is not robust, and contributes significant additional variance only when one or the other is combined with Protecting Instructional Time or Providing Incentives for Learning. The largest set to which its addition results in a significant R Square change contains either Promoting Professional Development or Providing Incentives for Teachers with Monitoring Student Progress, Providing Incentives for Learning, Protecting Instructional Time, and Visibility.

Coordinating the Curriculum Independently accounts for 40 percent of the variance of Innovativeness. When regressed on Innovativeness with any other single variable, it continues to contribute significantly to the explained variance. The robustness of its contribution to the variance of Innovativeness is particularly affected by Framing School

Goals, in that, when that variable is included in the model, Coordinating the Curriculum explains significant new variance with only three to five variables. If Framing School Goals is not part of the regression equation, Coordinating the Curriculum contributes significant additional variance when added to all variables combined with either Communicating School Goals or Promoting Professional Development; however, when these two latter variables are combined, it results in a significant R Square change with these and only one other variable, Protecting Instructional Time.

Monitoring Student Progress uniquely accounts for 31 percent of the variance of Innovativeness. It results in a significant R Square change when entered in an equation containing any single variable; however, it contributes to additional variance to that explained by a set of more than two variables only when Protecting Instructional Time is included, whereupon, it contributes to variance accounted for by various sets of three variables.

Protecting Instructional Time, as a unique variable, contributes 14 percent of the variance of Innovativeness. Its contributes additional variance beyond that accounted for by all single variables with the exception of Framing School Goals, Coordinating the Curriculum, and Promoting Professional Development. However, since it contributes to the explained variance of more than a single variable only

when added to Visibility, Providing Incentives for Learning, and Monitoring Student Progress, it does not appear that it should be included in the "best-fitting" model.

Visibility uniquely accounts for 27 percent of the variance of Innovativeness. Also, it explains significant variance beyond that accounted for by any single variable. When it is employed with various combinations of variables, it continues to explain significant new variance beyond that accounted for by sets of four or five variables. If Promoting Professional Development is in the regression equation, the addition of Visibility results in a significant R Square change with Supervision and Evaluation and Protecting Instructional Time only.

Providing Incentives for Teachers independently explains 33 percent of the variance of Innovativeness, and it continues to account for additional variance when any other single variable is included in the equation. It is not particularly robust when Communicating School Goals is included with other variables; it explains significant new variance when Communicating School Goals is combined with only, either Monitoring Student Progress or Providing Incentives for Learning, or with Supervision and Evaluation and Protecting Instructional Time.

Promoting Professional Development accounts for 45 percent of the variance of Innovativeness when regressed on it as a unique variable. When it is entered in a regression

equation of all other variables it continues to result in a statistically significant R Square change (R Square change = .02748,  $F = 19.35$ ,  $p < .0005$ ).

Providing Incentives for Learning uniquely accounts for 26 percent of the variance of Innovativeness. It continues to significantly add to variance explained by any single variable. When Framing School Goals or Communicating School Goals are included in the equation, it continues to significantly account for additional variance with only a small number of variables. For example, it contributes significant variance beyond that explained by Framing School Goals and only Supervision and Evaluation, Coordinating the Curriculum, and Protecting Instructional Time. When Framing School Goals and Communicating School Goals are not included in the model, Providing Incentives for Learning adds significantly to variance explained by all other variables.

When all variables are modeled on Teacher Innovativeness, only three variables statistically contribute to the variance. These variables are Framing School Goals, Communicating School Goals, and Promoting Professional Development. This can be seen from the statistically significant b weights and R Square changes shown in Table 30. If these three variables are entered in a model and regressed on Innovativeness, no other variable or set of variables contribute significant additional variance. See Table 31. In spite of the non significance of the other

Table 31

R Square Changes with  
 Promoting Professional Development, Framing School Goals,  
 and Communicating School Goals  
 for Innovativeness  
 (High School)

Variables	R Square Changes	F Changes	Significance
SUPEVAL	.00000	.0018	.9667
CURR	.00058	.4096	.5227
MONIT	.00199	1.422	.2340
PROTEC	.00013	.0904	.7639
VIS	.00195	1.393	.2383
INTEAC	.00143	1.021	.3131
INLEARN	.00202	1.442	.2308
ALL VAR	.00488	.4906	.8412

variables, in order to assess if any should be included in the "best-fitting" model, further analysis was completed. Since Promoting Professional Development explains most variance when the other nine variables are included in the model, it was selected as a primary variable; consequently, the addition of each variable beyond that explained by Promoting Professional Development was assessed. The results of this assessment are reported in Table 32. Similarly, since Framing School Goals is the unique variable that accounts for most variance of Innovativeness, the same process was repeated with this variable. It was entered first in the equation to determine the R Square changes resulting from the addition of other variables. See Table 33. The variable that explained most variance beyond the single variable, Promoting Professional Development, was Framing School Goals. For Framing School Goals, it was Promoting Professional Development. The variable resulting in the second highest R Square change was Communicating School Goals. All other variables, with the exception of Protecting Instructional Time, contributed significant additional variance. When Framing School Goals and Promoting Professional Development were combined, the only variable that accounted for statistically significant new variance was Communicating School Goals. See Table 34. As indicated in the above discussion of the analysis of each single variable, all the variance explained by any other variable

Table 32

R Square Changes with  
Promoting Professional Development  
for Innovativeness  
(High School)

Variables	R Square Changes	F Changes	Significance
FGOALS	.10767	74.740	.0000
CGOALS	.08944	59.603	.0000
SUPEVAL	.03758	22.485	.0000
CURR	.04858	29.709	.0000
MONIT	.04007	24.093	.0000
PROTEC	.00539	3.0347	.0825
VIS	.01949	11.261	.0009
INTEAC	.03563	21.239	.0000
INLEARN	.03553	21.173	.0000

Table 33

R Square Changes with Framing School Goals  
for Innovativeness  
(High School)

Variables	R Square Changes	F Changes	Significance
CGOALS	.03426	22.45	.0000
SUPEVAL	.00875	5.433	.0204
CURR	.01883	11.94	.0006
MONIT	.01639	10.34	.0014
PROTEC	.00106	.6468	.4219
VIS	.01814	11.49	.0008
INTEAC	.02013	12.80	.0004
INLEARN	.01189	7.434	.0068
PDEV	.06019	41.78	.0000

Table 34

R Square Changes with  
Promoting Professional Development and Framing School Goals  
for Innovativeness  
(High School)

Variables	R Square Changes	F Changes	Significance
CGOALS	.01264	9.002	.0029
SUPEVAL	.00111	.7678	.3816
CURR	.00238	1.653	.1995
MONIT	.00521	3.646	.0571
PROTEC	.00019	.1301	.7186
VIS	.00296	2.059	.1524
INTEAC	.00470	3.290	.0707
INLEARN	.00468	3.273	.0714

is accounted for by these three variables, Framing School Goals (b1), Communicating School Goals (b2), and Promoting Professional Development (b9). The model is as follows:

b weights:

$$.4233b_1 + .2688b_2 + .3937b_9 + 8.730a = \text{Innovativeness}$$

beta weights:

$$.3272b_1 + .2109b_2 + .2929b_9 + 8.730a = \text{Innovativeness}$$

Statistics related to this model are presented in Table 35. The amount of variance explained is 57 percent ( $F = 136.46$ ,  $DF = 3/303$ ,  $p < .0005$ ). The small standard error and the 95 percent confidence interval for each coefficient and the little difference between the R Square (.575) and the Adjusted R Square (.570) is evidence of the accuracy of the model.

This chapter has included the presentation of the results of the study, a discussion of the development of instructional leadership models, and a presentation of these models. The next chapter is a discussion of the study findings relative to the identified research needs and the statement of the problem.

Table 35

Model for Innovativeness  
(High School)

Coef/Va	Coefficient Statistics						Model Statistics			
	R Sq Change	B	F of B	Sig F	SE B	95 C. Int.	R Sq	SE	F	Sig F
b1/FGOALS	.03856	.42	22.1	.0000	.09	.25 to .54	.57	3.82	136.46	.0000
b2/CGOALS	.01264	.27	9.00	.0029	.09	.09 to .45				
b9/PDEV	.03856	.39	27.5	.0000	.08	.25 to .54				
a/CONSTANT		8.73	68.5	.0000	1.1	6.7 to 11				

## DISCUSSION OF RESULTS AND IMPLICATIONS

In this chapter, the results of the study are discussed and the implications are considered. Since the primary purpose of this study was to assess the appropriateness of instructional leadership in the modern organization, the first section focuses on that question. Particularly, the findings of this study are discussed in the context of arguments that instructional leadership is rational, and therefore inappropriate for the emergent organization (Deal, 1987b). This is followed by a discussion of the findings relative to the second question, whether school type (elementary or high school) accounts for significant variance in the relationship between instructional leadership behaviors of the principal and the selected school-level characteristics. Thirdly, each model of instructional leadership that has been developed for the separate school-level characteristics is discussed. Finally, the findings are summarized in the context of the contribution of this study to research and implications for practice.

Since a primary purpose of this study was to determine whether instructional leadership is appropriate for the modern organization, it is essential that the discussion of findings relate to that concern. Griffiths (1988) suggests that the most effective administrative practices are consistent with those recommended by Peters and Waterman (1982) and Kanter (1983). Both emphasize the importance of collaboration, commitment to a common vision, and a spirit of innovation. This emerging model of leadership for the modern organization discounts the rational, technological, planning models in favor of transformational leadership which focuses on the leader's ability to facilitate the creation of the above noted characteristics of collaborative involvement, commitment to the organization, and innovativeness.

Leithwood (1992) states that transformational leadership should subsume instructional leadership as the dominant image of the school administrator. In this recommendation, Leithwood's conceptualization of instructional leadership focuses on the improvement of school through the monitoring of student and teacher work. This conceptualization is consistent with the "narrow" view of instructional leadership. His description of transformation leadership, which is similar to others (Mitchel & Tucker, 1992), is much closer to the "broad" view of instructional leadership accepted for this study. The

primary difference between instructional leadership and transformational leadership appears to be with the explicit focus of the transformational leader on collaboration and teamwork. While collaboration is not an issue that is directly assessed in this study, characteristics that are indicative of collaboration, such as sharing teaching methods and strategies, talking about educational issues, learning from colleagues, and sharing interest in professional activities of colleagues in an atmosphere of shared purpose and innovativeness are addressed in the analysis of the school-level characteristics. Even though the facilitation of a collaborative effort is not an explicit function of the instructional leader, the findings of this study suggest that there is a positive relationship between them.

Pellicer, Anderson, Keefe, Kelley, and McCleary (1990) conclude from their research of eight schools that instructional leadership is leadership which encourages commitment to school improvement, a spirit of professional development, cooperation, and innovativeness. According to Sagor (1992) these are common features of a transformational leader. In his study of three effective principals, Sagor notes that whether the principal was assertive and opinionated, or supportive and nurturing was not significant. The transformational effects of the leadership functions were the critical component.

The findings of this study support the conclusion that instructional leadership as conceptualized by the Hallinger and Murphy model has transformational potential since all instructional leadership behaviors in the model are positively related to the school-level characteristics that are to be encouraged by transformational leaders. The additional contribution of this study is that the relationship of specific leadership behaviors are assessed in respect to these characteristics, and appropriate models are developed for each.

More specifically, this study addresses questions raised by those who contend that instructional leadership practices are incongruous with the school-level characteristics of Teacher Commitment, Professional Involvement, and Innovativeness. The thrust of the skepticism in this regard is represented by statements of four writers that have been summarized below. Burlingame (1987) argues that instructional leadership connotes docile followers who accept the rationality of the principal. Poplin (1992) contends that the instructional leadership model works to the detriment of teachers. Barth (1986) suggests that lists of effective instructional leadership behaviors limit creativity and innovation. Sergiovanni (1992) cautions that instructional leadership is potentially stifling to professionalism.

The issues that are raised by the above four statements were addressed in this study. The three school-level characteristics of Teacher Commitment, Professional Involvement, and Innovativeness relate directly to the concerns of docility, lack of creativity or innovativeness, absence of professionalism, and influences that are detrimental to teachers. Teacher Commitment refers to the degree to which teachers are supportive of and committed to the school and their colleagues. It refers to a sense of unity, group spirit, enthusiasm, shared sense of purpose, high morale, and promotion of the school in the community. It is obvious that a high degree of Teacher Commitment is antithetical to teacher docility or negative influences of leadership on teachers. Professional Involvement refers to the degree to which teachers are concerned about their work, are keen to learn from one another, and committed to professional development. Innovativeness refers to the degree to which variety, change, and new approaches are emphasized in the school. Both of the latter characteristics relate directly to concerns expressed by Barth (1986) and Sergiovanni (1992) in respect to potential negative effects of instructional leadership upon professionalism, creativity, and innovation. Since all 10 of the instructional leadership behaviors that compose the Hallinger and Murphy conceptualization of instructional leadership were found to be positively related to these

three characteristics for each school type, it appears reasonable to suggest that the findings of this study provide evidence to challenge the above criticisms.

In the context of differing perspectives of school effectiveness, this study provides evidence that instructional leadership is compatible with both perspectives. The common leadership behaviors that compose the "broad" conceptualization of instructional leadership accepted for this study have been formulated from research dependent upon the goal attainment model which has linked these behaviors to high student achievement on standardized tests. The results of this study provide evidence that these leadership behaviors are positively related to the school-level characteristics of teacher commitment, professional involvement, and innovativeness which are recognized as elements of an effective organization by those adhering to a systems resource, process perspective.

While the findings provide evidence that instructional leadership is compatible with both the goal attainment and the systems resource perspective, it indicates that instructional leadership cannot be conceived of as a discrete set of behaviors that must be performed if schools are to be effective. Hallinger (1992) cautions that while higher subscale scores on the PIMRS suggest greater instructional leadership activity by the administrator, the most effective principals do not necessarily score the

highest on all subscales. Contextual variables influence the type of instructional leadership that is appropriate. The results of this study provide evidence in support of that position in that the various subscales of instructional leadership behaviors relate differently to each school-level characteristic; furthermore, this variation of relationship is related to school type in respect to innovativeness and professional involvement. Barth (1986) condemns the "list logic" of those that promote instructional leadership as he argues that the practice of listing behaviors that must be performed by an effective principal is restrictive. The results of this study provide for consideration of such criticism as the appropriateness of a specific model varies according to context.

The study findings that instructional leadership is not a discrete set of behaviors that must be employed in all settings has implications for those that argue that instructional leadership is not appropriate for high schools (Firestone & Harriott, 1982; Glatthorn & Newberg, 1984; Jones, 1987). Jones (1987) employed the Hallinger and Murphy model of instructional leadership in a study to determine if there was a relationship among instructional leadership behaviors and student achievement at the Grade 12 level. No significant relationship was found. Jones concludes that the model is not appropriate at the high school level in that it assumes a direct relationship between principal behavior and

student achievement. Blank (1987) arrives at a similar conclusion in respect to a direct relationship between instructional leadership and student achievement at the high school level. However, he concludes that the principal's impact may have been indirect through the creation of conditions conducive to good teaching and learning. Conclusions reached by Bossert, Dwyer, Rowan, & Lee (1982) and Leithner (1990) that the linkage between instructional leadership and student learning is more complex than simple cause-effect is consistent with the above findings. While there are high school studies that identify a direct relationship between instructional leadership and student achievement (Heck, Larsen, & Marcoulides, 1990), the significance of the findings of this study is related to the question of indirect effects. A positive relationship is found to exist among instructional leadership behaviors and three school-level characteristics that are viewed as essential to an effective school from the systems resource perspective. This relationship exists in both elementary and high schools. If one accepts that teacher commitment, professional involvement, and innovativeness are linked to student learning, the results of this study provide support that indirect linkages exist between instructional leadership and student performance irrespective of school type. Such a conclusion provides reason to question arguments such as those of Firestone and Harriott (1982) and

Glatthorn and Newberg (1984) that instructional leadership is not appropriate for the high school setting. Their arguments are based on the necessity of the instructional leader to be an expert in instructional strategies. As a consequence, they argue that in the high school setting which is loosely coupled such "expert" power is not functional. Such an approach considers only the rational perspective of instructional leadership and ignores the positive relationship among instructional leadership behaviors and each of the school-level characteristics assessed in this study (Lee, 1987). While the results of this study recognize that there are differences between school types, there is also evidence that instructional leadership is no less appropriate with one type than another. In this context, the models of instructional leadership that best account for the selected school-level characteristics in both elementary and high schools were developed.

While effect size represented by the R square change for school type is small, even though statistically significant for Professional Involvement and Innovativeness, meaningfulness of the change is substantiated both statistically and through findings of previous research. Statistically, Darlington (1990) notes that when variables are highly correlated, as is the case in this study, statistical significance of R square change is difficult to

achieve; however, if significance is found the chance of committing a type 1 error is greatly reduced. This being the case, and given the stringent p level ( $p < .01$ ) for this study, the significant R square change is statistically meaningful.

Meaningfulness of the R square change is further substantiated through the model building process in that different instructional leadership behaviors were included in the models for each school type. Additionally, instructional leadership behaviors included in the models are consistent with differences that have been noted in other research and which suggest that high schools are more loosely coupled than elementary schools. Hoy and Miskel (1990) suggest that high schools are semi professional organizations where direct influence of the principal on student learning is less likely. Elementary schools resemble simple bureaucracies. Direct influences of the principal on student learning are to be expected. In this study, instructional leadership behaviors, such as Framing School Goals, that are included in the high school models are more indirectly related to the teaching-learning process; whereas, behaviors in the elementary school models include those of a more direct nature such as Monitoring Student Progress. The fact that the relationship with Commitment was not found to be affected by school type is also consistent with these findings. This particular characteristic is

related to school wide issues and to school community relations rather than to technical level issues that are specific to the classroom environment. Consistent with the Parsonian framework (Parsons, 1960), Professional Involvement and Innovativeness are technical level concerns while Commitment is related to managerial and institutional level concerns. If high schools are more professionally structured as the literature appears to suggest, then it is expected that behaviors of the school principal that directly relate to the teaching-learning process will not be well accepted. The developed models reveal clearly the acceptance of more direct instructional leadership behaviors at the elementary level, thereby, providing substantive evidence that the effect size of the R square change for school type as it relates to hypothesis 4(A) and hypothesis 4(B) is meaningful. Each model is presented and discussed below.

#### Teacher Commitment

Through the model building process, each instructional leadership behavior of principals was found to be positively related to Teacher Commitment. This is consistent with the findings of the study by Pitner, Oregon, and Charters (1988) which determined that leadership, irrespective of style was positively related to teacher commitment. When the

relationship of each leadership behavior and Teacher Commitment was assessed. In the context of the other behaviors, the variables that were shown to account for most of the variance explained by instructional leadership were Communicating School Goals, Supervision and Evaluation, Visibility, Promoting Professional Development, and Providing Incentives for Learning. Of these behaviors, Promoting Professional Development appears to be the most important behavior followed by Maintaining High Visibility within the school. While Supervision and Evaluation of instruction was found to be positively related to Teacher Commitment as a single behavior, when it was employed with other behaviors that increased the explained variance, it was weighted negatively. The fact that the  $b$  weight of the variable, Supervision and Evaluation, was negative does not suggest that it is negatively related to Teacher Commitment. Rather, in the model it is acting as a suppressor variable. Darlington (1990) states, "If a variable having a positive or zero correlation with  $Y$  receives a significantly negative value of  $b_j$ , then by definition it is a suppressor" (p. 154). This indicates that the variable helps correct for sources of error in the other variables and improves the prediction capabilities of the model. It does not indicate a negative relationship. In that it does suggest that the lower the level of Supervision and Evaluation, the higher will be the amount of Commitment accounted for by the other

variables, it might be suggested that the amount of supervision should be lowered. However, using Darlington's (1990) example of history knowledge and reading level as reference, to suggest the reduction of Supervision and Evaluation would be equivalent to suggesting that to improve one's history knowledge, his or her reading level should be reduced.

The fact that Supervision and Evaluation acts as a suppressor makes theoretical sense as it would be expected that the more Teacher Commitment that is accounted for by other means the less direct supervision is required. In fact, this is consistent with Sergiovanni's (1991) argument that the more teachers are committed the less direct supervision they require. Also, the fact that it behaves as a suppressor variable provides a possible explanation for the finding of Decotlis and Summers (1987) that closeness of supervision by the leader is negatively related to organizational commitment since it does suggest that at some stage of development, Supervision and Evaluation may reduce the positive relationship among other instructional leadership behaviors and Teacher Commitment. Such an explanation resulting from the findings of this modeling process reconciles the Decotlis and Summers findings with the model of developmental supervision proposed by Glickman (1981). He notes that supervision can be directive, collaborative, or non-directive depending on the

developmental stage of a particular teacher. The intent of the developmental process is to provide a leadership program that will enable teachers to grow along a continuum from levels of low commitment to high commitment. This growth occurs only if there exists appropriate leadership behaviors relating to teachers at the various levels of development. Finally, the fact that Supervision and Evaluations behaves as a suppressor variable in respect to Teacher Commitment, provides further evidence that educational leaders must be cautious in respect to this practice. Anderson (1989) notes that evidence relating to the efficacy of instructional supervision is inadequate since there are few consistent programs of supervision, and measurement systems are inadequate. While the findings of this study suggest that the practice of Supervision and Evaluation is positively related to Teacher Commitment, further analysis should not be conducted in isolation because of its potential as a suppressor variable.

While this model cannot be interpreted as a causal relationship, or generalizable beyond the population from which the sample was selected, it provides evidence that instructional leadership behaviors of principals are positively related to Teacher Commitment. Such behaviors should not be dismissed or discouraged as suggested by those that argue that instructional leadership is inherently rational and contrary to present organizational theory

(DeCotils & Summers, 1987; Griffiths, Stout, & Forsyth, 1988, Slater & Doig, 1988). It appears reasonable to suggest that principals who wish to assess their role in the development of teacher commitment would be advised to avail of the information provided by the developed model.

### Teacher Professional Involvement

Professional Involvement was found to be positively related to instructional leadership behaviors of principals; however, school type (elementary or high school) was found to significantly affect this relationship. Since it was determined that school type affects the relationship between instructional leadership behaviors of principals and Professional Involvement, separate models were developed for each type, elementary schools and high schools. The model that appears to most appropriately account for Professional Involvement at the elementary level includes the following instructional leadership behaviors: Coordinating the Curriculum, Monitoring Student Progress, Providing Incentives for Teachers, and Promoting Professional Development. As with Teacher Commitment, the instructional leadership behavior that accounts for most variance in Professional Involvement is Promoting Professional Development. In this model, Monitoring Student Progress is a suppressor variable. As with Supervision and Evaluation for

commitment, the inclusion of this variable in the model corrects for error and contributes to the accuracy of prediction by the model. It is only when this variable is included in the model that the variable, Coordinating the Curriculum, contributes significantly to the model.

Since the practice of Monitoring Student Progress is an example of direct principal involvement in an area that might be considered teacher domain, it is theoretically understandable that as teachers become more professionally involved, it is less acceptable to have principals directly associated. Parsons (1960) classifies the teaching-learning process as a technical function which is the direct responsibility of teachers. If the teachers are competent in this area they must be allowed to make decisions within that level since they are the people with the necessary expertise. He posits that for management to attempt to directly interfere at this technical level could meet with a great deal of resistance. This is also consistent with Barnard's (1938) concept of the Zone of Acceptance. If teachers feel that their level of expertise in this area is greater than the principals, which is a natural outgrowth of professional involvement, then they are less likely to accept principal "interference" (Hoy & Miskel, 1991).

The high school model reveals that Framing School Goals, Maintaining High Visibility, Providing Incentives for Teachers and Promoting Professional Development are

instructional behaviors that most accurately account for variance of Professional Involvement. In this model the suppressor variable is Providing Incentives for Teachers. Only when this variable is entered in the model does Visibility account for statistically significant variance within the model. As with the other suppressor variables, it appears to be theoretically understandable that as teachers become more professionally involved, direct incentives are less important, in that to be professionally involved inherently presupposes self motivation (Hoy & Miskel, 1991; & Sergiovanni, 1992). This model differs from the elementary model in that the leadership behaviors are less direct in respect to the instruction. Specifically, the elementary model includes Monitoring Student Progress and Coordinating the Curriculum which are directly related to the technical function of teaching. This difference appears to be consistent with research which suggests that high schools are more loosely coupled than elementary schools; therefore, direct involvement of the principal in the classroom is less frequent and less expected by teachers. However, it is important to note that as Professional Involvement increases, the direct involvement of the principal in the technical process in both school types becomes less a critical factor in accounting for this involvement.

### Innovativeness

A positive relationship was found among instructional leadership behaviors exhibited by principals and Innovativeness. School type (elementary or high school) was found to affect that relationship. Since school type was found to be a significant variable, separate models were developed for the school types. At the elementary school level, the "best-fitting" model is composed of five instructional leadership behaviors. These are Framing School Goals, Coordinating the Curriculum, Protecting Instructional Time, Providing Incentives for Teachers, and Promoting Professional Development. It appears that the most significant of these behaviors is Promoting Professional Development as it accounts for the most variance of Innovativeness with all possible subsets of behaviors.

The model selected as the most appropriate for the high school level contains three instructional leadership behaviors. Two of these behaviors, Framing School Goals and Promoting Professional Development, are common to the elementary model. The third leadership behavior of significance in this model is Communicating School Goals.

Since neither of the instructional leadership behaviors refers directly to the promotion of innovation within the

school, it might be speculated that the significant positive relationship among the models and innovativeness exists as a consequence of a transformational effect. Conger (1989) and Lord and Maher (1990) conclude that critical to acceptance and internalization of the leader's vision is subordinate perceptions that specific leadership behaviors are appropriate to the leadership role. Meyer (1990) employed the Hallinger and Murphy (1985) conceptualization of instructional leadership and found a significant positive correlation among these behaviors and leader authenticity. This suggests that teachers accept these behaviors as appropriate to the role. If one accepts the conclusions of Conger and Lord and Maher, it becomes apparent why instructional leadership is positively related to Innovativeness as well as the other two school-level characteristics of Teacher Commitment, and Professional Involvement. Furthermore, if this theory is accepted, professional development activities related to instructional leadership in a particular school must consider the specific instructional leadership behaviors that are considered essential by teachers in that context since only those will have the potential for the desired results (Thomas, 1976).

### Research Contribution and Implications for Practice

Krug, Ahadi, and Scott (1990) note that instructional leadership research has been dependent largely upon descriptive studies of a highly individualized nature. They suggest that further analysis should be broadened to become more generalizable. This study responds to their recommendation in that it focuses upon a random sample of schools in one Canadian province. It is not limited to schools that were identified as effective, nor is it restricted to urban centers that typify the instructional leadership research.

Additionally, this study is consistent with Immegart's (1988) recommendation that priority must be placed on building upon existing work, and that such research should be conducted using different aspects and variables. As researchers continue to emphasize the inappropriateness of a rational approach to leadership and school improvement, there is increased emphasis on the study of transformational leadership. In such a context the weaknesses of the research on effective schools and instructional leadership are emphasized, and there is an increasing possibility that our knowledge base developed from such research will be ignored or dismissed. It is in recognition of the necessity of building upon existing work as recommended by Immegart, that this study was conducted. The strength of the study is that,

while it recognizes the weaknesses of the research that has led to the development of the common functions of effective instructional leaders, rather than dismiss that entire body of research, it attempts to determine its relationship with emerging leadership theory. The findings of this study provide evidence to link instructional leadership with the emergent transformational leadership. Additionally, models of effective leadership behaviors are developed to guide practice in the development of the desired characteristics of Teacher Commitment, Professional Involvement, and Innovativeness. The need for the development of such models of effective leadership practices have been noted in current literature (Leithwood, Begley, & Cousins, 1990; Willower, 1987, 1988).

When all models for Commitment, Professional Development, and Innovativeness are considered, all ten instructional leadership behaviors included in the Hallinger and Murphy model are employed. Promoting Professional Development is included in all models, and appears to be the most important in each model with the exception of the model for Innovativeness at the high school level. In this model, Framing School Goals is the primary instructional leadership behavior followed by Promoting Professional Development. At the elementary level, all ten instructional leadership behaviors are employed in the three developed models; however, at the high school level, two instructional

leadership behaviors, Monitoring Student Progress and Protecting Instructional Time are not included in either of the models.

As a result of the hypothesis tests, and through the process of developing "best-fitting" models, it appears reasonable to conclude that all of the behaviors identified in the Hallinger and Murphy model are important to the school-level characteristics of Commitment, Professional Development, and Innovativeness. Since this conceptualization of instructional leadership was developed primarily on the basis of student achievement as the accepted criterion of effectiveness, the findings of this study which support its positive relationship with the school-level characteristics provide additional support for its validity. While there is no attempt in this study to argue that the selected school-level characteristics constitute a definition of organizational effectiveness, it can be argued that they are considered important characteristics of the effective modern organization (Barth, 1990; Buffie, 1989; Kanter, 1979, 1983; Leithwood & Jantzi, 1990). Therefore, the findings of this study provide support for those that argue that instructional leadership, broadly defined to include both direct and indirect principal influences, is positively related to the development of effective schools (Firestone & Wilson, 1985; Lord & Maher, 1990). Certainly, it calls into question arguments that

Instructional leadership is inherently rational and that instructional leadership behaviors are negatively related to characteristics of the modern organization (Griffiths, Stout, & Forsyth, 1988).

The links established in this study are correlational rather than causal, and the generalizability of the findings may be limited to the population from which the sample was drawn. Nevertheless, the positive relationships that have been found among the instructional leadership behaviors of principals and school-level characteristics suggest a direction of leadership that is acceptable to those that adhere to both the goal attainment and the systems resource perspective of school effectiveness. As a consequence of the relationship suggested by this study, it is recommended that more attention be given to the development of principals as instructional leaders. The developed models should be considered by researchers and educators involved in the development of school leadership as they attempt to determine which leadership behaviors are most effective in the creation of schools that successfully prepare students to meet the challenges of the twenty-first century.

The implications for researchers, and recommendations for future research in this area are noted in the following chapter. These recommendations are made in recognition that irrespective of the strength of the findings of this particular study, one cannot and should not assume that the

results apply universally. The findings of this study provide strong statistical support that instructional leadership as conceptualized herein must not be dismissed and must now be followed by research which builds on specificity and contextual relevance (Darlington, 1990; Immegart, 1988).

As for educational practitioners, the study findings and developed models provide conceptual guidelines for practice. While principals appear to believe in the importance of instructional leadership (Smith & Andrews, 1989), a primary constraint to their assuming that role is a lack of understanding of the concept and what it entails in respect to specific behaviors (Williams, Warren, & Pound-Curtis, 1992). To overcome this constraint, it is recommended that Faculties of Education include instructional leadership as a major component in their Educational Administration programs. Additionally, professional development for school administrators should include an emphasis on the importance of instructional leadership. The conceptualization of instructional leadership and the developed models presented in this research can provide the necessary framework for such programs. A school principal, employing such a framework, might determine that a primary focus for his or her particular school should be on innovativeness. In a high school, for example, the emphasis then would be placed on

Framing School Goals, Communicating School Goals, and Promoting Professional Development. While consideration would have to be given to the particular context, there is enough research support for the instructional leadership behaviors that compose the models of this study to suggest that these behaviors are generally accepted by teachers as appropriate, and that employment of a particular model will lead to the desired improvements in the selected school-level characteristic.

This chapter has included a discussion of the results of the study in the context of the differing perspectives of school effectiveness. This discussion has dealt with the applicability of instructional leadership to both elementary and high schools as modern organizations. This was followed by a presentation and discussion of the models that were developed for each school-level characteristic. Finally, the chapter was summarized with specific reference to the contribution of this study to the field of instructional leadership research and practice. The following chapter is the summary of the study and recommendations for further research.

## SUMMARY AND RECOMMENDATIONS

The purpose of this chapter is to summarize the study, and to suggest ideas for future research. The summary includes the purpose of the study; description of the major concepts studied, the sample, and the methodology employed; the hypotheses tested; the results; and the models developed. The final section of the chapter includes recommendations for future research that might build on the findings of this study.

### Summary

This study examined the relationship among instructional leadership behaviors of school principals and selected school-level characteristics. Instructional leadership as conceptualized in this study utilized the model developed by Hallinger and Murphy (1985). The model which Hallinger has revised (Hallinger, 1992) consists of ten instructional leadership behaviors: framing school goals, communicating school goals, supervising and evaluating instruction, coordinating the curriculum, maintaining high visibility, protecting instructional time, monitoring student progress,

providing incentives for teachers, promoting professional development, and providing incentives for learning.

The selected school-level characteristics were chosen on the basis of research in the area of organizational effectiveness. It is generally accepted that there can be no single criterion of effectiveness, and that the study of effectiveness must be completed with the recognition that the criteria employed are based on assumptions regarding organizations, leadership, and effectiveness. While there are many models of effectiveness, in general, two major perspectives can be identified in the literature, the goal attainment model and the systems resource model. Since the instructional leadership and effective schools research have been dependent upon the goal attainment model, those that adhere to the systems resource perspective argue that the concept of instructional leadership is narrowly conceived, and that the commonly accepted instructional leadership behaviors are negatively related to other school-level characteristics. Characteristics that are deemed important to successful schools from a systems resource perspective include a spirit of innovation, teachers that are professionally involved, and teachers that are committed to the school and supportive of their colleagues. These characteristics of innovativeness, professional involvement, and commitment were selected for this study.

The study was conducted in one province of Canada, Newfoundland and Labrador. It was hoped that limiting the study to one province would reduce the number of intervening variables. The unit of analysis was the individual teacher. Data were collected from a random sample of all teachers in elementary and high schools in the province of a minimum size of 100 students. Of the 72 schools that were randomly selected, 58 schools agreed to participate. Sixty percent of the teachers in these schools returned completed questionnaires. The total useable sample was composed of 624 teachers--317 elementary teachers, and 307 high school teachers.

The instruments selected to measure the independent and dependent variables had been employed in other educational research prior to this study and had met suitable standards of validity and reliability. The instructional leadership behaviors were measured by the Principal Instructional Management Rating Scale (Hallinger, 1992). The school-level characteristics were measured by selected scales of the School Organizational Climate Questionnaire (Giddings & Dellar, 1990).

The hypotheses that were tested are as follows:

Hypothesis 1. There is a positive relationship among instructional leadership behaviors exhibited by principals and the level of teacher commitment to and support of the school.

Hypothesis 2. There is a positive relationship among instructional leadership behaviors exhibited by principals and the level of teacher professional involvement.

Hypothesis 3. There is a positive relationship among instructional leadership behaviors exhibited by principals and the level of innovativeness in the school.

Hypothesis 4 (A). School type (elementary or high) does not affect the relationship among instructional leadership behaviors exhibited by principals and teacher commitment.

Hypothesis 4 (B). School type (elementary or high) does not affect the relationship among instructional leadership behaviors exhibited by principals and teacher professional involvement.

Hypothesis 4 (C). School type (elementary or high) does not affect the relationship among instructional leadership behaviors exhibited by principals and teacher innovativeness.

Only two of these hypotheses were not supported. These were hypothesis 4(B) and hypothesis 4(C). The relationship among instructional leadership behaviors of principals and the school-level characteristics of innovativeness and professional involvement were found to be statistically different for each school type.

After having determined that there was a significant positive relationship among the instructional leadership behaviors of principals and the three selected school-level

characteristics for each school type, "best-fitting" models were developed to explain or account for variance in the three characteristics. Since hypothesis 4(A) was supported, suggesting that school type did not affect the relationship between instructional leadership of principals and Commitment, only one model was developed for this characteristic. For the other characteristics, Innovativeness, and Professional Involvement, models were developed for both elementary and high schools. The instructional leadership behaviors that best accounted for variance varied with each characteristic and for each school type. As a consequence of the variations, each instructional leadership behavior was found to be of significance in at least one model. The instructional leadership behaviors included in the models for each school-level characteristic are noted below.

Elementary and High School. The model for Commitment is composed of Communicating School Goals, Supervising and Evaluating Instruction, Maintaining High Visibility, Promoting Professional Development, and Providing Incentives for Learning.

Elementary School. The model for Professional Involvement includes the following instructional leadership behaviors: Coordinating the Curriculum, Monitoring Student Progress, Providing Incentives for Teachers, and Promoting Professional Development. The model for Innovativeness

includes Framing School Goals, Coordinating the Curriculum, Protecting Instructional Time, Promoting Professional Development, Providing Incentives for Teachers.

High School. The model for Professional Involvement includes Framing School Goals, Maintaining High Visibility, Providing Incentives for Teachers, and Promoting Professional Development. The model for Innovativeness is composed of Framing School Goals, Communicating School Goals, and Promoting Professional Development.

#### Recommendations

While there is considerable evidence that leadership is essential to an effective school, the nature of this leadership is rather complex, and there remains much to be learned. The complex nature of the issues studied herein, is best explicated by restating a quotation by Madaus, Airasian, and Kallaghan (1980).

When a researcher sets out to study a process as complicated as schooling, he or she is faced immediately with constraints which necessitate simplifying the process in order to make research possible. In practice the constraints usually dictate the investigation of a limited number of important characteristics and the omission of others which may also be relevant. Research studies can never represent the richness and complexity

of reality, but instead must abstract or simplify it by selecting a small number of variables for study (p.15). It is in recognition that such constraints exist in this study, that the following recommendations for future research is proposed.

Recommendation 1. Since this study was conducted in one province of Canada, its generalizability beyond that is limited. In order to be able to increase its generalizability, the study should be replicated in other provinces and in regions of other countries where the school organization, and other contextual factors differ.

Recommendation 2. It is recognized that there are many potentially intervening variables in this study. Research suggests that some of the major demographic factors are age, gender, teaching experience, and qualifications of teachers and principals. Contextual variables such as school size, school district policies, a rural or urban population, or the social-economic status of the school population have been noted as potentially intervening as well. To control for all these variables in one study is not practical in terms of the many possible interactions and the needed sample size to account for statistical error. Other studies should be conducted with specific school types while one or more of these variables are considered as school type was in this study.

Recommendation 3. The school-level characteristics that were selected for this study, are critical factors in an effective school; however, they are certainly not exhaustive. Other factors of importance should be studied in respect to their relationship with the instructional leadership behaviors of school principals. For example, the relationship among instructional leadership behaviors of principals and attitudes of students and parents is of primary importance and could be a subject of another investigation.

Recommendation 4. Most of the studies that have been conducted in respect to school effectiveness or instructional leadership have been observational or correlational. In order to establish a causal relationship among the variables examined in this study an experimental study could be conducted. An experimental group of principals could be given appropriate training related to instructional leadership and the models developed in this study. Levels of commitment, innovativeness, and professional involvement in their schools could be compared with levels in control schools where principals have not been provided with the appropriate training. Such experimental research would allow for accumulation of evidence regarding cause and effect.

While it is understood that the above suggestions do not exhaust the implications for future research which are

indicated by the results of this study, they are indicative of the types of studies that might be pursued by investigators who are interested in this important aspect of education.

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Appendix A: Letter to School District Superintendents

Faculty of Education  
 145 Jean-Jacque Lussier  
 University of Ottawa  
 Ottawa, Canada  
 K1N 6N5

^<Name>  
 ^[Title]  
 ^[Board]  
 ^[Box]  
 ^[Town]  
 ^[Province]  
 ^[P. Code]

Dear ^<\*>:

I am a high school principal presently on leave from the Avalon North Integrated School Board to complete my Ph.D program at the University of Ottawa. I am conducting a study for my dissertation entitled "A Study of the Relationship among Instructional Leadership Behaviors of the School Principal and Selected School-Level Characteristics". Even though there is considerable consensus among researchers that certain instructional leadership behaviors by principals contribute to school effectiveness, others contend that these behavior have been identified through research primarily based on a narrow definition of effectiveness, student achievement on standardized tests. They contend that instructional leadership implies meddling and over-management, and suggest that such activities are negatively related to other criteria of school effectiveness such as teacher support of and commitment to the school, professional involvement, and receptivity to change and school improvement. It is the purpose of this study to investigate the validity of this latter contention and to develop models of instructional leadership that should lead to further clarification of the role of the principal as an instructional leader. It is hoped that the findings and the models developed will prove useful for training and professional development of school leaders.

I am hoping to collect my data from schools throughout Newfoundland and Labrador. I have received endorsement for this project from Dr. Wayne Oakley, Director of Program Development at the Department of Education. I am now requesting your permission to contact a random sample of principals in your district, to seek their cooperation. Each principal will be asked to complete a very short data form regarding demographics such as their years experience, school size and type. A random sample of teachers will be asked to complete a questionnaire which should take approximately 15 minutes of their time. A copy of each of these instruments is attached for your perusal.

The nature of the study requires that I have a large sample size; therefore, I may need to select up to 50 percent of the elementary and high schools in each school district. Since the data will involve schools throughout the province, and all data will be pooled, comparisons between principals, schools, or districts are not intended or of concern for this study. Questionnaires in each school will be number coded (no names will be required) so that demographic data provided by the school principal can be matched to teacher responses in the computer analysis. These codes will in no way be associated with particular schools when the data have been collected. You can be assured of the anonymity of all responses.

Should you have questions related to the study, or the instruments, please do not hesitate to contact me at the address above or by telephone (613) 564-5018/726-1160. As your affirmative response is critical to my research, I hope to receive your approval at your earliest convenience.

Yours sincerely,

Bruce Sheppard

Appendix B: Follow-up Letter Sent to School District  
Superintendents

Faculty of Education  
145 Jean-Jacque Lussier  
University of Ottawa  
Ottawa, Canada  
K1N 6N5

^<Name>  
^[Title]  
^[Board]  
^[Box]  
^[Town]  
^[Province]  
^[P. Code]

Dear ^<\*>:

This is a follow-up to my letter of March 2, 1992. At that time I requested your permission to contact your principals and teachers to solicit their support in the completion of a questionnaire regarding the instructional leadership behaviors of the school principal. This questionnaire is part of a research project in which I am involved as part of my Ph.D. program at the University of Ottawa.

As I indicated in my earlier letter, all responses are anonymous. Since the data will involve schools throughout the province, and all data will be pooled, comparisons between principals, schools, or districts are not intended or of concern for this study. Should you have questions related to the study, or the instruments, please do not hesitate to contact me at the address above or by telephone (613) 564-5018/726-1160. As noted in my earlier correspondence, your affirmative response is critical to my research, and I hope to receive your approval at your earliest convenience.

Yours sincerely,

Bruce Sheppard

**Appendix C: Package sent to School Principals**

1081 Ambleside Drive  
 Apt. 2402  
 Ottawa, Ontario  
 K2B 8C8

^<Name>  
 ^[[Title]  
 ^<school>  
 ^[Box]  
 ^<Town>  
 ^<Prov->  
 ^[P. Code]

Dear ^<Sal>:

I am a high school principal with the Avalon North Integrated School Board presently on leave to complete my Ph.D program at the University of Ottawa. I am doing a study for my dissertation entitled "A Study of the Relationship among Instructional Leadership Behaviors of the School Principal and Selected School-Level Characteristics". I have recently received approval from your superintendent to contact you to solicit your support, and that of your teachers, for my study. I realize that this is another request in your already hectic schedule, but the principal's form is quite short, two minute maximum, and the forms for teachers should not require more than 15-20 minutes to complete. Since the data will involve schools throughout the province, and all data will be pooled, comparisons between principals, schools, or districts are not intended or of concern for this study. Questionnaires for each school are coded merely so that the demographic data provided by the principal can be matched to teacher responses in the computer analysis. These codes will in no way be associated with particular schools. You can be assured of the anonymity of all responses.

Questionnaires and instructions for their distribution are enclosed. Should you have questions related to the study, or any of the instruments, please do not hesitate to contact me at the address above or by telephone (613) 564-5018/726-1160.

As your support is critical to my research, I am hopeful that your response is favorable, and that you will oversee the distribution, collection, and mailing of the questionnaires at your earliest convenience.

Yours sincerely,

Bruce Sheppard

#### NOTE

The following items should be in this package:

1. One Principal-School Demographics sheet--attached to the return envelope.
2. One copy for each teacher of the Teacher Questionnaire with attached letter of request.
3. One Return Envelope--postage paid.
4. One Instruction Sheet

Dear Teacher:

I am a school principal with the Avalon North Integrated School Board presently on leave to complete my Ph. D. program at the University of Ottawa. I am doing a study for my dissertation entitled "A Study of the Relationship among Instructional Leadership Behaviors of the School Principal and Selected School-Level Characteristics. In order to obtain the data that I need for this study, I need your assistance. I realize that this is another request in your already hectic schedule, but since the nature of my study requires a large sample size, your response is critical. The completion of this questionnaire should not require more than 15-20 minutes.

Your particular responses are anonymous. Also, since the data will involve schools throughout the province, and all data will be pooled, comparisons between principals, schools, or districts are not intended or of concern for this study. Questionnaires for each school are coded (number in the top right hand corner of the questionnaire represents your school) merely so that the demographic data provided by your principal can be matched to teacher responses in the computer analysis. These codes will in no way be associated with particular schools when the data has been collected. You can be assured of the anonymity of all responses.

**AS YOUR ASSISTANCE IS CRITICAL TO THE SUCCESS OF THIS STUDY, PLEASE COMPLETE THIS QUESTIONNAIRE AT YOUR EARLIEST CONVENIENCE.** When you have completed the questionnaire you should return it to the collection volunteer who has been provided with a common mailing envelop for your school. **THANK YOU** for your time and understanding in this matter.

Yours sincerely,

Bruce Sheppard

INSTRUCTIONS

- A. Please have the questionnaires distributed to all teachers in your school.
- B. If possible ask for a volunteer from among the teachers or secretarial staff to collect the completed questionnaires; also the involvement of the administration in the collection may affect responses. Have this individual collect the questionnaires in a manner that insures anonymity.
- C. Detach and complete the Principal-School Demographic sheet and pass it along to the collection volunteer to have it enclosed in the Return Envelope along with the Teacher Questionnaires.
- D. Return the completed questionnaires to me at your earliest convenience.

THANK YOU FOR YOUR ASSISTANCE

**Principal-School Demographics ..**

A Years experience as a teacher (including experience as principal)

\_\_\_1 \_\_\_2-4 \_\_\_5-9 \_\_\_10-15 \_\_\_more than 15

B Years experience as a principal.

\_\_\_1 \_\_\_2-4 \_\_\_5-9 \_\_\_10-15 \_\_\_more than 15

C Sex of the principal: \_\_\_F \_\_\_M

D The approximate student enrollment of the school: \_\_\_\_\_

E. Grade levels in your school (e g. K-12): \_\_\_\_\_

Appendix D: Follow-up Letter Sent to School Principals

Faculty of Education  
145 Jean-Jacque Lussler  
University of Ottawa  
Ottawa, Canada  
K1N 6N5

^<Name>  
^[Title]  
^[Board]  
^[Box]  
^[Town]  
^[Province]  
^[P. Code]

Dear ^<\*>:

Approximately one month ago, I sent you a package of questionnaires in anticipation that you and your staff would be able to participate in my study. If you have already returned the completed questionnaires, I would like to express my gratitude. However, if to this point you have been unable to help me out in this regard, I would truly appreciate your assistance.

As previously stated, this study does not relate to specific teachers, principals, or districts. The intent is to compare teacher responses on the separate sections of the questionnaire in the context of the principal demographic information.

Your assistance in this matter is of primary importance to me since I MUST have completed returns from a large percentage of schools in order to complete my study.

If you plan to have your school participate in the study, please return completed questionnaire to me within the next two weeks.

Sincerely,

Bruce Sheppard

**Appendix E: Teacher Questionnaire**

**Section I: Personal Demographic Data**

- A. Sex.  F  M
- B. Years experience as a teacher at the end of this school year  
 1  2-4  5-9  
 10-15  more than 15
- C. Years working with this current principal at the end of this current year.  
 1  2-4  5-9  
 10-15  more than 15
- D. Grade level you teach:  
 K-6  7-9  10-12  
 Other (Please describe) \_\_\_\_\_
- E. Teaching Qualifications (Grade):  
 Less than 4  4-6  7

**Section II: The Principal Instructional Management Rating Scale\***

This section is designed to provide a profile of principal instructional leadership. It consists of 50 behavioral statements that describe principal job-related behaviors. You are asked to consider each statement in terms of your principal's behavior over the past school year.

Read each statement carefully. Then circle the number that indicates the extent to which you feel your principal has demonstrated the specific job behavior or practice. For the response to each statement:

- 5 represents **Almost Always**
- 4 represents **Frequently**
- 3 represents **Sometimes**
- 2 represents **Seldom**
- 1 represents **Almost Never**

In some cases, these responses may seem awkward; use your judgement in selecting the most appropriate response to such questions.

Please respond to all questions, but do not circle more than ONE number for each.

\* This section of the questionnaire is a reproduction (some minor changes to the instructions to suit the purposes of this study) of the Hallinger Principal Instructional Management Scale. All rights are reserved. This instrument may not be reproduced in whole or part without the written permission of the publisher, Dr. Philip Hallinger.

To what extent does your principal...?

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Almost Always      Almost Never

### I. FRAME THE SCHOOL GOALS

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 1. Develop a focused set of annual school-wide goals  | 5 | 4 | 3 | 2 | 1 |
| 2. Frame the school's goals in terms of staff responsibilities for meeting them               | 5 | 4 | 3 | 2 | 1 |
| 3. Use needs assessment or other systematic methods to secure staff input on goal development | 5 | 4 | 3 | 2 | 1 |
| 4. Use data on student academic performance when developing the school's academic goals       | 5 | 4 | 3 | 2 | 1 |
| 5. Develop goals that are easily translated into classroom objectives by teachers             | 5 | 4 | 3 | 2 | 1 |

### II. COMMUNICATE THE SCHOOL GOALS

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 6. Communicate the school's mission effectively to members of the school community  | 5 | 4 | 3 | 2 | 1 |
| 7. Discuss the school's academic goals with teachers at faculty meetings  | 5 | 4 | 3 | 2 | 1 |
| 8. Refer to the school's academic goals when making curricular decisions with teachers  | 5 | 4 | 3 | 2 | 1 |
| 9. Ensure that the school's academic goals are reflected in highly visible displays in the school (e.g. posters or bulletin boards emphasizing reading or math) | 5 | 4 | 3 | 2 | 1 |
| 10. Refer to the school's goals in student assemblies   | 5 | 4 | 3 | 2 | 1 |

### III. SUPERVISE & EVALUATE INSTRUCTION

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 11. Ensure that the classroom priorities of teachers are consistent with the stated goals of the school | 5 | 4 | 3 | 2 | 1 |
| 12. Review student work products when evaluating classroom instruction                                  | 5 | 4 | 3 | 2 | 1 |

To what extent does your principal...?

	Almost Always	4	3	2	1 Almost Never
13. Conduct informal observations in classrooms on a regular basis (informal observations are unscheduled, last at least 5 minutes, and may not involve written feedback or a formal conference)	5	4	3	2	1
14. Point out specific strengths in teacher's instructional practices in post observation feedback (e.g., in conferences or written evaluations)	5	4	3	2	1
15. Point out specific weaknesses in teacher instructional practices in post observation feedback (e.g., in conferences or written evaluations)	5	4	3	2	1
<b>IV. COORDINATE THE CURRICULUM</b>					
16. Make clear who is responsible for coordinating the curriculum across grade levels (e.g., the principal, vice-principal, or teacher-leader)	5	4	3	2	1
17. Draw upon the results of school-wide testing when making curriculum decisions	5	4	3	2	1
18. Monitor the classroom curriculum to see that it covers the school's curriculum objectives	5	4	3	2	1
19. Assess the overlap between the school's curricular objectives and the school's achievement tests	5	4	3	2	1
20. Participate actively in the review of curricular materials	5	4	3	2	1
<b>V. MONITOR STUDENT PROGRESS</b>					
21. Meet individually with teachers to discuss student academic progress	5	4	3	2	1
22. Discuss the item analysis of tests with the faculty to identify curricular strengths and weaknesses	5	4	3	2	1
23. Use test results to assess progress toward school goals	5	4	3	2	1
24. Inform teachers of the school's performance results in written form (e.g., in a memo or newsletter)	5	4	3	2	1
25. Inform students of school's test results	5	4	3	2	1

To what extent does your principal...?

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Almost Always      Almost Never

### VI. PROTECT INSTRUCTIONAL TIME

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 26. Limit interruptions of instructional time by public address announcements                         | 5 | 4 | 3 | 2 | 1 |
| 27. Ensure that students are not called to the office during instructional time                       | 5 | 4 | 3 | 2 | 1 |
| 28. Ensure that tardy and truant students suffer specific consequences for missing instructional time | 5 | 4 | 3 | 2 | 1 |
| 29. Encourage teachers to use instructional time for teaching and practicing new skills and concepts  | 5 | 4 | 3 | 2 | 1 |
| 30. Limit the intrusion of extra-and co-curricular activities on instructional time                   | 5 | 4 | 3 | 2 | 1 |

### VII. MAINTAIN HIGH VISIBILITY

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 31. Take time to talk with students and teachers during recess and breaks | 5 | 4 | 3 | 2 | 1 |
| 32. Visit classrooms to discuss school issues with teachers and students  | 5 | 4 | 3 | 2 | 1 |
| 33. Attend/participate in extra-and co-curricular activities              | 5 | 4 | 3 | 2 | 1 |
| 34. Cover classes for teachers until a late or substitute teacher arrives | 5 | 4 | 3 | 2 | 1 |
| 35. Tutor students or provide direct instruction to classes               | 5 | 4 | 3 | 2 | 1 |

### VIII. PROVIDE INCENTIVES FOR TEACHERS

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 36. Reinforce superior performance by teachers in staff meetings, newsletters, and/or memos                   | 5 | 4 | 3 | 2 | 1 |
| 37. Compliment teachers privately for their efforts or performance  | 5 | 4 | 3 | 2 | 1 |
| 38. Acknowledge teachers' exceptional performance by writing memos for their personnel files                  | 5 | 4 | 3 | 2 | 1 |
| 39. Reward special efforts by teachers with opportunities for professional recognition                        | 5 | 4 | 3 | 2 | 1 |
| 40. Create professional growth opportunities for teachers as a reward for special contributions to the school | 5 | 4 | 3 | 2 | 1 |

**IX. PROMOTE PROFESSIONAL DEVELOPMENT**

Almost Always ... Almost Never

- 41. Ensure that in-service activities attended by the staff are consistent with the school's academic goals 5 4 3 2 1
- 42. Actively support the use of skills acquired during in-service training in the classroom 5 4 3 2 1
- 43. Obtain the participation of the whole staff in important inservice activities 5 4 3 2 1
- 44. Lead or attend teacher in-service activities concerned with instruction 5 4 3 2 1
- 45. Set aside time at faculty meetings for teachers to share ideas or information from in-service activities 5 4 3 2 1

**X. PROVIDE INCENTIVES FOR LEARNING**

- 46. Recognize students who do superior academic work with formal rewards such as an honor role or mention in the principal's newsletter 5 4 3 2 1
- 47. Use assemblies to honor students for academic accomplishments or for behavior or citizenship 5 4 3 2 1
- 48. Recognize superior student achievement or improvement by seeing students in the office with their work 5 4 3 2 1
- 49. Contact parents to communicate improved or exemplary student performance or contributions 5 4 3 2 1
- 50. Support teachers actively in their recognition and/or reward of student contributions to and accomplishments in class 5 4 3 2 1

### Section III: School-Level Characteristics\*

This section contains a number of statements about things that occur in some schools. After reading each statement carefully, indicate to what extent you agree or disagree that each of these statements actually applies to your school.

Some statements in this section are fairly similar to other statements. Don't worry about this--simply select the response which best describes your agreement or disagreement by drawing a circle around:

- 5 if you **Strongly Agree** with the statement
- 4 if you **Agree** with the statement
- 3 if you are **Uncertain** about the statement
- 2 if you **Disagree** with the statement
- 1 if you **Strongly Disagree** with the statement

Please respond to all the statements but do not circle more than **ONE** response for each.

	Strongly Agree			Strong Disagree
1. Teachers actively promote the school in the community	5	4	3	2 1
2. Teachers frequently discuss teaching methods and strategies with each other.	5	4	3	2 1
3. Teachers are encouraged to be innovators in this school.	5	4	3	2 1
4. There is little group spirit among teachers in this school	5	4	3	2 1
5. Teachers avoid talking about educational issues with each other.	5	4	3	2 1
6. Doing things in a different way is valued in this school	5	4	3	2 1
7. The morale of the staff is high.	5	4	3	2 1
8. Professional development matters are seldom discussed during staff meetings.	5	4	3	2 1
9. It is difficult to change anything in this school.	5	4	3	2 1
10. Teachers take pride in this school.	5	4	3	2 1
11. Teachers are keen to learn from their colleagues.	5	4	3	2 1
12. Variety and change are not considered important in this school.	5	4	3	2 1
13. There is little sense of unity among teachers at this school.	5	4	3	2 1
14. Many teachers attend inservice and other professional development courses.	5	4	3	2 1

\* This section of the questionnaire is a reproduction of scales from the School Organizational Climate Questionnaire, copyright by Graham B. Dellar, Curtin University, 1990.

	Strongly Agree	4	3	2	1 Strongly Disagree
15. New curriculum materials and teaching methods are frequently implemented in this school.	5	4	3	2	1
16. Teachers' loyalty to the school is not considered important.	5	4	3	2	1
17. Teachers show considerable interest in the professional activities of their colleagues	5	4	3	2	1
18. New approaches to things are rarely tried.	5	4	3	2	1
19. Teachers go about their work with enthusiasm	5	4	3	2	1
20. Teachers show little interest in teaching procedures operating in other schools.	5	4	3	2	1
21. There is a great deal of resistance to proposals for curriculum change	5	4	3	2	1
22. Teachers hold a shared sense of purpose at this school.	5	4	3	2	1
23. Teachers at this school are not committed to staying abreast of current developments in their teaching area	5	4	3	2	1
24. This school is among the first to try out new and interesting ideas.	5	4	3	2	1

**To insure complete confidentiality of your responses, return this questionnaire to the person collecting them and place it in the mailing envelop. Your time and effort in completing this questionnaire is appreciated. Thank you.**

Appendix F: Validity Rating Sheet for School-Level  
Characteristics

TEACHER WORK CLIMATE QUESTIONNAIRE

Please read each of the following statements carefully and identify in which category it should be placed by writing C, P, or I in the appropriate blank to the left. The statement should be assigned to a particular category if it is either NEGATIVELY or POSITIVELY related. The letters C, P, and I represent categories as follows:

C represents Commitment: The degree to which teachers perceive themselves to be supportive of and committed to the school and their colleagues.

P represents Professional involvement: The degree to which teachers are concerned about their work, are keen to learn from one another, and committed to professional development.

I represents Innovation: The extent to which variety, change and new approaches are encouraged in the school.

Note: If you are unable to place the statement in either category write N.A. in that space.

- \_\_\_1. There is little sense of unity among teachers at this school.
- \_\_\_2. This school is among the first to try out new and interesting ideas.
- \_\_\_3. There is a great deal of resistance to proposals for curriculum change.
- \_\_\_4. Teachers are keen to learn from their colleagues.
- \_\_\_5. There is little group spirit among teachers in this school.
- \_\_\_6. Teachers frequently discuss teaching methods and strategies with each other.
- \_\_\_7. Teachers' loyalty to the school is not considered important.
- \_\_\_8. Variety and change are not considered important in this school.
- \_\_\_9. Teachers avoid talking about educational issues with each other.
- \_\_\_10. Teachers go about their work with enthusiasm.
- \_\_\_11. Teachers show little interest in teaching procedures operating in other schools.

- \_\_\_12. Teachers at this school are not committed to staying abreast of current developments in their teaching area.
- \_\_\_13. Teachers show considerable interest in the professional activities of their colleagues.
- \_\_\_14. Teachers take pride in this school.
- \_\_\_15. Doing things in a different way is valued in this school.
- \_\_\_16. Teachers hold a shared sense of purpose at this school.
- \_\_\_17. Professional development matters are seldom discussed during staff meetings.
- \_\_\_18. New curriculum materials and teaching methods are frequently implemented in this school.
- \_\_\_19. New approaches to things are rarely tried.
- \_\_\_20. Teachers are encouraged to be innovators in this school.
- \_\_\_21. The morale of the staff is high.
- \_\_\_22. It is difficult to change anything in this school.
- \_\_\_23. Many teachers attend inservice and other professional development courses.
- \_\_\_24. Teachers actively promote the school in the community.

Appendix G: Models to Which Individual Variables  
Make Significant R Square Changes  
Elementary School

Models to Which Individual Variables  
Make Significant R Square Changes  
for Commitment  
(Elementary School)

Variable	Model	R Sq Ch	F Ch	Sig F Ch
FGOALS	PROTEC VIS INLEARN MONIT INCTEAC SUPEVAL CURR.....	.01209	7.624	.0061
CGOALS	CURR VIS FGOALS PROTEC SUPEVAL MONIT PDEV.....	.00586	4.225	.0407
	CURR VIS INLEARN INCTEAC PROTEC PDEV SUPEVAL MONIT.....	.00668	4.872	.0280
SUPEVAL	INLEARN VIS FGOALS INCTEAC PDEV CGOALS MONIT CURR.....	.00514	3.749	.0558
	INLEARN VIS FGOALS INCTEAC PDEV CGOALS PROTEC CURR.....	.00574	4.175	.0419
	INLEARN VIS FGOALS INCTEAC PDEV CGOALS MONIT PROTEC.....	.00512	3.730	.0544
CURR	FGOALS SUPEVAL PROTEC.....	.00967	4.802	.0292
	FGOALS MONIT INLEARN.....	.00805	3.816	.0517
	FGOALS MONIT PROTEC.....	.01078	5.342	.0215
	FGOALS PROTEC INLEARN.....	.01036	5.259	.0225
	FGOALS INCTEAC.....	.01114	5.360	.0213
	CGOALS.....	.01417	6.779	.0097
	MONIT PROTEC SUPEVAL INCTEAC INLEARN.....	.00984	4.974	.0264
	MONIT VIS INCTEAC PROTEC SUPEVAL...	.01153	6.921	.0089
	MONIT VIS INLEARN PROTEC SUPEVAL...	.00767	3.108	.0301

MONIT	FGOALS CGOALS.....	.00991	4.712	.0307
	FGOALS INLEARN.....	.01088	5.113	.0244
	VIS PROTEC SUPEVAL.....	.00805	5.113	.0244
	PROTEC INCTEAC.....	.01007	4.899	.0276
	PROTEC INLEARN.....	.01731	8.309	.0042
	INCTEAC INLEARN.....	.01034	4.828	.0287
	INCTEAC VIS.....	.00950	5.543	.0192
PROTEC	VIS SUPEVAL MONIT CURR INCTEAC.....	.00870	5.220	.0230
	VIS FGOALS SUPEVAL.....	.00612	3.77	.0531
	FGOALS CGOALS MONIT SUPEVAL CURR INCTEAC INLEARN.....	.03205	16.72	.0001
VIS	FGOALS CGOALS SUPEVAL CURR MONIT PROTEC INCTEAC PDEV INLEARN.....	.04090	29.72	.0000
INCTEAC	VIS SUPEVAL PROTEC.....	.00928	5.439	.0203
	VIS MONIT.....	.00706	4.118	.0433
	PDEV PROTEC FGOALS CGOALS SUPEVAL MONIT CURR.....	.03205	16.72	.0001
	PDEV INLEARN SUPEVAL MONIT PROTEC FGOALS.....	.00561	3.730	.0544
	PDEV INLEARN SUPEVAL MONIT PROTEC CURR.....	.00601	3.979	.0470
PDEV	FGOALS CGOALS SUPEVAL MONIT CURR PROTEC INCTEAC VIS INLEARN.....	.05869	42.65	.0000
INLEARN	FGOALS CGOALS SUPEVAL MONIT CURR PROTEC VIS INCTEAC.....	.00764	4.891	.0277
	PDEV CGOALS SUPEVAL MONIT CURR PROTEC VIS INCTEAC.....	.00515	3.753	.0536
	FGOALS PDEV SUPEVAL MONIT CURR PROTEC VIS INCTEAC.....	.00673	4.868	.0281
	CGOALS FGOALS PDEV MONIT CURR PROTEC VIS INCTEAC.....	.00527	3.797	.0522
	SUPEVAL CGOALS FGOALS PDEV MONIT			

PROTEC VIS INCTEAC.....	.00520	3.789	.0525
CURR SUPEVAL CGOALS FGOALS PDEV MONIT PROTEC VIS.....	.00574	4.184	.00574

Models to Which Individual Variables  
Make Significant R Square Changes  
for Professional Involvement  
(Elementary School)

Variable	Model	R Sq Ch	F Ch	Sig F Ch
FGOALS	SUPEVAL CURR MONIT PROTEC.....	.00767	3.854	.0505
	SUPEVAL CURR MONIT VIS.....	.00917	4.703	.0309
	SUPEVAL CURR MONIT INCTEAC.....	.00820	4.003	.0463
	SUPEVAL MONIT PROTEC INCTEAC INLEARN VIS.....	.00919	4.613	.0290
	CURR MONIT PROTEC.....	.00873	4.386	.0370
	CURR MONIT VIS.....	.01004	5.158	.0238
	CURR MONIT INCTEAC.....	.00946	4.656	.0326
	CURR MONIT INLEARN.....	.00904	4.334	.0382
CGOALS	PDEV INLEARN VIS PROTEC FGOALS MONIT SUPEVAL.....	.00611	3.730	.0544
	FGOALS SUPEVAL CURR MONIT PROTEC VIS INCTEAC INLEARN.....	.00939	5.098	.0247
SUPEVAL	FGOALS CGOALS MONIT INLEARN.....	.01053	5.136	.0241
	FGOALS CGOALS PROTEC.....	.00836	4.222	.0407
	CURR FGOALS MONIT INLEARN.....	.00807	3.906	.0490
	MONIT PROTEC VIS.....	.01088	5.418	.0206
	MONIT PROTEC INLEARN INCTEAC.....	.00755	3.771	.0531
	MONIT VIS INCTEAC.....	.00868	4.294	.0391
	MONIT VIS INLEARN.....	.00904	4.562	.0335
	INCTEAC PROTEC VIS.....	.01134	5.743	.0171
	INCTEAC PROTEC INLEARN.....	.01202	6.013	.0147
	PROTEC VIS INLEARN.....	.01311	6.729	.0099
CURR	FGOALS CGOALS SUPEVAL PROTEC INCTEAC PDEV INLEARN MONIT.....	.00608	3.763	.0533

MONIT	FGOALS CGOALS.....	.01441	6.807	.0095
	FGOALS PROTEC VIS.....	.00848	4.324	.0384
	FGOALS INCTEAC.....	.00922	4.342	.0380
	FGOALS INLEARN.....	.01758	8.096	.0047
	CGOALS.....	.01466	6.944	.0088
	SUPEVAL PROTEC VIS.....	.00928	4.620	.0324
	PROTEC VIS INCTEAC.....	.00995	5.026	.0257
	PROTEC VIS INLEARN.....	.00941	4.799	.0292
	INCTEAC INLEARN.....	.01339	6.247	.0130
PROTEC	FGOALS CGOALS SUPEVAL CURR MONIT VIS INCTEAC INLEARN.....	.01305	7.083	.0082
VIS	FGOALS CGOALS SUPEVAL MONIT PROTEC VIS CURR INLEARN.....	.02043	11.086	.0010
INCTEAC	FGOALS CGOALS SUPEVAL CURR MONIT PROTEC INLEARN.....	.00909	4.778	.0296
	VIS FGOALS CGOALS PROTEC.....	.00719	3.838	.0510
	VIS MONIT PROTEC INLEARN.....	.00882	13.362	.0003
	PDEV PROTEC FGOALS SUPEVAL CURR MONIT VIS.....	.00695	4.274	.0395
PDEV	FGOALS CGOALS SUPEVAL CURR MONIT PROTEC INCTEAC INLEARN VIS.....	.07120	44.053	.0000
INLEARN	FGOALS CGOALS SUPEVAL MONIT VIS PROTEC.....	.00712	3.790	.0525
	FGOALS CGOALS SUPEVAL MONIT VIS CURR.....	.00830	4.415	.0364
	INCTEAC CGOALS VIS.....	.00807	4.272	.0396
	INCTEAC CGOALS FGOALS.....	.00844	4.168	.0420
	INCTEAC SUPEVAL VIS PROTEC .....	.01578	8.175	.0045
	INCTEAC SUPEVAL VIS MONIT CURR....	.01255	6.557	.0109
	INCTEAC PROTEC MONIT VIS.....	.01481	7.642	.0060

Models to Which Individual Variables  
Make Significant R Square Changes  
for Innovativeness  
(Elementary School)

Variable	Model	R Sq Ch	F Ch	Sig F Ch	
FGOALS	CGOALS SUPEVAL MONIT PROTEC VIS INTEAC PDEV.....	.00601	3.849	.0507	
	CGOALS SUPEVAL MONIT PROTEC VIS INTEAC INLEARN.....	.00834	5.043	.0254	
	SUPEVAL CURR MONIT PROTEC VIS INTEAC PDEV INLEARN.....	.00615	4.030	.0456	
CGOALS	FGOALS SUPEVAL PROTEC MONIT.....	.00701	3.962	.0474	
	FGOALS SUPEVAL PROTEC VIS.....	.00665	3.912	.0488	
	SUPEVAL CURR MONIT PROTEC VIS INTEAC INLEARN.....	.00802	4.924	.0272	
	SUPEVAL PDEV MONIT PROTEC VIS INTEAC INLEARN.....	.00641	4.083	.0442	
	SUPEVAL CURR PDEV MONIT PROTEC VIS.....	.00703	4.467	.0353	
	FGOALS CURR MONIT.....	.00939	5.080	.0249	
	FGOALS MONIT PROTEC VIS.....	.00680	4.017	.0459	
	FGOALS MONIT INTEAC.....	.00712	3.952	.0477	
	FGOALS MONIT INLEARN.....	.01078	5.762	.0170	
	FGOALS PROTEC INLEARN.....	.01024	5.788	.0167	
	FGOALS VIS INTEAC.....	.00651	3.814	.0517	
	FGOALS VIS INLEARN.....	.00665	3.869	.0501	
	SUPEVAL	FGOALS PDEV.....	.00617	3.801	.0521
		FGOALS CURR MONIT.....	.00807	4.355	.0377
FGOALS CGOALS INLEARN MONIT.....		.01130	6.139	.0138	
FGOALS CGOALS INLEARN PROTEC.....		.00795	4.547	.0338	
FGOALS CGOALS INLEARN INTEAC.....		.00673	3.790	.0525	

	FGOALS CGOALS VIS.....	.00696	3.985	.0468
	CURR MONIT INLEARN.....	.00899	4.798	.0292
	MONIT PROTEC VIS INLEARN.....	.00667	3.985	.0468
	MONIT VIS INCTEAC.....	.00813	4.459	.0292
	MONIT PDEV.....	.02019	4.648	.0319
	PROTEC PDEV VIS.....	.01214	7.283	.0073
	PROTEC VIS INCTEAC.....	.01258	7.081	.0082
	INLEARN PDEV.....	.00852	5.194	.0233
	INCTEAC INLEARN.....	.02951	15.692	.0001
CURR	FGOALS CGOALS SUPEVAL MONIT PROTEC VIS INCTEAC PDEV INLEARN....	.00931	6.079	.0142
MONIT	FGOALS CGOALS PROTEC.....	.00985	5.535	.0193
	FGOALS CGOALS VIS.....	.00865	4.963	.0266
	FGOALS CGOALS INLEARN.....	.01182	6.317	.0125
	FGOALS SUPEVAL.....	.00988	5.192	.0234
	FGOALS PROTEC VIS.....	.01025	5.992	.0149
	FGOALS PROTEC INLEARN.....	.00901	5.081	.0249
	FGOALS INCTEAC.....	.00865	4.755	.0300
	CGOALS PROTEC VIS.....	.00685	3.991	.0466
	SUPEVAL PROTEC INLEARN.....	.00783	4.224	.0407
	SUPEVAL PROTEC VIS.....	.01703	9.282	.0029
	SUPEVAL INCTEAC VIS.....	.01703	9.282	.0025
	SUPEVAL INLEARN VIS.....	.00760	4.197	.0413
	PROTEC VIS INCTEAC INLEARN.....	.00680	3.925	.0484
	PROTEC VIS PDEV.....	.01241	7.4450	.0067
PROTEC	FGOALS CGOALS SUPEVAL MONIT CURR VIS INCTEAC PDEV INLEARN.....	.00588	3.840	.0509
VIS	FGOALS CGOALS SUPEVAL MONIT CURR VIS INCTEAC PDEV INLEARN.....	.00588	3.840	.0509

	PDEV CGOALS INLEARN MONIT.....	.00760	4.787	.0294
INTEAC	FGOALS CGOALS SUPEVAL MONIT CURR PROTEC PDEV INLEARN VIS.....	.00900	5.878	.0159
PDEV				
	FGOALS CGOALS SUPEVAL MONIT CURR PROTEC INTEAC INLEARN VIS....	.02734	17.845	.0000
INLEARN	FGOALS CGOALS SUPEVAL MONIT CURR PROTEC VIS.....	.00615	3.760	.0534
	INTEAC PROTEC SUPEVAL MONIT VIS...	.001197	6.919	.0063
	INTEAC CURR SUPEVAL MONIT VIS FGOALS.....	.00630	3.801	.0521
	INTEAC FGOALS CGOALS SUPEVAL.....	.00683	4.258	.0399
	PDEV CURR SUPEVAL MONIT PROTEC VIS.....	.00806	5.127	.0242
	PDEV INTEAC SUPEVAL MONIT VIS.....	.00684	4.286	.0393
	PDEV CURR SUPEVAL MONIT FGOALS CGOALS VIS.....	.00602	3.838	.0510
	PDEV INTEAC PROTEC VIS.....	.00697	4.413	.0365

Appendix H: Models to Which Individual Variables  
Make Significant R Square Changes  
High School

Models to Which Individual Variables  
Make Significant R Square Changes  
for Teacher Involvement  
(High School)

Variable	Model	R Sq Ch	F Ch	Sig F Ch
FGOALS	CGOALS SUPEVAL CURR MONIT PROTEC VIS INCTEAC PDEV INLEARN.....	.01044	5.248	.0227
CGOALS	FGOALS SUPEVAL CURR MONIT PROTEC VIS INCTEAC INLEARN.....	.01427	6.750	.0098
	PDEV SUPEVAL CURR MONIT PROTEC VIS INCTEAC INLEARN.....	.01928	9.554	.0022
SUPEVAL	SUPEVAL MONIT PROTEC VIS INCTEAC INLEARN.....	.01606	6.790	.0096
	CGOALS INLEARN.....	.00914	4.068	.0446
	PDEV PROTEC VIS INCTEAC INLEARN.....	.00778	3.739	.0541
CURR	FGOALS SUPEVAL INLEARN.....	.00820	3.745	.0539
	FGOALS SUPEVAL PROTEC.....	.00827	3.780	.0528
	FGOALS INLEARN PROTEC.....	.01389	6.346	.0123
	FGOALS INCTEAC.....	.01109	5.446	.0203
	CGOALS MONIT PROTEC INCTEAC INLEARN.....	.00872	3.938	.0481
	CGOALS VIS INCTEAC INLEARN.....	.00996	4.636	.0321
	PDEV PROTEC VIS INCTEAC INLEARN.....	.00941	4.537	.0340
	CURR SUPEVAL MONIT PROTEC VIS INCTEAC INLEARN.....	.02018	8.753	.0033
MONIT	FGOALS INLEARN INCTEAC PROTEC.....	.00958	4.350	.0378
	CGOALS INLEARN INCTEAC PROTEC.....	.00901	4.033	.0455
	SUPEVAL INLEARN INCTEAC PROTEC.....	.01253	5.143	.0240
	PDEV INLEARN PDEV VIS INCTEAC.....	.00788	3.790	.0525
PROTEC	MONIT INLEARN.....	.01321	5.255	.0226

	VIS INLEARN.....	.01390	5.571	.0189
	INTEAC INLEARN.....	.01276	4.875	.0280
	CGOALS.....	.00853	3.800	.0522
	SUPEVAL.....	.01021	4.055	.0449
VIS	FGOALS SUPEVAL CURR MONIT PROTEC INTEAC INLEARN.....	.01632	7.723	.0058
	PDEV CGOALS FGOALS PROTEC INTEAC INLEARN SUPEVAL CURR.....	.00866	4.357	.0377
INTEAC	SUPEVAL PROTEC.....	.01279	5.150	.0239
	MONIT PROTEC.....	.01421	5.687	.0177
	MONIT INLEARN.....	.01323	5.262	.0225
	PROTEC VIS INLEARN.....	.01141	4.627	.0328
	VIS INLEARN.....	.01878	7.576	.0063
PDEV	FGOALS CGOALS SUPEVAL CURR MONIT PROTEC VIS INTEAC INLEARN.....	.03896	19.58	.0000

Models to Which Individual Variables  
Make Significant R Square Changes  
for Innovativeness  
(High School)

Variable	Model	R Sq Ch	F Ch	Sig F Ch	
FGOALS	CGOALS SUPEVAL CURR MONIT PROTEC VIS INCTEAC PDEV INLEARN.....	.02747	16.52	.0001	
CGOALS	FGOALS SUPEVAL CURR MONIT PROTEC VIS INCTEAC PDEV INLEARN.....	.00746	5.250	.0227	
SUPEVAL	FGOALS PROTEC.....	.00783	4.847	.0284	
	FGOALS INLEARN.....	.00594	3.749	.0538	
	CGOALS PROTEC.....	.00712	4.239	.0404	
	CGOALS INLEARN.....	.00859	5.177	.0236	
	CURR PROTEC.....	.01010	5.296	.0220	
	CURR VIS.....	.00802	4.317	.0386	
	CURR INLEARN.....	.00775	4.256	.0400	
	MONIT INLEARN PROTEC VIS INCTEAC.....	.02036	10.72	.0012	
	PDEV MONIT INLEARN PROTEC VIS.....	.00758	4.706	.0308	
	PDEV INLEARN INCTEAC PROTEC VIS.....	.01095	6.772	.0097	
	CURR	FGOALS CGOALS SUPEVAL PROTEC.....	.00566	3.728	.0545
		FGOALS CGOALS INLEARN.....	.00578	3.846	.0508
FGOALS SUPEVAL VIS INLEARN PROTEC...		.00595	3.821	.0516	
FGOALS SUPEVAL INLEARN INCTEAC PROTEC.....		.00671	4.312	.0387	
FGOALS MONIT PROTEC INLEARN.....		.00671	4.297	.0390	
FGOALS PROTEC INLEARN VIS INCTEAC.....		.00574	3.717	.0548	
CGOALS INLEARN SUPEVAL MONIT VIS PROTEC INCTEAC.....		.00972	6.045	.0145	
PDEV CGOALS PROTEC.....	.00612	4.113	.0434		

	PDEV SUPEVAL MONIT PROTEC VIS INTEAC INLEARN.....	.00679	4.260	.0399
MONIT	FGOALS SUPEVAL PROTEC.....	.00413	2.630	.1059
	FGOALS VIS PROTEC.....	.00634	4.041	.0453
	FGOALS INLEARN PROTEC.....	.00917	5.811	.0165
	CGOALS SUPEVAL PROTEC.....	.00672	4.046	.0452
	CGOALS INLEARN PROTEC.....	.00733	4.436	.0360
	CGOALS INTEAC.....	.00694	4.200	.0413
	CGOALS PDEV.....	.00559	3.760	.0534
	SUPEVAL INLEARN PROTEC VIS.....	.00778	4.056	.0449
	SUPEVAL INTEAC PROTEC.....	.00898	4.679	.0313
	SUPEVAL PROTEC CURR.....	.00708	3.747	.0538
	SUPEVAL PROTEC VIS INTEAC.....	.00796	4.135	.0429
	SUPEVAL PROTEC VIS PDEV.....	.00808	4.933	.0271
	SUPEVAL PROTEC VIS INLEARN.....	.00778	4.056	.0449
	SUPEVAL PROTEC INLEARN INTEAC.....	.00898	4.678	.0313
	CURR PROTEC PDEV.....	.00731	4.515	.0344
	PROTEC VIS INTEAC PDEV INLEARN.....	.00869	5.351	.0214
PROTEC	CGOALS.....	.00842	4.965	.0266
	SUPEVAL.....	.01165	5.400	.0208
	INTEAC.....	.01034	4.737	.0303
	MONIT VIS INLEARN.....	.00789	3.914	.0488
VIS	FGOALS CGOALS SUPEVAL PROTEC INLEARN.....	.00638	4.231	.0406
	FGOALS CGOALS SUPEVAL PROTEC CURR.....	.00649	4.325	.0384
	FGOALS CGOALS SUPEVAL PROTEC MONIT.....	.00617	4.094	.0439
	FGOALS CGOALS SUPEVAL PROTEC INTEAC.....	.00610	4.056	.0449

	FGOALS INCTEAC INLEARN.....	.00590	3.796	.0523
	FGOALS SUPEVAL CURR MONIT PROTEC...	.00603	3.861	.0504
	FGOALS SUPEVAL INCTEAC.....	.00669	4.300	.0390
	FGOALS SUPEVAL INLEARN.....	.00727	4.639	.0320
	CGOALS SUPEVAL CURR MONIT PROTEC...	.00730	4.541	.0339
	CGOALS SUPEVAL INCTEAC MONIT PROTEC.....	.00807	4.939	.0270
	CGOALS SUPEVAL INLEARN MONIT PROTEC.....	.00722	4.422	.0363
	CGOALS SUPEVAL INCTEAC CURR PROTEC.....	.00629	3.926	.0485
	CGOALS SUPEVAL INCTEAC MONIT CURR.....	.00605	3.774	.0530
	CGOALS CURR MONIT PROTEC.....	.00725	4.526	.0342
	CGOALS CURR INCTEAC PROTEC.....	.00620	3.884	.0497
	CGOALS CURR INCTEAC MONIT.....	.00601	3.764	.0533
	CGOALS MONIT PROTEC INCTEAC INLEARN.....	.00687	4.213	.0410
	SUPEVAL CURR MONIT PROTEC INCTEAC.....	.00725	3.982	.0469
	SUPEVAL PDEV PROTEC.....	.00643	3.871	.0500
	SUPEVAL INLEARN CURR.....	.00688	3.815	.0517
	SUPEVAL INLEARN MONIT PROTEC INCTEAC.....	.00804	4.233	.0405
INCTEAC	FGOALS SUPEVAL CURR MONIT PROTEC...	.00706	4.531	.0341
	FGOALS CGOALS PROTEC.....	.00590	3.897	.0493
	FGOALS INLEARN SUPEVAL PROTEC.....	.00664	4.218	.0409
	FGOALS VIS SUPEVAL PROTEC.....	.00721	4.619	.0324
	FGOALS VIS PROTEC INLEARN.....	.00660	4.232	.0405
	CGOALS SUPEVAL PROTEC.....	.00675	4.061	.0448
	CGOALS MONIT			

	CGOALS INLEARN.. ...	.00799	4.867	.0291
	SUPEVAL CURR MONIT PROTEC VIS.....	.01186	6.512	.0122
	SUPEVAL PDEV CURR PROTEC.....	.00765	4.752	.0300
	SUPEVAL PDEV MONIT PROTEC.....	.00609	3.745	.0539
	SUPEVAL PDEV PROTEC VIS.....	.00797	4.862	.0282
	PDEV PROTEC VIS INLEARN.....	.00825	5.007	.0260
	PDEV CURR MONIT PROTEC.....	.00641	3.994	.0466
	PDEV CURR PROTEC VIS.....	.00767	4.892	.0277
PDEV	FGOALS CGOALS SUPEVAL CURR MONIT PROTEC VIS INCTEAC INLEARN.....	.02748	19.35	.0000
INLEARN	FGOALS SUPEVAL CURR PROTEC.....	.00700	4.470	.0353
	CGOALS SUPEVAL CURR.....	.00663	4.117	.0433
	CGOALS SUPEVAL PROTEC.....	.00828	4.996	.0261
	CGOALS PDEV.....	.00557	3.743	.0540
	SUPEVAL CURR MONIT PROTEC VIS INCTEAC PDEV.....	.00611	3.830	.0513