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ABSTRACT

Despite uncertainty about implementation models, program assessment methods, and application of effective schools research to varied school settings, increasing numbers of schools and school districts have initiated effective schools improvement programs since the early 1970s. Because of the considerable resources committed yearly to management development reform initiatives across the country, studies of interaction effects between such training and school outcome measures are important. The study summarized in this paper exposed experimental group school principals to specific professional development experiences provided at the 1985 West Virginia Principals' Academy, then attempted to determine if there was a significant difference between experimental and control group schools' experience on: (1) three academic achievement measures; (2) attendance rates; and (3) dropout rates. Several hypotheses were proposed concerning the performance of experimental and control groups on the various outcome measures. A quasi-experimental investigation method and a Non-randomized Control Group Pretest-Posttest design were used. Residualized school outcome data on each of the dependent variables were compared using one-tailed T tests to test the hypotheses. No significant difference was determined between experimental and control group performance on all outcome measures. However, elementary and low socioeconomic status elementary experimental groups demonstrated significantly greater gains than did control groups in total reading and total basic skills. The study involved 25 elementary and 10 secondary schools in the experimental sample, with a similar set of schools in the control group. Numerous appendices contain Principals' Academy follow-up surveys and data tables. (157 references) (MLH)

Interaction Effects of Principal Participation in the West Virginia Principals' Academy on School Outcome Measures

by

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ABSTRACT

The problem in this study was to determine if there was a significant difference in the performance of experimental and control group schools on (a) three academic achievement measures, (b) attendance rates, and (c) dropout rates after exposing experimental group school principals to specific professional development experiences provided at the 1985 West Virginia Principals' Academy. Ten hypotheses were proposed concerning the performance of experimental and control groups on the various outcome measures.

A quasi-experimental method of investigation and a Nonrandomized Control-Group Pretest-Post Test design were used because random assignment of schools to experimental and control groups was not possible. Residualized school outcome data on each of the dependent variables were compared using one-tailed T tests to determine if any significant differences existed between the experimental and control groups and to test the ten hypotheses.

No significant difference was determined in the performance of experimental and control groups on all outcome measures. However, elementary and low socioeconomic status elementary experimental groups demonstrated significantly greater gains than control groups in total reading and total basic skills.

Chapter I

Problem

Introduction

In recent years, educators have been interested in identifying those factors of schooling which most contributed to improved student learning. In addition, the identification of methods and procedures for implementing and measuring the impact of school improvement initiatives based upon these factors has received increased attention in the education community.

The time, resources, and energy devoted by educational researchers and practitioners to the identification of content and appropriate methods for implementing school reform initiatives provided evidence of the interest in school improvement. Further evidence of the interest in school improvement was the call for educational reform in a deluge of national reports and other literature e.g. (The Paidcia Proposal, Adler, 1982; High School: A Report on Secondary Education in America, Boyer, 1983; A Place Called School, Goodlad, 1983; A Nation at Risk, National Commission on Excellence in Education, 1983; etc.) which identified problems confronting our public schools and recommended a wide variety of potential solutions.

Some attempts to identify factors which contributed to student learning focused upon the relationships between various resources found in the school environment and school outcome measures such as test scores ("Variables Related," 1972; Guthrie, 1970, 1973; Spady, 1973; Glasman & Biniaminov, 1981; Robbins, 1975). Many researchers claimed that the most significant

factor related to student achievement was the socioeconomic status (SES) of the learner and that variables within the public schools had little influence on the outcome of schooling for students (Coleman, Cambell, Hobson, McPartland, Mood, Weinfeld & York, 1966; Jencks, Smith, Acland, Bane, Cohen, Gintis, Heyns & Michelson, 1972; Averch, Caroll, Donaldson, Kiesling & Pincus, 1972; Mosteller & Moynihan, 1972). However, the proposition that schooling variables had little influence on the outcome of schocling was not appealing to many educators and researchers. This dissatisfaction prompted the onset of effective schools research. Studies emerged which indicated that exemplary pupil performance in "effective schools" was the result of many policies, behaviors, and attitudes that together shaped the learning environment (Rutter, Maughan, Mortimer, Ouston & Smith, 1979; Brookover & Lezotte, 1979; Edmonds, 1979). There was growing evidence that effective schools research provided a sound conceptual foundation for school improvement.

Some practitioners believed that effective schools research provided the potential to increase both the quality and equity of school outcome measures in a cost effective manner. However, effective schools researchers offered little direction for practitioners concerning appropriate models for implementing these research findings or for assessing the impact of implementation on school outcome measures. In addition, school effectiveness studies focused primarily on elementary schools in urban settings.

Despite uncertainty about models for implementation, the appropriateness of effective schools research as the basis for school reform in varied school settings, and methods of assessing the impact of implementation

on school outcome measures, increasing numbers of state departments of education, school districts, and schools began implementing effective schools research. Early effective schools improvement initiatives began in the mid 1970s in New York, New York; Chicago, Illinois; St. Louis, Missouri; New Haven, Connecticut; and Milwaukee, Wisconsin. These initiatives were followed by similar initiatives in Jackson, Mississippi; Norfolk, Virginia; Memphis, Tennessee; Spencerport, New York; Glendale, Arizona; and Berkeley, Michigan which began by the late 1970s or early 1980s. Similarly, the West Virginia Principals' Academy, a state sponsored attempt to implement effective schools reform, was initiated in 1984.

Justification for Study

Because of the considerable resources committed each year to the West Virginia Principals' Academy and other similar school reform initiatives across the country, it was important to study the interaction affects between such training and school outcome measures. Furthermore, the findings of this study provided a useful foundation for future investigations pertaining to the implementation of effective schools research and resulting affects on school outcome measures.

The influence of other schooling input variables, including teacher experience, education level, and salaries, teacher/pupil ratios, expenditures per student, percentages of students qualifying for free or reduced meals, per capita income, pretest scores, and school size were controlled through matching and regression techniques. The research design and methods used in this study were different than those used in previous effective schools

research. Therefore, many of the previous limitations were not problematic in this study and several unique and useful findings were revealed.

The findings of this study provided information for other state departments of education, school districts, or schools interested in implementing effective schools research and measuring the resulting affects on school outcome measures. Insights were gained concerning both the model for implementing effective schools research used in the West Virginia Principals' Academy and the method used for assessing interaction affects between implementation and school outcome measures. Also, differing interaction affects were revealed for elementary and secondary schools, low and high socioeconomic level schools, and schools with low and high levels of implementation concerning the school improvement process presented at the academy.

Problem Statement

The problem in this study was to determine if there were significant differences in the performance of experimental and control group schools on (a) three academic achievement measures, (b) attendance rates, and (c) dropout rates after experimental group principals were exposed to specific professional development experiences provided at the 1985 West Virginia Principals' Academy.

Hypotheses

H1: Elementary experimental group schools will demonstrate significantly higher gains in total reading, math, basic skills, and attendance rates than will elementary control group schools.

H2: Elementary low SES experimental group schools will demonstrate significantly higher gains in total reading, math, basic skills, and attendance rates than will elementary low SES control group schools.

H3: Elementary high SES experimental group schools will demonstrate significantly higher gains in total reading, math, basic skills, and attendance rates than will elementary high SES control group schools.

H4: Elementary LIL experimental group schools will demonstrate significantly higher gains in total reading, math, basic skills, and attendance rates than will elementary control group schools.

H5: Elementary HIL experimental group schools will demonstrate significantly higher gains in total reading, math, basic skills, and attendance rates than will elementary control group schools.

H6: Secondary experimental group schools will demonstrate significantly higher gains in total reading, math, basic skills, attendance rates, and significantly lower dropout rates than will secondary control group schools.

H7: Secondary low SES experimental group schools will demonstrate significantly higher gains in total reading, math, basic skills, attendance rates, and significantly lower dropout rates than will secondary low SES control group schools.

H8: Secondary high SES experimental group schools will demonstrate significantly higher gains in total reading, math, basic skills, attendance rates, and significantly lower dropout rates than will secondary high SES control group schools.

H9: Secondary LIL experimental group schools will demonstrate significantly higher gains in total reading, math, basic skills, attendance rates, and significantly lower dropout rates than will secondary control group schools.

H10: Secondary HIL experimental group schools will demonstrate significantly higher gains in total reading, math, basic skills, attendance rates, and significantly lower dropout rates than will secondary control group schools.

Assumptions

Two major assumptions of this study were that the school principal (a) was the key "change agent" at the school site, and (b) influenced school performance on certain outcome measures.

Design of Study

The interaction affects between attendance at "the academy" and school outcome measures were analyzed by comparing the performance schools where the principals participated in the academy (experimental group) and schools where the principals did not participate in the academy (control group) on (a) three measures of academic achievement, (b) attendance rates, and (c) dropout rates (secondary level). A quasi-experimental method of investigation and a Nonrandomized Control-Group Pretest-Post Test design were used. This design was necessary because random assignment of schools to the experimental and control groups was not possible.

Definition of Terms

There were several key terms defined in relation to their utilization within the context of this study. The definitions of these key terms follow:

1. Academic Achievement - A measure of a students' performance in total

reading skills, total math skills, and total basic skills on a norm referenced standardized achievement test.

2. Comprehensive Test of Basic Skills (CTBS) - A series of norm-referenced, objectives-based tests for kindergarten through twelfth grade. The series was designed to measure achievement in the basic skills commonly found in state and district curricula. (Comprehensive Tests of Basic Skills: Technical Report: 1982)

3. Control Group - Schools where the principal did not attend the 1985 West Virginia Principals' Academy or any other state sponsored effective schools training and which contain either grades three and six or grades nine and eleven.

4. Experimental Group - Schools where the principal attended the 1985 West Virginia Principals' Academy, which contain either grades three and six or grades nine and eleven, and which had the same principal from the pre to the post test period of this study.

5. High Implementation Level (HIL) - Experimental group schools which scored above the median score obtained by all experimental group schools on a Principals' Academy Follow-Up Survey. (Appendix A)

6. Low Implementation Level (LIL) - Experimental group schools which scored below the median score obtained by all experimental group schools on a Principals' Academy Follow-Up Survey.(Appendix A)

7. Predicted Score - A score resulting from a Multivariate Regression Analysis where the school's actual mean post test scores in total reading, total math, and total basic skills, average daily attendance rates, and dropout rates

(secondary level only) were the dependent variables. Other schooling input variables determined to relate to these outcome measures through regression analyses were the independent variables.

8. Principals' Academy Follow-Up Survey - A nine question survey administered to all principals who attended the 1985 West Virginia Principals' Academy. The survey measured the principal's perceptions of the level of implementation at their schools on each step in the improvement process presented at the academy. (Appendix A)

9. Residual Score - A measure of students' performance obtained by subtracting predicted scores, calculated in a Multivariate Regression Analysis, from actual scores obtained on school outcome measures.

10. Socioeconomic Status (SES) - An estimate of the social and economic conditions of students comprising a school population that was based upon the percentage of students eligible for free or reduced priced meals and text books or the per capita income of the county in which the school was located.

11. West Virginia Principals' Academy - A professional development experience for school principals designed to provide specific training concerning five correlates of school effectiveness and the use of a school based improvement model to implement school reform initiatives.

Limitations of Study

Due to the nature of the problem in this study, certain limitations existed. A listing and description of these limitations follows:

1. This study did not control for the possible influence of all variables which may affect school outcomes.

2. Random selection and assignment of schools to the experimental and control groups was not possible. Experimental group schools were a function of (a) the selection of principals who attended the academy by county superintendents, (b) the grade configuration at experimental and control group schools, and (c) the requirement that academy trained principals had to remain at experimental group schools from the pre to post test period. Control group schools were matched to experimental group schools on the bases of pretest total basic skills scores and other variable(s) determined in a Forward Stepwise Regression Analysis. The absence of a randomized sample presented the major threat to the validity of this study.

3. Only West Virginia public schools were studied. This condition limited the generalizability of the findings.

4. A limited number of secondary experimental and control groups schools were available for study.

5. The implementation level of the school improvement process reported by experimental group schools may have been influenced by the fact that the Principals' Academy Follow-Up Survey was conducted by the state department of education.

Chapter II

Literature Review

Introduction

In this review, literature concerning variables that influenced school performance on certain outcome measures, various models for implementing school reform, and the West Virginia Principals' Academy were examined. This type of review was necessary because the problem in this study analyzed interaction affects between principal training provided at the "Principals' Academy" and school performance at schools where the principals attended the academy. Furthermore, training provided at the academy was intended to promote the implementation of school reforms based on research findings concerning factors that influenced school performance.

This review spanned approximately twenty years of literature ranging from 1968 to 1988. First, an examination of the literature concerning variables which influenced school performance on certain outcome measures, including input-output studies, process-outcome studies, and effective schools studies occurred. It was important to review (a) input-output studies because the input variables examined were critical elements in the treatment of data for this study, (b) process-outcome studies because these studies were the precursors of effective schools research, and (c) effective schools research because that research provided the content of the "Principals' Academy" curriculum. Second, literature concerning studies of the implementation of school improvement initiatives, various change models used in implementing school improvement, the state role in school improvement, and change models used

in implementing effective school research, including the West Virginia Principals' Academy, were examined. It was important to review (a) implementation studies because they provided insights concerning the role of the principal in the school improvement process, (b) studies of various change models because these studies contributed to the development of the school improvement model presented at the "Principals' Academy", (c) the state role in school improvement because the "Principals' Academy" was a state sponsored reform initiative, and (d) change models used in implementing effective schools research because these models contributed to the success or failure of school improvement initiatives based upon effective school research.

Literature Concerning Factors Influencing School Performance

For many years educational researchers attempted to determine those school factors that most affected student achievement by focusing upon the relationships between various resources found in the school environment and school outcomes measures such as standardized test scores. These types of studies were referred to as input-output studies and often generated conflicting findings. Later studies, commonly referred to as process-outcome studies, focused on the relationships between certain school processes and school outcomes. More recently, researchers identified certain characteristics evident in schools that were successfully teaching the children of the poor. These studies were commonly referred to as effective schools or outlier studies. An examination of every input-output, process-outcome, and effective schools study and their findings was not appropriate or necessary for this study. However, a review of the findings of some of the more prominent studies

concerning the relationship between different schooling variables and processes and school performance was conducted.

Input-Output Studies

Input-output studies produced some expansive findings concerning the relationship of inputs into the schooling process to school performance and provided a substantial knowledge base upon which later studies were built. A wide range of inputs into the schooling process were examined by researchers using the input-output design. For example, researchers examined the relationships of expenditures, school personnel, and teacher education variables to student outcome measures ("Variables Related," 1972; Guthrie, 1970, 1973: Spady, 1973; Glasman and Biniaminov, 1981; Robbins, 1975). Also, researchers studies the relationships of teacher experience, teacher salaries, and class size variables to student outcome measures (Bridge, Judd, & Moock, 1979; Glasman and Biniaminov, 1981; Guthrie, 1973; Murnane, 1975; Robbins, 1975; "Variables Related," 1972; "Class Size," 1978). Similarly, researchers examined the relationships of administrative and other school personnel, facilities and supplies, classroom and instructional variables, school and district size, and grade arrangement to student outcome measures ("Variables Related," 1972; Bridge et al., 1979; Murnane, 1975, 1980; Spady, 1973; Datta, McHale, & Mitchell, 1976; Gupta, 1979; Fonstad, 1973; "Organization," 1983). Generally, the findings of input-output studies were mixed and inconclusive. A summary of the findings of studies which examined the above relationships follows in the next eight sections.

Socioeconomic Status - Many input-output studies found academic

achievement to be a function of family background and related variables rather than conditions inherent in the schooling process. Variables such as differences in school size, class size, teachers' salaries, teachers' experience, teach 3' education level, facilities, expenditures per pupil, the number of books in the library, the reading series used, the age of the school building, the existence of compensatory education programs, and others similar to these were found to have little influence on student achievement (Averch et al., 1972; Coleman et al., 1966; Jencks et al., 1972; Stephens, 1967; Hanushek, 1981; Mullin & Summers, 1981; Murnane, 1980).

In fact, during the late 1960s and early 1970s many researchers (Coleman et al., 1966; Jencks et al., 1972; Averch et al., 1972; Mosteller & Moynihan, 1972) published studies which claimed that the most significant factor related to student achievement in schools was the socioeconomic status of the learner and that variables within the public schools had little influence on the outcome of schooling for students. Repeatedly, these reports concluded that variations in student outcomes which could be attributed to school inputs were minimal when contrasted with those attributable to student background characteristics. The most prominent of these reports was the Coleman Report. In his study, Coleman et al. (1966) concluded:

> schools bring little influence to bear on a child's achievement that is independent of his background and general social context; and that this very lack of independent affect means that the inequalities imposed on children by their home, neighborhood, and peer environment are carried along to become the inequalities with which they confront adult life at

the end of school (p. 325).

Such findings fueled the efforts of federal and state agencies to provide compensatory education experiences for socioeconomically disadvantaged students.

Expenditures per Student - A second relationship examined in more traditional input-output studies was the affect of school expenditures on the quality of educational outcomes. School expenditures examined in this review ranged from personnel to instructional supplies to facility measures. However, the findings from many of these studies, which frequently used regression analysis to test the relationship between school expenditures and schooling outcomes, were often difficult to interpret. Interpretation problems often resulted from the use of highly aggregated expenditure data. It was difficult to relate such highly aggregated spending data to pupil performance because aggregated expenditure figures often contained costs not intended to influence achievement, such as food services, building maintenance, and student transportation costs. According to Vallina (1978), the aggregation of noninstructional and instructional expenditures obscured the impact of instructional expenditures on student outcomes.

Concerning such studies, researchers for the New York State Education Department ("Variables Related," 1972) concluded that any significant relationship between expenditures and student performance were questionable because researchers could not determine if all or some of the instructional expenditures influenced school outcomes. Similarly, nonsignificant relationships failed to indicate whether all or some of the instructional

expenditures were unrelated to school outcomes. Such general findings, noted the New York State Education Department Report ("Variables Related," 1972), "are of little value to the school administrator as he allocates available funds among a variety of goods and services" (p. 111). They further concluded that there was no need to directly assoicate expenditures with achievement to establish a relationship between the two because "money does not influence school quality directly; it buys resources which can influence the level of output" (p. 107).

However, researchers could relate expenditures to school outcomes when added cost to the school district were associated with the quality and quantity of school personnel, facilities, and supplies. For example, school personnel measures showed a greater relationship to school outcomes than measures of facilities and supplies. Guthrie (1973) summarized, "the strongest findings by far are those which relate to the number and quality of the professional staff, particularly teachers" (p. 45). He noted some characteristics of teachers seemed "to be significantly associated with one or more measures of pupil performance" (p. 45). Spady (1973) also concluded "data support the principle of concentrating expenditures on personnel rather than on tangible facilities" (p. 150). Glasman and Biniaminov (1981) concurred with the clearer relationship between instructional personnel measures and pupil performance. They reported "because of the student-teacher interaction, instructional personnel variables are central and direct to student achievement" (p. 523).

Expenditures for administrative personnel seemed to be related to school outcome measures. Researchers for the New York State Education Department

("Variables Related," 1972) found that administrators' salaries were positively related to student cognitive performance. However, they attributed the relationship to administrator quality, which they believed was causing the variation in administrator salary levels. Bridge et al. (1979) also reported a positive relationship between expenditures per pupil on administrative staff and pupil performance. Conversely, other researchers noted little impact concerning administrator/pupil ratios on student achievement ("Variables Related," 1972). Bridge et al. (1979) cited evidence of a negative relationship between the number of administrators and student outcomes. They suggested that this finding could have reflected the hiring of relatively large numbers of administrators by school districts having special problems in maintaining discipline.

Other school personnel expenditures did not seem to positively relate to school outcome measures. The number of special staff in a school including guidance counselors, psychologists, social workers, librarians, and library aides did not seem to be related to school outcomes. According to the New York State Education Department ("Variables Related," 1972), the number of special staff per pupil was unrelated to achievement. Likewise, Bridge et al. (1979) discerned little association between student achievement and the number of nonteaching and nonadministrative or auxiliary staff. They hypothesized that the nonsignificant findings could have resulted from distinctly different professional types being grouped together by researchers for these studies and the nature of these groupings obscuring relationships which may have existed.

Researchers did not find a positive relationship between physical

resources found in schools and school outcome measures. "The current conclusion is that the physical resources available in a school in a particular year are not systematically related to the achievement of the students in that year" (Murnane, 1980; p. 11). After examining the relationship between instructional supplies and student outcomes, Bridge et al. (1979) concluded "there seems to be no consistent relationship between achievement and the availability or current acquisition of library books and other teaching materials" (p. 274). They also questioned the use of library size measures by researchers when testing the relationship between library resources and pupil performance. They believed library book circulation would constitute a better measure since books must be read to produce benefits. The New York State Education Department ("Variables Related," 1972) also found that "more appropriately defined dimensions of the school library such as types of holdings and rate of circulation. . . may be more likely to produce a realistic picture of the library's contribution to student achievement" (p. 274).

By using the cost of instructional materials as a school input, researchers failed to demonstrate a positive relationship between textbook/supplies expenditures and cognitive achievement. However, there was evidence that textbook quality corresponded to variations in pupil performance ("Variables Related," 1972).

Attempts to relate facility expenditures to school outcome measures produced mixed findings. Bridge et al. (1979) found no relationship between the age of school buildings and achievement. Neither did the number of science labs, the building value per pupil, not the per pupil value of property

correspond significantly with pupil performance. However, research by Michelson (1970) disclosed that aspects of the physical plant related significantly to pupil performance. His study showed a positive association between achievement and both school acreage and a school facilities rating on an index.

Other researchers reported a positive relationship between the influence of facilities and supplies on student achievement. Guthrie (1970) observed "service components such as age of school building, adequacy and extent of physical facilities for instruction also are significantly linked to increments in scales of pupil performance" (pp. 45-46). Spady (1973) wrote "facilities themselves do pay off" (p. 150) but he did not find facilities to influence student achievement to the same degree as personnel expenditures. Although researchers suggested a direct affect of facilities on achievement, Spady (1973) concluded that it was possible that the relationship resulted from some high achieving schools having both better facilities and better staff or were influenced by the placement of students already performing at a high level into specialized schools with superior facilities. Similarly, Bridge et al. (1979) surmised that positive relationships between facilities and supplies and student achievement may have resulted from certain facilities and physical plant measures acting as proxies for socioeconomically related variables such as community wealth or population density.

Finally, some researchers challenged the validity of specific facility measures included in some input-output research. Murnane (1980) suggested that the inability of some research to relate facility measures to student

achievement was caused by inadequacies in the research methodology used. He considered physical facilities, in addition to other variables such as class size, curricula, and instructional strategies ". . . secondary resources that affect student learning through their influence on the behavior of teachers and students" (p. 14). Murnane further suggested that current research methodology "may be inappropriate for measuring the influence of secondary resources" (p. 14). Bridge et al. (1979) concluded that the impact of per pupil expenditures on achievement "is probably mediated in turn through the quantity and quality of school inputs" (p. 262).

Teacher Education - A third input into the schooling process that was studied in input- output research designs was the relationship between teacher education and student achievement. The findings from these studies were often inconclusive. Some studies indicated that greater educational attainment and higher degree status of teachers corresponded with better pupil performance (Glasman and Biniaminov, 1981; Guthrie, 1970; Robbins, 1975; "Variables Related," 1972). Other findings conflicted with this assessment. For example, Bridge et al. (1979) found a negative relationship between teachers' educational attainment and mathematics achievement at the elementary school level. Elsewhere, Murnane (1980) reported "teachers with Master's Degrees are no more effective on average than teachers with only Bachelor's Degree" (p. 5).

The extent to which teachers were committed to upgrading their education was found to be more important than the formal degrees or number of credit hours they possess. Hanushek (1970) failed to find an independent

relationship between teachers' degree status and student achievement. He observed in his study that higher achievement occurred when teachers were more recently exposed to their latest education experience. Similarly, Bridge et al. (1979) suggested that a teachers' effectiveness could deteriorate from the time of the teachers' latest educational experience. They further concluded that the length of time since a teachers' most recent educational experience could have acted as a proxy for "teacher's motivation and enthusiasm for teaching" (p. 243). Spady (1973) concluded that the teacher's "involvement in periodically upgrading his own education, rather than either collecting a terminal graduate degree or receiving no advanced training at all, seems to be one key to his effectiveness" (p. 151). He further concluded that school systems and researchers were attending to the "wrong aspects of teacher qualifications by emphasizing formal degrees and credit hours rather than the teacher's ongoing engagement in expertise-enhancing activities" (p. 151).

Attempts to relate the type of education teachers received to student achievement were also termed inconclusive (Bridge et al., 1979). Although Winkler (1975) found some evidence of a positive relationship between the quality of the college that teachers attended and student reading achievement, he surmised that it could have resulted from the assignment of teachers with better academic preparation to schools having wealthier students.

Teacher Experience - A fourth input into the schooling process examined in input-output research designs was the relationship between teacher years of experience and student achievement. Bridge et al. (1979); Glasman and Biniaminov (1981); Guthrie (1973); Murnane (1980); and Robbins (1975)

revealed that teaching experience tended to be positively related to pupil performance. However, Spady (1973) observed statistical relationships between teaching experience and student achievement could be partially attributable to teachers with seniority transferring to schools in better neighborhoods that also had high achieving students. According to Spady (1973), "teacher experience must be regarded as in inadequately studied variable whose affect on student achievement remains obscure" (p. 151).

Murnane (1975) reported a nonlinear relationship between teaching experience and pupil performance. He wrote, "experience over the first two years positively affected student achievement but . . . additional years of experience showed no relationship to achievement" (p. 248). Attempts to explain the nonlinear relationships between teacher experience and student achievement produced interesting findings. Bridge et al. (1979) proposed that teachers' capacity to improve was diminished after they have gained a certain amount of experience. They wrote concerning this phenomena "nothing more is learned that enhances teacher effectiveness" (p. 248). Spady (1973) concluded that, beyond a certain point in their careers, teachers may have difficulty in sustaining their interest, maintaining their enthusiasm, and improving their performance. Once this point has been reached, Spady concluded "age and experience will quite likely inhibit capacity to learn and grow on the job" (p. 151). Bridge et al. (1979) suggested that more effective teachers tend to leave the classroom after a few years because they are better able than less effective teachers to advance into new jobs.

Bridge et al. (1979) reported "Apparently no relationship exists between

student achievement and a teacher's being certified or tenured" (p. 243). Also, Katzman, (1971); Michelson, (1970); and Perl, (1973) conducted studies generating nonsignificant, and often negative, correlations between teacher certification/tenure and achievement measures. Michelson (1970) uncovered a significant negative relationship between the percent of teachers tenured and the mathematics achievement of white students. However, this single finding could have been a chance result.

Teacher Salaries - A fifth input examined using input-output research designs was the relationship between teacher salaries and student achievement. According to Bridge et al. (1979); Glasman and Biniaminov (1981); Guthrie (1970); Robbins (1975); and New York State Education Department ("Variables Related," 1972), there appeared to be a positive relationship between teachers' salaries and student achievement. Researchers for the New York State Education Department ("Variables Related," 1972) reported that school districts often based teachers' salaries on their education and experience, both of which generally were positively related to achievement. Therefore, they concluded the positive relationship between teachers' salaries and student achievement "should not be surprising" (p. 109). The significant relationship between teachers' salaries and student achievement may not have been entirely attributable to teachers' salaries acting as proxies for education and experience. According to Bridge et al. (1979), in many studies salary data often had been aggregated at the school or district level and "at this level of aggregation, a teacher's salary probably functions primarily as a proxy for the socioeconomic status of the school district" (p. 269).

Class Size - A sixth factor which researchers investigated using input-output studies was the relationship between class size and student achievement. According to The Educational Research Service ("Class Size," 1978), class size studies generated mixed findings concerning the impact of differing pupil/teacher ratios on student achievement. They concluded that the relationship between pupil achievement and class size was "highly complex" (p. 68) and published the following summary of class size research:

1. Research to date provides no support for the concept of an "optimum" class size in isolation of other factors. Rather, the indicators are that efficient class sizes are a product of many variables, including: subject area, nature and number of pupils in the classroom, nature of learning objectives, availability of materials and facilities, instructional methods and procedures used, skills and temperament of the teacher and support staff, and budgetary constraints.
2. Existing research findings do not support the contention that smaller classes will of themselves result in greater academic achievement gains for pupils. The evidence is that within the mid-range of about 25 to 34 pupils, class size seems to have little if any decisive impact on the academic achievement of most pupils in most subjects above the primary grades.
3. There is research evidence that small classes are important to increased pupil achievement in reading and mathematics in the early primary grades.
4. There is also some evidence of a positive relationship between small

class size and pupil achievement when primary grade pupils are taught in small classes for two or more consecutive years.

5. There is evidence that pupils with lower academic ability tend to benefit more from smaller classes than do pupils with average ability.

6. Some research indicates that smaller classes can positively affect the scholastic achievement of economically or socially disadvantaged pupils.

7. Few if any pupil benefits can be expected from reducing class size if teachers continue to use the same instructional methods and procedures in the smaller classes that they used in the larger classes.

8. Some studies have found that even when teachers have small classes, many teachers do not take advantage of them to individualize instruction.

9. Research on class size suggests the importance of an emphasis on the methods and quality of instruction in the classroom rather than on the quantity of pupils in the classroom. (p. 69)

Glass and Smith (1978) revealed a strong inverse relationship between class size and academic achievement. They did not find the relationship to "differ appreciably across different school subjects, levels of pupil IQ, or several other obvious demographic features of classrooms" (p. 45). The negative relationship between class size and student achievement was stronger at the secondary level than at the elementary school level. Also, the relationship was most clear in "well-controlled studies in which pupils were randomly assigned to classes of different sizes" (p. 45). Glass and Smith (1978) reported maximal benefits to students of reduced class size were "obtained as size was reduced below 20 pupils" (p. 45).

School Size - A seventh input into the schooling process which has been studied extensively using input-output research designs was school size. Studies conducted by Bridge et al. (1979) and the New York State Education Department ("Variables Related," 1972) did not show school or district size to relate directly to student performance. Investigators for the New York State Education Department (1972) also suggested an indirect affect on student learning produced by enrollment. They wrote "school size (either school district or individual school) is neither an asset nor handicap affecting student performance, though larger schools are probably better able to meet the criterion of offering more course choices to students" (p. 96).

Fonstad (1973) found a direct relationship between the comprehensiveness of services provided by schools and school enrollments. The ability of the school to offer a wide variety of courses and special programs seemed to be related to the school district's ability to utilize resources efficiently and to justify additional services. Fonstad (1973) reported that high school programs were negatively affected by small enrollments while at the elementary school, "enrollments are not considered to be so critical" (p. 6). Fonstad (1973) summarized:

1. Over 80 percent of the reports relating elementary, junior high, or middle school size to effectiveness recommended pupil enrollments of at least 300.
2. Over 70 percent of the reports relating high school size to effectiveness recommended student enrollments of a least 500 (grades 9-12).

3. Over 90 percent of the reports relating administrative unit size to effectiveness recommended an optimum school district size of at least 10,000 elementary and secondary school pupils.

4. Over 70 percent of the reports recommended a minimum school district size of no fewer than 2,000-5,000 pupils. (pp. 33, 40)

The study "Violent Schools-Safe Schools: The Safe School Study Report to the Congress" (1978) which examined school process factors related to school violence and vandalism and a safe and orderly environment disclosed some interesting findings concerning school size. This study reported "large schools have greater property loss through burglary, theft, and vandalism; they also have slightly more violence" (p. 132).

School Attendance - A eighth factor in the schooling process examined in input-output studies was the relationship between student achievement and student attendance. Studies by Stallings and Kaskowitz (1974); Fredrick (1977); Good and Beckerman (1978); Fisher, Filby, Marliave, Cahen, Dishaw, Moore, and Berliner (1980) and Evertson (1980); among others, associated student engaged time or time-on-task with pupil performance. According to Squires, Huitt, and Segars (1983), "student engaged time, or time on task, is a measure of involvements that takes into consideration both allocated time and engagement rate (that is, student engaged time = allocated time x engagement rate)" (p. 10).

The positive relationship demonstrated between student engaged rate or time on task and student academic achievement was supported in numerous studies which examined the relationship of days in the calendar year, days

attended by students, hours in the school day, and hours of instruction in the school year to student achievement. Studies conducted by Perl (1973) and Bowles (1970) suggested that a longer school year related to higher cognitive achievement. However, Grant and Eiden (1982) questioned the value of using the length of the school year as a legitimate instructional time measure in statistical analysis because of the small variation in the school year across school districts. Also, Caldwell, Huitt and Grader (1982) identified other delimiters of instructional time (e.g., student attendance, length of the school day) which would further obscure relationships between the length of the school year and student achievement.

The Educational Research Service ("Student Absenteeism," 1977) described the impact of student attendance/absenteeism on achievement as a long standing issue of concern for educators. The cause for concern was probably related to the fact that the number of hours in the school day correlated positively with student achievement in studies conducted by Stallings and Kaskowitz (1974) and Gilbert and Price (1981) and absenteeism obviously reduces the number of hours in the school day for the student who is absent. Karweit (1983) reported that for most school districts the major factor reducing the scheduled school term was student absenteeism. Therefore, it is not surprising that low student attendance rates also corresponded with poor student achievement in studies conducted by Bond and Dykstra (1967); Fredrick (1977); Kean et al. (1979); Kersting (1967); and Trauschke (1970).

Mervilde (1981) and Stennett and Isaacs (1980) found attendance to be linked to various student socioeconomic status measures. Fredrick and

Walberg (1980) suggested "student background predicts both achievement and attendance, or that background and attendance are so closely linked that the separate affect of attendance cannot be accurately estimated" (p. 187).

Process-Outcome Studies

Researchers attempted to determine those factors that influenced school performance by using process-outcome research designs. In process-outcome studies, researchers examined the relationship of certain schooling processes i.e., decision making, problem solving, discipline procedures, etc. to school outcome measures. Important implications for schools as social institutions which appeared to demonstrate a need for students, faculty, and administration to work collaboratively in the daily operation of the school were revealed in these studies. This collaboration fostered personal interactions which demonstrated to students that they had the ability to affect the school environment. These studies were the forerunners of effective schools research which also examined the relationship between schooling processes and outcome measures. However, as was the case with input-output studies, process-outcome studies produced mixed and often controversial findings. An examination of various process-outcome studies and their findings follows.

Violent Schools Studies - Researchers have linked school effectiveness with low amounts of violence and vandalism. For example, researchers ("Violent Schools," 1978) disclosed process factors that were associated with school violence, vandalism, and a safe and orderly environment. In this study, randomly selected urban, suburban, and rural schools, exhibited a set of processes that schools established which seemed to counteract crime. These

school processes rather than community influence and socioeconomic factors were determined to influence crime and vandalism in schools. A major finding of the study was that the size and impersonality of the school was positively related to school crime. Larger schools and classes were more likely to let students go unnoticed. Impersonal schools, which demonstrated little contact between teachers and students, tended to produce students that were less affected by teachers' opinions of them.

A second finding was related to systematic school discipline. The study revealed that:

1. student reports of strict enforcement of school rules and strict control of classroom behavior were associated with low levels of school property loss.

2. student perceptions of tight classroom control, strictly enforced rules and principal's firmness were associated with low levels of student violence.

3. reports by the teachers of strong coordination between faculty and administration are associated with a lower level of property loss. (p. 133)

It appeared that student perceptions of coordinated discipline and classroom control were affected by the amount of social interaction among school participants which existed during the development and implementation of consistent disciplinary policies. In addition, it appeared that students perceptions of consistency in principals' firmness and teachers' tight classroom control were critical in creating a safe and orderly climate.

A third finding was related to arbitrariness and student frustration.

Student crime resulted when students perceived rules to be arbitrarily enforced by an unnecessarily punitive staff. When these conditions were present, they generally indicated weak disciplinary policy. Weak disciplinary policies resulted in students feeling unfairly singled out for punishment which tended to increase crime. Because teachers perceived students as unruly, they developed poor attitudes toward the students which caused the cycle of frustration to continue. The result was loss of property and increased violence.

A fourth finding was related to rewards and incentive systems present in schools. Four factors appeared to be related to violence and property loss. These findings suggested that an emphasis on getting good grades decreased violence and increased vandalism. Researchers ("Violent Schools," 1978) described this syndrome as "a situation in which the competition for rewards is intense, the availability of rewards is limited and the unfair distribution of rewards is prevalent. These students care about the rewards of the school but see the rewards being unfairly distributed; they react by attacking the school" (p. 135). School rewards included things other than grades such as membership on the football team or in the band.

A fifth finding was related to student alienation. The study defined alienation as "the breakdown of the social bond that ties each individual to society" (p. 136). Researchers revealed that student violence was higher in schools where most students reported that they could not influence what happened to them. Students believed that their future was dependent upon the actions of others or on luck, rather than on their own efforts.

Finally, researchers ("Violent Schools," 1978) revealed an interesting

relationship between leadership processes and school performance. They reported:

> An effective principal who has developed a systematic policy of discipline helps each individual teacher to maintain discipline by providing a reliable system of support, appropriate inservice training for teachers, and opportunities for teachers to coordinate their actions. (p. 137)

School Process Studies - A second group of process-outcome studies examined school processes that were associated with higher student achievement. In these studies researchers controlled for the influence of SES variables, aggregated outcome data by schools, and examined processes in high and low achieving schools that may have accounted for differences in student achievement. A number of these studies were conducted by state departments of education. The findings demonstrated differences among schools with students from the same SES levels. According to Brookover, Beady, Flood, Schweitzer, and Wisenbaker (1979):

> Our data indicate that high achieving schools are most likely to be characterized by the students' feeling that they have control, or mastery of their academic work and the school system is not stacked against them. This is expressed in their feelings that what they do may make a difference in their success and that teachers care about their academic performance. Teachers and principals in higher achieving schools express the belief that students can master their academic work, and that they expect them to do so, and they are committed to seeing that their students learn to read, and to do mathematics, and other academic

work. These teacher and principal expectations are expressed in such a way that the students perceive that they are expected to learn and the school academic norms are recognized as setting a standard of high achievement. These norms and the teachers commitment are expressed in the instructional activities which absorb most of the school day. There is little differentiation among students or the instructional programs provided for them. Teachers consistently reward students for their demonstrated achievement in the academic subjects and do not indiscriminately reward students for responding regardless of the correctness of their response.

In contrast, the schools that are achieving at lower levels are characterized by the students' feeling of futility in regard to their academic performance. This futility is expressed in their belief that the system functions in such a way that they cannot achieve, that teachers are not committed to their high achievement, and that other students will make fun of them in they actually try to achieve. These feelings of futility are associated with lower teacher evaluations of their ability and low expectations on the part of teachers and principals. The norms of achievement as perceived by the students and teachers are low. Since little is expected and teachers and principals believe that students are not likely to learn at a high level, they devote less time to instructional activity, write off a large proportion of students as unable to learn, differentiate extensively among them, and are likely to praise students for poor achievement. (p. 143-144)

Brookover and Lezotte (1979) shifted the research perspective from the material aspects of the school to a set of attitudes and perceptions which influence student achievement. Previously, Weber (1971) found eight school process factors that affected reading achievement: strong leadership, high expectations, good atmosphere, strong emphasis on reading, additional reading personnel, use of plans, individualization, and careful evaluation of student progress. Other studies by Austin (1979); Wellisch, MacQueen, Karriere, and Duck (1978); Edmonds (1978); Felsenthal (1978); Irvine (1979); McLaughlin and Marsh (1978); and the "Violent Schools" (1978) associated principal leadership with student achievement.

Longitudinal Studies - A third type of research which examined the relationship between schooling processes and outcome measures were longitudinal studies. One of the more prominent longitudinal studies was entitled "Fifteen Thousand Hours" (Rutter et al. 1979). This study was more sophisticated than previous process-outcome studies because it tracked the performance of twelve inner-city schools over a period of five years. The researchers controlled for the input of SES and examined school performance on four separate outcome measures: achievement, attendance, student behavior, and delinquency. Although the twelve schools studied were similar in terms of input variables, they produced varying outcomes in terms of outcome measures. The significant differences on output measures obtained by students appeared to be attributable simply to the different schools attended.

Rutter et al. (1979) suggested that the formation and maintenance of a social group, with norms and values that support the purpose of the school,

may be the most important resources the school possesses. They hypothesized that school processes which were under the control of teachers and administrators influenced the differences in outcome measures. These process differences between schools were systematically related to their characteristics as social institutions. Among these characteristics were: academic emphasis, skills of teachers, teachers' actions in lessons, rewards and punishments, pupil conditions, responsibility and participation, and staff organization.

Rutter et al. (1979) introduced the concept of "ethos" or "climate" which are related to the style and quality of school life. Rutter attributed the ethos to the norms and values of the school to a social organization. He organized these norms and values into four general process areas. The first of these areas was group management in the classroom. The second was school values and norms of behavior which encompassed teacher expectations and standards, models provided by teachers, and feedback. The third area was concerned with the consistency of school values. The final area concerned pupil acceptance of the school norms. Rutter et al. (1979) indicated that significant differences in school outcome measures reflect both school inputs and school process characteristics.

Desegregated Schools Studies - A fourth kind of process outcome research was the study of effective desegregated schools. These studies also revealed the importance of school processes. In these studies, equal access and participation in the academic and co-curricular activities of the school were viewed by students as an important dimension associated with successful desegregation. Studies by Pettigrew (1975); Crain (1973); Jones, Erickson,

and Crowell (1972); and Porwoll (1978) revealed that rigid tracking tended to teach children that only a few would be successful. Rist (1978, 1979) and Schofield (1978) extended the rational for equal and fair access to social positions and co-curricular activities of the school.

Codes of conduct were also found to be important in desegregated schools. Studies by Lincoln (1979) and Willie and Greenblatt (1980) disclosed the need for a uniform code of conduct, firm discipline, and procedures that were perceived to be fair by all groups. Similarly, high expectations were found to be important. Davey (1973); Eddy (1976); and Mackler (1969) all related what children learn to what was expected of them by the school.

Effective Schools Studies - A fifth type of process-outcome research was initiated in reaction to the findings of input-output studies conducted during the late 1960s and early 1970s by Coleman et al. (1966); Jencks et al. (1972); Averch et al. (1972); and Mosteller and Moynihan, (1972). Generally, findings from these input-output studies claimed that the most significant factor related to student achievement was the socioeconomic status of the learner and that variables within the public schools had little influence on the outcome of schooling for students.

This proposition was not appealing to many educators and researchers. The result of this discontent was the emergence of effective schools research. Studies began to emerge which were conducted by researchers (e.g. Rutter et al., 1979: Brookover & Lezotte, 1979; Edmonds, 1979; etc.) who believed that schools could make a difference in the outcomes of schooling for students and who published findings which supported their beliefs.

The Educational Research Service ("Effective Schools," 1983), reported "the conclusion that the determinants of student achievement lie chiefly outside the control of the school, with the schools largely powerless to compensate for the affects of the nonschool factors, was unacceptable to many persons" (p. 1). In affect, the input-output research findings of the 1960s and 1970s spawned a reaction in the educational research community which focused on the identification analysis of schools which were able to successfully break the link between socioeconomic background and student achievement. These studies came to be known as the effective schools research. Since effective schools research began to evolve in the late 1960s and early 1970s, many attempts were made to use the results of its findings to improve the quality of schooling.

Educational researchers continued to give increased attention to the analysis of schools which were characterized as instructionally effective. Bickel (1983) suggested that the origin and growth in popularity of the effective schools movement could be traced to several major factors. One factor was related to the reaction of many educators to the rather gloomy analysis of school affects as assessed and reported in the Coleman report and others similar to it. A second factor was the psychological climate prevalent among practitioners across the country by the mid 1970s. Bickel (1983) stated, "educators were ready to hear a more optimistic message regarding the ability of schools to teach children" (p. 3). A third factor was the common sense nature of its highly publicized findings. The findings of effective schools studies appealed to people knowledgeable about schools and their

organizational/social structures.

Concerning the basic assumption underlying the effective schools philosophy, Bickel (1983) stated:

> the effective schools movement is framed by three central assumptions: (a) schools can be identified that are unusually effective in teaching poor and minority students basic skills as measured by standardized tests; (b) these successful schools exhibit characteristics that are correlated with their success and that lie well within the domain of educators to manipulate; and (c) the characteristics of successful schools provide a basis for improving schools not deemed to be successful. Implicit in this last assumption is the conviction that the school is an appropriate level to focus educational reform efforts. (p. 3)

Many studies compared effective and less effective schools. School effectiveness research indicated that pupil performance resulted from many policies, behaviors, and attitudes that shaped the learning environment. Models for success differed across studies, with various factors that contributed to achievement in some schools having little relationship to achievement in others. However, effective schools research revealed important similarities between instructionally effective schools. Edmonds (1982), identified the following characteristics of effective schools:

1. the principal's leadership and attention to the quality of instruction.
2. a pervasive and broadly understood instructional focus.
3. an orderly, safe climate conducive to learning.
4. teacher behaviors that convey the expectation that all students are

expected to obtain at least minimum mastery.

5. the use of measures of pupil achievement as the basis for program evaluation. (p. 4)

Similar characteristics have since been proposed by L. Lezotte (personal communication, July, 1987), W. Brookover (personal communication, July, 1987), and Rutter et al. (1979). Major research findings related to each of these characteristics were examined in the following portion of this literature review.

School Climate - Effective schools research often revealed similarities between effective schools that were related to aspects of the learning climate. These findings indicated that specific climate factors had a major impact on the level of school performance as determined by outcome measures ultimately attained. Effective schools had environments which supported the learning process and were purposeful, orderly, and cooperative. Weber (1971) wrote "it is difficult to escape the conviction that the order, sense of purpose, relative quiet, and pleasure in learning of these schools play a role in their achievements" (p. 26). Similarly, Wynne (1981) termed coherence the key characteristic of good schools. He referred to a predictable relationship between the different elements of the school environment. Wynne (1981) wrote "the goodness in a good school was pervasive" (p. 377). Poorly managed schools often exhibited displays of inefficiency while the vitality of the total environment in good schools stifled occasional inefficiencies that developed as "students kept peers from breaking rules; teachers helped colleagues solve professional problems; and things seemed to work out without obvious conflict

and stress" (p. 377). These outcomes, Wynne (1981) reported, "stem from considerable planning and effort, often accompanied by tension and vigorous leadership when in the early stages" (p. 377).

A study conducted by the Maryland State Department of Education ("Process Evaluation," 1978) described the atmosphere in schools that were successful at teaching basic skills as giving the:

> immediate impression that it is "being run" as opposed to "running". There is an air about the school that suggests it has a direction, a point of view, and an orientation. One of the things that immediately impresses the visitor is that there are very few children in the halls and those who are there seem to be going about their business in an orderly fashion. The halls tend to be clean and there is a general air about the building that it is being cared for. The bulletin boards are neatly done and reflect projects going on in the school. (p. 17)

School climate was also found to be related to the overall physical condition of the school. Effective administrators structured the physical environment of the school to reflect the building's positive, goal oriented philosophy. Well kept interiors and administrative attention to the schools appearance were cited in several research reports. For example, successful principals studied by Vallina (1978) involved both students and staff in creating a positive physical appearance in their schools. The students "painted murals on mobiles, planted trees and shrubbery, and discussed the aesthetic aspect of the school plant" (p. 165).

Symptoms of student alienation and frustration were more obvious in less

effective schools. Fighting, stealing, and other student behavior problems transpired less frequently in higher achieving schools, compared to lower achieving schools. Wynne (1981) reported a uniform understanding of prohibitions by staff in good schools. Rules were clear, firm, and consistently enforced. Staff members perceived rule enforcement as a professional responsibility. When enforcing rules, they were able to depend on supervisors to back them up. Good schools conducted periodic reviews of their rules and made appropriate revisions. They also made arrangements to assure that students always held current copies of the regulations and penalties. Vallina (1978) noted the presence of systematic discipline procedures in relatively successful Chicago elementary schools as well as the practice of self-discipline by students. The less successful Chicago schools he studied encountered numerous student discipline problems.

Also, a spirit of cooperation enhanced school climate in many effective schools. The New York State Office of Education Performance Review ("School Factors," 1974) disclosed that, in high achieving elementary schools, friendly and constructive administrator/teacher relations existed and the teachers believed they could depend on the administrative team for assistance. Teachers considered the school well run, and felt insulated from community and bureaucratic problems. Staff morale was high as the teachers viewed the school as "a pleasant place in which to work" (p. 15).

Similarly, Phi Delta Kappa ("Why Do," 1980) case studies indicated that effective principals in successful schools shared decision making with staff through advisory groups and teacher instructional policy groups. Accordingly,

"shared decision making seemed to create a positive atmosphere and a feeling of ownership of the decisions made affecting that school" (p. 133). Ownership generated through shared decision making was believed to have contributed to the durability of decisions made. However, the report also suggested that "the principal must retain the ultimate responsibility for what happens in the school" (p. 135).

Researchers consistently revealed higher staff morale among better performing schools. Although Brookover and Lezotte (1979) concluded that teacher satisfaction and morale were actually higher in sampled declining school than in improving schools, they attributed the higher morale to "a pattern of complacency and satisfaction with the current levels of educational attainment" (p. 67). The staff in improving schools were considered "more likely to experience some tension and dissatisfaction with the existing situation" (p. 68).

Parent involvement was also found to contribute to school climate and performance. Researchers concluded that parents of students in effective schools were perceived as more interested and more concerned over their childrens' schoolwork than were parents of students in less effective schools (Fetters, Collins, & Smith, 1968; Gigliotti & Brookover, 1975; "Process Evaluation," 1978; "Three Strategies," 1976). Consistently, research revealed that effective schools developed and maintained a positive relationship between themselves and the community. Parents were made to feel welcome at school. Researchers found that effective principals were adept in community relations skills ("Process Evaluation," 1978; Vallina, 1978; and Venezky and Winfield,

1979).

Instructional Leadership - In addition to the role of the principal in developing and maintaining a positive school climate, other aspects of the principal's leadership role were found to be important to enhancing overall school effectiveness. School effectiveness was often the product of a unified, collegial effort exhibited by the school wide integration of attitudes, goals, policies, and procedures which facilitated learning. The existence of these success components in the daily operation of the school were often found to be dependent on the leadership of school administrators. In a study of exceptional urban elementary schools ("Why Do," 1980), it was reported that the actions of designated leaders were crucial to school success because principals "influence the behavior of subordinates and other school participants, initiate programs, set policy, obtain material and fiscal resources and provide motivation and support for school improvement" (p. 203). Conversely, nondesignated leaders "such as teacher, parent, or other extraschool groups, experience difficulty in mounting school improvement initiatives because they lack the necessary prerequisites of effective leadership, i.e. permanence, power, and legitimacy" (p. 203). Berman and McLaughlin (1978) found that administrative support from both principals and superintendents was the major factor affecting the success of newly implemented programs. Similarly, Liberman and Miller (1981) emphasized the importance of the principal as an instructional leader in bringing about improvements in teaching.

Researchers consistently identified leadership from the school

administration as important to school success. The building principal often was identified as the key administrative figure (Armor, Carroll, Donoldson, Kiesling, and Pincus, 1976; Brookover & Lezotte, 1979; "California School," 1977; Felsenthal, 1982; "The Journalism," 1980; Levine and Stark, 1981; Lipham, 1981; "Process Evaluation," 1978; "School Factors," 1974; Sweeney, 1982; Venezky and Winfield, 1979; Weber, 1971; "Why Do," 1980). The Educational Research Service ("The Role," 1982) reported that "building principals occupied a strategic position in the school organizational structure for developing and maintaining a school climate conducive to learning" (p. 26). This position was the result of the principals' status as chief administrators, building site managers, and instructional leaders who represented school system management and were responsible for implementing central management decisions and school board policy. Also principals were in direct charge of both the immediate and continuing operations of the school. As instructional leaders, principals were responsible for maintaining and improving the quality of the building's instructional program. All of these factors provided substantial leadership opportunities and responsibilities to principals ("The Role," 1982). Research findings showed effective schools had principals who exercised assertive leadership. In unsuccessful schools, principals' time was consumed with administrative detail. These principals were unable to apply themselves to leadership activities (Brookover and Lezotte, 1979; "Process Evaluation," 1978; Vallina, 1978; Venezky and Winfield, 1979).

However, school leadership did not always emanate from the school

principal. Several researchers identified persons other than the principal as sources of instructional leadership in effective schools. The New York State Office of Education Performance Review ("School Factors," 1974) found that some principals effectively delegated instructional leadership responsibility to skilled assistant principals so that they could concentrate on managerial tasks. Other findings by Venezky and Winfield (1979) revealed strong instructional leadership was being provided by district level administrators or by directors of educational programs. Weber (1971) identified an area superintendent in one of the four successful schools he studied as the person who provided instructional leadership. The California State Department of Education ("Report On," 1980), found building level leadership was assumed by groups of teachers or by a resource teacher. In such cases, the principal facilitated leadership by providing cooperation and support.

Research findings of Berman and McLaughlin (1975) also disclosed the importance of facilitating behaviors by principals. The analysis of the implementation by schools of externally funded change programs indicated that the principal's support made a significant difference in whether or not the program was successfully implemented. As a result of these findings, Berman and McLaughlin (1975) termed principals "gatekeepers of change" (p. 20).

Other studies described building principals in successful schools as task oriented, action oriented, well organized, skilled in work delegation, and skilled in getting things done (Felsenthal, 1982; "Process Evaluation," 1978; "School Factors," 1974; Vallina, 1978; Venezky & Winfield, 1979; "Why Do," 1980). In similar studies, principals exercising leadership set and

communicated high goals for their buildings (Venezky & Winfield, 1979; "Why Do," 1980), conveyed high expectations for student, staff, and principal performance ("Process Evaluation," 1978; "Why Do," 1980), and set policies in their schools that were well defined, written down, and well communicated ("School Improvement," 1979, Spartz, Valdes, McCormick, Myers, and Geppert, 1977). Effective principals used good communication skills with students and staff to clarify school goals and staff responsibilities ("School Factors," 1974; "Why Do," 1980; Wynne, 1981).

Highly effective principals strove for high achievement and assumed a strong instructional leadership role (Brookover & Lezotte, 1979; Felsenthal, 1982; "The Journalism," 1980; "Process Evaluation," 1978; Vallina, 1978; Venezky & Winfield, 1979; "Why Do," 1980). In one successful Michigan elementary school studied by Brookover, Beady, Flood, Schweitzer, and Wisenbaker (1977), the principal:

1. frequently visited classrooms.
2. presented innovative programs and techniques to staff.
3. met with staff to discuss books relating to school effectiveness.
4. met with small groups of teacher to discuss their students' achievement.
5. organized teacher effectiveness training. (pp. 210-211)

Vallina (1978) provided another example of strong instructional leadership by revealing that more effective administrators were involved the in the assessment of program needs and tended to approach assessment in a systematic manner. They were active in planning program improvements,

included staff and parents in planning, and used creative organizational patterns when implementing improvements.

Effective principals also demonstrated knowledge and skills related to curriculum design and delivery. Venezky and Winfield (1979) suggested that curricular leadership was provided when a principal "attends to materials, coordinates the program, works closely with the reading specialist, encourages and reinforces the staff, and praises children who do well" (p. 7). In attempting to meet school goals, effective principals took "personal charge of staff development and program implementation" (p. 8).

Principals in effective schools were often involved directly in teacher selection. They used program needs and guidelines as criteria for selection ("Process Evaluation," 1978; Vallina, 1978; "Why Do," 1980; Wynne, 1981). Principals in less effective schools tended to rely more on central offices placement. Principals in good schools exercised deliberation when choosing personnel (Wynne, 1981). They carefully checked references and involved staff in evaluating candidates. Some of these principals used job interviews as opportunities to spell out school goals and expectations to potential employees.

Also, effective principals utilized a variety of methods and materials to orientate new faculty (Vallina, 1978). They developed staff handbooks to assist in orientation and developed policies which facilitated experienced teachers working with new staff members to familiarize them with role expectations, responsibilities, and recommended procedures. Ineffective principals placed less emphasis on assimilating new staff as demonstrated by the lack of a variety of orientation methods.

Effective principals spent a significant amount of their time observing classes while administrators in underachieving schools spent almost all of the day in their offices dealing with administrative detail (Armor et al., 1976; Brookover et al., 1977; Felsenthal, 1982; Kean et al., 1979; "Process Evaluation," 1978; Vallina, 1978). Vallina (1978) suggested that successful principals stressed staff assessment and instructional evaluation when visiting classrooms. Less successful principals appeared more concerned with picking up litter and closing open classroom doors. Similarly, Armor et al. (1976), noted that effective principals "visited individual classes often (perhaps once a week) and went there with a specific purpose in mind" (p. 37). These visits helped principals determine classroom needs and identify types of assistance most needed by teachers.

Administrative leaders provided strong support to their teaching staffs ("School Improvement," 1979; "Why Do," 1980). This was evident in the responses supplied by teachers participating in the "California School Effectiveness Study, The First Year: 1974-75," (1977). Teachers in high academic performing schools rated their principals higher on "specific standards of helpfulness" (p. 30) and other standards of performance. Included among the standards of helpfulness were: (a) supporting new ideas and projects; (b) backing up teachers; (c) enhancing parent-community relations; (d) enforcing discipline; (e) developing instructional leadership; and (f) acquiring and distributing materials (p. 30).

Similar findings were obtained by the New York State Office of Education Performance Review ("School Factors," 1974). The report revealed that faculty

members believed "they could rely on members of the administrative team. . . for instructional support and assistance" (p. 13). Similarly, Armor et al. (1976) found that successful principals considered providing assistance to teachers to be a major role responsibility. Highly effective principals attempted to "maintain an environment that supports teacher efforts in the classroom and minimizes outside factors that can disrupt the learning process" (p. 36). Levine and Stark (1981) also found successful principals to be "both supportive of teachers and skilled in providing a structured institutional pattern in which teachers could function effectively" (p. 56).

Another leadership behavior of principals that corresponded with higher achievement was encouragement for inservice training ("California School," 1977; "School Improvement," 1979; Spartz et al. 1977; Venezky & Winfield, 1979; "Why Do," 1980). However, inservice training was most effective when it was relevant to actual school experiences. Phi Delta Kappa ("Why Do," 1980) noted that training was most effective when "targeted toward specific school or program goals" (p. 205). Vallina (1978) observed that successful principals gave priority to classroom carryover from inservice training and encouraged the exchange of ideas among staff. Similarly, Armor et al. (1976) revealed a relationship between higher achievement and informal discussions among teachers.

Effective principals provided formal professional growth experiences for teachers in their schools. Such experiences often facilitated the implementation of new programs. Berman and McLaughlin (1978) found that the major factor affecting the success of newly implemented programs was

administrative support from both the principals and superintendents. Likewise, Liberman and Miller (1981) emphasized the importance of the principal in bringing about improvements in teaching. Stallings and Mohlman (1981) found that teachers improved most in schools where the principal was supportive of teachers and clear and consistent in communicating school policies. Similarly, Little (1981) found that staff development efforts were successful when people worked cooperatively and were unaffraid to take risks.

The California State Department of Education ("Report On," 1980) revealed that successful inservice programs were often provided by principals who had an ongoing commitment to inservice training "closely tied to the instructional program" (p. 18). Such programs had a more positive affect on staff behavior, classroom practices, and student performance and included the following features: (a) the inservice training "adapted the new program to teachers' preexisting instructional practices"; (b) the staff development program was "adequately comprehensive" rather than narrowly focused on a single curricular area; and (c) the faculty was committed to the program (p. 18).

Levine and Stark (1981) also concluded that commitment to ongoing, building level staff development was essential for improving instruction. They wrote, "our study . . . reinforces much recent analysis and research pointing to building-centered staff development as the key level for effective in-service training" (p. 52). They further noted that "all of the schools described in this study placed intensive and on-going emphasis on building-level staff development to the extent that this was virtually a defining characteristic of

their mode of functioning" (p. 52).

High Expectations - In addition to having strong instructional leadership and a positive school climate, programs and policies of effective schools were based on the premise that all students were eminently educable. The professional staff believed that their students could achieve and this belief permeated the climate of these schools. As a result, the professional staff in effective schools held high expectations for student achievements (Brookover & Lezotte, 1979; Felsenthal, 1982; "The Journalism," 1980; "Report On," 1980; "School Improvement," 1979; Weber, 1971; "Why Do," 1980). Less effective schools had contrasting beliefs and attitudes about student achievement. Lower levels of student performance were expected and accepted.

Many researchers compared teachers perceptions of student ability in high and low performing schools (Azumi & Madhere, 1982; Brookover & Lezotte, 1979; Fetters, Collins & Smith, 1968; Gigliotti & Brookover, 1975; "Process Evaluation," 1978; "Three Strategies," 1976). Consistently, these researchers found that higher teacher perceptions of students abilities related to higher student achievement. A classical example of this condition was provided by Jacobson and Rosenthal (1968). They reported in the book Pygmalion in the Classroom, that teachers' expectations of student performance may alter the way teachers treat students to the point that it may have a negative affect on the behavior and learning of students for which teachers hold low expectations.

Brophy (1982) further related teacher expectations to teacher

effectiveness. He stated that many studies of teacher effectiveness identified specific classroom management practices, instructional techniques, and expectations of teachers that appeared to help many students raise their reading and math scores. Consequently, Brophy (1982) further suggested that teachers who managed their classrooms in a businesslike manner, utilized active teaching practices, and held high expectations for their students tended to have students who achieved more in reading and math.

Teachers' expectations for students were also related to the quality and quantity of interactions teachers had with students in their classrooms. Many researchers have studied the relationship between classroom interaction variables and student academic achievement. Cooper and Good (1983) reported strategies for communicating higher expectations for students such as equalizing response opportunities. Similarly, Aspy and Roebuck (1982) suggested that teachers' levels of interpersonal communication skills related positively to student attitudes and learning. Other teacher effectiveness research showed that effective teachers divided their students into fewer but larger groups (Kean et al., 1979). By doing so, teachers increased the amount of time during which students and the teacher were involved in direct instruction. Kean et al. (1979) also suggested that larger groupings were superior to smaller groupings because of the benefits derived from teachers being directly involved with more students more of the time.

Researchers also examined the affects on achievement of ability grouping. Some studies showed ability grouping to have negative affects on students' mathematics and verbal achievement (Bowles, 1969; Michelson, 1970).

However, Bridge et al. (1979) suggested "this apparent consistency is much less apparent when one considers a wider range of studies. . . the results appear to be quite mixed" (p. 261). While more than a third of the tracking studies reviewed by the National Education Association (1968) reported ability grouping to have a positive affect on achievement, Bridge et al. (1979) concluded that additional research was needed to explain the seemingly contradictory results among different tracking studies.

In effective schools, classes tended to be divided into three or fewer groups for instruction (Azumi & Madhere, 1982; "California School," 1977; Process Evaluation, 1978; Spartz et al., 1977). In addition, effective schools made grouping decisions based upon objective data rather than teacher opinion ("California School," 1977). Brookover et al. (1977) concluded that more effective schools grouped students on the basis of "objective student performance" (p. 205). Conversely, lower achieving schools clustered pupils according to "those who would 'make it' and those who could not" (p. 205). The achievement differences between the slow learners and fast learners tended to increase over time.

Some highly effective schools had policies that facilitated student mobility from one group to another "if both the teacher and the principal agreed that the student would benefit from the change" (Spartz et al., 1977, p. 14). Not only were rigid grouping practices based on the perceived ability of students less prevalent in effective schools, a wider variety of alternative grouping practices were evident. Slavin (1980) noted that group or team learning approaches enhanced student learning and reflected higher

expectations for student achievement. The findings of effective schools researchers suggest that when students were perceived as capable of academic success, greater incentives existed for both students and teachers to work toward that end.

Emphasis on Academics - In addition to factors related to school climate, high expectations and strong instructional leadership, a review of effective schools research revealed a relationship between the degree to which schools placed an emphasis on academics and school outcome measures. Effective schools researchers have consistently identified an emphasis on academics as a key element contributing to a school's effectiveness (Brookover & Lezotte, 1979; Brookover et al., 1977; Edmonds, 1979a, 1979b; 1982; Edmonds and Frederiksen, 1979; Rutter et al., 1979). Attempts to define emphasis on academics, usually focused upon the issue of teaching and learning being the primary purpose of the school and taking priority over all other functions of schooling.

The literature concerning both effective schools and the effective teaching provided information concerning those conditions in schools and classrooms that contributed to student learning and helped define "emphasis on academics". This was particularly true with regard to research concerning effective teaching. A combination of certain teacher and student behaviors provided the dimensions of effective teaching. Teacher behaviors included such things as planning for instruction, managing the classroom, and attending to the quality of instructional design and delivery. Student behaviors included involvement in the learning act, coverage of the content which they were

expected to learn, and successful interactions with material to be learned. The observable presence of these teacher and student behaviors provided the best indicators of the degree to which a school emphasized academics.

Monitoring - The final characteristic of effective schools reviewed in this study was monitoring. Effective schools frequently monitored student, teacher and overall school performance (Felsenthal, 1982; Levine & Stark, 1981; "Report on," 1980; "School Improvement," 1979; Spartz et al., 1977; Vallina, 1978; Venezky & Winfield, 1979; Weber, 1971; "Why Do," 1980). Furthermore, these schools used the results of monitoring when making educational decisions. Results of a study by the California State Department of Education ("California School," 1977) indicated that higher achieving schools relied heavily on scores from standardized tests when placing students in reading and math classes. Less weight was given to the results of teacher made tests, to students' performance in the classroom, and to recommendations from teachers. Similarly, Brookover et al. (1977) concluded that successful schools grouped students on the basis of objective student performance.

Researchers found a significant difference in the availability of diagnostic information on students between schools achieving above and below expectancy (Spartz, et al. 1977). Information systems in schools achieving above expectancies provided specific information concerning skills that students had mastered. Effective schools enacted policies requiring students to repeat work if they were identified as performing unsatisfactorily. Fetters et al. (1968) found over achieving schools, "have slow learning pupils repeat grades in which they do failing work" (p. 13). Conversely underachieving schools promoted

these students with their age group. Wynne (1981) also revealed that good schools retained and provided extra help to students not performing at grade level. He commented "it is my impression, that an active policy of retention (instead of social promotion) spurred orderly efforts to identify and correct learning problems" (p. 380).

The School Improvement Process

In the previous sections of this literature review, variables which influenced school performance were examined. It was important to review 1) input-output studies because the input variables examined were critical elements in the treatment of data for this study, 2) process-outcome studies because these studies were the precursors of effective schools research, and 3) effective schools research because that research provided the content of the "Principals' Academy" curriculum.

In this portion of the review, literature concerning studies of the implementation of school improvement initiatives, various change models used in implementing school improvement, the state role in school improvement, and change models used in implementing effective schools research, including the West Virginia Principals' Academy, were examined. It was important to review (a) implementation studies because they provide insights concerning the role of the principal in the school improvement process, (b) studies of various change models because these studies contributed to the development of the school improvement model presented at the "Principals' Academy", (c) the state role in school improvement because the "Principals' Academy" was a state sponsored reform initiative, and (d) change models used in implementing

effective schools research because these models contributed to the success or failure of school improvement initiatives based upon effective schools research.

Implementation Studies

Improving public education was high on the agendas of many people in the Unites States, particularly during the past two decades. Educational reform established itself as a top priority on the list of concerns of educators during the 1980s. Since the call for reform was made by the National Commission on Excellence in Education, (A Nation at Risk, 1983), federal, state, and local educational agencies embarked on the road to reform. Some 30 reports and books followed A Nation at Risk which suggested that the current reform movement was well established prior to 1983. A majority of these reports focused on the failure of the secondary school but recommended sweeping reforms which extended from the primary to the post secondary school.

Some researchers found that educators were not necessarily anxious or willing to embark upon the road to educational reform. Neufeld, Farrar, and Miles (1983) suggested that educators had become leary of innovation and improvement. They wrote:

> School people do not talk about the creation of an effective school as an innovation; they describe it as an on-going, long-term process that will alter beliefs, relationships and emphasis in the school. They describe the effort as one that takes time and hard work and from which it is inappropriate to expect magnificent results immediately. (p. 12)

Other researchers found that effective schools based reform initiatives had already begun by 1980 in many of the larger city schools across the United

States. Effective schools studies conducted by Edmonds (1979), Brookover, Beady, Flood, Schweitzer and Wisenbaker (1977), Venezky and Winfield (1979), and others identified characteristics of effective and ineffective schools. Many of the nation's urban schools were implementing school improvement programs based upon these characteristics.

As practitioners attempted to implement school reforms, it became obvious that knowing what factors were important for improving schools was not the same as being able to create those factors in schools. The concerns regarding school improvement began to center on questions of processes for implementing effective schools based improvement initiatives. Unfortunately, questions concerning improvement processes were not answered by reviewing school improvement literature. Implementation studies provided clues about planning for change at the local level but the theory of school improvement was incomplete. Berman (1981) reported "the state of the art at the level of specific findings and of practical advice appears to be in disarray" (p. 253). There was little research basis from which to choose approaches for school improvement.

In schools, teacher characteristics and attitudes appeared to play an important role in the successful implementation of change models. Crawford (1978) found that a measure of teachers' verbal ability correlated significantly and positively with teachers' observed use of recommended practices. McKibbin and Joyce (1980) found a positive correlation between teachers' conditions in relation to Maslow's hierarchy of needs and teacher self-reports of transfer of training to the classroom. Teachers whose conditions were low

on Maslow's hierarchy were less likely to transfer training to the classroom than teachers whose conditions were high on Maslow's hierarchy.

Doyle and Ponder (1977) suggested that three criteria influenced teachers decisions regarding implementation of recommended practices. The first, instrumentality, referred to the extent to which recommendations were stated clearly and specifically. The second criterion, congruence, was related to how well the new practice fit in with the teacher's philosophy and teaching. The third, cost, was related to how great the pay off for teachers would be. Although many of the barriers to change were explained by the notions of instrumentality, congruence, and cost, two other aspects of teacher change also were noted. First it appeared that it might be necessary to help teachers develop a higher sense of self-efficacy or ability to deal with classroom problems. Second, teacher change involved the restructuring of teacher's conceptualization of the subject matter.

Many researchers identified the principal as the key change agent in schools. Berman and McLaughlin (1978) found that the major factor affecting the success of newly implemented programs was administrative support from the principals and superintendents. Liberman and Miller (1981) emphasized the importance of the principal as an instructional leader in bringing about improvements in teaching. Similarly, Stallings and Mohlman (1981) found that teachers improved most in schools where the principal was supportive of teachers and clear and consistent in communicating school policies. Little (1981) found that staff development efforts were most likely to be successful where a norm of collegiality and experimentation existed between the principal

and school staff.

An examination of the implementation of various change models revealed that scheduling was a concern. Lawrence (1974) found that inservice programs consisting of a single session were largely ineffective. Also, Berman and McLaughlin (1978) found that most staff development programs that had an impact on teaching behavior were spaced over time. The Concerns - Based Adoption Model considered teachers concerns at various stages of the change process and designed training activities that addressed those concerns (Hall and Louchs, 1978). Research by Stallings, Needels, and Stayrook (1978) concluded that a schedule of four to six, three hour workshops spaced one or two weeks apart produced positive results. Similar conclusions were reached by Anderson, Evertson, and Brophy (1979).

Change Models

Various staff development models were developed to increase the effectiveness of school based improvement initiatives. Wood, Thompson, and Russell (1981) developed a model which had five steps (a) readiness, (b) training, (c) planning, (d) implementation, and (e) maintenance. A similar model called Staff Development for School Improvement studied by Hough and Urich (1981) and Titsworth and Bonner (1983) had six steps (a) awareness, (b) readiness, (c) commitment among staff, (d) needs assessment, (e) planning, implementation and evaluation, and (f) reassessment and continuation.

Joyce and Showers (1982) studied training activities included in staff development programs. They concluded that for fine tuning of skills, presentation and modeling were adequate for some teachers to use the skills

routinely. However, as the recommended methods became less familiar and more complex, consistent practice with feedback was necessary for most teachers. Similarly, Sparks (1983) studied workshops with trainer provided coaching, with peer observation, and workshops with neither coaching nor peer observation. The teachers in the peer observation group improved more than the teachers in either of the other two groups.

Schiffer (1980) argued that staff development programs often failed because they utilized one-sided and short sighted models. She further suggested that the problem with most models of staff development was that they were:

> (a) biased toward fulfilling organizational goals through the use of rational change strategies... (b) they were biased toward making personal change and did not make sufficient provisions for organizational accommodation to these changes... (c) they were based on unrealistic assumptions about authority prerogatives... (p. 158).

Schiffer presented a model for staff development that emphasized the importance of identifying specific organizational subsystems which needed to be changed for the mission of staff development to be fulfilled. She identified organization subsystems which included technologies, procedures, rules, routines, schedules, rewards, structures for decision making, inservice education, and monitoring and evaluation of the change process. She argued for more adequate conceptualization of staff development based upon three foci: political, personal, and organization.

Schiffer (1980) developed a model which consisted of four basic stages of

development. The first stage, self-study, involved the selection of a mission and establishing structures for decision making. The second stage, exploration, involved building shared meanings and goals. The third stage, planning, required the development of long range goals and identifying and planning for needed subsystem changes. In the fourth stage, change occurred in individuals, groups, inside-outside interactions, and subsystems. Schiffer's model was based upon basic, political, personal, and organization principles.

Havelock, (1973) proposed a model for planned change which included six stages (a) relationship, (b) diagnosis, (c) acquiring relevant resources, (d) choosing the solution, (e) gaining acceptance, and (f) stabilization and self-renewal. During the first stage, the change agent developed a viable relationship with the client system. In the second stage the change agent determined if the clients were aware of their needs and able to articulate their needs as a problem statement. Stage three required the change agent to identify and obtain resources relevant to solutions. During the fourth stage, the change agent helped the client to derive implications, generate a range of alternatives, and settle upon potential solutions. Also solutions were adapted and reshaped to fit the special characteristics of the client. During stage five, the solution was moved toward acceptance and adoption by the widest possible number in the client system. This was accomplished through describing, discussing, and demonstrating to help the clients to gain awareness, develop interests, evaluate, try out, and finally adopt the innovation. The sixth stage involved the development of an internal capability to maintain the innovation and continue appropriate use without outside help.

Change was often difficult, sometimes tolerated, and rarely institutionalized. Davis and Odden (1986) state:

> those educators who lived through the push for innovation in the 1960s and 1970s may view school improvement efforts with some skepticism. This is understandable. They have seen new approaches arrive with overblown expectations, and they have watched them disappear just as quickly without leaving so much as a ripple on the surface of day-to-day educational practice. (p. 593)

The failure of many innovations was blamed on a lack of understanding of organizational change. It was known that the long-term success of an innovation required more than the simple introduction of a good idea. However, in many cases nothing more was provided. Referring to state involvement in attempted innovations, Odden and Anderson (1986) concluded:

> the elements necessary for their success appear to be the use of a high quality, research-based, proven program; good up-front training; ongoing assistance in the form of observation, feedback, and coaching to help teachers and administrators master the skills in the program; and sustained support in the form of resources and encouragement from district and state leaders. (p. 585)

According to Davis and Odden (1986), "when such programs succeed in the long run, they do so because they incorporate elements that go beyond the introduction of an idea to the implementation and maintenance of the new practices that derive from it" (p. 593). It was essential to incorporate strategies that provided for continuing technical assistance into the change

initiative. This was particularly true as the leadership shifted from the state to local districts. Another feature that contributed to the success of these programs was the latitude given schools to identify the unique obstacles to improvement and devise plans for overcoming those obstacles. A third feature that contributed to the success of these programs was their ability to confront a variety of school issues.

Effective Schools Reform Initiatives

Of primary concern to this study, were the methods which educators used to implement effective schools research. As schools attempted to implement effective schools research, the need for appropriate change models became increasingly evident. Cooper (1984) examined two predominant models for implementing effective schools improvement initiatives. According to Cooper, both approaches relied upon standard activities such as needs assessments, collaborative decision making, parent involvement, and staff development. However, these activities were initiated and implemented in various ways depending upon which model of effective schools provided the framework for school improvement.

The literature based upon the input-output model for increasing school effectiveness proposed by Edmonds (1978, 1979a, 1979b, 1982) focused on student academic achievement and relied upon top-down mandates to more tightly couple the system. Conversely the literature based upon the school climate model for increasing school effectiveness proposed by Brookover et al. (1977, 1979a,, 1979b, 1982) and Rutter et al. (1979) focused on intervening variables, assumed a loosely coupled organization, and encouraged bottom-up

implementation strategies. Unfortunately, most effective schools based reform initiatives employed the change models based upon input-output relationships.

Implanting the Five Correlates

Edmonds (1979) proposed a plan of action for instilling the five correlates in less effective schools. His process for school improvement was driven by outcomes related to academic achievement. Edmonds maintained that educators already possessed the knowledge necessary to change schools and focused on creating the political will to do so. He strove for agreement on the goal of educating poor and minority children rather than on issues of implementation. Edmonds insisted that the most difficult part of school improvement was "a motive for extending the services of the school to the full range of the population" (Brandt, 1982, p. 15). Edmonds (1979) brought the issue of the educability of all students to the agenda for school reform when he stated:

> ...how many effective schools would you have to see to be persuaded of the educability of poor children? If your answer is more than one, then I submit that you have reasons of your own for preferring to believe that basic pupil performance derives from family background instead of school response to family background... We can, whenever and wherever we choose, successfully teach all children whose schooling is of interest to us; we already now more than we need to know to do that; and whether or not we do it must finally depend on how we feel about the fact that we haven't so far. (pp. 19-20)

The process of school improvement proposed by Edmonds began and

ended with a focus on the goal of improving the quality and equity of test scores. The process required a disaggregated analysis of current standardized test scores to compare the performance of various racial, social, and sexual subgroups in schools. Differences in the proportion of various subgroups achieving minimal mastery justified beginning an improvement program. According to Edmonds, the process also required the "systematic, formal evaluation of the presence or absence, strength or weakness, of each of the correlates of school effectiveness" (Brandt, 1982, p. 15). Using data from needs assessments, school intervention programs were designed to introduce or strengthen the correlates.

Edmonds failed to adequately describe procedures for developing or strengthening the characteristics of effective schools. Instead, he relied upon traditional forms of implementing change initiatives and offered no advice about specific implementation strategies at the school level. The emphasis was on improving the product. Edmonds stated "The ultimate test of the design...is its ability to cause an annual increase in proportion of low income children rising to academic mastery" (Brandt, 1982, p. 15).

Edmonds (1979) plan for directly implanting the characteristics of an effective school viewed schools and school systems as loosely coupled organizations which needed to be more tightly coupled. In a summary of the characteristics of effective schools, Edmonds (1979) called for "strong administrative leadership without which the disparate elements of good schooling can neither be brought together nor kept together" (p. 22).

Creating a School Climate

A second approach to school improvement relied on a school climate model which emphasized process and viewed schools as loosely coupled organizations. Improvement was promoted using bottom-up strategies to support the creation of a strong school culture (Brookover, Beamer, Efthim, Hathaway, Lezotte, Miller, Passalacqua, & Tornatzky, 1982; and Rutter et al., 1979). A similar model was proposed by Joyce, Hersh, and McKibbin (1983) which stressed a three-stage process of school change.

Brookover et al. (1982) proposed a school climate model which revealed complex causal relationships between independent, dependent, and intervening variables which affected school performance. Student achievement was valued as a outcome of school improvement initiatives. However, the models recognition of other variables related to components of the schools' climate and school social structure suggested that process was equally important.

While both Brookover et al. (1982) and Rutter et al. (1979) recommended specific changes in the organizational structure and in the norms and beliefs present in schools, they emphasized the fact that each school has its own unique personality. This recognition of the uniqueness of each school's culture and social context was related to two assumptions: (a) schools are loosely coupled organizations and subject to the nature of cultural change, and (b) emphasis was on the school as the unit of change and the building of a strong school climate or ethos; a system of values which provided a cohesive meaning to the behaviors of people.

Rutter et al. (1979) concluded that "it appears helpful for there to become kind of consensus on how school life should be organized...it is necessary not only to have ways of ensuring that there is joint staff action but also that staff feel part of the group whose value they share" (p. 194). Rutter did not outline a process for school improvement but he suggested that strategies such as collective decision making, consensus building, and efforts to build teacher morale should be employed at the school level to build a strong school ethos.

Brookover et al. (1982) concurred with other effective schools researchers in defining student achievement as proof of school improvement efforts. However, teachers and administrators improved student achievement by creating a school learning climate that (a) included high expectations for student and teacher performance that became norms or standards for the school, (b) reflected high expectations by eliminating tracking and other organizational mechanisms that stratified students into different levels of expectations, and (c) specified instructional techniques which transformed high expectations into actual student achievement (Brookover et al., 1982, p. 2 -6).

School climate models for implementing effective schools research focused on collective staff actions which required commitment at the school level rather than mandated from higher levels as the prerequisite for change. Brookover et al. (1982) suggested "a school learning climate is the collective norms, organization, and practices among the members of the social system...a combined effort by all staff is required to successfully establish an effective

school learning climate" (p. 8). These strategies helped to develop a sense of collegiality among staff members and reinforced collective commitment for the common goal.

Joyce, Hersh, and McKibbin (1983) extended the assumptions of the school climate model by formally shifting the goal of school improvement from improving student academic achievement to creating preconditions for change within schools. They argued "the condition that must be created is a homeostasis of change, a condition in which organizational stability actually depends upon the continuous process of school improvement" (p. 79). Joyce et al. (1983) perceived the "creation of a certain type of school culture, i.e., a set of organizational norms, expectations, beliefs, and behaviors which allow the establishment of activities fundamental to school improvement" as prerequisites to the implementation of change strategies (p. 6). Accordingly, they developed a model of school improvement which emphasized the gradual and process oriented nature of school improvement. They identified a three stage structure for improvement which involved all participants in the creation of an environment conducive to innovation.

In the first stage, a committee was established and charged with bringing together members of the school community to study and improve the social dimension of life in schools. Joyce et al. (1983) saw the loose coupling of classrooms and administrative units of the school as a problem to overcome through bottom-up implementation strategies which created a sense of ownership for change efforts among all parties. In the second stage, the committee developed a "professional growth-oriented ecology" in schools (p.

149). In the third stage, the committee considered the schools basic mission and initiated school wide change efforts suggested by effective school researchers. The three-stage process depended upon bottom-up strategies of collaborative decision making, school initiated staff development, and altering attitudes about change.

Differing assumptions about the process of school improvement outlined by Edmonds' and the school climate model endorsed by Brookover, Rutter, and others conflicted in various ways. Practitioners who adhered to Edmonds' writings believed that school improvement required the tightening up of organizational structures to focus on producing a better product. The model depended on a strong principal charged with instilling the characteristics of effective schools.

Reform based on the work of Brookover, Rutter, and others viewed schools as social and cultural systems where student academic achievement was related to a complex structure of cultural norms, roles, and organizational structures. Practitioners were charged with adapting the notion of cultural change to their unique school and school improvement required teachers and administrators to collectively assume new responsibility for the creation of a climate that fostered academic achievement.

According to Cooper (1984) the two components of the literature presented a series of forced choices: product or process orientation; vision of schools in need of bureaucratic tightening or of cultural unification; a schedule for immediate or gradual change; the use of top-down or bottom-up strategies. Rather than providing a prescription for practitioners, the literature provided

two very different and incompatible models for improving schools.

The State Role in School Reform

It was important to examine the role of the state related to the school reform process because the West Virginia Principals' Academy was a state sponsored reform initiative. Recently, a multitude of school reform initiatives were implemented across the country and many of these reform initiatives were state sponsored. While some were highly successful in reforming schools, others were not. However, Anderson and Odden (1986) suggested "states can play several substantive and important roles in helping local schools - and the students, teachers, and principals in them - to improve over time" (p. 578). Events indicated that states were anxious to assume a greater role in school reform. Fuhrman, Huddle and Armstrong (1986) stated "despite the strong American tradition of local autonomy for the schools, the states have taken their role in education more and more seriously in recent years" (p. 594). Evidence of the expanded role of state governments in the operation of local schools was the development of policy by state agencies in areas traditionally considered within the exclusive domain of the local school boards.

States responded to both economic and political pressures to improve the performance of public schools during the 1980s. According to Fuhrman et al. (1986), state agencies today are caught in at least two perplexing paradoxes:

1. They are being asked to take a more important leadership role in a wide range of activities designed to stimulate the improvement of local schools, but at the same time they are receiving fewer resources to help them carry out this role, and

2. Despite evidence that increasing the number of regulations and procedures often increases bureaucratization rather than school effectiveness, and despite evidence that school improvement is best accomplished at the building level, many state agencies have come up with new strategies that are demonstrably effective in improving local schools. (p. 594)

The intensity and manner in which states responded to the call to initiate school reform appeared to be related to the success of school reform efforts. Odden and Anderson (1986) concluded "states have created two general types of educational improvement programs, each of which can provide a conceptual framework for school leaders to guide the multi-textured process of improving education locally" (p. 582). One type of program was school based, focussed on processes, and utilized bottom-up change strategies such as engaging local school people in planning, problem solving, and program implementation. The other type of program was instructionally focused, concerned with outcomes, and utilized top-down change strategies designed to improve the skills of teachers and administrators. Farrar and Flakus-Mosqueda (1986) suggested that school based reform efforts differed from others in that:

> they do not advocate instructional or classroom management techniques that teachers are asked to master, nor do they include fixed standards that schools must attain. Instead, school based improvement programs outlined a process for schools to engage in that would enable faculties to identify problems and devise solutions of their own choosing. (p. 586)

In addition, certain conditions at both the state and local levels

influenced the success of school reform efforts. According to Anderson and Odden (1986), five factors contributed to the successful implementation of a state wide school improvement programs. First, the state environment, including political and demographic characteristics, were supportive. Second, the local environment, including current policies and practices, were supportive. Third, the school improvement program and strategies used to promote desired outcomes, were sound. Fourth, the current program and methods used to help schools change, were matched to the intended program. Finally, expected program outcomes were realistic and appropriate to the needs of the school.

Anderson and Odden (1986) also suggested that four conditions at the state level and five conditions within state departments of education influenced the success of school reform initiatives. The four conditions at the state level which influenced the success of school reform initiatives were: (a) state pressure to change, reform, or improve education; (b) state respect for the traditional balance between state and local control; (c) support from political leaders; and (d) discretionary money available to local districts and schools. The five factors within the state departments of education which influenced the success of the improvement programs were (a) political support within the department, (b) a collegial relationship with local school people, (c) adequate resources, (d) the structure and organization of the state department, and (e) an effort to develop local capacity through technical assistance.

While four general factors in the local environment negatively affected school performance in reform initiatives, two factors had a positive affect.

Local factors that negatively affected school performance were (a) turmoil caused by the reform, (b) innovation overload, (c) school/district size, and (d) school/district complexity. The two local variables that were positively associated with the successful implementation of school improvement programs were stability of staffing and leadership and good labor relations. Anderson and Odden (1986) concluded that nearly all these conditions were within the control of state and local education leaders.

Principal Centers

One way that state departments became involved in school reform was through the development of principals' centers. Concerning principals' centers, Wells and Gendler (1988) reported "Now, some five years into the 1980s reform movement, educators have become convinced that principals are powerful change agents for school improvement. As the formal head of the school, principals can and should have a positive influence on student achievement" (p. 2). According to Risan (1987), thirty-two states had some formal affiliation between state departments of education and at least one principals' center.

Similarly, Wallace (1987) reported "In recent years, many states and school districts have developed wide-ranging, costly and often compulsory staff development programmes designed to enhance the performance of teachers and principals" (p. 288). Contextually, principals' centers began at a time when the importance of principals as leaders was being recognized because of their role in initiating "top-down" staff development programs. Van der Bogert (1986) suggested that the idea of a principals' center was initially

conceptualized by Dr. Roland Barth, a staff member of the School of Education at Harvard University. Barth proposed that a university funded center would develop stronger links between the School of Education and key local practitioners.

According to Van Loon and Van Bryck (1985), a diversity of principals' centers developed. They reported that by 1985 there were 70 centers and in 1986 there were over 100 centers in operation. Nationally, centers differed concerning goals, funding, and the degree of principal involvement. Wallace (1987) reported:

> parties involved in setting up principals' centres included state departments, district offices, universities and principals' professional associations; funding may be through these groups, possibly augmented by finance from business concerns, private foundations, fees for activities and membership charges. Involvement of principals ranges from participation in events organized by others to offering activities and staffing the centre, and principals; control over centres ranges from having little formal influence on policy to constituting the majority of the planning and policy-making group. (p. 289)

West Virginia Principals' Academy

The 1985 West Virginia Principals' Academy attempted to implement school reform by providing sixteen days of intensive professional development for principals related to five correlates of effective schooling and a school based improvement model. This was accomplished through a ten day summer residential session and two three day follow-up sessions conducted in the fall

and spring. Although it is referred to as a "principals' academy", the West Virginia Principals' Academy shared many common characteristics with the contemporary conception of "principals' center". According to the Southern Regional Education Board (Effective School Principals, 1986).

> The term "academy" or "institute" implies a permanent staff, although not necessarily a single central location. Most are sponsored by state departments of education; a few by universities. Georgia State University, in conjuction with Atlanta University and surrounding school districts, has established an institute on its campus. The Vanderbilt Principals' Institute has been operating in Tennessee for several years. The Institute of Government at the University of North Carolina at Chapel Hill has implemented the Principals' Executive Program. Texas A & M University and Baylor University sponsor principals' centers; the University of Virginia has established the School Improvement Project for area administrators. (p. 14)

Principal centers have been organized in several districts in Virginia. The centers were organized by principals, directed by principals, and provided a collegial atmosphere for school leaders. An example was the Fairfax County (Virginia) Principals' Research group, planned and conducted by area principals, which focused on improvement in the district. Last year the group concentrated on allocation of instructional staff and funds to improve student learning. (p. 26)

Research concerning the impact of "principals' academies" is limited. However, Wallman (1987) conducted a study of the 1985 West Virginia

Principals' Academy which examined "the perceptions and actions of selected principals in West Virginia during their school improvement process in order to identify and describe leadership and change facilitator behaviors reportedly used by principals." (p. 5)

Wallman (1987) concluded:

1. There was no significant relationship between the leadership and change facilitator styles of these principals.
2. These principals espoused the philosophy of the Effective Schools Research.
3. Principals had a limited perception of their leadership role in the school improvement process.
4. School improvement occurred with very little central office involvement. (pp. 99 - 100)

Historical and Contextual Perspective

The effort to improve schools by utilizing the Principals' Academy concept represented a major component of a comprehensive, state level reform initiative developed and implemented by the West Virginia Department of Education. The comprehensive reform initiative was entitled the Master Plan for Public Education (1978). In implementing the Master Plan, the West Virginia Department of Education worked aggressively to focus the energy, commitment, and enthusiasm of educational leaders throughout the state on the business of teaching for learning. The department desired to increase learning, not just for the advantaged student but for all students attending West Virginia public schools. Two basic strategies were pursued to translate this

philosophy into practice.

According to J. Pisapia, Assistant Superintendent for the Bureau of General, Special, and Professional Education at the West Virginia Department of Education (personal communication, January, 1989), the first strategy focused on changing policy and operating procedures at the state, district, and school levels, which affected the way schools were operated. These policy changes reflected the belief that schools were the most appropriate level for substantial and sustained change to occur. However, restructuring the school site to focus on learning required significant changes in the way schools operated. Beginning in 1982, state level policy changes were adopted. The intent of these policy changes was to focus educators', parents', and students' attention on:

1. What students were expected to learn through the adoption of state minimal learning outcomes,

2. Requirements for staff development intended to create conditions in schools where students could master expected learner outcomes,

3. Requirements for schools to develop improvement plans to increase student learning,

4. Increasing collaboration between internal and external school communities via school advisory councils with broad representation from both,

5. Restructuring college training programs to be more sensitive to the public school curriculum, and

6. Increasing teachers input into certification standards.

Pisapia (personal communication, January, 1989) reported that at the

district and school levels, major restructuring also occurred. Teachers and principals were given the authority to and responsibility for establishing:

1. A curriculum based upon but not limited to the state adopted learning outcomes,

2. Individual time allocations for the delivery of the curriculum, and

3. Professional development programs designed to improve the delivery of those learner outcomes.

With this restructuring underway, a second complementary strategy was pursued. The West Virginia Department of Education designed and implemented a plan to provide state level leadership development for building principals. This plan for providing leadership development was implemented to support a school based focus on learning. The first leadership development activities for principals were provided during the 1983-84 school year with the establishment of the nations first state operated Principals' Academy.

Funding and Other Support

In 1983, a proposal was submitted to the West Virginia Legislature for funding of a Principals' Academy. However, funding was not initially received. After merging the concepts of a Principals' Academy and a Principal Assessment Center, a revised proposal intended to focus on principals, their selection, and leadership development was submitted. In 1984, the proposal was approved by the legislature which also appropriated $150,000 to initiate development activities. In addition, West Virginia began receiving Leadership in Education Administration Development (LEAD) grant funds from the United States Department of Education in 1987 which were used to conduct the

Principals' Academy, Principal Assessment Centers, and other leadership development activities throughout the state. LEAD grant funding amounted to approximately $145,000 making a total of approximately $295,000 available for leadership development activities.

The direct cost in materials, consultant fees, lodging, meeting facilities, meals, etc. of providing this training through the West Virginia Principals' Academy was approximately $110,000. An estimated $75,000 of indirect costs such as salaries paid to state department personnel and costs for implementing improvement initiatives at the school level were also incurred.

Not only has the Principals' Academy continued to be funded at essentially the same level each year, it has grown in stature, reputation, and effectiveness while adhering to the belief that the findings of effective schools research had the potential to substantially change education in West Virginia. The Principals' Academy has also led to other innovative leadership development opportunities for West Virginia's professional educators. For example, in 1985, a state sponsored Effective Schools Program was initiated to meet demands for district wide school effectiveness training. Also, a school effectiveness network was established by academy graduates. The Network conducted state wide conferences and produced a journal: The West Virginia Net.

Since 1984, five classes or 404 principals (a few assistant principals are included in this number) have graduated from the academy. There were 61 graduates in 1984, 67 in 1985, 86 in 1986, 94 in 1987 and 96 in 1988. However, this study was concerned with only the 1985 Principals' Academy.

Demographic Context

The total number of schools distributed throughout 55 county school systems in the state was 1096. Secondary or middle/junior high schools comprised 309 of the 1096 schools. Since the Principals' Academy was initiated in 1984, significant changes in demographic, political, and financial conditions in the state occurred. Demographically, the population of the state declined from 1,950,183 in 1984 to an estimated 1,919,000 in 1987. These figures represent a 1.6% reduction in the state population. The affect of this decline was a corresponding decrease in the student population in the public schools from 370,551 to 346,440 during the same time period. This 6.5% decrease in student population combined with a 3.5% increase in the number of teachers employed, reduced the state average pupil/teacher ratio from 16.74/1 to 15.13/1, the fifth lowest in the nation.

Other demographic conditions included a county mean of 56% of the adults 25 years of age or older that were high school graduates and 10.4% of the adults 25 years of age or older that completed four or more years of college. Also, state per capita income for 1983, when the Principals' Academy was conceived, was $8,938.00. The number of students eligible for free or reduced priced meals between 1984 and 1987 decreased by only 2.8% while the general student population decreased by 6.5% indicating a greater proportion of low socioeconomic students remaining in the public schools.

During this same time period, county mean student achievement of total basic skills as measured by the Comprehensive Test of Basic Skills (CTBS), the major component of the State/County Testing Program, rose by 5 points at the

third grade level, 4 points at the sixth grade level, declined by 3 points at the ninth grade level, and rose by 9 points at the eleventh grade level.

Unfortunately, these modest gains in achievement within the context of the changes in demographics could not defuse the political and financial pressure to legislatively reform education in the state. Before the impact of State Department of Education reform efforts could be realized, the state legislature in response to political and financial pressure, and armed with the findings of recent national reports on education, was contemplating a comprehensive educational reform bill.

Principals' Academy Design

The Academy was a substantial effort to train school principals in the basic tenets of effective schools research and the utilization of a school based improvement model to implement school reform initiatives. The West Virginia Department of Education described the Principals' Academy as a comprehensive and positive approach for working with principals and schools to improve achievement for all learners. According to the West Virginia Department of Education (Initiating, 1988), the Principals' Academy was based upon four assumptions:

1. The primary purpose of schooling in our society is teaching and learning.
2. The degree of a school's effectiveness must be judged in terms of student output measures, primarily student achievement measures.
3. An effective school is one which demonstrates both quality and equity in its student output measures.

4. There are many things over which the school has control that can significantly influence student achievement. (pp. 31-34).

The West Virginia Principals' Academy model for increasing school effectiveness recognized the key role of the building principal in the implementation of school reform initiatives. Valuable contributions to the development of the academy were made by numerous practicing principals who staffed the academy each year. The academy provided training for principals related to five correlates of effective schools that were generalized from the findings of effective schools research. The academy training stressed that these correlates could be enhanced at the school site. The West Virginia Department of Education (Initiating, 1988) defines these correlates as follows:

1. Strong instructional leadership which usually emanates from the principal and which gives direction, emphasis and support to the school's instructional program.
2. Positive school climate which evolves from a commonly agreed upon school purpose and is characterized as safe, orderly, businesslike, conducive to learning and free from bodily harm.
3. High expectations which reflect a belief by the total school community that all children can learn and that the staff can assist all students to learn.
4. Emphasis on academics that is exemplified in the utilization of resources (money, personnel, and time) to facilitate the delivery of a high quality educational program for all students.
5. Frequent monitoring of student achievement that enhances school

programs and facilitates curriculum improvement. (p. 37)

The school improvement process presented at the West Virginia Principals' Academy was research based, ongoing, and viewed change as a process rather than an event. It stressed the involvement of administration, staff, students, parents, and community in the analysis of current school conditions and planning for school improvements. Many recent research findings concerning successful staff development and planned change were incorporated into the design of the school improvement model. The following steps comprised the improvement model:

1. **Staff development** - The principal, as instructional leader, conducted schoolwide staff development concerning the findings of school effectiveness research. This staff development created an awareness among staff members concerning the research basis, assumptions and belief systems, and the improvement process related to creating effective schools that were presented at the academy.

2. **Forming a school improvement team** - Since the ultimate purpose of the school improvement process was to improve school outcomes by changing the culture of the school, the involvement of individuals who defined that culture was desired. Therefore, the involvement of a large number of people in the school improvement process was encouraged to positively affect morale, commitment, and cohesiveness and enhance school improvement efforts. This "bottom-up" approach was based upon three key assumptions: (a) each school had a unique culture embodied in the norms, beliefs, and attitudes of the people in that school, (b) the culture itself must be shaped to support any

potential school improvement, and (c) schools, as well as individuals, had the capacity for self-renewal and redirection.

3. **Collection and analysis of baseline data** - To determine school improvement goals and provide a benchmark against which the success of the school improvement efforts were measured, the schools identified specific student outcome measures to be improved. The selection of outcome measures (such as student achievement, staff and student attendance, dropout rates, discipline referrals, etc.) varied according to the unique needs of the school and were based upon what each school considered acceptable proof that it was effective, both in quality and equity of student outcomes. To assess equity, baseline data was collected and disaggregated.

4. **Establishing school outcome goals** - After data concerning outcome measures was collected and disaggregated, the school staff set long term (three year) and annual improvement goals. It was emphasized that these outcome goals be reasonably high but attainable and that they provided a yardstick by which schools measured their improvement.

5. **Collection and analysis of inventory data** - Data was collected to assess the presence of the correlates of an effective school: climate, instructional leadership, expectations, emphasis on academics, and monitoring of pupils and programs. The West Virginia School Effectiveness Inventory, which consisted of four separate questionnaires distributed to parents, students, teachers, and administrators, was used to collect information regarding the perceptions of these groups concerning the presence of the correlates at each school. The inventory assessed the presence of thirty-two key concepts related to the five

correlates presented at the academy. Completing the inventory required consideration of a number of logistical factors regarding administration of the inventory instrument.

Analyzing the inventory data provided information to the schools regarding perceptions held by various groups related to the thirty-two concepts and five correlates. A computer printout of inventory results was prepared by the State Department of Education for each school. The printout compared perceptions of parents, students, administrators, and teachers regarding the correlates of effective schools. Principals and improvement team members interpreted data to determine improvement priorities and lead the staff in a consensus building process related to improvement objectives.

6. **Identification of improvement objectives** - After consensus was obtained concerning the correlate(s) most in need of improvement and a clear understanding of improvement goals was established, the school staff determined specific improvement objectives and action steps that would be implemented to meet school goals.

7. **Development of a improvement plan** - Based upon goals resulting from the collection and analysis of baseline data and objectives resulting from the collection and analysis of inventory data, the staff developed an improvement plan. The plan formalized the improvement effort by describing school outcome goals, improvement objectives and action steps for accomplishing the objectives, timelines, and the names of persons responsible for each action step.

8. **Implementing the improvement plan** - Once the improvement plan

was developed, a management system to assure its continuation was established. The design of the management system depended largely on the size of the school. In a very small school, the principal acted as the primary coordinator and involved all teachers with specific responsibilities. In larger schools, the principal worked through a school improvement team. In either event, it was important that as many people as possible were involved in the improvement effort so that it did not appear the responsibility of just a few.

9. **Monitoring the improvement plan** - In order to evaluate the success of the improvement process, the principal assured that annual data collections included outcome data related to improvement goals and objectives. The improvement plan was reviewed annually. Data and the staff's best professional judgment were used to make revisions to the improvement plan as necessary.

Although modifications of this sequence were made to meet local needs, principals were encouraged to ensure that each step was preserved to obtain desired results. The State Department of Education's direct involvement in the improvement process ended at the completion of the West Virginia Principals' Academy which lasted one year. However, State Department of Education staff remained available to Academy participants for leadership activities, direct or indirect technical assistance, and monitoring of the improvement process.

Considered critical to the success of the academy was the commitment and support of the county superintendents. The initial support of the superintendent was to designate a principal to attend the Principals' Academy. Other support included the assignment of county central office staff to assist with the implementation of school improvement plans and identification of

other assistance needed by the principal. Central office support also took the form of calendar changes and financial assistance.

Summary

Both the input-output and process-outcome studies examined in this review left unresolved several issues concerning the affects of various inputs and processes on school outcome measures. It remained questionable to what degree certain inputs contributed to school performance. Equally questionable was the issue of to what degree certain processes contributed to school performance.

Process-outcome studies yielded substantial evidence that school processes did affect school outcomes. Purkey and Smith (1983) concluded that despite the problems perceived by some reviewers of the school effectiveness research "theory and common sense ... do support many of the findings" (p. 427). There was a considerable degree of replication in the research findings from various studies, differing in design and quality, concerning the importance of strong leadership, an orderly climate, and other school characteristics. Most importantly there was evidence that effective schools research was useful as a framework for school improvement programs.

Also, input-output studies revealed that student learning depended more on the people providing educational services than on school facilities and supplies. Student performance was consistently more sensitive to the quality of educational inputs than to their quantity. This suggested that the way school personnel utilized school resources was a more critical factor in student academic development than the number of resources available. The general

results of the input-output research underscored how important the quality of student-teacher interactions were to student learning. These studies consistently showed some characteristic of teachers to correspond with some measures of pupil performance. To a lesser degree, input-output research revealed an affect of school administrators on student achievement.

Yet, the examination of the West Virginia Principals' Academy clearly indicated that the academy curriculum was primarily focused on the correlates of effective schools identified by Ron Edmonds. Although a degree of consistency between the literature concerning processes for successfully implementing school improvement initiatives and the school improvement model presented at the academy was revealed in this review, there was evidence that schooling processes did not receive equal attention in the overall academy design and delivery. Also, questions remain as to whether or not a school reform initiative, such as the academy, can influence school outcome measures. Finally, this review clearly indicated that school input variables must be considered or statistically controlled for a valid assessment of the affects of the academy experience on school outcomes to be made.

Chapter III

Research Design

General Methodology

A quasi-experimental method of investigation and Nonrandomized Control-Group Pretest-Post Test design were used in this study to determine the significance of differences between experimental and control group schools on the various outcome measures. Regression analyses were used to determine from among eight schooling input variable(s) those most related to school performance on certain outcome measures and to produce residual scores for each school on each outcome measure. Elementary and secondary experimental and control group schools were matched according to pretest achievement scores and the input variable(s) most positively related to pretest scores in the regression analyses to ensure equivalence of experimental and control group schools.

Separate comparisons of experimental and control group data were conducted for elementary and secondary level schools. At each level, data were compared for experimental and control groups, low and high SES experimental groups and low and high SES control groups, and low and high implementation level experimental groups and control groups. The implementation level of the experimental group schools was determined by administering a Principals' Academy Follow-Up Survey (Appendix B) to experimental group principals after post test outcome data were collected for all schools in the sample. Schools scoring above the median were classified as high implementation level (HIL). Schools scoring below the median were classified as low implementation level

(LIL). Similarly, schools having SES levels below the median for the group were classified as low SES and schools having a SES level above the median for the group were classified as high SES.

A series of one-tailed T tests were conducted to determine the significance of any differences in residual scores between experimental and control groups, low and high SES experimental groups and low and high SES control groups, and low and high implementing experimental groups and control groups on each of the dependent variables. The dependent variables were total reading, math, and basic skills scores obtained on the Comprehensive Test of Basic Skills, attendance rates, and dropout rates, at the secondary level.

Issac and Michael (1981) recommended that the quasi-experimental method be used when the investigator wants to "approximate the conditions of the true experiment in a setting which does not allow the control and/or manipulation of all relevant variables" (p. 42). They further stated that "the researcher must clearly understand what compromises exist in the internal and external validity of his design and proceed within these limitations" (p. 42). According to Isaac and Michael (1981), when using the Nonrandomized Control-Group Pretest-Post Test design, "groups that are as similar as availability permits" should be selected. (p. 69)

Similarly, Kerlinger (1964) identified weaknesses due to the possible lack of equivalence between groups as a major concern in utilizing this design. He stated "researchers commonly take pains to establish equivalence by other means, and to the extent they are successful in doing so, to this extent the

design is valid" (p. 315). A summary of statistical work on the effectiveness of matching in reducing bias in nonrandomized samples by Cochran (1963) indicated that regression adjustment alone was generally superior to matching alone but that the combination of matching and regression adjustment generally appeared to be better than either alone.

According to Campbell and Stanley (1963), the major threats to internal validity when using the Nonrandomized Control-Group Pretest-Post Test design were regression (although questionable) and the interaction of selection and maturation. The major threat to external validity was the interaction of testing and the treatment. It was questionable as to whether or not threats to validity were posed by reactive arrangements and the interaction of selection and the treatment.

Specific Procedures and Data Treatment

The specific procedures and treatment of data in this study occurred in four major phases: (a) matching of elementary and secondary experimental and control group schools that comprised the sample for the study, (b) calculation of residuals scores for each elementary and secondary experimental and control group school on certain outcome measures, (c) classification of experimental group schools as high or low implementing based upon their responses on a Principals' Academy Follow-Up Survey (Appendix B) and classification of experimental and control group schools as high or low socioeconomic status (SES) based upon the percentage of students eligible for free or reduced priced meals and textbooks, and (d) comparing the performance of experimental and control group schools on certain residualized

outcome measures. The specific procedures used in the treatment of data for each phase of this study follow.

Matching Procedure

The matching procedure involved three steps: (a) collecting data concerning dependent and independent variables included in a Forward Stepwise Regression Analysis, (b) performing a Forward Stepwise Regression Analysis to determine which independent variable(s) most influenced the dependent variable, and (c) matching of experimental and control group schools based upon pretest total basic skills scores and the independent variable(s) that most influenced the dependent variable in the Forward Stepwise Regression Analysis.

The specific steps in the matching procedure were:

1. Data concerning the dependent variable (county mean total basic skills) for the third and ninth grades during the 1984-85 school year were obtained.

2. Data concerning the independent variables which appeared to influence school performance on the dependent variable in a review of the literature were obtained for the 1984-85 school year. The eight independent variables for which data were collected follow:

(a) county size - in terms of student population as reported in the West Virginia Report Card: Educational Trends 1981-82 through 1985-86,

(b) socioeconomic status - of the county schools as determined by the percentage of students eligible for free or reduced priced meals and text books (calculated by dividing the number of students eligible for free or

reduced priced meals and text books by the net enrollment),

(c) per capita income - of the county as reported in the West Virginia Report Card: Educational Trends 1981-82 through 1985-86,

(d) educational level of professional staff - in terms of the percentage of professional staff with a masters degree or beyond 'calculated by dividing the total number of professional personnel with masters degrees or more by the total number of professional personnel),

(e) years of experience - of the professional staff determined by the percentage of professional personnel with six or more years of experience (calculated by dividing the number of professional personnel with six or more years of experience by the total number of professional personnel),

(f) expenditures per pupil - as reported in the West Virginia Public Report Card: Educational Trends 1981-82 through 1985-86,

(g) average salary - per teacher as reported in the West Virginia Report Card: Educational Trends 1981-82 through 1985-86, and

(h) teacher pupil ratios - per 1000 students as reported in the West Virginia Report Card: Educational Trends 1981-82 through 1985-86.

3. A Forward Stepwise Regression Analysis was performed to determine the relative influence of each independent variable on mean county pretest scores in total basic skills for each of the 55 county school systems in the state of West Virginia.

4. Elementary and secondary experimental group schools were selected from a list of 67 schools where the principal participated in the 1985 West

Virginia Principals' Academy. Experimental group schools met two selection criteria: (a) an academy trained principal remained in the school from the pre to the post test period, and (b) the school had the necessary grade configuration (grades 3 and 6 or grades 9 and 11) to permit the collection of pre and post test data at the same school from the pre to post test period. Note. County superintendents selected principals from their counties who attended the 1985 Principals' Academy.

5. Potential elementary and secondary control group schools were determined. Control group schools had the necessary grade configuration (grades 3 and 6 or grades 9 and 11) to permit the collection of pre and post test data at the same school from the pre to post test period.

6. Pretest data concerning school mean total basic skills scores for all experimental and potential control group schools were obtained for the 1984-85 school year.

7. School data concerning the independent variable(s) that most influenced total basic skills performance in the previous Forward Stepwise Regression Analysis were obtained for the 1984-85 school year.

8. Experimental group schools were matched with potential control group schools on the basis of school mean pretest scores in total basic skills and the independent variable(s) which most strongly related to school pretest scores.

Determining Residual Scores

The second phase in the specific procedures and treatment of data for this study was to calculate residual scores for each experimental and control

group school on each dependent variable. This was accomplished by performing a series of multivariate regression analyses using the Statistical Analysis System (SAS). In these analyses, data related to the independent variables were regressed on each dependent variable for each experimental and control group school. The independent variables in each analysis were the same as those in the previous matching procedure except school level data were substituted for county level data wherever possible. The specific steps in calculating residual scores were:

1. Pretest data concerning the dependent variables (total reading, total math, total basic skills scores, average daily attendance rates, and dropout rates at the secondary level) were obtained for the third and ninth grades at all elementary and secondary experimental and control group schools for the 1984-85 school year.

2. Post test data for the dependent variables (total reading, total math, and total basic skills scores) from the 1987-88 (elementary) and 1986-87 (secondary) school year were obtained for the sixth and eleventh grades for all elementary and secondary experimental and control group schools.

3. Post test data concerning the dependent variables attendance rates and dropout rates (secondary level) were obtained for the sixth and eleventh grades for all elementary and secondary experimental and control group schools for the 1987-88 school year.

4. A series of Forward Stepwise Regression Analyses were performed to determine which independent variables most influenced each of the dependent variables at the experimental and control group schools. The independent

variables included in these Forward Stepwise Regression Analyses were the same as those in the previous Forward Stepwise Regression except: (a) school size was substituted for county size, (b) socioeconomic status of the school was substituted for the socioeconomic status of the county, and (c) pretest data for the appropriate dependent variables were added to the regression equations for the various analyses.

Note. Dependent variable data concerning attendance rates and dropout rates (secondary level) were included as independent variables in the Forward Stepwise Regression Analyses for the dependent variables total reading, total math and total basic skills.

5. A series of Multivariate Regression Analyses were performed to produce residual scores for each elementary and secondary experimental and control group school on the dependent variables (total reading, total math, total basic skills, attendance rates, and dropout rates secondary level). In these analyses, data concerning the independent variables selected in the previous Forward Stepwise Regression Analyses were regressed on each of the dependent variables.

Two assumptions were made regarding the residual scores obtained in this process. They were as follows: (a) if the gains in residual scores of experimental groups from pre to post test periods were significantly greater than gains of the control groups, it was assumed that the experimental groups were improving more than the control groups, and (b) if the gains in residual scores of experimental groups from pre to post test periods were not significantly greater than gains of the control groups, it was assumed that the

experimental groups were not improving more than the control groups.

Classification of Schools by Implementation Level and SES

The third phase in the specific procedures and treatment of data for this study was to determine the implementation and SES levels of the elementary and secondary experimental and control group schools. The specific steps in this phase were:

1. A Principals' Academy Follow-Up Survey (Appendix A), which assessed the level of implementation of the effective schools improvement process delivered at the Principals' Academy, was developed and field tested on the participants of the 1983-84 Principals' Academy.

2. A revised Principals Academy Follow-Up Survey (Appendix B), which assessed the level of implementation of the effective schools improvement process delivered at the Principals' Academy, was administered to the participants of the 1984-85 Principals' Academy.

3. The median implementation level of the experimental group schools was calculated. Schools scoring above the median were classified as high implementing schools. Schools scoring below the median were classified as low implementing schools.

4. Implementation data were used to regroup elementary and secondary experimental group schools according to level of implementation so that differences in performance on school outcome measures between control group schools and experimental group schools with high and low levels of implementation could be determined.

5. The SES levels of all elementary and secondary experimental and control group schools were obtained.

6. The median SES levels of all elementary experimental and control group schools were calculated. Schools with SES levels above the median were classified as high SES and schools with SES levels below the median were classified as low SES.

7. The median SES levels of all secondary experimental and control group schools were calculated. Schools with SES levels above the median were classified as high SES and schools with SES levels below the median were classified as low SES.

Determining the Significance of Differences in Experimental Group and Control Group Outcome Measures

A series of one-tailed T tests were performed to determine the significance of any differences between experimental group and control group residual scores on each dependent variable (total reading, total math, total basic skills, attendance rates, and dropout rates at the secondary level). The significance of differences in residual scores were analyzed for the following groups:

a. elementary experimental and control,

b. secondary experimental and control,

c. elementary high SES experimental and high SES control,

d. secondary high SES experimental and high SES control,

e. elementary low SES experimental and low SES control,

f. secondary low SES experimental and low SES control,

g. elementary high implementation level experimental and elementary control,

h. secondary high implementation level experimental and secondary control,

i. elementary low implementation level experimental and elementary control, and

j. secondary low implementation level experimental and secondary control.

By determining the significance of any differences between residual scores obtained by the above groups on each dependent variables, the hypotheses in this study were tested.

Instrumentation

Two instruments were used to collect data in this study. The Comprehensive Test of Basic Skills was used to obtain all academic achievement data and a Principals' Academy Follow-Up Survey (Appendix B) was used to determine the improvement process implementation level of experimental group schools.

Comprehensive Test of Basic Skills

The Comprehensive Tests of Basic Skills (CTBS) Form U was a norm referenced test administered in four grades to measure academic achievement throughout West Virginia. The CTBS was selected from among several achievement tests because it provided the best match to basic skills objectives in the state. The CTBS Form U consisted of a series of norm referenced, objectives based tests for kindergarten through twelfth grade. The series was

designed to measure achievement in the basic skills commonly found in state and district curricula. There were ten overlapping levels in Form U. The test levels and the grade ranges utilized in this study were:

Level E	2.6 - 3.9
Level G	4.6 - 6.9
Level J	8.6 - 12.9
Level K	10.6 - 12.9

All forms of the CTBS were validated and demonstrated to be reliable. The CTBS was considered the best standardized measure of student achievement available for this study. The West Virginia State/County Testing Program (SCTP) used a mixture of levels of the CTBS Form U at each grade. In 1984, a Test Review Committee, comprised of a wide representation of educators throughout the state, recommended this mixture of levels in order to have a better match between curriculum and test content.

Principals' Academy Follow-Up Survey

The Principals' Academy Follow-Up Survey (Appendix B) was a nine item questionnaire developed specifically for this study. The items on the questionnaire related directly to the steps in the school improvement process presented at the Principals' Academy. The experimental group principals were asked to respond to each item on the questionnaire by rating their perceptions of the level of implementation of each item at their school. A five point Likert scale was used to obtain responses. The original instrument (Appendix A) was field tested on participants from the 1983-84 Principals' Academy and found to have a split-half reliability coefficient of .81. The revised instrument (Appendix

B) was administered to experimental group principals who participated in the 1985 Principals' Academy and had a split-half reliability coefficient of .79.

Population and Sample

A sample of elementary and secondary schools was taken from a population of 1112 public schools in West Virginia during the 1984-85 school year. The sample consisted of thirty-five matched pairs of experimental group and control group schools at the elementary and secondary schools. The experimental group schools were selected from 67 schools where the principal attended the 1985 West Virginia Principals' Academy and which met two additional selection criteria. The first criteria was that the school had the necessary grade configuration (grades 3 and 6 at the elementary level or grades 9 and 11 at the secondary level) to permit the collection of both pre and post test data from the same school over the time of the study. The second criteria was that a Principals' Academy trained principal remained at the school from the pre to the post test period.

Control groups consisted of schools where the principal did not attend any West Virginia Principals' Academy or receive any other state or county sponsored effective schools training. Elementary and secondary control groups were selected from 804 schools which met the above criteria and also had the necessary grade configuration (grades 3 and 6 at the elementary level or grades 9 and 11 at the secondary level) to permit the collection of both pre and post test data from the same school over the time of the study.

Twenty-five elementary experimental and ten secondary experimental group schools were matched to an equal number of elementary and secondary

control group schools on the basis of pretest scores in total basic skills and the independent variable(s) which most positively related to school performance in total basic skills in a Forward Stepwise Regression Analyses performed using the Statistical Analysis System (SAS).

Data Collection

School outcome data (dependent variable) needed for this study included: (a) pre and post test CTBS expanded standard scores in total reading, math, and basic skills; (b) average daily attendance rates for each school; and (c) dropout rates for each secondary school. School input data (independent variable) needed for this study were pretest period measures for each of the independent variables included in the Forward Stepwise and Multivariate Regression Analyses. Also, survey data regarding the level of implementation of the effective schools improvement process by the experimental group schools were collected.

The collection of data in this study primarily involved the retrieval of: (a) CTBS data concerning the three academic outcome measures from the State Department of Education's State/County Testing Program files; (b) school level average daily attendance and dropout rate data from state required attendance and dropout reports; (c) data concerning independent variables from the West Virginia Report Card: Educational Trends 1981-82 through 1985-86; (d) school socioeconomic status data obtained from the Title I program files; and (e) data concerning the level of implementation of the effective schools improvement process at experimental group schools obtained from a Principals' Academy Follow-Up Survey. (Appendix B)

School outcome data for elementary experimental and control groups and secondary experimental and control groups were compared for a three year pre to post test period with the exception of academic achievement outcome data for secondary experimental and control groups which were compared for a two year pre to post test period. All groups were pre and post tested on achievement outcomes using the CTBS Form U which was administered to all third, sixth, ninth, and eleventh grade students in the state of West Virginia as the major component of the State/County Testing Program. All pretest scores (T1) were obtained from the 1984-85 testing year. Post test scores (T2) for the secondary groups were obtained from the 1986-87 testing year and post test scores (T2) for the elementary groups were obtained from the 1987-88 testing year. All data concerning the independent variables included in the Forward Stepwise Regression Analyses and Multivariate Regression Analyses were obtained for the 1984-85 school year. Data concerning the implementation level of the school improvement process presented at the 1985 Principals' Academy for each experimental group school were obtained by conducting a survey during the summer of 1988.

Note. Any data which existed as percentages were converted to ARCSINS.

According to Freud and Williams (1966), this transformation was often used to make data consisting of proportions (or frequencies) amenable to analysis of variance or regression techniques. A conversion table contained in the book Statistical Methods written by Snedecor and Cochran (1967) was used to make these transformations.

Summary

The experimental method and research design used in this study offered a number of important advantages in assessing the possible interaction affects between the treatment (Principals' Academy training) and certain school outcomes. The method and design were more adequate than the trend data analysis or simple correlational methods used in most studies of this type. The use of a quasi-experimental method of investigation was appropriate for this study. In fact, Issac and Michael (1981) recommended that the quasi-experimental method be used when the investigator wants to "approximate the conditions of the true experiment in a setting which does not allow the control and/or manipulation of all relevant variables" (p. 42). They further stated that "the researcher must clearly understand what compromises exist in the internal and external validity of his design and proceed within these limitation". (p. 42)

The use of the Nonrandomized Control-Group Pretest-Post Test design was also appropriate for this study. However, Isaac and Michael (1981) stated that when using the Nonrandomized Control-Group Pretest-Post Test design, "groups that are as similar as availability permits" (p. 69) should be selected. Also, Kerlinger (1964) identified weaknesses due to the possible lack of equivalence between groups in variables other than the treatment as a major concern in utilizing this design. He states "researchers commonly take pains to establish equivalence by other means, and to the extent they are successful in doing so, to this extent the design is valid." (p. 315)

Equivalence between experimental and control groups was established in

this study by using a matching technique. A summary of statistical work on the effectiveness of matching in reducing bias in nonrandomized samples by Cochran (1963) indicated that regression adjustment alone was generally superior to matching alone but that the combination of matching and regression adjustment generally appeared to be better than either alone. Both matching and regression adjustment were used in this study.

According to Campbell and Stanley (1963), the major threats to internal validity when using the Nonrandomized Control-Group Pretest-Post Test design were regression (although questionable) and the interaction of selection and maturation. The major threat to external validity was the interaction of testing and the treatment. It was also questionable as to whether or not threats were posed by reactive arrangements and the interaction of selection and the treatment. Because of these threats, extensive efforts were made to ensure equivalence of experimental and control groups in this study. These efforts were designed to control as many extraneous variables as possible thus reducing the threats to internal and external validity.

Chapter IV

Findings

Introduction

The treatment of data in this study occurred in four major phases: (a) matching elementary and secondary experimental and control group schools, (b) determining residual scores for each elementary and secondary experimental and control group school, (c) classifying experimental group schools by level of implementation of the school improvement process presented at the academy and classifying experimental and control group schools as high or low socioeconomic status (SES), and (d) comparing the performance of experimental and control group schools on various outcome measures. The findings of these procedures will be reported in the same order as the procedures were presented above.

Matching Procedure

The matching procedure involved three steps: (a) collecting data concerning dependent and independent variables, (b) performing a Forward Stepwise Regression Analysis that determined which independent variables most influenced county schools' performance on the dependent variable total basic skills in the 55 county school districts in West Virginia, and (c) matching experimental with control group schools based upon pretest measures obtained on the dependent variable total basic skills and the independent variable that most influenced the dependent variable in the Forward Stepwise Regression Analysis. The findings matching procedure for experimental and control group schools follow.

Data Collection

Data were collected as outlined in Chapter III. All county data concerning the dependent and independent variables that were included in the Forward Stepwise Regression Analysis are contained in Appendix C.

Forward Stepwise Regression Analysis

A Forward Stepwise Regression Analysis was performed to determine those independent variables that most influenced performance on the dependent variable. The dependent variable was the total basic skills score obtained by each of the 55 county school districts in West Virginia. The independent variables were socioeconomic status (SES), per capita income, average daily attendance, expenditures per pupil, teacher experience, teacher education, teacher/pupil ratio, teacher salaries, and county size. The r square value of the regression model was .44 and the F value was 1.00. There was a 32% probability of a greater F value occurring. The Forward Stepwise Regression Analysis identified four independent variables that influenced county schools' performance on the dependent variable at the .50 level of significance. The results of the Forward Stepwise Regression Analysis are included in Table 1.

Table 1

Variables Influencing County Performance on Total Basic Skills

Variable Entered	DF	Partial R**2	Model R**2	F Value	Prob>F
SES	54	0.34	0.34	27.08	0.0001
T/P Ratio	54	0.08	0.42	6.95	0.0110
Income	54	0.01	0.43	0.87	0.3567
Size	54	0.01	0.44	1.00	0.3216

Note. No other variables met the .50 significance level required for inclusion in the regression model. DF = Degrees of freedom; SES = Socioeconomic status; T/P = Teacher/Pupil.

A summary of the number of observations, means, standard deviations, minimums, maximums, and ranges for all dependent and independent variables included in the Forward Stepwise Regression Analysis of county level data were reported in Table 2. Clearly, the independent variables that most influenced county school districts' performance on total basic skills measures were SES and teacher/pupil ratio.

Other independent variables that influenced total basic skills measures at the .50 level of significance were county per capita income and county size. However, these independent variables did little to improve the r square value and greatly increased the probability of error (Prob>F) of the regression model. Experimental and control group schools were matched according to SES and

teacher/pupil ratio. These two independent variables accounted for 42% of the variance on the dependent variable with an F value of 6.95 and only a 1% probability of a greater F value occurring.

Table 2

County Level Data Included in the Forward Stepwise Regression Analysis

Variable	N	Mean	SD	Minimum	Maximum	Range
Total Basic Skills	55	1372.5	23.5	1330.8	1469.7	38.9
SES	55	41.9	7.3	28.4	58.8	30.4
Per Capita Income	55	8718.7	1439.5	6108.0	12499.0	63391.0
Expenditure Per Student	55	2814.8	258.9	2451.0	4008.0	1557.0
Teacher Experience	55	60.5	4.4	50.2	75.6	25.4
Teacher Education	55	41.6	4.9	30.5	53.7	23.2
Teacher/ Pupil Ratio	55	15.5	1.1	12.5	17.3	4.8
Teacher Salary	55	19453.0	742.4	18199.0	22526.0	4327.0
County Size	55	6493.0	6062.5	1107.0	38012.0	36905.0

Note. N = Number of schools; SD = Standard Deviation; SES = Socioeconomic status.

Matching Experimental and Control Group Schools

The independent variables SES and teacher/pupil ratio, and the dependent variable total basic skills were used to match elementary experimental group and elementary control group schools. Data concerning these variables were included in Appendix D. Experimental and control group schools were presented as matched pairs under the heading "Match Number" and the differences in SES, total basic skills, and teacher/pupil ratios between each matched experimental and control group school were presented under the heading "Difference". The range of differences in total basic skills measures between matched elementary experimental group and control group schools was 0 to 15.4. The difference of 15.4 was an outlier with the next greatest difference being 7.0. The range of differences in SES levels between matched elementary experimental group and control group schools was .1 to 7.9. The range of differences in teacher/pupil ratios between matched elementary experimental group and control group schools was 12.52 to 17.33. Total basic skills measures represented expanded standard scores obtained on the CTBS and SES measures represented percentages of students qualifying for free or reduced lunches. Teacher/pupil ratios represented the number of teachers per 1000 students in the county where the school was located. As illustrated in Appendix D, 25 elementary experimental group schools were matched with an equal number of equivalent elementary control group schools.

Similarly, the independent variables SES and teacher/pupil ratio, and the dependent variable total basic skills were used to match secondary experimental group and secondary control group schools. Data concerning

these variables were included in Appendix E. Experimental and control group schools were presented as matched pairs under the heading "Match Number" and the differences in SES, total basic skills, and teacher/pupil ratios between each matched experimental and control group school were presented under the heading "Difference". The range of differences in total basic skills measures between matched secondary experimental group and control group schools was 0 to 9.2. The differences of 9.2 and 6.5 were outliers with the next greatest difference being 3.3. The range of differences in SES levels between matched secondary experimental group and control group schools was .4 to 14.9. The differences of 14.9 and 7.7 were outliers with the next greatest difference being 2.6. The range of differences in teacher/pupil ratios between matched secondary experimental group and control group schools was 13.4 to 17.3. As illustrated in Appendix E, 10 secondary experimental group schools were matched with an equal number of equivalent secondary control group schools.

In summary, the matching procedure outlined above produced equivalent pairs of experimental and control group schools at the elementary and secondary levels. Considering that additional regression adjustments were made to the dependent variables before comparisons of experimental group and control group performance were made, valid comparisons were possible.

Determining Residual Scores

In the second phase of the treatment of data, residual scores were calculated for each experimental group and control group school on each dependent variable. This was accomplished by performing two procedures: (a)

a series of Forward Stepwise Regression Analyses which determined those independent variables that most influenced school performance on each of the dependent variables at the elementary and secondary levels, and (b) a series of Multivariate Regression Analyses which regressed the pretest dependent variable and those independent variables that influenced pretest measures in the Forward Stepwise Regression Analyses onto the post test measures for each dependent variable at each school.

Forward Stepwise Regression Analyses

In the first procedure, a series of Forward Stepwise Regression Analyses were performed to determine those independent variables that most influenced school performance on each of the dependent variables at the elementary and secondary levels. The independent variables in the Forward Stepwise Regression Analyses were the same as those in the previous matching procedure except school level data were substituted for county level data for the variables SES and school size. School level data were also substituted for county level data for the dependent variables, total reading, math, and basic skills, attendance rates, and dropout rates (secondary level). All data considered in the Forward Stepwise Regression Analyses for elementary and secondary schools are included in Appendices F and G respectively. However, a summary of the independent variables that most influenced elementary and secondary school performance on each of the dependent variables in the Forward Stepwise Regression Analyses is presented in Table 3.

Table 3

Independent Variables Influencing Dependent Variables at the School Level

Independent Variables	Dependent Variables				
	Total Reading	Total Math	Total Skills	Attendance Rates	Dropout Rates
Socioeconomic Status	Elem.		Elem.	Sec.	NA
County Income Mean	Sec.		Elem.		NA
Teacher Education		Elem.	Elem. Sec.	Sec.	NA Sec.
Teacher Experience	Sec.	Sec.	Sec.	Elem. Sec.	NA
Teacher Salaries		Elem.	Elem.	Elem. Sec.	NA NA
Teacher/Pupil Ratio		Elem.		Sec.	NA Sec.
Expenditures/Pupil		Elem. Sec.		Sec.	NA Sec.
School Size	Elem.	Elem.	Elem.	Elem.	NA Sec.
School Attendance	Sec.	Elem. Sec.	Elem. Sec.	Elem. Sec.	NA Sec.
Pretest Measures	Elem. Sec.	Elem. Sec.	Elem. Sec.	NA NA	NA NA

Note. Elem. = Elementary; Sec. = Secondary; NA = Not Applicable.

Those independent variables that most influenced schools performance were included in the regression equations for a series of Multivariate Regression Analyses to produce residual scores for each school on each dependent variable. For example, the independent variables included in the regression equation to determine residual scores for the dependent variable "Total Reading" at the elementary level were: SES, school size, and pretest scores in total reading. Likewise, the independent variables included in the regression equation to determine residual scores for the dependent variable "Total Reading" at the secondary level were: income, teacher experience, school attendance, and pretest reading performance.

A summary of the number of observations, means, standard deviations, minimums, maximums, and ranges for all dependent and independent variables included in the Forward Stepwise Regression Analysis of elementary and secondary data are reported in Appendices H and I respectively. A complete reporting of the results of the Forward Stepwise Regression Analyses for each dependent variable at the elementary level can be found in Appendix J. Similarly, a complete reporting of the results of the Forward Stepwise Regression Analyses for each dependent variable at the secondary level can be found in Appendix K.

Multivariate Regression Analysis

In the second procedure, a series of Multivariate Regression Analyses were performed to produce residual scores for each school on each dependent variable. In these analyses, data concerning the independent variables selected in the previous Forward Stepwise Regression Analyses and pretest measures for

the appropriate dependent variable were regressed onto the post test measures obtained by each school on each of the dependent variables. As illustrated in table 3, different independent variables were included in each of the regression equations for the different dependent variables at the elementary and secondary levels.

The number of observations, means, standard deviations, minimums, maximums, and ranges, of residual scores obtained in total reading, math, and basic skills, and attendance rates by the various experimental and control groups at the elementary level were included in Appendix L. However, a summary of the multivariate regression models which produced residual scores for each dependent variable at the elementary level is reported in Table 4. Also, the residual scores obtained by elementary schools on each dependent variable are reported on Table 5.

Table 4

Summary of the Multivariate Regression Models for Each Dependent Variable at the Elementary Level

Variable	N	DF	R Square	F Value	Prob>F
Reading	50	49	.38	9.46	.0001
Math	50	49	.26	2.11	.0635
Total	50	49	.26	2.11	.0635
Attendance	50	49	.15	1.06	.4041

Note. N = Number of schools; DF = Degrees of freedom.

Table 5

Residual Scores for Elementary Group Schools on Each Dependent Variable

Match Number	School Number	Group* Residual	Read Residual	Math Residual	TBS Residual	Attendance
1	28	1	6.77	1.55	6.38	.75
1	29	2	-2.46	3.46	-.17	-.75
2	7	1	-5.65	.72	1.42	-1.45
2	21	2	-32.12	-15.55	-19.96	2.24
3	38	1	12.71	-5.06	5.64	4.89
3	23	2	-8.12	-4.63	-5.43	-10.0
4	35	1	3.39	5.36	7.30	1.53
4	20	2	-6.15	-3.84	-4.99	-2.91
5	48	1	9.47	-2.89	1.40	6.06
5	50	2	-5.80	-2.82	-4.05	4.72
6	19	1	2.17	4.27	2.38	-2.59
6	12	2	4.47	5.01	7.08	-.06
7	11	1	-4.69	-7.67	-3.40	-3.63
7	15	2	3.75	4.11	6.09	-4.66
8	22	1	-8.22	-.10	-5.58	-1.16
8	30	2	-29.89	-6.46	-17.32	2.77
9	47	1	35.63	23.64	27.61	3.53
9	49	2	-9.60	-14.04	-13.89	5.70
10	2	1	-11.08	-4.95	-9.72	1.45
10	36	2	-3.67	-8.72	-2.80	1.21
11	40	1	17.91	1.83	7.27	-2.88
11	32	2	-18.06	5.74	8.49	.05

(table continues)

Match Number	School Number	Group* Residual	Read Residual	Math Residual	TBS Residual	Attendance
12	24	1	8.37	2.30	5.81	.09
12	25	2	.45	-7.66	2.40	-1.11
13	16	1	10.61	6.78	1.55	.70
13	17	2	-11.39	.96	-7.12	2.34
14	34	1	3.01	11.30	11.45	1.97
14	9	2	12.02	11.50	3.43	-2.18
15	45	1	-11.59	-9.54	-12.34	1.14
15	26	2	8.18	1.01	4.91	-2.94
16	41	1	9.65	-1.67	.58	3.54
16	10	2	20.52	1.52	4.47	5.52
17	46	1	-12.80	-8.38	-12.54	-.71
17	3	2	6.42	-3.36	2.75	4.09
18	43	1	-10.49	-7.31	-15.83	-2.13
18	37	2	.62	-6.73	-4.88	3.91
19	44	1	-1.75	-9.78	-5.05	2.45
19	4	2	-2.43	1.47	-2.58	3.54
20	5	1	3.15	-2.43	-.17	5.11
20	6	2	11.37	4.78	5.04	.45
21	27	1	-1.50	1.19	.62	-5.59
21	18	2	-14.77	2.30	-5.23	-3.58
22	42	1	16.18	13.63	12.68	-6.23
22	33	2	26.24	11.82	18.77	-2.74
23	14	1	6.48	7.37	3.12	-1.62
23	39	2	12.69	8.91	11.28	4.25

(table continues)

Match Number	School Number	Group* Residual	Read Residual	Math Residual	TBS Residual	Attendance
24	8	1	7.36	9.17	6.46	-2.74
24	31	2	-13.40	-5.74	-10.13	-.22
25	13	1	14.16	-3.87	3.53	-8.99
25	1	2	-26.89	-8.51	-16.72	8.26

Note. * = school level data; Group 1 = Experimental; Group 2 = Control; TBS = Total basic skills.

Pretest measures and independent variables selected in the Forward Stepwise Regression Analyses were also regressed onto the post test measures for each of the dependent variables for all secondary schools using Multivariate Regression Analyses. The number of observations, means, standard deviations, minimums, maximums, and ranges, of residual scores obtained in total reading, math, and basic skills, attendance rates, and dropout rates by the various experimental and control groups at the secondary level were reported in Appendix M.

A summary of the multivariate regression models which produced residual scores for each dependent variable at the secondary level is reported in Table 6. Also, the residual scores obtained by secondary schools on each dependent variable are reported in Table 7.

Table 6

Summary of the Multivariate Regression Models for Each Dependent Variable at the Secondary Level

Variable	N	DF	R Square	F Value	Prob > F
Reading	20	19	.72	9.47	.0005
Math	20	19	.88	27.20	.0001
Total	20	19	.89	31.69	.0001
Attendance	20	19	.63	2.38	.0917
Dropout	20	19	.82	6.13	.0037

Note. N = Number of schools; DF = Degrees of freedom.

Table 7

Residual Scores for Secondary Group Schools on Each Dependent

Match No.	School No.	Group.*	Drop. Res.	Att. Res.	Read Res.	Math Res.	TBS Res.
1	13	1	-3.14	-1.15	-3.24	-.75	-1.91
1	14	2	1.68	.83	-3.54	1.23	.25
2	1	1	-1.46	-1.11	2.50	4.33	5.05
2	2	2	2.55	-2.24	-12.65	.34	-5.79
3	17	1	2.82	2.16	.25	.62	1.53
3	18	2	-.85	-1.92	-3.19	-5.09	.42
4	11	1	-.05	.-93	2.19	-.67	-.43
4	12	2	-2.03	4.80	16.75	-1.07	6.48
5	7	1	-2.04	4.15	-.68	.29	-.67
5	8	2	2.00	1.20	5.32	1.97	5.20
6	19	1	.34	-1.84	-.49	-1.52	-.25
6	20	2	-.11	-1.24	-3.40	-1.59	-3.31
7	3	1	.20	.34	-1.79	-3.03	-3.22
7	4	2	.25	-3.92	5.80	-1.43	.68
8	15	1	1.27	2.97	-3.89	-.18	-3.57
8	16	2	1.40	-.24	-5.61	4.28	-1.19
9	9	1	-1.72	-1.40	-2.88	-.06	-.79
9	10	2	-1.31	1.28	5.57	.27	.77
10	5	1	.02	-1.75	-3.33	-1.94	-3.82
10	6	2	.21	-.01	6.30	4.00	4.58

Note. * = School level data; Group 1 = Experimental; Group 2 = Control; No. = Number; Drop. = Dropout rates; Res. = Residuals; Att. = Attendance rates; TBS = Total basic skills.

The amount of variance from pre to post test periods on the outcome measures examined at the elementary level decreased significantly for total reading, total basic skills, and attendance rates. However, the amount of variance from the pre to post test period for total math at the elementary level increased significantly. The amount of variance from pre to post test periods on outcome measures examined at the secondary level decreased modestly for reading, math, total basic skills, and attendance rates but the amount of variance in secondary dropout rates increased.

Also, different independent variables influenced outcome measures at the elementary and secondary levels. Total reading residuals were affected by SES, school size, and pretest measures at the elementary level and by county income, teacher experience, school attendance, and pretest measures at the secondary level. The only independent variable common to both elementary and secondary schools, in terms of influencing the dependent variable total reading, were pretest measures.

Total math residuals were affected by teacher education, teacher salary, teacher/pupil ratio, expenditures per pupil, school size, school attendance, and pretest measures at the elementary level. The only independent variables that did not affect total math at the elementary level were SES and county per capita income, two socioeconomic status indicators, and teacher experience. At the secondary level total math was affected by teacher experience, expenditure per pupil, school attendance, and pretest measures. The independent variables common to both elementary and secondary schools, in terms of affecting total math, were expenditures per pupil, school attendance,

and pretest measures.

Total basic skills residuals were affected by SES, income, teacher education, teacher salary, school size, school attendance, and pretest measures at the elementary level. While at the secondary level, total basic skills were affected by teacher education, teacher experience, school attendance, and pretest measures. The independent variables common to both elementary and secondary schools, in terms of affecting total basic skills, were teacher education, school attendance, and pretest measures.

Student attendance at the elementary level was affected by teacher experience, teacher salary, and pretest attendance. At the secondary level, student attendance was affected by SES, teacher education, teacher experience, teacher salary, teacher/pupil ratio, expenditure per pupil, and pretest attendance measures. The only independent variables common to both elementary and secondary schools, in terms of affecting student attendance were teacher experience, teacher salary, and pretest attendance measures. Finally, dropout rates at the secondary level were influenced by teacher education, teacher salary, teacher/pupil ratio, expenditures per pupil, school size, attendance rates, and pretest dropout rates.

Data aggregated at the school level, as opposed to the county level, revealed different relationships between the independent and dependent variables in regression analyses. SES, the independent variable that most influenced county school's performance in the first Forward Stepwise Regression Analysis, still influenced total basic skills and reading measures at the elementary level. However, it did not influence elementary total math and

attendance measures when data were aggregated at the school level. Also, SES only influenced secondary attendance rates when data were aggregated at the school level. Likewise, teacher/pupil ratio, which had the second greatest influence on county school's performance on total basic skills measures, only influenced elementary total math performance and secondary attendance and dropout rates when data were aggregated at the school level. Similarly, county per capita income, which had the third greatest influence on county schools total basic skills measures, only influenced elementary total basic skills and secondary total reading when data were aggregated at the school level. Finally, school or county size, which had the fourth greatest influence on county school's performance in total basic skills, influenced elementary school performance on all outcome measures but only influenced secondary dropout rates.

Conversely, school attendance, which did not influence county school's performance on any outcome measures at the .50 level of significance, influenced both elementary and secondary school performance on all outcome measures, except elementary total reading, when data were aggregated at the school level. Similarly, teacher education which did not impact county school's performance on any outcome measures at the .50 level of significance, influenced elementary total reading and basic skills and secondary total basic skills, attendance, and dropout rates when data were aggregated at the school level. Likewise, teacher experience which did not influence county school performance on any outcome measure at the .50 level of significance, influenced elementary attendance rates and secondary total reading, math, and

basic skills, and attendance rates when data were aggregated at the school level. Also teacher salaries which did not influence county school performance on any outcome measure at the .50 level of significance, influenced elementary total math, basic skills, and attendance rates, and secondary attendance and dropout rates when data were aggregated at the school level. Finally, county expenditures per pupil which did not influence county school performance on any outcome measure at the .50 level of significance, influenced both elementary and secondary total math and secondary attendance and dropout rates when data were aggregated at the school level.

The number of independent variables influencing school performance on all outcome measures also varied significantly for elementary and secondary schools and for different dependent variables. Elementary total reading was influenced by three independent variables. Elementary math was influenced by seven independent variables. Elementary total basic skills was influenced by seven independent variables. Elementary attendance rates were influenced by four independent variables.

Similarly secondary total reading was influenced by four independent variables. Secondary total math was influenced by four independent variables. Secondary total basic skills were influenced by four independent variables. Secondary attendance rates were influenced by seven independent variables. Finally, secondary dropout rates were influenced by seven independent variables.

Elementary total math and basic skills were influenced by more independent variables than elementary total reading and attendance rates.

Secondary attendance and dropout rates were influenced by more independent variables than secondary total reading, math, and basic skills.

Classifying Schools by Socioeconomic Status (SES) and Implementation Level

The third phase in the specific procedures and treatment of data for this study was to determine the implementation and SES levels of the elementary and secondary experimental and elementary and secondary control group schools. Before the hypotheses were tested by comparing residual scores of various groups on each of the dependent variables, elementary and secondary experimental and elementary and secondary control group schools were classified as high or low implementers of the school improvement process presented at the academy and as high or low socioeconomic status (SES). Both classifications were accomplished by determining the median implementation score or SES level of all elementary or secondary group schools and classifying those schools that fell above the median implementation score or SES level as high implementers or high SES and those schools that fell below the median implementation score or SES level as low implementers or low SES. The specific procedures used and findings from this phase of the treatment of data follow.

Classification of Schools by SES Level

The SES levels of all elementary and secondary experimental and elementary and secondary control group schools were ascertained. The median SES levels of all elementary and secondary, experimental and control group schools were calculated. Schools with SES levels above the median were classified as high SES and schools with SES levels below the median were

classified as low SES within either the elementary and secondary levels. Using the median scores to classify elementary and secondary schools as high or low SES assured that equivalent numbers of schools were in both groups.

Classification of Schools by Implementation Levels

The implementation levels of all elementary and secondary experimental and elementary and secondary control group schools were ascertained by administering a Principals' Academy Follow-Up Survey (Appendix B). The median implementation levels of all elementary and secondary, experimental group schools were calculated. Schools with implementation levels above the median were classified as high implementation level (HIL) and schools with implementation levels below the median were classified as low implementation level (LIL) within either the elementary and secondary levels.

The implementation scores and SES levels of all elementary group schools are presented in Appendix N. The SES classification of each school is designated by assigning schools to SES group 3 or 4. The implementation level classification of each school is designated by assigning schools to implementation group 5 or 6. Also, the median implementation score and SES levels are identified. The range of implementation scores obtained by elementary experimental group schools on the Principals' Academy Follow-Up Survey (Appendix B) was 10 to 45 with a median score of 30. The range of SES levels of elementary experimental and elementary control group schools, as determined by the percentages of students eligible for free or reduced lunches, was 26 to 84.1 with a median of 55.6.

The implementation scores and SES levels of all secondary group schools

are presented in Appendix O. The SES classification of each school is designated by assigning schools to SES group 3 or 4. The implementation level classification of each school is designated by assigning schools to implementation group 5 or 6. Also, the median implementation score and SES levels are identified. The range of implementation scores obtained by secondary experimental group schools on the Principals' Academy Follow-Up Survey (Appendix B) was 25 to 42 with a median score of 33. The range of SES levels of secondary experimental and secondary control group schools, as determined by the percentages of students eligible for free or reduced lunches, was 1 to 64.1 with a median of 36.9. After each elementary and secondary experimental group school was classified as either high or low implementers of the school improvement process presented at the academy and as either high or low SES level, residual scores were compared.

The Principals' Academy Follow-Up Survey

The Principals' Academy Follow-Up Survey (Appendix B) was a nine item questionnaire developed specifically for this study. The items on the questionnaire related directly to the steps in the school improvement process presented at the Principals' Academy. The experimental group principals were asked to respond to each item on the questionnaire by rating their perceptions of the level of implementation of each item at their school. A five point Likert scale was used to obtain responses. The original instrument (Appendix A) was field tested on 22 participants from the 1983-84 Principals' Academy and found to have a split-half reliability coefficient of .81. The revised instrument (Appendix B) was administered to 35 experimental group principals who

participated in the 1985 Principals' Academy and had a split-half reliability coefficient of .79.

The responses of the experimental group principals to the Principals' Academy Follow-Up Survey are reported in table 8. The percentages of low (1 and 2), average (3), and high (4 and 5) responses reported by all respondents on each item are indicated. Interestingly, 97% of the respondents indicated that they felt the implementation of effective schools research has improved the conditions for learning at their schools. Yet, only 60% of the respondents reported that they had formed school improvement teams at their schools. The formation of a school improvement team was presented as a cornerstone of the school improvement process presented at the academy. Furthermore, as a group, only 40% of the respondents reported that the school improvement teams at their schools meet on a regular basis and only 29% of the respondents indicated that the school improvement teams at their schools are involved in the collection and disaggregation of baseline data. Both the regular meeting of the school improvement team and the collection and disaggregation of baseline data were also presented as keys to school improvement at the academy.

Table 8

Item Analysis of the Responses of Experimental Group Principals on the Principals' Academy Follow-Up Survey

	Implementation Rankings		
Item Number	% Low	% Average	% High
1. I have conducted staff development sessions at my school concerning effective schools research.	3 %	20 %	77 %
2. My school has formed a school improvement team which is responsible for building level implementation of effective schools research.	14 %	26 %	60 %
3. The school improvement team meets at least every two months to discuss and recommend school improvements.	46 %	14 %	40 %
4. The school improvement team collects and disaggregates baseline data concerning my school.	52 %	20 %	29 %
5. I have conducted the West Virginia effective schools inventory at my school.	17 %	6 %	77 %

(table continues)

	Implementation Rankings		
Item Number	% Low	% Average	% High
6. The school improvement team uses the findings from disaggregating baseline data and from the effective schools inventory to develop long and short term goals for the school.	35 %	14 %	54 %
7. My school has a school improvement plan which was developed to implement effective schools research.	3 %	23 %	74 %
8. Most of the staff at my school have agreed to the long and short term improvement goals developed by the school improvement team and included in the school improvement plan	3 %	23 %	74 %
9. I feel the implementation of effective schools research has improved the conditions for learning at my school.	0 %	3 %	97 %

Comparing the Performance of Experimental Group and Control Group Residuals on Outcome Measures

Residual scores obtained by each school on each dependent variable were used to compare the performance of experimental groups and control groups, low SES experimental groups and low SES control groups, high SES experimental groups and high SES control groups, low implementing experimental groups and control groups, and high implementing experimental groups and control groups at the elementary and secondary levels. Separate comparisons of experimental and control group data were conducted. A series of one-tailed T tests were used to determine the significance of any differences in residual scores obtained by the various experimental and control groups on each of the dependent variables.

Elementary Group Comparisons

The findings were mixed at the elementary level. The mean residual score obtained by the experimental group schools were higher than the control group schools on all three academic achievement measures but lower on attendance measures as illustrated in Table 9. The differences in total reading were significant at the .05 level. The differences in total math, basic skills, and attendance rates were not significant.

Table 9

Elementary Residuals by Group for Each Dependent Variable

	Reading	Math	Basic Skills	Attendance
Experimental	3.12	1.02	1.62	.26
Control	-4.38	-.92	-1.82	.26
Difference	** 7.50	1.94	3.44	.52

Note. ** = Significant difference at the .05 level.

Hypothesis 1 stated that elementary experimental group schools will demonstrate significantly higher gains in total reading, math, basic skills, and attendance rates than will elementary control group schools. The results of the one-tailed T test which compared residual scores obtained by elementary experimental and control groups did not support hypothesis 1 except for total reading.

When academic achievement and attendance rates of low SES elementary experimental and low SES elementary control groups were compared, the mean scores obtained by the low SES experimental group schools were again higher than those obtained by the control group on all three achievement measures but lower on attendance rates as illustrated in Table 10. Differences in favor of the experimental group in both total reading and basic skills were significant at the .01 level, but differences in total math and attendance rates were not significant.

Table 10

Elementary Residuals for Low SES Experimental and Control Groups on Each Dependent Variable

	Reading	Math	Basic Skills	Attendance
Experimental	8.49	3.96	5.85	-.51
Control	-6.95	-2.04	-3.58	.24
Difference	* 15.44	6.00	* 9.43	.75

Note. * = Significant difference at the .01 level

Hypothesis 2 stated that elementary low SES experimental group schools will demonstrate significantly higher gains in total reading, math, basic skills, and attendance rates than will elementary low SES control group schools. The results of the one-tailed T test which compared residual scores obtained by low SES elementary experimental and low SES elementary control groups did not support hypothesis 2 except for total reading and basic skills.

Results of comparisons between high SES elementary experimental and high SES elementary control groups revealed that on all three academic achievement and attendance rates, the control group's mean scores were higher than those of the experimental group. However, these differences were not significant for any of the comparisons as illustrated in Table 11.

Table 11

Elementary Residuals for High SES Experimental and Control Groups on Each Dependent Variable

	Reading	Math	Basic Skills	Attendance
Experimental	-2.69	-2.17	-2.96	.23
Control	1.03	-.08	.49	.29
Difference	3.72	2.25	3.45	.52

Hypothesis 3 stated that elementary high SES experimental group schools will demonstrate significantly higher gains in total reading, math, basic skills, and attendance rates than will elementary high SES control group schools. The results of the one-tailed T test which compared residual scores obtained by high SES elementary experimental and high SES elementary control groups did not support hypothesis 3.

When outcome data were compared by the level of implementation of the school improvement process as reported by experimental group schools, low implementing elementary experimental group schools had higher means than control group schools on all three academic achievement measures. These differences were significant at the .05 level for total basic skills and at the .01 level for reading. Differences in mean math residuals were not significant. Control group schools demonstrated slightly but not significantly higher attendance rates as illustrated in Table 12.

Hypothesis 4 stated that elementary LIL experimental group schools will demonstrate significantly higher gains in total reading, math, basic skills, and attendance rates than will control group schools. The results of the one-tailed T test which compared residual scores obtained by low implementing elementary experimental and control groups did not support hypothesis 4 except for total reading and basic skills.

Table 12

Elementary Residuals for Low Implementing Experimental and Control Groups on Each Dependent Variable

	Reading	Math	Basic Skills	Attendance
Experimental	6.07	2.01	3.81	-.44
Control	-7.07	-2.25	-3.26	-.31
Difference	* 13.14	4.26	** 7.07	.13

Note. * = Significant difference at the .01 level; ** = Significant difference at the .05 level.

Results of comparisons of high implementing elementary experimental and control groups revealed higher achievement in reading and math for experimental group schools. However, these differences were not significant. Control group gains in total basic skills and attendance rates were higher than experimental group gains, but these differences also were not significant as illustrated in Table 13.

Table 13

Elementary Residuals for High Implementing Experimental and Control Groups on Each Dependent Variable.

	Reading	Math	Basic Skills	Attendance
Experimental	-.08	-.05	-1.58	-.37
Control	-.50	-.37	-.63	.37
Difference	.42	.32	.95	.74

Hypothesis 5 stated that elementary HIL experimental group schools will demonstrate significantly higher gains in total reading, math, basic skills, and attendance rates than will control group schools. The results of the one-tailed T test which compared residual scores obtained by high implementing elementary experimental and control groups did not support hypothesis 5.

Secondary Group Comparisons

At the secondary level, control group gains demonstrated on the three academic achievement measures were higher than experimental group gains as illustrated in Table 14. However, these differences were not significant. Experimental group schools demonstrated slightly higher attendance rates and slightly lower dropout rates than control group schools but these differences also were not significant.

Table 14

Secondary Residuals for Experimental and Control Groups on Each Dependent Variable

	Reading	Math	Basic Skill	Attendance Rate	Dropout Rate
Experimental	-1 .14	-.29	-.81	.14	-.38
Control	1.14	.29	.81	-.15	.38
Difference	2.28	.58	1.62	.29	.76

Hypothesis 6 stated that secondary experimental group schools will demonstrate significantly higher gains in total reading, math, basic skills, attendance rates, and significantly lower dropout rates than will secondary control group schools. The results of the one-tailed T test which compared residual scores obtained by secondary experimental and control groups in total reading, math, basic skills, attendance rates, and dropout rates did not support hypothesis 6.

When secondary data were compared for secondary low SES experimental and control groups, gains obtained by the low socioeconomic status control group were higher than those for the low socioeconomic status experimental group on some measures, and lower on other measures as illustrated in Table 15. For example, total reading and basic skills scores obtained were higher for the control group, but neither of these differences were significant. Conversely, the mean scores for the experimental group were

higher than those of the control group in total math and attendance rates, but again the differences were not significant. Also dropout rates were slightly but not significantly lower for the experimental group.

Hypothesis 7 stated that secondary low SES experimental group schools will demonstrate significantly higher gains in total reading, math, basic skills, attendance rates, and significantly lower dropout rates than will control group schools. The results of the one-tailed T test which compared residual scores obtained by secondary low SES experimental and control groups did not support hypothesis 7.

Table 15

Secondary Residuals for Low SES Experimental and Control Groups on Each Dependent Variable

	Reading	Math	Basic Skill	Attendance Rate	Dropout Rate
Experimental	-.02	.10	.20	-.13	-.33
Control	.63	-1.20	.41	-.49	.32
Difference	.65	1.30	.21	.36	.65

Note. Negative dropout rate residual scores are desirable.

When high socioeconomic status secondary experimental and control groups were compared, the mean scores on all three achievement measures were higher for the control group than for the experimental group. However, the differences were not significant. Attendance rates were slightly higher and

dropout rates were slightly lower for the experimental group, but again these differences were not significant as illustrated in Table 16.

Table 16

Secondary Residuals for High SES Experimental and Control Groups on Each Dependent Variable

	Reading	Math	Basic Skill	Attendance Rate	Dropout Rate
Experimental	-2.60	.21	-1.34	.43	-.43
Control	1.98	.89	.73	.20	.43
Difference	4.58	.68	2.07	.23	.86

Note. Negative dropout rate residual scores are desirable.

Hypothesis 8 stated that secondary high SES experimental group schools will demonstrate significantly higher gains in total reading, math, basic skills, attendance rates, and significantly lower dropout rates than will control group schools. The results of the one-tailed T test which compared residual scores obtained by secondary high SES experimental group and control group schools did not support hypothesis 8.

When secondary experimental and control group data were compared according to the levels of implementation of the school improvement process presented at the academy, control group schools demonstrated greater gains on all three achievement measures than low implementing secondary experimental group schools. Also, dropout rates were slightly higher and

attendance rates lower for the experimental group. However, none of these differences were significant as illustrated in Table 17.

Table 17

Secondary Residuals for Low Implementing Experimental and Control Groups on Each Dependent Variable

	Reading	Math	Basic Skill	Attendance Rate	Dropout Rate
Experimental	-1.46	-1.47	-2.26	-.24	.36
Control	5.09	1.02	2.02	-.12	-.06
Difference	6.55	2.49	4.28	.12	.30

Hypothesis 9 stated that secondary LIL experimental group schools will demonstrate significantly higher gains in total reading, math, basic skills, attendance rates, and significantly lower dropout rates than will control group schools. The results of the one-tailed T test which compared residual scores obtained by secondary low implementing experimental and control groups did not support hypothesis 9.

Finally, when secondary high implementing experimental group and control group schools were compared, high implementing secondary experimental group schools demonstrated greater gains on all three achievement measures, dropout rates were lower, and attendance rates were higher than control group schools. However these differences were not significant as illustrated in Table 18.

Table 18

Secondary Residuals for High Implementing Experimental and Control Groups on Each Dependent Variable

	Reading	Math	Basic Skill	Attendance Rate	Dropout Rate
Experimental	-.81	.89	.64	.53	-1.11
Control	-1.70	-.26	.17	-.17	.81
Difference	.89	1.15	.47	.70	1.92

Hypothesis 10 stated that secondary HIL experimental group schools will demonstrate significantly higher gains in total reading, math, basic skills, attendance rates, and significantly lower dropout rates than will control group schools. The results of the one-tailed T test which compared residual scores obtained by secondary high implementing experimental and control group schools did not support hypothesis 10.

Summary

The matching procedure used produced very closely matched pairs of experimental and control group schools based upon the input variables that most influenced the performance of West Virginia's 55 county school districts in total basic skills. The residual scores produced for each school on each dependent variable adjusted raw scores obtained by identifying those input variables that most influenced experimental and control group school's performance on each dependent variable. This was accomplished by

performing separate Forward Stepwise Regression Analyses and then regressing identified input variables onto each dependent variable for each school. Schools were properly classified as high or low SES and high or low implementers of the school improvement process presented at the academy. When experimental and control group schools' performance were compared using one-tailed T tests, experimental group schools did not perform significantly better than control group schools on all dependent variables. However, some experimental group schools did perform significantly better than control group schools on some dependent variables and the converse was not true.

For example, there was a significantly positive interaction affect between principal training provided at the West Virginia Principals' Academy and elementary school performance on the dependent variables total reading and total basic skills. There was not a significant interaction affect between principal training provided at the West Virginia Principals' Academy and secondary school performance on the dependent variables total reading and total basic skills. These different interaction affects occurred despite the matching procedures and regression adjustments used to control for the influence of the independent variables described.

Chapter V

Conclusions, Discussion, and Recommendations

Introduction

The problem in this study was to determine if there was a significant difference in the performance of experimental and control group schools on (a) three academic achievement measures, (b) attendance rates, and (c) dropout rates after exposing experimental group school principals to specific professional development experiences proved at the 1985 West Virginia Principals' Academy. Ten hypotheses were proposed concerning the performance of experimental and control groups on the various outcome measures.

A quasi-experimental method of investigation and a Nonrandomized Control-Group Pretest-Post Test design were used because random assignment of schools to experimental and control groups was not possible. Residualized school outcome data on each of the dependent variables were compared using one-tailed T tests to determine if any significant differences existed between the experimental and control groups and to test the ten hypotheses.

No significant difference was determined in the performance of experimental and control groups on all outcome measures. However, elementary and low socioeconomic status elementary experimental groups demonstrated significantly greater gains than control groups in total reading and total basic skills.

Several conclusions were drawn concern the findings of this study. Also, recommendations for future implementation of effective schools research and

further study of the interaction affects between implementation and school performance on outcome measures were made. These conclusions, related discussion, and recommendations are presented in the following section.

Conclusions

Conclusions were made with respect to the interaction affects between principal participation in the West Virginia Principals' Academy and school outcome measures. Also, conclusions were made concerning the degree to which principals implemented the school improvement process presented at the academy. The conclusions were:

Conclusion 1: While no experimental groups demonstrated significantly greater gains than control groups on all outcome measures examined, there was a significant positive interaction between training provided at the West Virginia Principals' Academy and performance in total reading and total basic skills measures at elementary and low SES elementary experimental group schools. There were no instances where a significant difference between experimental and control group schools occurred in relation to total math measures, attendance rates, or dropout rates.

Conclusion 2: The interaction affects between elementary school principals' participation in the West Virginia Principals' Academy and school outcome measures were more positive than the interaction affects between secondary school principals' participation in the academy and school outcome measures. Elementary experimental group schools demonstrated significantly greater gains in total reading and total basic skills than elementary control group schools. However, secondary experimental group schools demonstrated no

significantly greater gains than control groups on any outcome measures examined.

Conclusion 3: Interaction affects between low socioeconomic status group school principals' participation in the West Virginia Principals' Academy and school outcome measures were more positive than the interaction affects between high socioeconomic status group school principals' participation in the academy and school outcome measures.

Conclusion 4: It was concluded that experimental group principals demonstrated varying degrees of implementation of the school improvement process presented at the principals' academy.

Recommendations

Recommendations resulting from the treatment of data in this study were made with respect to (a) future implementation of effective schools research by the West Virginia Department of Education using the Principals' Academy model, and (b) research methods for future studies of the interaction affects between implementation of similar school reform initiatives and schooling outcomes. These recommendations were:

Recommendation 1: The department of education should recognize that interaction affects between Principals' Academy participation and schooling outcomes were different for the various schooling outcomes examined in this study. This awareness during the design and implementation of future academies may promote better selection and utilization of school improvement strategies. Also, the department should experiment with different school improvement strategies and attempt to identify those most appropriate for use

with different schooling outcomes before selecting any single strategy.

Recommendation 2: The department of education should recognize that the interactions affects between elementary group school principals' training at the Principals' Academy and schooling outcomes were different than the interaction affects between secondary group school principals' training at the Principals' Academy and school outcomes. Being aware of this condition during the design and implementation of future academies may promote better selection and utilization of school improvement strategies.

Recommendation 3: The department of education should recognize that low and high SES schools demonstrated different interaction affects between principals' training at the Principals' Academy and school outcomes. This awareness may improve the design and implementation of future academies and promote better selection and utilization of school improvement strategies.

Recommendation 4: The design and delivery of the improvement process component of the Principals' Academy should be modified to promote fuller implementation of improvement strategies. Such modifications might better prepare principals to overcome situational or contextual differences at their schools that present obstacles to the implementation of the improvement process.

Discussion

The implementation of effective schools research and the study of the interaction affects between implementation and schooling outcome measures are highly complex issues. Weaknesses in research design and conceptual flaws were reported in previous examinations of effective schools research (Cuban,

1983; Rowan et al., 1983). In this study, an attempt was made to compensate for some of these weaknesses by utilizing research methods and procedures which addressed many of the limitations revealed in critiques of previous research studies. As a result, some issues related to implementing and evaluating the affects of implementing effective schools research were clarified. Also, insights concerning relationships between other factors such as input, contextual, structural, and organizational variables that may have influenced the affects of implementing effective schools research were gained.

According to Rowan, Bossert, and Dwyer (1983), effective schools researchers concentrated on a single dimension of school effectiveness (student achievement) although they assessed effectiveness in a number of ways. Using an absolute standard to assess effectiveness tended to preclude schools serving predominantly low socioeconomic status students from being classified as effective. Conversely, various methods that controlled for students background permitted schools with low absolute scores to be labeled effective (Purkey & Smith, 1989; Rowan et al., 1983). Several critiques of effective schools literature suggested that many studies did not properly control for the affects of demographic factors (Purkey & Smith, 1983; Ralph & Fennessey, 1983; Rowan et al., 1983). Yet, evidence existed that certain school-level factors and effectiveness were related by a pattern of simultaneous causation that defied simple description (Rowan et al., 1983).

In this study, the influence of demographic factors and numerous input variables were controlled through matching procedures and regression adjustments to performance measures. For example, the independent variable

SES accounted for the greatest amount of variance in the mean total basic skills scores obtained by county schools in the Forward Stepwise Regression Analysis performed to select variables for matching schools. However, the influence of the SES variable was controlled by the use of regression techniques to produce residual scores for comparing experimental and control groups and by the matching technique which produced nearly equivalent experimental and control groups for comparison.

Although the matching procedure produced highly equivalent pairs of matched experimental and control group schools in relation to the variables considered, the aggregation level of data included in the regression analyses to pick variables for matching experimental and control group schools and to produce residual scores may have limited the explanatory power of the regression model. If this were true, the ability of the regression model to select the independent variable(s) that most influenced county performance on total basic skills measures may also have been limited.

According to Purkey and Smith (1983), a schools' effectiveness may vary across grades, subjects, or subgroups of children. In addition, current assessment techniques "can obscure important inconsistencies in school effectiveness across types of students, grade levels or subjects and thus give an inaccurate view of school effectiveness" (Rowan et al., 1983, p. 30). The findings of this study are consistent with the observations of Purkey, Smith, and Rowan concerning variance across grade levels, subjects, and subgroups of school populations.

According to the interaction affects between the implementation of

effective schools research and schooling outcomes in this study, no experimental group schools demonstrated significantly higher gains than their control group counterparts on all outcome measures examined. Therefore, it might be concluded that the treatment had no positive affect on the experimental groups examined.

However, the elementary experimental group schools demonstrated significantly higher gains than control group schools on certain outcome measures while the converse was never true. This would indicate, that the treatment did have positive affects on certain outcome measures examined. Questions remain concerning the issue of why certain outcomes were positively affected by the treatment while others remained unaffected.

Despite the nearly equivalent match of experimental and control groups on dependent and independent variables, other more appropriate dependent and independent variables might have been considered in the regression analyses performed to match schools and produce residual scores for each dependent variable. This was particularly true for the dependent variables math and attendance rates at the elementary level.

Also, elementary experimental group schools demonstrated significantly higher gains on certain outcome measures examined, than did secondary experimental group schools. Likewise, low socioeconomic status experimental group schools demonstrated significantly higher gains on certain outcome measures examined than did high socioeconomic status experimental group schools. Therefore, the selection of a school reform initiative which focused on improving the outcomes of schooling for socioeconomically disadvantaged

students appears to have been appropriate for the sample examined in this study. Again, questions remain concerning why certain subgroups of the total sample i.e. elementary experimental group schools and low SES experimental group schools were more positively affected by the treatment than other subgroups examined.

Previously, effective schools researchers focused on the analysis of differences between successful and unsuccessful schools. They suggested to educators that certain correlates were key determinants of effectiveness. However, the attributes of these correlates and methods for implementing them were not clearly defined (Cuban, 1983; Rowan et al., 1983). In this study, experimental group school principals were provided with specific training at the Principals' Academy related to both the correlates of effective schools and methods for implementing these correlates before the interaction affects between implementation and schooling outcome measures were examined.

Concerning implementation, experimental group principals clearly demonstrated a belief that implementing effective schools research as presented at the Principals' Academy would improve the performance of their schools over time. However, experimental group schools demonstrated great variance in implementation scores obtained on the Principals' Academy Follow-Up Survey. In general, experimental group school principals consistently rated their schools low in relation to the implementation of certain aspects of the school improvement process presented at the academy such as forming a school improvement team and meeting regularly to discuss school improvement goals and objectives. Also, rated low by principals was the

utilization of school outcome data for the purpose of determining school improvement goals. Why would principals not implement a process for school improvement that they believed would improve the performance of their school over time? Was it a lack of initiative on the part of the principal or were there other factors within the schooling context which prohibited implementation? Or, could it have been disagreement with the process outlined during the academy, or lack of skill on behalf of the principal which limited their ability to implement certain some or all of the steps of in the improvement process?

Relatedly, the classification of schools as high or low implementers of the school improvement process presented at the academy and high or low SES level, based upon their relative position to the median implementation score and SES level for the elementary and secondary groups studied, may have confounded the findings of this study. A standard criterion for the classification of schools as either high or low SES or high or low implementers of the school improvement process presented at the academy should have been developed and applied when grouping elementary and secondary schools for comparisons.

The experimental and control group schools examined in this study had a wide range of socioeconomic levels, county per capita income levels, teacher/pupil ratios, expenditures per pupil, teacher education, experience, and salary levels, county sizes, and pretest performance levels on total basic skills measures. The amount of variance on these indicators increases the generalizability of the findings from this study.

Because academic outcome measures at the secondary level were the only

outcomes examined over a two year period and because secondary experimental group schools demonstrated greater gains than control group schools (although not significant) on many outcome measures, it was believed that time available for implementation affected academic outcome measures at the secondary level.

Finally, effective schools researchers often employed relatively small samples and tended to focus on a narrow segment of educational institutions; urban elementary schools serving poor children (Cuban, 1983; Purkey and Smith, 1983; Rowan et al., 1983). Such outlier studies (regression-based determination of unusually effective and ineffective schools) often identified a set of schooling characteristics that appeared more highly suited to the management of small schools. In this study, the interaction affects between Principals' Academy training and schooling outcome measures were examined for a larger number of highly diverse schools.

Recommendations for Further Study

Additional studies of this type are needed to provide a more comprehensive, valid, and reliable assessment of the affects of training such as the West Virginia Principals' Academy on schooling outcome measures. These studies should:

1. Utilize data aggregated at the school or student level. This would enhance both the explanatory capabilities of the independent variables and the ability of the regression procedure to identify independent variables which influence school or student performance on outcome measures.

2. Utilize randomly selected experimental and control groups. However,

if random selection is not possible, great pains should be taken to ensure that experimental and control group schools or students are as similar as possible with respect to input, outcome, and other variables.

3. Utilize regression techniques to select variables for matching experimental and control group schools. Separate regression analyses should be conducted at the elementary and secondary levels.

4. Examine the impact of implementing effective schools research on a wide range of schools differing substantially concerning various inputs into the schooling process.

5. Examine the affects of different independent variables such as teacher expectations, school organization, instructional methods, teacher efficacy, and structural variables on schooling outcomes. A greater number, a wider variety, or more appropriate input and process variables should be considered in the regression equations to match schools and produce residual scores. Greater attempts should be made to determine how and why different outcomes are influenced by different numbers and kinds of schooling variables.

6. Clearly define socioeconomic status and implementation levels. A clearer definition of these conditions will facilitate better analysis of interaction affects between implementation of effective schools research and schooling outcome measures.

7. Be conducted over a longer period of time. This would allow the affects of implementation to be more fully realized.

Summary

Although no experimental group schools significantly out-performed control group schools on all outcome measures, evidence was revealed in this study which supports the continued implementation of effective schools research as presented at the Principals' Academy, provided that modifications to the design and delivery of the academy are made which support future implementation of the school improvement process. This is particularly true for elementary and low SES elementary schools. The department of education should continue to provide training to school principals related to the implementation of effective schools research. However, this training should be coupled with the recognition that SES accounted for a large amount of the variance in school outcome measures in this study and that increased efforts should be made to deal with inequities in educational opportunities available to students due to economic and political conditions unique to schools and school districts.

This study raised concerns related to the implementation of effective schools reforms which provide fertile ground for future research. For example, the influence of different reform strategies on the specific schooling outcomes should be examined in future research. Also, the interaction affects between different school improvement strategies and school outcome measures at elementary and secondary schools should be further examined. Similarly, the interaction affects between school improvement strategies and school outcomes for low and high SES schools should be examined. Relatedly, administrators, and teachers' efficacy for the improvement process should be

studied. In summary, future studies should attempt to determine what situational or contextual variables facilitate or hinder the implementation of the school improvement process.

Bibliography

Adler, M. J. (1982). The paideia proposal. New York: Macmillan.

Anderson, B., & Odden, A. (1986, April). State initiatives can foster school improvement. Phi Delta Kappan, 578-81.

Anderson, L., Evertson, C., & Brophy, J. (1979). An experimental study of effective teaching in first-grade reading groups. Elementary School Journal, 79, 193-223.

Armor, D., Carroll, S. J., Donaldson, T. S., Kiesling, J. J., & Pincus, J. (1976, August). Analysis of the school preferred reading program in selected Los Angeles minority schools. Prepaid for the Los Angeles Unified School District, Santa Monica, CA: Rand Corporation, 74.

Aspy, D. N., & Roebuck, F. N. (1982). Affective Ed.: Sound investment. Educational Leadership, 39 488-493.

Austin, G. (1979, October). Exemplary schools and the search for effectiveness. Educational Leadership, 31(1), 10-14.

Averch, H. A., Caroll, S. J., Donaldson, T. S., Kiesling, H. J., & Pincus, J. (1972, March). How effective is schooling? A critical review and synthesis of research findings. Prepaid for President's Commission on School Finance, Santa Monica, CA: Rand Corporation, 222.

Azumi, J., & Madhere, S. (1982, January). Characteristics of high achieving elementary schools in Newark. Newark School District Research Report. ORET Report No. 5. Newark, NJ: Office of Research, Evaluation and Testing, Newark Board of Education, 149. (ED 217 099)

Berman, O. (1981). Educational change: An implementation paradigm. In R. Lehming & M. Kane (Eds.), Improving Schools: Using What We Know, Beverly Hills, CA.

Berman, P., & McLaughlin, M. W. (1975, January). Federal programs supporting educational change, Vol. IV: The findings in review. Santa Monica, CA: Rand Corporation, 47.

Bickel, W. E. (1983, April). Effective schools: Knowledge, dissemination, inquiry. Educational Researcher, 12, 3-5.

Bond, G. L., & Dysktra, R. (1976, Summer). The cooperative research program in first-grade reading instruction. Reading Research Quarterly, 2, 5-142.

Bowles, S. S. (1969). Education production functions. Final Report, Washington, DC: Office of Education, U. S. Department of Health, Education, and Welfare.

Bowles, S. S., (1970). Towards an educational production function. In W. L. Hansen (Ed.), Education, Income and Human Capital, NY: National Bureau of Economic Research.

Boyer, E. (1983). High School: A report on secondary education in America. NY: Harper & Row.

Brandt, R. (1982, October). On improving teaching effectiveness: A conversation with David Berliner. Educational Leadership, 12-15.

Bridge, R. G., Judd, C. M., & Moock, P. R. (1979). The determinants of educational outcomes: The impact of families, peers teachers, and school. Cambridge, MA: Ballinger, 357.

Brookover, W. B., Beady, C., Flood, P., Schweitzer, J., & Wisenbaker, J. (1977). Schools can make a difference. East Lansing: Michigan State University, College of Urban Development 321. (ED 145 034)

Brookover, W. B., Beady, C., Flood, P., Schweitzer, J., & Wisenbaker, J. (1979). School social systems and student achievement: Schools can make a difference. NY: Praeger.

Brookover, W., Beamer, L., Efthim, J., Hathaway, D., Lezotte, L., Miller, S., Passalacqua, J., & Tornatzky, L. (1982). Creating effective schools: An inservice program for enhancing school learning climate and achievement. Holmes Beach, FL: Learning Publications.

Brookover, W. B., & Lezotte, L. W. (1979, May). Changes in school characteristics coincident with changes in student achievement. Occasional Paper No. 17. East Lansing: Michigan State University, Institute for Research on Teaching, 95.

Brophy, J. (1982, March). Classroom management and learning. American Education, 20-23.

Caldwell, J. H., Huitt, W. G., & Graeber, A. O. (1982, May). Time spent in learning: Implications from research. The Elementary School Journal, 82, 471-480.

California school effectiveness study: The first year: 1974-75. (1977). Sacramento, CA: Office of Program Evaluation and Research, California State Department of Education, 64.

Campbell, D. T., & Stanley, J. C. (1963). Experimental and quasi-experimental designs for research. Chicago: Rand McNally.

Class size: A summary of research. (1978). ERS Research Brief. Arlington, VA: Educational Research Service, 84.

Cochran, R. B. (1983). Sampling techniques. NY: John Wiley & Sons.

Coleman, J. S., Cambell, E. Q., Hobson, C. J., McPartland, J., Mood, A. M., Weinfeld, F. D., & York, R. L. (1966). Equality of educational opportunity. Washington, DC: Office of Education, U. S. Department of Health, Education, and Welfare, 737.

Comprehensive test of basic skills - Technical report. (1984). CTB/McGraw-Hill, Monterey, CA.

Cooper, H., & Good, T. (1983) Pygmalion grows up: Studies in the expectation communication process. NY: Longman.

Cooper, L. (1984, May). The effective schools literature as a basis for school improvement efforts. Unpublished dissertation, Harvard Graduate School of Education.

Crain, R. (1973). Southern schools: An evaluation of the emergency school assistance program and of desegregation. Vol. 1., Chicago: National Opinion Research Center.

Crawford, J. (1978). Interactions of learner characteristics with the difficulty level of instruction. Journal of Educational Psychology, 70(4), 523-531.

Cuban, L. (1983, June). A friendly but cautionary note. Phi Delta Kappan, 64, 695-96.

Datta, L., McHale, C., & Mitchell, S. (1976). The effects of Head Start classroom experience on some aspects of child development: A summary report of national evaluations 1966-1969. Washington, DC: Office of Human Development, Office of Child Development, U.S. Department of Health, Education, and Welfare, 92. (ED 129 416)

Davey, A. (1973). Teachers, race, and intelligence. Race, 15, 195.

Davis, A., & Odden, A. (1986, April). How state instructional improvement programs affect teachers and principals. Phi Delta Kappan, 590-593.

Doyle, W., & Ponder, G. (1977). The practicality, ethics and decision making. Interchange, 8, 1-12.

Eddy, E. (1976). Walk the white line. NY: Doubleday.

Edmond, R. R. (1978). A discussion of the literature and issues related to effective schools. Paper prepared for the National Conference on Urban Education, St. Louis, MO: Urban Education Program.

Edmonds, R. R. (1979, October). Effective schools for the urban poor. Educational Leadership, 37,(1), 15-24.

Edmonds, R. R. (1979). Making public schools effective. Social Policy, 9, 28-32.

Edmonds, R. R. (1982, December). Programs of school improvement: An overview. Educational Leadership, 40, 4-11.

Edmonds, R., & Frederiksen, J. R. (1979). Search for effective schools: The identification and analysis of city schools that are instructionally effective for poor children, 66. (ED 170 396).

Effective schools: A summary of research. (1983). ERS Research Brief. Arlington, VA: Educational Research Service.

Effective school principal. (1986). A report to the Southern Regional Education Board by its Commission for Educational Quality, Atlanta, GE.

Evertson, C. M. (1980, March). Differences in instructional activities in high and low achieving Junior High Classes. R+D Rep. No. 6106. Austin: University of Texas, Research and Development Center for Teacher Education, 47. (ED 195 546)

Farrar, E., & Flakus-Mosqueda, P. (1986, April). State-sponsored schoolwide improvement programs: What's going on in the school?, Phi Delta Kappan, 586-89.

Felsenthal, H. (1978). The present: What works in teaching of reading. Paper presented at the 21st Century Expo, Madison.

Felsenthal, H. (1982, March). Factors influencing school effectiveness: An ecological analysis of an "Effective School". Paper presented at the annual meeting of the American Educational Research Association, 21. (ED 214 299)

Fetters, W. B., Collins, E. F., & Smith, J. W. (1968, March). Characteristics differentiating under and overachieving elementary schools. Technical Note No. 63. Washington, DC: Division of Data Analysis and Dissemination, National Center for Education Statistics, 47. (ED 021 318)

Fisher, C. W., Filby, N. N., Marliave, R. S., Cahen, L. S., Dishaw, M. M., Moore, J. E., & Berliner, D. C. (1980, May). Teaching behaviors, academic learning time, and student achievement: An overview. In C. Denham & A. Lieberman, (Eds.), Time to Learn, 7-32. Washington, DC: National Institute of Education, U.S. Department of Education.

Fonstad, C. (1973, October). What research says about schools and school districts. . . factors related to effectiveness. Madison, WI: Division for Field Services, Wisconsin Department of Public Instruction. 68. (ED 085 892)

Fredrick, W. W. (1977, January). The use of classroom time in high schools above or below the median reading score. Urban Education, 11, 459-464.

Fredrick, W. C., & Walberg, H. J. (1980, March/April). Learning as a function of time. Journal of Educational Research, 73, 183-194.

Fuhrman, S., Huddle, E., & Armstrong, J. (1986, April). Improving schools: The state role, Phi Delta Kappan, 594-96.

Gigliotti, R. J., & Brookover, W. B. (1975, October). The learning environment: A comparison of high and low achieving elementary schools. Urban Education, 10, 245-261.

Gilbert, R. M., & Price, A. T. (1981, March). Is the school day long enough? Phi Delta Kappan, 62, 524.

Glasman, N. S., & Biniaminov, I. (1981, Winter). Input-output analyses of schools. Review of Educational Research, 51, 509-39.

Glass G. V., & Smith, M. L. (1978, September). Meta-analysis of research on the relationship of class-size and achievement. San Francisco, CA: Far West Laboratory for Educational Research and Development, 66.

Good, T. L., & Beckerman, T. M. (1978, January). Time on task: A naturalistic study in sixth-grade classrooms. The Elementary School Journal, 78, 193-201.

Goodlad, J. I. (1983). A place called school: Prospects for the future. St. Louis, MO: McGraw-Hill.

Grant, W. V., & Eiden, L. J. (1982). Digest of education statistics 1982. Washington, DC: National Center for Educational Statistics, 208.

Gupta, N. (1979, June). Some school and classroom antecedents of student achievement. Austin, TX: Regional Planning Council, Southwest Educational Development Laboratory, 38.

Guthrie, J. W. (1970). A survey of school effectiveness studies. In Do teachers make a difference?. Washington, DC: Bureau of Education Personnel Development, Office of Education, U.S. Department of Health, Education, and Welfare, 25-54.

Guthrie, J. W. (1973). The new skeptics have gone too far. In Proceedings of the conferences on improving school effectiveness. (Robert J. Solomon, Chairman). Princeton, NJ: Educational Testing Service, 15-25.

Hall, G., & Louchs, S. (1978). Innovation configuration: Analyzing the adaptation of innovation. Paper presented to the annual meeting of the American Educational Research Association, Toronto.

Hanushek, E. (1970). The production of education, teacher quality and efficiency. In Do teachers make a difference?. Washington, DC: Bureau of Educational Personnel Development, Office of Education, U.S. Department of Health, Education, and Welfare, 79-99.

Hanushek, E. (1981). Throwing money at schools. Journal of Policy Analysis and Management, 1, 19-41.

Havelock, R. G. (1973). The change agent's guide to innovation in education. Englewood Cliffs, NJ: Educational Technology Publications.

Hough, W. M., & Urich, R. V. (1981). Leadership, educational change and the politicalization of American education. In P. L. Houts & D. V. Meyer (Eds.), Education in the 80's: Curricular challenges, Washington, DC: National Education Association.

Initiating school effectiveness: Two West Virginia models. (in press), West Virginia Department of Education, Charleston; WV.

Irvine, D. J. (1979). Factors associated with school effectiveness. Educational Technology, 29,(5), 53-55.

Isaac, S., & Michael, W. B. (1981). Handbook in Research and Evaluation. San Diego, CA: Edits Publishers.

Jacobson, W., & Rosenthal, R. (1968). Pygmalion in the classroom: Teacher expectations and pupil's intellectual development. NY: Holt, Rinehart, and Winston.

Jencks, C., Smith, M., Acland, H., Bane, M., Cohen, D., Gintis, H., Heyns, B., & Michelson, S. (1972). Inequality: A reassessment of the effects of family and schooling in America. NY: Basic Book, 399.

Jones, J., Erickson, E., & Crowell, R. (1972). Decreasing the gap between whites and blacks. Education and Urban Society, 4, 339-349.

The journalism research fellows report: What makes an effective school? (1980). Study of Schools That Work in: Arkansas, Florida, Maine Maryland, Nebraska, Virginia, Urban Districts Nationwide. D. Brundage, Ed. Washington, DC: George Washington University, Institute for Educational Leadership, 109.

Joyce B., Hersh, R. M. & McKibbin, M. (1983). The structure of school improvement. NY: Longman Press.

Joyce, B., & Showers, B. (1982, October). The coaching of teaching. Educational Leadership, 4-11.

Karweit, N. (1983, January). Time on task: A research review, Report No. 332. Baltimore, MD: John Hopkins University, Center for Social Organization of Schools, 56.

Katzman, M. T. (1971). The political economy of urban schools. Cambridge, MA: Harvard University Press, 235.

Kean, M. H., and Others. (1979). What works in reading? The results of a joint school district/federal reserve bank emperical study in Philadelphia. Philadelphia, PA: Office of Research and Evaluation, School District of Philadelphia, 63.

Kerlinger, F. N. (1964). Foundations of behavioral research. NY: Holt, Rinehart and Winston.

Kersting, J. (1967, February). Absences and averages. School and Community, 53, 17.

Lawrence, G. (1974). Patterns of effective inservice education: A state of the art summary of research on materials and procedures for changing teaching behaviors in inservice education. Tallahassee, FL: Florida State Department of Education. (ED 176 424).

Levine, D., & Stark, J. (1981, August). Instructional and organizational arrangements and processes for improving academic achievement at inner city elementary schools. A study of the Chicago Mastery Learning Reading Program and other school-wide approaches for improving reading at selected schools in Chicago, Los Angeles, and New York. Extended Summary and Conclusions. Kansas City, MO: Center for the Study of Metropolitan Problems in Education, School of Education, University of Missouri-Kansas City, 71. (ED 213 814)

Lieberman, A. L., & Miller, L. (1981, April). Synthesis of research on improving schools. Educational Leadership, 38, 583-586.

Lincoln, W. (1976). Mediation: A transferable process for the prevention and resolution of racial conflict in public secondary schools. Washington, DC: National Institute of Education.

Lipham, J. A. (1981). Effective principal, effect schoo. Reston, VA: National Association of Secondary School Principals, 26.

Little, J. J. (1981). School success and staff development: The role of staff development in urban desegregated schools. Executive Summary, Washington, DC: National Institute of Education.

Mackler, B. (1969). Grouping in the ghetto. Education and Urban Society, 2, 82.

McKibbin, M., & Joyce, B. (1980). Psychological states and staff development. Theory Into Practice, 19, 248-255.

McLaughlin, M. W., & Marsh, D. D. (1978). Staff development and school change. Teachers College Record, 80(1), 69-94.

Mervilde, J. (1981, June). Student absenteeism: Causes, effects, and possible solutions. Study directed by Charles R. DuVall. 50. (ED 207 157)

Michelson, S. (1970). The association of teacher resourceness with children's characteristics. In Do teachers make a difference?, Washington, DC: Bureau of Education Personnel Development, Office of Education, U.S. Department of Health, Education, and Welfare, 120-168.

Mosteller, F., & Moynihan, D. (Eds). (1972). On equality of educational opportunity. Papers deriving from the Harvard University Faculty Seminar on the Coleman Report, NY: Vintage Books, 570.

Mullin, S. P., & Summers, A. A. (1981, May). Is more better? A review of the evidence on the effectiveness of spending on compensatory education. Unpublished manuscript, University of Pennsylvania.

Murnane, R. J. (1975). The impact of school resources on the learning of inner city children. Cambridge, MA: Ballinger, 125.

Murnane, R. J. (1980, December). Interpreting the evidence of school effectiveness. Working Paper No. 830. New Haven, CT: Institution for Social and Policy Studies , Yale University, 24.

National Commission on Excellence on Education. (1983, April). A nation at risk. The imperative for educational reform. Washington, DC: Government Printing Office.

National Education Association. (1968). Ability grouping. Research Summary 1968-83. Washington, DC. NEA Research Division, 52.

Neufeld, B., Farrar, E., & Miles, M. (1983, January). A review of the effective schools research: The message for secondary schools. Paper Prepared for the National Commission of Excellence in Education, Cambridge, MA: Huron Institute.

Odden, A., & Anderson, B. (1986, April). How successful state education programs work. Phi Delta Kappan, 582-85.

Organization of the middle grades: A summary of research. (1983). ERS Research Brief. Arlington, VA: Educational Research Services, 200.

Perl, L. J. (1973, Spring). Family background, secondary school expenditure and student ability. Journal of Human Resources, 8, 156-180.

Pettigrew, T. (1975). The cold structural inducements to integration. Urban Review, 8, 137-144.

Porwoll, P. (1978). Class size. Arlington, VA: Education Research Services.

Process evaluation: A comprehensive study of outliers. (1978, February). Baltimore, MD: University of Maryland, Maryland State Department of Education, Center of Educational Research and Development, 201. (ED 160 633)

Purkey, S., & Smith, M. (1983, March). Effective schools: A review. The Elementary School Journal, 83, 427-452.

Ralph, J., & Fennessey, J. (1983, June). Science of reform: Some questions about the effective schools model. Phi Delta Kappan, 64, 689-694.

Report on the special studies of selected ECE schools with increasing and decreasing reading scores. (1980). Sacramento, CA: Office of Program Evaluation and Research, California State Department of Education, 78. (ED 188 106)

Risan, J. (1987). National Directory of Principals' Centers. Cambridge, MA: Harvard University Graduate School of Education.

Rist, R. (1978). The Invisible Children. Cambridge, MA: Harvard University Press.

Rist, R. (Ed.). (1979). Desegregated Schools. NY: Academic Press.

Robbins, J. H. (1975). A summary of selected major studies which associate input and process variables with the various measures of school quality or output, 32. (ED 114 954)

The role of elementary school principals: A summary of research. (1982). ERS Research Service, 107.

Rowan, B., Bossert, S., & Dwyer, D. (1983, April). Research on effective schools: A cautionary note. Educational Researcher, 12(4), 24-31.

Rutter, M., Maughan, B., Mortimore, P., Ouston, J., & Smith, A. (1979). Fifteen thousand hours: Secondary schools and their effects on children, Cambridge, MA: Harvard University press, 285.

Schofield, J. (1978). The impact of positively structured school on intergroup behavior, Washington, DC: National Institute of Education.

Schiffer, J. (1980). School renewal through staff development. Columbia University, NY: Teachers College Press.

School factors influencing reading achievement: A case study of two inner city schools. (1974, March). Albany, NY: State of New York Office of Education Performance Review, 28.

School improvement project: The case study phase. (1979). NY: School Improvement Project, New York City Board of Education, 16.

Slavin, R. (1980). Cooperative Learning. Review of Educational Research, 50, 315-342.

Snedecor, G. W., & Cochran, W. G. (1967). Statistical methods. Ames: The Iowa State University Press.

Spady, W. G. (1973). The impact of school resources on students. In F. N. Kerlinger (Ed.). Review of Research in Education, Itasca, IL: F.E. Peacock, 135-177.

Sparks, G. M. (1983). Evaluation of the staff development for school program, Final Report, Detroit, MI: Wayne State University.

Spartz, J. L., Valdes, A. L., McCormick, W. J., Myers, J., & Geppert, W. J. (1977, September). Delaware educational accountability system case studies: Elementary schools grades 1-4 (A Report of Results). Dover, DE: Delaware Department of Public Instruction, 49.

Squires, D., Huitt, W., & Segars, J. (1983, December). Improving classrooms and schools: What's important. Educational Leadership, 39(3), 174-179.

Stallings, J. A., & Kaskowitz, D. (1974). Follow through classroom observation evaluation 1972-1973. Menlo Park, CA: Stanford Research Institute.

Stallings, J. A., & Mohlman, G. G. (1981). School policy, leadership style teacher change, and student behavior in eight schools. Final Report, Washington, DC: National Institute of Education.

Stallings, J. A., Needels, M., & Stayrook, L. (1978) How to change the process of teaching basic reading skills. In Secondary Schools: Phase II and Phase III Final Report, Menlo Park, CA: SRI International.

Stedman, L. (1987, November). It's time we change the effective schools formula. Phi Delta Kappan, 215-227.

Stennett, R. G., & Isaacs, L. M. (1980). Absence from school: Patterns and effects. Research Report 80-01. London, Ontario: Educational Research Services, London Board of Education, 29. (ED 207 192)

Stephens, J. M. (1967). The process of schooling. NY: Holt Rinehart.

Student absenteeism. (1977). ERS Report. Arlington, VA: Educational Research Service, 52.

Sweeney, J. (1982, February). Research synthesis of effective school leadership. Educational Leadership, 39, 346-352.

Three strategies for studying the effects of school process: An expanded edition of which school factors relate to learning? (1976, March). NY: University of the State of New York, New York State Education Department, Bureau of School Programs Evaluation, 62. (ED 126 572).

Titsworth, G., & Bonner, C. (1983). School improvement in a local Michigan school district. Journal of Staff Development, 4, 120-128.

Trauschke, E. M. Jr. (1970). An evaluation of a middle school by a comparison of the achievement, attitudes and self-concept of students in a middle school with students in other school organizations. Unpublished Ed. D. dissertation, University of Florida, 86.

Vallina, S. A. (1978). Analysis of observed critical task performance of Title I-ESEA Principals, State of Illinois. Unpublished Ed. D. dissertation, Loyola University, 216.

Van der Bogert, (1986). Tillers of the soil. In S. MacDonald (Ed.), Reflections. Harvard, MA: National Network of Principals' Centers.

Van Loon, & Ver Brych. (Eds.). National Directory of Principals' Centers. Harvard, MA: Harvard Principals' Centers.

Variables related to student performance and resource allocations decisions at the school district level. (1972, June). Albany, NY: University of the State of New York, New York State Education Department, Bureau of School Programs Evaluation, 130. (ED 071 181)

Venezky, R. L., & Winfield, L. F. (1979, August). Schools that succeed beyond expectations in teaching reading. Newark, DE: University of Delaware Studies of Education, Technical Report No. 1, Department of Educational Studies, 52. (ED 177 484)

Violent schools - safe schools: The safe school study report of the congress, Volume 1. (1978, January). Washington, DC: National Institute of Education, U.S. Department of Health, Education, and Welfare, 247.

Wallace, M. (1987). Principals' centres: A transferable innovation? School Organization, 7(3), 287-295.

Wallman, D. (1987). Leadership styles, change facilitator styles, and actions of selected West Virginia principals involved in school improvement. Unpublished Ed. D. dissertation, West Virginia University, 196.

Weber, G. (1971). Inner-city children can be taught to read: Four successful schools. Washington, DC: Council for Basic Education.

Wells, J., & Gendler, T. (1988). Beyond management: Improving principals' instructional leadership. A report to the Ford Foundation on Principals' Centers in North Carolina, West Virginia, and California. Washington, DC: Council for Basic Education.

Wellisch, J. B., MacQueen, A. H., Karriere, R. A., & Duck, F. A. (1978). School management and organization in successful schools. Sociology of Education, 51, 211, 226.

West Virginia report card: Educational trends 1981-82 through 1985-86. (in press), Vol. Two-County Data, Technical Report, West Virginia Department of Education.

Why do some urban schools succeed? (1980). The Phi Delta Kappa Study of Exceptional Urban Elementary Schools. Bloomington, IN: Phi Delta Kappa, 225.

Willie, C., & Greenblatt, S. (1980). Community politics and educational change: Ten school systems under court order, NY: Longman.

Winkler, D. R. (1975, Spring). Educational achievement and school peer group composition. Journal of Human Resources, 10, 189-204.

Wood, F., Thompson, S., & Russell, F. (1981). Designing effective staff development programs. In B. Dillion-Peterson (Ed.) Staff Development/Organization Development, Alexandria, VA: Association for Supervision and Curriculum Development.

Wynne, E. A. (1981, January). Looking at good schools. Phi Delta Kappan, 62, 377--381.

Appendix A

Principals' Academy Follow-Up Survey - Field Test Instrument

Principal's Name _____School:_____

DIRECTIONS: Respond to each question by circling one of the numbers on the scale provided after each question. Circle 5 if you strongly agree with the statement, 4 if you agree with the statement, 3 if you have no opinion regarding the statement, 2 if you disagree with the statement and 1 if you strongly disagree with the statement.

1. I have conducted staff development sessions at my school concerning effective schools research.

1 2 3 4 5

2. I have formed a school improvement team which is responsible for building level implementation of effective schools research.

1 2 3 4 5

3. The school improvement team meets at least every two months to discuss and recommend school improvement.

1 2 3 4 5

4. The school improvement team collects and disaggregates baseline data concerning my school.

1 2 3 4 5

5. I have administered the effective schools inventory at my school.

1 2 3 4 5

6. The school improvement team uses the findings from disaggregated baseline data and from the effective schools inventory to develop long and short term goals for the school.

1 2 3 4 5

(appendix continues)

7. My school has a school improvement plan which was developed to implement effective school research.

1 2 3 4 5

8. Most of the staff has agreed to the long and short term goals developed by the school improvement team.

1 2 3 4 5

9. I feel the implementation of effective schools has improved the conditions for learning at my school.

1 2 3 4 5

Appendix B

Principals' Academy Follow-Up Survey

Principal's Name: _____ School:_____

DIRECTIONS: Respond to each question by circling one of the numbers on the scale provided after each question. Circle the number which corresponds with your perception of the level of implementation at your school for each item. Circling "1" would indicate 0 to 20%; "2" would indicate 21 to 40%; "3" would indicate 41 to 60%; "4" would indicate 61 to 80%; and "5" would indicate 81 to 100%.

1. I have conducted staff development sessions at my school concerning effective schools research.

1 2 3 4 5

2. My school has formed a school improvement team which is responsible for building level implementation of effective schools research.

1 2 3 4 5

3. The school improvement team meets at least every two months to discuss and recommend school improvement.

1 2 3 4 5

4. The school improvement team collects and disaggregates baseline data concerning my school.

1 2 3 4 5

5. I have conducted the West Virginia effective schools inventory at my school.

1 2 3 4 5

6. The school improvement team uses the findings from disaggregated baseline data and from the effective schools inventory to develop long and short term goals for the school.

1 2 3 4 5

(appendix continues)

7. My school has a school improvement plan which was developed to implement effective school research.

1 2 3 4 5

8. Most of the staff has agreed to the long and short term goals developed by the school improvement team and included in the school improvement plan.

1 2 3 4 5

9. I feel the implementation of effective schools has improved the conditions for learning at my school.

1 2 3 4 5

Appendix C

County Data Included in the Forward Stepwise Regression Analysis

County Number	Pre TBS	SES ARCSIN	County Income	Attend. ARCSIN	Expend./ Pupil	Experience ARCSIN
1	1411.0	50.6	8357	73.9	2669	56.17
2	1368.0	33.1	10145	74.4	2699	63.29
3	1353.5	44.1	8440	77.6	2624	54.57
4	1371.6	51.2	7548	76.8	3004	57.42
5	1384.7	33.4	9711	76.7	2744	63.22
6	1383.3	34.5	10829	77.0	2707	66.74
7	1371.2	55.3	6707	76.2	3364	57.10
8	1334.4	58.8	6172	77.1	2556	57.37
9	1345.7	50.1	6891	77.2	3087	60.73
10	1355.6	45.9	8412	76.2	2618	60.94
11	1382.2	49.4	7512	75.7	3058	60.60
12	1395.1	46.3	8506	74.2	3039	60.33
13	1378.7	44.2	8743	73.7	2738	64.01
14	1382.3	44.7	7509	77.6	2726	62.51
15	1384.1	28.4	11165	75.1	2685	75.58
16	1365.2	44.3	7402	73.7	3063	63.44
17	1377.6	38.1	10269	76.2	2840	62.44
18	1385.6	37.6	9370	75.3	2975	59.87
19	1380.3	37.1	9888	75.6	2451	63.79
20	1383.5	34.0	12499	75.8	2788	65.42
21	1356.9	42.9	8936	76.8	2721	57.10
22	1341.8	55.4	6427	76.6	2822	56.54
23	1336.2	44.8	8630	73.0	2739	57.73
24	1364.3	32.1	10616	77.8	2693	61.62
25	1396.1	32.8	95877	75.3	3152	68.70
26	1356.1	38.2	8637	75.6	2995	63.51
27	1379.3	42.6	9747	75.9	2619	62.51
28	1382.1	36.6	8525	77.2	2900	66.97
29	1330.8	47.2	8142	79.4	2678	57.10
30	1384.0	33.2	10205	76.1	2719	60.40
31	1365.3	47.5	7277	74.9	2952	62.37
32	1368.9	38.2	9662	78.8	2867	64.38
33	1342.8	54.1	8048	76.3	2734	56.60
34	1370.8	38.8	8669	77.0	2567	57.92
35	1408.2	33.3	11692	76.6	2956	67.13
36	1371.8	48.5	6339	76.7	3155	62.80

(appendix continues)

County Number	Pre TBS	SES ARCSIN	County Income	Attend. ARCSIN	Expend./ Pupil	Experience ARCSIN
37	1402.7	33.5	9787	77.5	4008	68.11
38	1361.0	45.7	8373	76.3	3244	59.80
39	1364.4	39.9	8354	78.5	2773	54.15
40	1469.7	28.7	10377	71.8	2898	60.27
41	1386.1	35.3	9835	75.1	2507	59.60
42	1381.9	45.3	8719	75.8	3001	55.00
43	1349.5	41.9	7898	75.3	2690	56.42
44	1340.5	52.6	7975	73.8	2498	55.98
45	1382.6	45.9	7532	75.1	2651	60.07
46	1351.1	44.6	8477	78.8	2851	55.43
47	1364.2	41.3	7269	77.1	2747	58.69
48	1391.8	35.5	8489	75.7	2818	54.63
49	1372.8	41.0	8770	77.2	2474	59.02
50	1364.9	41.9	7888	75.5	2586	61.89
51	1331.4	49.1	6108	75.0	2705	50.24
52	1372.7	35.4	10031	78.8	2612	61.07
53	1383.0	44.0	7546	80.5	2763	58.89
54	1401.9	31.1	11231	78.2	2660	62.65
55	1363.7	45.8	7551	75.1	2625	57.29

Note. TBS = Total Basic Skills; SES = Socioeconomic Status;

Attend. = Attendance Rate; Expend. = Expenditure.

Appendix C

(Cont'd)

County Data Included in the Forward Stepwise Regression Analysis

County Number	Education ARCSIN	Teacher/ Pupil Ratio	County Salary	County Size
1	40.23	15.99	18717	3269
2	39.87	16.06	19112	9385
3	38.12	16.09	19290	6534
4	33.83	13.07	18594	2889
5	47.58	15.60	19720	5179
6	53.01	15.48	20090	16888
7	31.82	12.52	18720	1697
8	40.86	17.33	19203	1697
9	39.23	15.84	19422	1465
10	38.65	16.69	19427	11097
11	37.29	14.07	18831	1384
12	37.52	14.85	19156	2044
13	39.47	15.27	19631	6791
14	40.57	16.15	19328	2883
15	50.77	16.47	21842	6521
16	43.17	14.35	19862	1944
17	44.48	16.03	19673	13303
18	40.22	14.92	19478	5143
19	39.52	16.36	19264	5989
20	46.09	12.84	19445	38012
21	40.46	15.68	19253	3439
22	44.08	14.89	19091	5172
23	39.29	17.19	19488	11122
24	46.43	16.18	19811	10680
25	50.71	15.31	22526	6974
26	44.37	15.68	19620	5097
27	45.06	16.27	19449	13406
28	48.73	14.52	19870	5275
29	41.21	16.41	19488	8942
30	53.67	15.96	19544	10280
31	40.74	13.74	19296	2287
32	43.39	15.01	19743	2074
33	36.63	16.54	18805	10599
34	38.00	15.97	19259	5934

(appendix continues)

County Number	Education ARCSIN	Teacher/ Pupil Ratio	County Salary	County Size
35	47.41	14.93	20659	7058
36	35.55	13.80	19190	1437
37	42.30	13.42	21019	1584
38	39.58	14.11	19419	1751
39	42.65	14.90	18972	6288
40	47.87	15.85	20529	8153
41	41.38	17.20	19428	17081
42	37.94	13.40	18666	5234
43	39.00	16.05	18736	2102
44	36.30	16.57	18738	3226
45	39.76	15.40	19097	2588
46	44.31	14.57	19158	3096
47	41.15	16.23	19396	1623
48	37.70	16.01	18594	2241
49	40.05	15.99	18978	4765
50	47.41	16.78	19852	9414
51	30.53	14.99	18199	2601
52	40.74	15.06	18901	4379
53	38.35	15.48	19357	1107
54	43.68	14.77	19575	16943
55	38.06	15.78	19408	8243

Appendix D

Differences in SES, Teacher/Pupil Ratio, and Total Basic Skills of Matched Elementary Schools

Match Number	School Number	Group*	SES%	Diff.	Pre TBS	Diff.	T/P Ratio	Diff.
1	28	1	51.8		558.2		16.4	
1	29	2	51.6	.2	565.2	7.0	16.4	0
2	7	1	60.7		592.0		17.3	
2	21	2	52.8	7.9	587.4	4.6	15.0	2.3
3	38	1	52.8		605.0		13.4	
3	23	2	52.2	.6	605.3	.3	16.3	2.9
4	35	1	45.4		609.1		14.9	
4	20	2	43.5	1.9	608.6	.5	15.0	.1
5	48	1	41.3		620.9		15.7	
5	50	2	41.2	.1	618.9	2.0	17.3	1.6
6	19	1	47.8		628.3		15.7	
6	12	2	49.3	1.5	628.3	0	15.3	.4
7	11	1	42.4		629.3		14.1	
7	15	2	43.2	.8	629.7	.4	15.8	1.7
8	22	1	64.5		630.3		16.5	
8	30	2	66.5	2.0	630.6	.3	16.4	.1
9	47	1	63.9		631.0		17.3	
9	49	2	57.2	6.7	632.8	1.8	16.0	1.3
10	2	1	38.0		633.8		15.6	
10	36	2	38.9	.9	634.1	.3	17.2	1.6
11	40	1	51.0		634.6		16.6	
11	32	2	49.3	1.7	634.6	0	16.0	.6
12	24	1	55.9		635.8		16.3	
12	25	2	57.3	1.4	635.6	.2	16.3	0
13	16	1	39.9		638.7		15.8	
13	17	2	40.7	.8	639.6	.9	15.8	0
14	34	1	51.4		639.2		14.1	
14	9	2	49.7	1.7	638.9	.3	15.8	1.7
15	45	1	45.0		639.6		15.8	
15	26	2	45.3	.3	639.2	.4	16.3	.5
16	41	1	57.0		645.5		16.6	
16	10	2	55.4	1.6	644.5	1.0	16.7	.1
17	46	1	47.4		644.7		15.8	
17	3	2	47.9	.5	645.8	1.1	15.5	.3

(appendix continues)

Match Number	School Number	Group*	SES%	Diff.	Pre TBS	Diff.	T/P Ratio	Diff.
18	43	1	47.5		647.4		16.2	
18	37	2	48.2	.7	647.6	.2	17.2	1.0
19	44	1	33.4		656.1		14.8	
19	4	2	34.5	1.1	653.9	2.2	15.5	.7
20	5	1	31.8		654.7		15.5	
20	6	2	30.8	1.0	655.0	.3	15.5	0
21	27	1	33.0		656.3		16.3	
21	18	2	30.7	2.3	657.0	.7	15.8	.5
22	42	1	36.0		656.5		14.6	
22	33	2	35.7	.3	657.8	1.3	13.9	.7
23	14	1	51.6		658.1		16.2	
23	39	2	51.4	.2	660.0	1.9	13.4	2.8
24	8	1	58.8		661.9		17.3	
24	31	2	54.4	4.4	677.3	15.4	15.0	2.3
25	13	1	58.8		682.5		15.3	
25	1	2	52.1	6.7	686.2	3.7	16.1	.8

Note. SES = Socioeconomic Status; Diff. = Difference; TBS = Total Basic Skills; T/P = Teacher/Pupil; Group* = 1 - Experimental or 2 - Control.

Appendix E

Differences in SES, Teacher/Pupil Ratio, and Total Basic Skills of Matched Secondary Schools

Match Number	School Number	Group*	SES%	Diff.	Pre TBS	Diff.	T/P Ratio	Diff.
1	13	1	53.2		709.3		13.6	
1	14	2	52.2	1.0	700.1	9.2	15.0	1.6
2	1	1	50.3		724.4		13.1	
2	2	2	52.7	2.4	722.6	1.8	16.3	3.2
3	17	1	37.7		728.8		14.6	
3	18	2	39.1	1.4	725.5	3.3	16.8	2.2
4	11	1	52.8		736.0		13.4	
4	12	2	51.2	1.6	729.5	6.5	16.7	3.3
5	7	1	28.8		732.0		16.0	
5	8	2	29.3	.5	732.0	0.0	17.2	1.2
6	19	1	35.2		732.8		16.0	
6	20	2	34.5	.7	731.3	1.5	14.9	1.1
7	3	1	45.1		736.5		14.1	
7	4	2	44.7	.4	734.4	2.1	16.3	2.2
8	15	1	37.7		737.9		15.4	
8	16	2	34.8	2.6	737.9	0.0	16.7	1.3
9	9	1	15.6		740.7		15.8	
9	10	2	23.3	7.7	741.3	.6	14.8	1.0
10	5	1	5.7		746.9		16.0	
10	6	2	20.6	14.9	747.2	.3	16.8	.8

Note. SES = Socioeconomic Status; Diff. = Difference; TBS = Total Basic Skills; T/P = Teacher/Pupil; Group* = 1 - Experimental or 2 - Control.

Appendix F

School Data Considered in the Forward Stepwise Regression Analyses at the Elementary Level

Match Number	School Number	Group	Pre* Read	Pre* Math	Pre* TBS	Pre ADA ARCSIN	Size	SES* ARCSIN
1	28	1	542.0	566.0	558.2	74.6	109	51.8
1	29	2	561.8	567.7	565.2	73.6	143	51.6
2	7	1	580.8	589.7	592.0	62.7	126	60.7
2	21	2	569.9	594.6	587.4	73.6	87	52.8
3	38	1	582.0	613.9	605.0	74.6	100	52.8
3	23	2	601.3	608.2	605.3	73.6	362	52.2
4	35	1	611.5	602.1	609.1	67.4	247	45.4
4	20	2	596.7	615.9	608.6	78.5	52	43.5
5	48	1	613.1	629.3	620.9	74.6	316	41.3
5	50	2	619.8	622.4	618.9	76.3	612	41.2
6	19	1	614.5	633.7	628.3	73.6	103	47.8
6	12	2	632.5	612.8	628.3	66.7	487	49.3
7	11	1	634.0	616.5	629.3	73.6	233	42.4
7	15	2	622.2	627.4	629.7	80.0	527	43.2
8	22	1	625.7	624.0	630.3	78.5	252	64.5
8	30	2	627.9	629.6	630.6	63.4	65	66.5
9	47	1	641.3	602.1	631.0	67.2	56	63.9
9	49	2	614.7	643.6	632.8	80.4	172	57.2
10	2	1	614.6	632.6	633.8	74.6	222	38.0
10	36	2	640.9	628.0	634.1	75.8	303	38.9
11	40	1	625.3	637.5	634.6	77.1	904	51.0
11	32	2	622.4	640.9	634.6	78.5	162	49.3
12	24	1	634.3	630.2	635.8	74.6	293	55.9
12	25	2	632.1	637.8	635.6	73.6	123	57.5
13	16	1	639.2	632.4	638.7	74.6	921	39.9
13	17	2	629.3	640.0	639.6	78.5	192	40.7
14	34	1	642.0	633.5	639.2	77.1	218	51.4
14	9	2	635.1	636.8	638.9	80.0	92	49.7
15	45	1	636.7	629.5	639.6	74.6	255	45.0
15	26	2	639.6	630.9	639.2	69.7	425	45.3
16	41	1	623.6	651.9	645.5	77.1	135	57.0
16	10	2	648.6	637.3	644.5	73.6	270	55.4
17	46	1	645.5	632.2	644.7	74.6	604	47.4
17	3	2	646.5	629.2	645.8	73.6	172	47.9

(appendix continues)

Match Number	School Number	Group	Pre* Read	Pre* Math	Pre* TBS	Pre ADA ARCSIN	Size	SES* ARCSIN
18	43	1	663.3	627.6	647.4	73.6	450	47.5
18	37	2	648.2	640.6	647.6	75.8	333	48.2
19	44	1	663.1	634.1	656.1	77.1	249	33.4
19	4	2	658.4	653.0	653.9	81.9	273	34.5
20	5	1	654.6	649.8	654.7	75.8	329	31.8
20	6	2	669.0	654.6	655.0	81.9	119	30.8
21	27	1	665.8	646.3	656.3	64.2	291	33.0
21	18	2	664.6	645.0	657.0	78.5	280	30.7
22	42	1	655.5	640.2	656.5	80.0	150	36.0
22	33	2	655.0	652.3	657.8	78.5	232	35.7
23	14	1	660.4	646.3	658.1	77.6	144	51.6
23	39	2	664.2	645.8	660.0	77.6	414	51.4
24	8	1	651.2	667.3	661.9	65.7	56	58.8
24	31	2	660.3	681.3	677.3	68.9	51	54.4
25	13	1	698.0	663.0	682.5	73.6	166	58.8
25	1	2	714.7	661.6	686.2	74.6	161	52.1

Note. TBS = Total Basic Skills; SES = Socioeconomic Status; * indicates school level data; Group 1 = Experimental; Group 2 = Control.

Appendix F

(Cont'd)

School Data Considered in the Forward Stepwise Regression Analyses at the Elementary Level

Match Number	School Number	Group	T/P Ratio	Exper. ARCSIN	Ed. ARCSIN	Salary	Expend./ Pupil
1	28	1	16.4	57.1	41.2	19488	2678
1	29	2	16.4	57.1	41.2	19488	2678
2	7	1	17.3	55.4	40.9	19203	2556
2	21	2	15.0	56.5	44.1	19091	2822
3	38	1	13.4	55.0	37.9	18666	3001
3	23	2	16.3	62.5	45.1	19449	2619
4	35	1	14.9	54.2	42.7	18972	2773
4	20	2	15.0	56.5	44.1	19091	2822
5	48	1	15.7	63.5	44.4	19620	2995
5	50	2	17.2	59.6	41.4	19428	2507
6	19	1	15.7	57.2	40.5	19253	2721
6	12	2	15.3	64.0	39.5	19631	2738
7	11	1	14.1	60.6	37.3	18831	3058
7	15	2	15.8	65.4	46.1	19445	2788
8	22	1	16.5	56.6	36.6	18805	2734
8	30	2	16.4	57.1	41.2	19488	2678
9	47	1	17.3	55.4	40.9	19203	2556
9	49	2	16.0	62.4	44.5	19673	2840
10	2	1	15.6	63.2	47.6	19720	2744
10	36	2	17.2	59.6	41.4	19428	2507
11	40	1	16.6	56.0	36.3	18738	2498
11	32	2	16.0	57.9	38.0	19259	2567
12	24	1	16.3	62.5	45.1	19449	2619
12	25	2	16.3	65.5	45.1	19449	2619
13	16	1	15.8	65.4	46.1	19455	2788
13	17	2	15.8	65.4	46.1	19455	2788
14	34	1	14.1	59.8	39.6	19419	2344
14	9	2	15.8	60.7	39.2	19422	3087
15	45	1	15.8	57.3	38.1	19408	2625
15	26	2	16.3	62.5	45.1	19449	2619
16	41	1	16.6	56.0	36.3	18738	2498
16	10	2	16.7	60.9	38.7	19427	2618

(appendix continues)

Match Number	School Number	Group	T/P Ratio	Exper. ARCSIN	Ed. ARCSIN	Salary	Expend./ Pupil
17	46	1	15.8	57.3	38.1	19408	2625
17	3	2	15.5	66.7	53.0	20090	2707
18	43	1	16.2	58.7	41.2	19396	2747
18	37	2	17.2	59.6	41.4	19428	2507
19	44	1	14.8	62.7	43.7	19575	2660
19	4	2	15.5	66.7	53.0	20090	2707
20	5	1	15.5	66.7	53.0	20090	2707
20	6	2	15.5	66.7	53.0	20090	2707
21	27	1	16.3	65.5	45.1	19449	2619
21	18	2	15.8	65.4	46.1	19455	2788
22	42	1	14.6	55.4	44.3	19158	2851
22	33	2	14.9	67.1	47.4	20659	2956
23	14	1	16.2	62.5	40.6	19328	2726
23	39	2	13.4	55.0	37.9	18666	3001
24	8	1	17.3	55.4	40.9	16203	2556
24	31	2	15.0	64.4	43.4	19743	2867
25	13	1	15.3	64.0	39.5	19631	2738
25	1	2	16.1	54.6	38.1	16290	2624

Note. T/P = Teacher/Pupil; Exper. = Experience; Ed. = Education; Expend. = Expenditure; Group 1 = Experimental; Group 2 = Control.

Appendix F

(Cont'd)

School Data Considered in the Forward Stepwise Regression Analyses at the Elementary Level

Match Number	School Number	Group	Income	Post* Read	Post* Math	Post* TBS	Post* ADA ARCSIN
1	28	1	8142	719.5	707.8	711.3	78.5
1	29	2	8142	713.9	709.1	705.3	76.6
2	7	1	6172	710.6	701.8	706.4	72.5
2	21	2	6427	687.0	688.8	689.6	76.4
3	38	1	8719	734.2	702.7	715.5	77.2
3	23	2	9747	710.7	700.4	700.4	65.1
4	35	1	8354	731.4	706.9	715.6	73.6
4	20	2	6427	725.0	704.8	714.8	70.2
5	48	1	8637	738.1	703.4	718.4	80.7
5	50	2	9835	716.1	704.1	706.7	80.0
6	19	1	8936	733.6	715.5	720.6	70.2
6	12	2	8743	728.4	711.7	718.7	74.7
7	11	1	7512	730.4	698.4	715.6	68.0
7	15	2	12499	727.5	710.1	715.5	69.7
8	22	1	8048	712.6	708.4	707.2	71.8
8	30	2	8142	695.6	701.2	693.7	75.8
9	47	1	6172	765.8	728.4	742.7	75.8
9	49	2	10269	714.9	699.0	702.8	69.3
10	2	1	9711	723.4	704.3	710.3	75.0
10	36	2	9835	732.9	701.6	716.7	74.7
11	40	1	7975	727.6	706.6	714.2	70.7
11	32	2	8669	735.3	722.0	730.1	73.6
12	24	1	9747	734.6	710.4	718.3	73.6
12	25	2	9747	730.2	702.4	716.7	71.9
13	16	1	12499	707.7	707.0	705.3	74.9
13	17	2	12499	724.7	710.4	710 0	75.0
14	34	1	8373	735.5	731.7	732.6	75.8
14	9	2	6891	747.4	723.6	730.8	71.7
15	45	1	7551	722.1	703.9	711.2	74.7
15	26	2	9747	737.6	705.8	717.5	69.8
16	41	1	7975	737.3	712.1	720.2	74.7
16	10	2	8412	750.9	713.4	723.4	79.1

(appendix continues)

Match Number	School Number	Group	Income	Post* Read	Post* Math	Post* TBS	Post* ADA ARCSIN
17	46	1	7551	711.8	701.8	705.6	73.6
17	3	2	10829	743.1	705.6	720.7	77.9
18	43	1	7269	722.4	699.4	704.0	71.1
18	37	2	9835	733.0	704.4	713.4	77.1
19	44	1	11231	744.3	704.1	720.2	74.8
19	4	2	10829	741.3	715.0	723.5	77.6
20	5	1	10829	745.9	707.7	723.5	78.5
20	6	2	10829	763.8	720.0	735.1	73.9
21	27	1	9747	744.2	706.4	720.8	64.8
21	18	2	12499	732.2	711.7	717.5	68.0
22	42	1	8477	761.9	724.8	741.3	64.6
22	33	2	11692	769.7	730.5	749.0	73.6
23	14	1	7509	745.1	720.6	729.9	70.6
23	39	2	8719	744.7	717.6	729.3	74.7
24	8	1	6172	742.5	719.1	729.1	67.5
24	31	2	9662	726.3	709.7	715.7	71.1
25	13	1	8743	761.0	714.9	733.8	62.7
25	1	2	8540	723.2	707.3	713.4	78.8

Note. TBS = Total Basic Skills; * indicates school level data;

Group 1 = Experimental; Group 2 = Control.

Appendix G

School Data Considered in the Forward Stepwise Regression Analyses at the Secondary Level

Match Number	School Number	Group	Pre* Read	Pre* Math	Pre* TBS	Pre* ADA ARCSIN	Pre* Dropout ARCSIN	Size*
1	13	1	724.4	717.7	709.3	67.4	13.1	313
1	14	2	719.6	700.8	700.1	77.8	7.0	271
2	1	1	739.4	722.0	724.4	75.2	16.2	831
2	2	2	739.0	719.6	722.6	75.2	6.6	460
3	17	1	750.3	723.7	728.8	77.5	13.7	749
3	18	2	741.9	722.2	725.5	74.5	13.6	839
4	11	1	757.1	720.6	736.0	85.3	11.5	100
4	12	2	731.9	726.7	729.5	81.9	13.7	395
5	7	1	74732	725.5	732.0	78.5	8.5	505
5	8	2	743.2	724.9	732.0	65.7	13.7	266
6	19	1	753.1	724.3	732.8	78.5	12.3	1531
6	20	2	747.4	727.0	731.3	78.9	8.7	524
7	3	1	751.3	730.8	736.5	74.6	12.7	397
7	4	2	757.1	723.2	734.4	71.6	9.8	240
8	15	1	754.4	727.1	737.9	63.1	13.4	890
8	16	2	758.4	727.0	737.9	84.3	16.5	432
9	9	1	759.1	733.2	740.7	75.4	7.3	608
9	10	2	759.1	731.9	741.3	69.2	7.5	691
10	5	1	764.5	734.4	746.9	75.0	11.5	605
10	6	2	755.5	735.5	747.2	70.6	8.1	441

Note. TBS = Total Basic Skills; * indicates school level data;

Group 1 = Experimental; Group 2 = Control.

Appendix G

(Cont'd)

School Data Considered in the Forward Stepwise Regression Analyses at the Secondary Level

Match Number	School Number	Group	SES* ARCSIN	T/P Ratio	Exper. ARCSIN	Ed. ARCSIN	Salary
1	13	1	53.2	16.6	56.0	36.3	18738
1	14	2	52.2	15.0	64.4	43.4	19743
2	1	1	50.3	13.1	57.4	33.3	18594
2	2	2	52.7	16.3	62.5	45.1	19449
3	17	1	37.7	14.6	55.4	44.3	19158
3	18	2	39.1	16.8	61.9	54.2	19852
4	11	1	52.8	13.4	55.0	37.9	18666
4	12	2	51.2	16.7	60.9	38.7	19427
5	7	1	28.8	16.0	60.4	53.7	19544
5	8	2	29.3	17.2	59.6	41.4	19428
6	19	1	35.2	16.0	59.0	40.0	18978
6	20	2	34.5	14.9	54.2	42.7	18972
7	3	1	45.1	14.1	60.6	37.3	18831
7	4	2	44.7	16.3	62.5	45.1	19449
8	15	1	37.4	15.4	60.0	39.8	19079
8	16	2	34.8	16.7	60.9	38.7	19427
9	9	1	15.6	15.8	60.3	47.9	20529
9	10	2	23.3	14.8	62.6	43.7	19575
10	5	1	5.7	16.0	62.4	44.5	19673
10	6	2	20.6	16.8	61.9	54.2	19852

Note. SES = Socioeconomic Status; T/P = Teacher/Pupil; Exper. = Experience; Ed. = Education; Group 1 = Experimental; Group 2 = Control; * indicates school level data.

Appendix G

(Cont'd)

School Data Considered in the Forward Stepwise Regression Analyses at the Secondary Level

Match Number	School Number	Group	Expenditure/ Pupil	Income	Post* Read	Post* Math
1	13	1	2498	7975	753.3	726.0
1	14	2	2867	9662	757.3	720.7
2	1	1	3004	7548	775.0	736.0
2	2	2	2619	9747	760.0	734.5
3	17	1	2851	8477	778.0	733.7
3	18	2	2586	7888	775.3	730.8
4	11	1	3001	8719	786.2	731.3
4	12	2	2618	8412	786.9	740.0
5	7	1	2719	10205	776.9	738.7
5	8	2	2507	9835	776.7	740.2
6	19	1	2474	8770	783.0	735.9
6	20	2	2773	8364	771.3	734.2
7	3	1	3058	7512	783.5	737.6
7	4	2	2619	9747	792.8	734.7
8	15	1	2651	7532	780.6	735.1
8	16	2	2618	8412	786.1	746.3
9	9	1	2898	10377	783.0	743.2
9	10	2	2660	11231	790.9	742.9
10	5	1	2840	10269	789.2	743.7
10	6	2	2586	7888	794.7	749.8

Note. Group 1 = Experimental; Group 2 = Control; * indicates school level data.

Appendix G

(Cont'd)

School Data Considered in the Forward Stepwise Regression Analyses at the Secondary Level

Match Number	School Number	Group	Post* TBS	Post* ADA ARCSIN	Post* Dropout ARCSIN
1	13	1	729.3	73.3	10.5
1	14	2	732.0	74.2	5.7
2	1	1	752.7	71.6	13.1
2	2	2	741.9	74.8	9.8
3	17	1	748.5	76.3	15.0
3	18	2	747.2	73.1	11.7
4	11	1	755.8	76.2	8.7
4	12	2	761.8	87.4	11.7
5	7	1	751.2	76.7	5.7
5	8	2	756.9	77.3	16.6
6	19	1	754.9	77.0	15.6
6	20	2	745.4	73.8	8.5
7	3	1	756.4	72.5	12.8
7	4	2	757.4	73.0	10.1
8	15	1	753.3	77.2	16.4
8	16	2	761.7	82.1	17.6
9	9	1	759.2	77.3	5.7
9	10	2	763.2	77.2	6.3
10	5	1	764.2	71.7	12.9
10	6	2	768.6	75.0	9.1

Note. TBS = Total Basic Skills; Group 1 = Experimental; Group 2 = Control;

* indicates school level data.

Appendix H

Summary of Elementary Data Included in the Forward Stepwise Regression Analysis

Variable	N	Mean	SD	Minimum	Maximum	Range
Total Reading Pretest	50	636.4	34.0	542.0	722.4	180.4
Total Reading Post Test	50	732.1	17.1	687.0	769.7	82.7
Total Math Pretest	50	631.4	22.3	566.0	681.0	115.0
Total Math Post Test	50	709.6	88.9	688.8	731.0	42.2
Total Basic Skills Pretest	50	636.1	25.4	558.2	686.2	128.0
Total Basic Skills Post Test	50	717.7	11.9	689.6	749.0	59.4
Attendance Pretest	50	74.5	4.7	62.7	81.9	19.2
Attendance Post Test	50	73.2	4.2	62.7	80.7	18.0
Socioeconomic Status	50	47.7	9.1	30.7	66.5	35.8
Per Capita Income	50	9030.3	1706.4	6172.0	12499.0	6327.0
Expenditures/ Pupil	50	2711.6	157.2	2344.0	3087.0	743.0
Teacher Experience	50	60.2	3.9	54.2	76.1	12.9

(appendix continues)

Appendix H

(Cont'd)

Summary of Elementary Data Included in the Forward Stepwise Regression Analysis

Variable	N	Mean	SD	Minimum	Maximum	Range
Teacher Education	50	42.6	4.4	36.3	53.0	16.7
Teacher/Pupil Ratio	50	15.8	0.1	13.4	17.3	3.9
Teacher Salary	50	19407.2	384.8	18666.0	20659.0	1993.0
School Size	50	257.8	196.2	16.0	921.0	905.0

Appendix I

Summary of Secondary Data Included in the Forward Stepwise Regression Analysis

Variable	N	Mean	SD	Minimum	Maximum	Range
Total Reading Pretest	20	747.7	12.1	719.6	764.5	44.9
Total Reading Post Test	20	779.1	11.4	753.3	794.7	41.4
Total Math Pretest	20	725.1	7.6	700.8	735.4	34.6
Total Math Post Test	20	736.8	6.8	720.7	749.8	29.1
Total Basic Skills Pretest	20	731.4	11.4	700.1	747.2	47.1
Total Basic Skills Post Test	20	753.1	10.2	729.3	768.6	39.3
Attendance Pretest	20	75.0	5.9	63.1	85.2	22.2
Attendance Post Test	20	75.9	3.7	71.6	87.4	15.8
Dropout Pretest	20	11.3	3.0	6.6	16.5	9.9
Dropout Post Test	20	11.2	3.8	5.7	17.6	11.9
Socioeconomic Status	20	37.2	13.6	5.7	53.2	47.5
Per Capita Income	20	8928.5	1114.2	7512.0	11231.0	3719.0

(appendix continues)

Appendix I

(Cont'd)

Summary of Secondary Data Included in the Forward Stepwise Regression Analysis

Variable	N	Mean	SD	Minimum	Maximum	Range
Expenditures/ Pupil	20	2722.4	178.0	2474.0	3058.0	584.0
Teacher Experience	20	59.9	2.9	54.2	64.0	9.8
Teacher Education	20	43.1	5.9	33.8	54.2	20.4
Teacher/Pupil Ratio	20	15.6	1.2	13.1	17.2	4.1
Teacher Salary	20	19348.2	478.7	18594.0	20529.0	1935.0
School Size	20	553.5	313.6	100.0	1513.0	1413.0

Appendix J

Summary of the Forward Stepwise Regression Analysis for all Dependent Variables at the Elementary Level

Variable Entered	DF	Partial R**2	Model R**2	F Value	Prob > F
Total Reading					
Pre Read	49	0.25	0.25	16.05	0.0002
Size	49	0.06	0.31	4.02	0.0507
Socioeconomic Status	49	0.07	0.38	5.35	0.0252
Total Math					
Pre Math	49	0.11	0.11	5.61	0.0220
Size	49	0.04	0.14	2.15	0.1491
Pre ADA	49	0.04	0.18	1.94	0.1706
Expenditures	49	0.02	0.19	0.87	0.3556
Teacher/Pupil Ratio	49	0.01	0.21	0.63	0.4315
Salary	49	0.01	0.21	0.49	0.4898
Education	49	0.05	0.26	2.61	0.1140
Total Basic Skills					
Pre TBS	49	0.23	0.23	14.62	0.0004
Size	49	0.06	0.30	4.29	0.0438
Socioeconomic Status	49	0.04	0.34	2.70	0.1072
Income	49	0.02	0.35	1.15	0.2894
Pre ADA	49	0.02	0.37	1.39	0.2453
Salary	49	0.01	0.39	0.73	0.3895
Education	49	0.01	0.39	0.49	0.4888

(appendix continues)

Variable Entered	DF	Partial R**2	Model R**2	F Value	Prob > F
Average Daily Attendance Rates					
Pre TBS	49	0.06	0.06	3.18	0.0809
Salary	49	0.05	0.11	2.82	0.0995
Experience	49	0.02	0.13	0.84	0.3649
Size	49	0.02	0.16	1.28	0.2637
Pre ADA	49	0.02	0.17	0.97	0.3296

Note. TBS = Total Basic Skills

Appendix K

Summary of the Forward Stepwise Regression Analysis for all Dependent Variables at the Secondary Level

Variable Entered	DF	Partial R**2	Model R**2	F Value	Prob > F
Total Reading					
Pre Read	19	0.65	0.65	33.33	0.0007
Experience	19	0.03	0.68	1.56	0.2290
Income	19	0.02	0.70	1.35	0.2631
Pre ADA	19	0.01	0.72	0.67	0.4255
Total Math					
Pre Math	19	0.78	0.78	61.99	0.0001
Size	19	0.05	0.83	5.27	0.0348
Pre ADA	19	0.04	0.87	5.39	0.0338
Expenditures	19	0.01	0.89	0.91	0.3550
Total Basic Skills					
Pre TBS	19	0.83	0.83	85.15	0.0001
Experience	19	0.03	0.86	3.62	0.0741
Education	19	0.02	0.88	2.79	0.1140
Pre ADA	19	0.02	0.89	2.36	0.1452

(appendix continues)

Variable Entered	DF	Partial R**2	Model R**2	F Value	Prob > F
Average Daily Attendance Rates					
Teacher/Pupil Ratio	19	0.11	0.11	2.19	0.1559
Pre ADA	19	0.18	0.29	4.29	0.0538
Education	19	0.10	0.39	2.53	0.1315
Salary	19	0.05	0.43	1.30	0.2719
Expenditures	19	0.08	0.51	2.23	0.1579
Pre TBS	19	0.05	0.56	1.36	0.2641
Socioeconomic Status	19	0.05	0.61	1.68	0.2191
Experience	19	0.02	0.63	0.64	0.4405
Dropout Rates					
Pre Dropout	19	0.68	0.68	37.58	0.0001
Expenditures	19	0.05	0.73	3.13	0.0946
Pre TBS	19	0.03	0.76	1.96	0.1805
Education	19	0.01	0.77	0.83	0.3771
Size	19	0.01	0.78	0.93	0.3531
Salary	19	0.01	0.81	0.58	0.4609
Pre ADA	19	0.01	0.82	0.57	0.4673

Note. TBS = Total Basic Skills

Appendix L

Summary of Data From the Multivariate Regression Analyses for Elementary Experimental and Elementary Control Groups on All Dependent Variables

Group	Variable	N	Mean	SD	Minimum Value	Maximum Value	Range
Elementary							
Experimental	Read	25	3.12	11.49	-12.80	35.63	48.43
Control	Read	25	-4.38	15.52	-32.12	26.24	58.36
Elementary							
Experimental	Math	25	1.01	8.02	-9.78	23.64	33.42
Control	Math	25	-.92	7.41	-15.55	11.82	27.37
Elementary							
Experimental	TBS	25	1.62	9.13	-15.83	27.61	43.44
Control	TBS	25	-1.82	9.93	-19.96	18.77	38.73
Elementary							
Experimental	Att.	25	-.26	3.68	-8.98	6.06	15.04
Control	Att.	25	.26	4.08	10.00	8.25	18.25
Low SES Elementary							
Experimental	Read	13	8.49	10.93	-8.22	35.63	43.85
Control	Read	13	-6.95	16.92	-32.12	20.52	52.64
Low SES Elementary							
Experimental	Math	13	3.00	7.61	-5.06	23.64	28.70
Control	Math	13	-2.03	8.64	-15.55	11.50	27.05
Low SES Elementary							
Experimental	TBS	13	5.85	7.69	-5.58	27.61	33.19
Control	TBS	13	-3.57	10.89	-19.96	11.28	31.24
Low SES Elementary							
Experimental	Att.	13	-.51	3.64	-8.98	4.89	13.87
Control	Att.	13	.24	4.72	-10.00	8.25	18.25
High SES Elementary							
Experimental	Read	12	-2.69	9.33	-12.80	16.18	28.98
Control	Read	12	1.03	11.15	-14.77	26.24	41.01

(appendix continues)

Group	Variable	N	Mean	SD	Minimum Value	Maximum Value	Range
High SES Elementary							
Experimental	Math	12	-2.17	7.47	-9.78	13.63	23.41
Control	Math	12	.08	5.6	-8.72	11.82	20.54
High SES Elementary							
Experimental	TBS	12	-2.96	8.56	-15.83	12.68	28.51
Control	TBS	12	.49	7.39	-7.12	18.77	25.89
High SES Elementary							
Experimental	Att.	12	.23	3.57	-6.23	6.06	12.29
Control	Att.	12	.29	3.46	-4.66	4.72	9.38
LIL Elementary							
Experimental	Read	13	6.07	11.99	-11.08	35.63	46.71
Control	Read	13	-7.07	13.29	-32.12	12.02	44.01
LIL Elementary							
Experimental	Math	13	2.01	8.11	-7.67	23.64	31.31
Control	Math	13	-2.25	8.29	-15.55	11.50	27.05
LIL Elementary							
Experimental	TBS	13	3.81	8.56	-9.72	27.61	37.33
Control	TBS	13	-3.26	8.95	-19.96	8.49	28.45
LIL Elementary							
Experimental	Att.	13	-.44	4.41	-8.96	5.11	14.07
Control	Att.	13	-.13	3.85	-5.70	8.25	13.95
HIL Elementary							
Experimental	Read	12	-.08	10.48	-12.80	16.18	28.98
Control	Read	12	-.50	14.30	-29.89	26.24	56.13
HIL Elementary							
Experimental	Math	12	-.05	8.13	-9.78	13.63	23.41
Control	Math	12	-.37	6.36	-6.73	11.82	18.55

(appendix continues)

Group	Variable	N	Mean	SD	Minimum Value	Maximum Value	Range
HIL Elementary							
Experimental	TBS	12	-1.58	8.74	-15.83	12.68	28.51
Control	TBS	12	-.63	9.97	-17.32	18.77	36.09
HIL Elementary							
Experimental	Att.	12	-.37	3.08	-6.23	4.89	11.12
Control	Att.	12	.37	5.16	-10.00	5.52	15.52

Note. TBS = Total Basic Skills; Att. = Attendance Rate; SES = Socioeconomic Status; LIL = Low Implementing Level; HIL = High Implementing Level.

Appendix M

Summary of Data From the Multivariate Regression Analyses for Secondary Experimental and Secondary Control Groups on All Dependent Variables

Group	Variable	N	Mean	SD	Minimum Value	Maximum Value	Range
Secondary							
Experimental	Read	10	-1.14	2.29	-3.89	2.50	6.39
Control	Read	10	1.14	8.34	-12.65	16.75	29.40
Secondary							
Experimental	Math	10	-.29	1.96	-3.03	4.33	7.36
Control	Math	10	.29	2.80	-5.09	4.28	9.37
Secondary							
Experimental	TBS	10	-.81	2.67	-3.82	5.06	8.87
Control	TBS	10	.81	3.81	-5.79	6.48	12.27
Secondary							
Experimental	Att.	10	.41	2.17	-1.84	4.15	5.99
Control	Att.	10	-.15	2.41	-3.92	4.80	8.72
Secondary							
Experimental	Drpt.	10	-.38	1.75	-3.14	2.82	5.96
Control	Drpt.	10	.38	1.51	-2.03	2.55	4.58
Low SES Secondary							
Experimental	Read	5	-.02	2.49	-3.24	2.82	5.96
Control	Read	5	.63	11.12	-12.65	16.75	29.40
Low SES Secondary							
Experimental	Math	5	.10	2.71	-3.03	4.33	7.36
Control	Math	5	-1.20	2.42	-5.09	1.23	6.32
Low SES Secondary							
Experimental	TBS	5	.20	3.23	-3.22	5.05	8.27
Control	TBS	5	.41	4.34	-5.80	6.48	12.28
Low SES Secondary							
Experimental	Att.	5	-.14	1.42	-1.15	2.16	3.31
Control	Att.	5	-.49	3.41	-3.92	4.80	8.72

(appendix continues)

Group	Variable	N	Mean	SD	Minimum Value	Maximum Value	Range
Low SES Secondary							
Experimental	Drpt.	5	-.33	2.21	-3.14	2.82	5.96
Control	Drpt.	5	.32	1.85	-2.03	2.55	4.58
High SES Secondary							
Experimental	Read	5	-2.60	2.11	-5.61	-.49	6.10
Control	Read	5	1.98	5.15	-3.89	6.30	10.19
High SES Secondary							
Experimental	Math	5	.21	2.46	-1.94	4.28	6.22
Control	Math	5	.89	2.15	-1.59	4.00	5.59
High SES Secondary							
Experimental	TBS	5	-1.34	1.42	-3.82	-.25	4.07
Control	TBS	5	.73	4.17	-3.57	5.20	8.77
High SES Secondary							
Experimental	Att.	5	.43	2.90	-1.84	4.15	5.99
Control	Att.	5	.20	1.06	-1.24	1.28	2.52
High SES Secondary							
Experimental	Drpt.	5	-.43	1.41	-2.04	1.27	3.31
Control	Drpt.	5	.43	1.30	-1.31	1.89	3.20
LIL Secondary							
Experimental	Read	5	-1.46	2.44	-3.89	2.19	6.08
Control	Read	5	5.09	8.08	-5.61	16.75	22.36
LIL Secondary							
Experimental	Math	5	-1.47	1.11	-3.03	-.18	3.21
Control	Math	5	1.02	2.86	-1.43	4.28	5.71
LIL Secondary							
Experimental	TBS	5	-2.26	1.76	-3.82	-.25	4.07
Control	TBS	5	2.02	3.34	-1.19	6.48	7.60
LIL Secondary							
Experimental	Att.	5	-.24	2.00	-1.84	2.97	4.81
Control	Att.	5	-.12	3.16	-3.92	4.80	8.72

(appendix continues)

Group	Variable	N	Mean	SD	Minimum Value	Maximum Value	Range
LIL Secondary							
Experimental	Drpt.	5	.36	.53	-.05	1.27	1.32
Control	Drpt.	5	-.06	1.24	-2.03	1.40	3.43
HIL Secondary							
Experimental	Read	5	-.81	2.34	-3.24	2.50	5.74
Control	Read	5	-1.70	7.54	12.65	5.57	18.22
HIL Secondary							
Experimental	Math	5	.89	1.99	-.75	4.33	5.08
Control	Math	5	-.26	2.79	-5.09	1.97	7.06
HIL Secondary							
Experimental	TBS	5	.64	2.76	-1.91	5.05	6.96
Control	TBS	5	.17	3.91	-5.79	5.20	10.99
HIL Secondary							
Experimental	Att.	5	.53	2.50	-1.40	4.15	5.55
Control	Att.	5	-.17	1.76	-2.24	1.28	3.52
HIL Secondary							
Experimental	Drpt.	5	-1.11	2.29	-3.14	2.82	5.96
Control	Drpt.	5	.81	1.76	-1.31	2.55	3.86

Note. TBS = Total Basic Skills; Att. = Attendance Rate; Drpt. = Dropout Rate; SES = Socioeconomic Status; LIL = Low Implementing Level; HIL = High Implementing Level.

Appendix N

Summary of the Groupings of Elementary Schools by Implementation and SES Levels

Match Number	School Number	Group	Implement. Score	Implement. Group	SES %	SES Group
1	28	1	28	5	61.7	3
1	29	2	0	NA	61.5	3
2	7	1	26	5	76.1	3
2	21	2	0	NA	63.4	3
3	38	1	32	6	63.4	3
3	23	2	0	NA	62.4	3
4	20	2	0	NA	47.3	4
4	35	1	24	5	50.7	4
5	48	1	27	5	43.5	4
5	50	2	0	NA	43.3	4
6	12	2	0	NA	57.4	3
6	19	1	38	6	54.8	4
7	11	1	29	5	45.4	4
7	15	2	0	NA	46.8	4
8	22	1	45	6	81.4	3
8	30	2	0	NA	84.1	3
9	47	1	10	5	80.6	3
9	49	2	0	NA	70.6	3
10	2	1	30	5	37.9	4
10	36	2	0	NA	39.4	4
11	32	2	0	NA	57.5	3
11	40	1	27	5	60.4	3
12	24	1	21	5	68.6	3
12	25	2	0	NA	70.8	3
13	16	1	41	6	41.2	4
13	17	2	0	NA	42.6	4
14	9	2	0	NA	58.1	3
14	34	1	23	5	61.0	3
15	26	2	0	NA	50.6	4
15	45	1	39	6	50.0	4
16	10	2	0	NA	67.7	3
16	41	1	44	6	70.4	3
17	3	2	0	NA	55.0	4
17	46	12	40	6	54.1	4

(appendix continues)

Appendix N

(Cont'd)

Summary of the Groupings of Elementary Schools by Implementation and SES Levels

Match Number	School Number	Group	Implement. Score	Implement. Group	SES %	SES Group
18	37	2	0	NA	55.6	4
18	43	1	43	6	54.4	4
19	4	2	0	NA	32.1	4
19	44	1	41	6	30.3	4
20	5	1	30	5	27.7	4
20	6	2	0	NA	26.2	4
21	18	2	0	NA	26.0	4
21	27	1	27	5	29.7	4
22	33	2	0	NA	34.0	4
22	42	1	37	6	34.5	4
23	14	1	33	6	61.5	3
23	39	2	0	NA	61.1	3
24	8	1	39	6	73.2	3
24	31	2	0	NA	66.1	3
25	1	2	0	NA	62.3	3
25	13	1	24	5	73.2	3
Median			30		55.6	

Note. Group 1 = Experimental; Group 2 = Control; SES Group 3 = Low; SES Group 4 = High; Implement. Group 5 = Low; Implement. Group 6 = High.

Appendix O

Summary of the Groupings of Secondary Schools by Implementation and SES Levels

Match Number	School Number	Group	Implement. Score	Implement. Group	SES %	SES Group
1	13	1	38	6	64.1	3
1	14	2	0	NA	62.5	3
2	1	1	42	6	59.2	3
2	2	2	0	NA	63.2	3
3	17	1	38	6	37.4	3
3	18	2	0	NA	39.7	3
4	11	1	32	5	63.4	3
4	12	2	0	NA	60.8	3
5	7	1	33	6	23.2	4
5	8	2	0	NA	23.9	4
6	19	1	31	5	33.3	4
6	20	2	0	NA	32.0	4
7	3	1	33	5	50.1	3
7	4	2	0	NA	49.4	3
8	15	1	25	5	36.9	4
8	16	2	0	NA	32.5	4
9	9	1	36	6	7.2	4
9	10	2	0	NA	15.6	4
10	5	1	26	5	1.0	4
10	6	2	0	NA	12.4	4
Median			33		36.9	

Note. Group 1 = Experimental; Group 2 = Control; SES Group 3 = Low; SES Group 4 = High; Implement. Group 5 = Low, Implement. Group 6 = High.