

70-22,976

CAMPBELL, Leonard Gene, 1933-  
RELATIONSHIPS OF SOCIO-ECONOMIC CONDITIONS AND  
EXPENDITURE PER PUPIL TO ACADEMIC ACHIEVEMENT  
IN THE STATE OF OKLAHOMA.

The University of Oklahoma, Ed.D., 1970  
Education, general

University Microfilms, A XEROX Company, Ann Arbor, Michigan

THE UNIVERSITY OF OKLAHOMA  
GRADUATE COLLEGE

RELATIONSHIPS OF SOCIO-ECONOMIC CONDITIONS AND  
EXPENDITURE PER PUPIL TO ACADEMIC ACHIEVE-  
MENT IN THE STATE OF OKLAHOMA

A DISSERTATION  
SUBMITTED TO THE GRADUATE COLLEGE  
in partial fulfillment of the requirements for the  
degree of  
DOCTOR OF EDUCATION

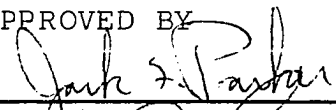
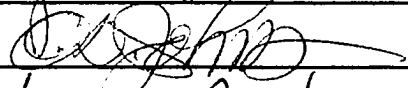
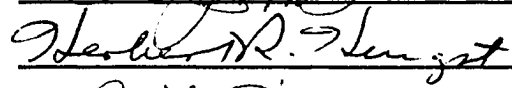
BY  
LEONARD G. CAMPBELL

Norman, Oklahoma

1970

RELATIONSHIPS OF SOCIO-ECONOMIC CONDITIONS AND  
EXPENDITURE PER PUPIL TO ACADEMIC ACHIEVE-  
MENT IN THE STATE OF OKLAHOMA

APPROVED BY


DISSERTATION COMMITTEE

## ACKNOWLEDGEMENTS

To Dr. Jack F. Parker, chairman of the doctoral committee, the writer wishes to express his sincere appreciation for his time, interest, and guidance which were essential to the development of the study.

Sincere appreciation goes to Dr. Herbert R. Hengst, Dr. O. D. Johns, and Dr. Robert F. Bibens for their kind assistance in the study.

Special thanks go to the writer's wife, Linda, and daughter, Kristi. Without their inspiration, sympathetic understanding, and constant encouragement this study would not have been completed.

## TABLE OF CONTENTS

|                                                 | Page |
|-------------------------------------------------|------|
| ACKNOWLEDGEMENTS . . . . .                      | iii  |
| LIST OF TABLES . . . . .                        | vi   |
| <br>Chapter                                     |      |
| I. INTRODUCTION . . . . .                       | 1    |
| Statement of the Problem . . . . .              | 6    |
| Need for the Study . . . . .                    | 6    |
| Hypothesis . . . . .                            | 7    |
| Limitations of the Study . . . . .              | 7    |
| Definition of Terms . . . . .                   | 8    |
| Procedures . . . . .                            | 8    |
| Organization of the Study . . . . .             | 10   |
| II. REVIEW OF THE LITERATURE . . . . .          | 11   |
| Studies Previous to the 1960's . . . . .        | 13   |
| Process-Oriented Studies . . . . .              | 14   |
| Product-Oriented Studies . . . . .              | 20   |
| Studies During the Past Decade . . . . .        | 26   |
| Summary of Related Literature . . . . .         | 38   |
| III. METHODS AND PROCEDURES . . . . .           | 40   |
| Selection of Instrument for Measuring           |      |
| Achievement . . . . .                           | 40   |
| Grouping of Schools . . . . .                   | 42   |
| Expenditure Per Pupil . . . . .                 | 44   |
| Socio-Economic Conditions . . . . .             | 45   |
| Test Scores . . . . .                           | 46   |
| Statistical Design . . . . .                    | 46   |
| IV. PRESENTATION AND ANALYSIS OF DATA . . . . . | 49   |
| Data for Schools With an ADA from 500-900       | 50   |
| Analysis of Data . . . . .                      | 51   |
| Interpretation of Data . . . . .                | 51   |
| Analysis of Variance for the Regression         | 53   |

| Chapter                                                             | Page |
|---------------------------------------------------------------------|------|
| Data for Schools With an ADA from<br>950-1,550 . . . . .            | 53   |
| Analysis of Data . . . . .                                          | 54   |
| Interpretation of Data . . . . .                                    | 54   |
| Analysis of Variance for the Regression                             | 55   |
| Summary . . . . .                                                   | 56   |
| V. SUMMARY, FINDINGS, CONCLUSIONS, AND<br>RECOMMENDATIONS . . . . . | 58   |
| Summary . . . . .                                                   | 58   |
| Findings . . . . .                                                  | 61   |
| Conclusions . . . . .                                               | 63   |
| Recommendations . . . . .                                           | 64   |
| BIBLIOGRAPHY . . . . .                                              | 67   |
| APPENDIX . . . . .                                                  | 72   |

## LIST OF TABLES

| Table                                                                                                                         | Page |
|-------------------------------------------------------------------------------------------------------------------------------|------|
| I. Raw Data Relative to Schools With an<br>Average Daily Attendance Between<br>500-900 . . . . .                              | 50   |
| II. Correlation of Independent Variables to<br>Composite Achievement Scores in Schools<br>With an ADA from 500-900 . . . . .  | 51   |
| III. Analysis of Variance for the Regression<br>in Schools With an ADA from 500-900 . . .                                     | 53   |
| IV. Raw Data Relative to Schools With an<br>Average Daily Attendance Between<br>950-1,550 . . . . .                           | 53   |
| V. Correlation of Independent Variables to<br>Composite Achievement Scores in Schools<br>With an ADA from 950-1,550 . . . . . | 54   |
| VI. Analysis of Variance for the Regression<br>in Schools With an ADA from 950-1,550 . .                                      | 55   |
| VII. Correlations Compared by Variables Accord-<br>ing to School Size . . . . .                                               | 56   |

RELATIONSHIPS OF SOCIO-ECONOMIC CONDITIONS AND  
EXPENDITURE PER PUPIL TO ACADEMIC ACHIEVE-  
MENT IN THE STATE OF OKLAHOMA

CHAPTER I

Introduction

The past hundred years has been a period of vast expansion in American education. National leaders have become increasingly convinced that education is essential not only for making self-government work and teaching the equality of man, but also for survival and progress.

Wilbur J. Cohen, Secretary of Health, Education and Welfare, in his December, 1967, opening remarks to the President's National Advisory Council Conference, said:

The American people are committed, deeply committed, to the idea that education is a solution to all or at least many of these problems. It is probably an overstatement, but, nevertheless, I think the American people do believe deeply that education is important, that education should be universal, that boys and girls should get as much of it as they are willing to take, that it should go all the way from pre-school to age ninety with adult education, and that in no aspect of the human life cycle should education be absent.<sup>1</sup>

---

<sup>1</sup>President's National Advisory Council, Opening Remarks, Address by Wilbur J. Cohen, (Washington, D.C.: Bell & Associates, 1967); p. 4.

The effort of the past century has centered on increasing the number of people in school and the length of time they attend. "From 1950 to 1960 school enrollment increased nearly 15 million students. The educational level, in terms of years of schooling completed, is the highest it has ever been--the average adult now has over 11 years of education."<sup>2</sup> With the demand of modern civilization for greater knowledge, understanding, and technological skills, further expansion of formal schooling is likely to occur during the next century.

However, the greatest emphasis in the years ahead is likely to be on improving the quality of education. Harold Howe, II, former U.S. Commissioner of Education, stated:

Although we would not like to admit it, some of what we have called education--in this country as in others, in our times as in times past--has been little more than a painful process of putting children into the past, of arresting development as much as encouraging it. I would hope that through efforts such as Title III of the Elementary and Secondary Education Act we can somehow reverse that process. Title III has dedicated 200 million dollars to improve the quality of education in America by encouraging, in the most productive way possible, the widespread adoptions of constructive new ideas and practices in education.<sup>3</sup>

---

<sup>2</sup>Peterson, LeRoy J., Implications of Population Growth for School Finance (St. Louis, Mo.: National Education Association, 1961), p. 35.

<sup>3</sup>President's National Advisory Council, National Priorities, Address by Harold Howe, II, (Washington, D.C.: Bell & Associates, 1967), p. 7.

The concern during the past decade for overcoming the educational deficiencies of the disadvantaged student, especially the child with a low socio-economic background, is best documented by the extensive federal legislation that has been enacted relative to it. In 1966-67, one billion dollars was distributed through Title I of the Elementary and Secondary Education Act for use in schools serving areas with large concentrations of children from low income areas.<sup>4</sup>

The guidelines, issued for Title I of ESEA indicate:

The rationale for these programs has been the close correlation between conditions of poverty and lack of educational development and poor academic achievement. School districts with a high percentage of pupils qualifying for science awards, national scholarships, and college entrance tend to be found in high-income areas. Dropout rates seem to follow an inverse ratio with income levels.<sup>5</sup>

The growing interest in solving our social problems through education has brought tremendous pressures upon school systems throughout the nation to develop programs that will meet the needs of all youth. Educators have often responded by indicating that increased services and quality education will be provided only when the funds provided for education are substantially increased. A substantial amount

---

<sup>4</sup>Second Annual Report of Title I of The Elementary & Secondary Education Act of 1965, Title I - Part II, (Washington, D.C.: U.S. Government Printing Office, 1968), p. 1.

<sup>5</sup>Oklahoma State Department of Education, Guidelines--Regulations: Title I Elementary & Secondary Education Act of 1965, (Oklahoma City: State Department of Education, 1968), p. 2.

of research tends to support such intentions by revealing significant correlation between various measures of school quality and expenditure levels.<sup>6</sup>

After reviewing studies of the relationship between cost and quality made prior to 1952, Paul Mort came to the following conclusions:

Every empirical study of the relationship between expenditure level and quality of education adds its bit to the presumption that the relationship is strong. Studies of the relationship in acceptably organized districts suggest that schools that spend more contribute more to the life-long personal happiness of their charges and to the social and economic strength of Americans as a people.<sup>7</sup>

During the year 1967-68, the expenditure per pupil in average daily attendance in Oklahoma ranged from \$263 in the school district with the lowest expenditure to \$2,604 in the highest expenditure district.<sup>8</sup> Although these districts represent the extremes, a difference of \$100 or more per pupil is common throughout the state.

Financial support for education has increased substantially during the past twenty years. The average expenditure per pupil in Oklahoma has increased from \$143 to \$483.

---

<sup>6</sup>Paul R. Mort, William S. Vincent, and Clarence A. Nervell, The Growing Edge (New York: Metropolitan School Study Council, 1946), p. 47.

<sup>7</sup>Paul R. Mort, The Foundation Program in State Educational Policy (Albany: New York State Education Department, 1957), p. 25.

<sup>8</sup>Oklahoma State Department of Education, General Statistical Report, (Oklahoma City: State Department of Education, 1968).

On the other hand, the demand by the public for additional services has increased even more rapidly.

A large part of the financial support for public schools comes from the property tax, and increasing demands for money for education have resulted in substantial increases in the local property tax rate. For example, in 1965, the Oklahoma Constitution was amended to make it possible for school districts to tax themselves for an additional ten mills. By the 1967-68 school year, more than seventy-five percent of all Oklahoma school districts had voted all or a portion of this ten mills.<sup>9</sup> Consequently, many people have become increasingly aware of school costs.

The increase in and growing awareness of school costs have occurred concurrently with increased negative criticism concerning the effectiveness of the schools. Increasing numbers of people realize that there is greater need for more and better education for a larger proportion of the people. There is growing concern about providing better educational opportunities for people living at or below subsistence levels. Both educators and the public have come to recognize that to serve modern society, education in the future must be more effective and consequently, more complex and more costly.

---

<sup>9</sup>Oklahoma State Department of Education, General Statistical Report, (Oklahoma City: State Department of Education, 1968), p. 12.

The evaluation of the educational programs of school districts, states, or the nation takes many forms. As the cost of education continues to increase, ways should be found to measure what the additional funds buy in increased quality of education for pupils. Considerable research seems to indicate that there is a positive correlation between expenditure level and academic achievement. Since the amount spent per pupil has increased so sharply in recent years, additional research to investigate the degree to which earlier assumptions continue to be valid would seem to be appropriate. This study has been designed to contribute to that effort.

#### Statement of the Problem

This study was designed to examine the relationship between expenditure per pupil and achievement scores on the Iowa Test of Educational Development at the ninth grade level in selected school districts of comparable size in Oklahoma. In addition, the variables of per capita income and the percent of low income students in the selected school districts were examined to determine the extent to which these variables might influence achievement scores.

#### Need for the Study

With continued pressure for additional taxation on local property, teacher strikes becoming more common, and continued emphasis on school district reorganization, the

relationship between expenditure levels per pupil and academic achievement could become an important issue in Oklahoma. As government officials and local school boards consider further taxation of the general public, a study of this nature might well provide useful guidelines for decisions. It is also important for school administrators to become aware of the relationships of socio-economic environment and expenditure per pupil to academic achievement.

If there is a relationship between expenditure level and achievement, the range in expenditure per pupil of \$263 to \$2,604 suggests the possibility of a high degree of inequity of educational opportunity within the State of Oklahoma.

#### Hypothesis

$H_{01}$ . There is no statistically significant difference between the correlation found through a multiple regression analysis using expenditure per pupil, per capita income, and percent of low income students to predict scores on the Iowa Test of Educational Development at the ninth grade level and a correlation of 0.

#### Limitations of the Study

In order to define clearly its scope, the following limitations were observed in the design of the investigations:

1. Only school districts that administered the Iowa Test of Educational Development at the ninth grade level during the year 1967-68 were used.

2. The study was ex post facto in design since only 1967-68 data were available.

#### Definition of Terms

Expenditure per pupil--The total amount of money, except transportation, (local, state, and federal) spent per pupil in average daily attendance as computed by the Oklahoma State Department of Education, January, 1968.

Academic achievement--The mean standard scores of ninth grade students on the Iowa Tests of Educational Development administered in 1967-68.

Per-capita income--As indicated by the 1968 Oklahoma Data Book prepared by the Bureau of Business Research of the University of Oklahoma.

Low income student--A student from a family whose total income is less than \$3,000 as reported to the ESEA, Title I Division of the State Department of Education.

#### Procedure

Data for this study were obtained from three primary sources: (1) Records of the Oklahoma State Department of Education, (2) Oklahoma University Bureau of Business Research, and (3) student cumulative folders. The procedure included the following steps:

1. The size of school districts was obtained from the average daily attendance report in the annual statistical report.

2. The instrument used to measure student achievement was obtained from the annual report submitted to the Guidance and Counseling Division of the State Department of Education.

3. Schools to be used in the study were designated due to their use of the Iowa Test of Educational Development, the most widely administered instrument to measure student achievement in the State of Oklahoma.

4. The school districts were grouped according to average daily attendance.

5. Total expenditure per pupil was obtained from the 1968 General Statistical Report prepared by the Finance Division of the State Department of Education.

6. The percent of poverty students was taken from the reports submitted to the ESEA, Title I Division of the State Department of Education.

7. The per-capita income was taken from the 1968 Oklahoma Data Book prepared by the Bureau of Business Research of the University of Oklahoma.

8. The mean standard scores on the Iowa Tests of Educational Development were taken from student cumulative folders and from the Division of Evaluation and Testing of Oklahoma University.

9. A multiple regression design was judged to be the most appropriate means of dealing with the data. A multiple R represents the maximum correlation between a

dependent variable and a combination of independent variables. For the purpose of determining whether the F Value was significantly different from 0, an analysis of variance for the regression was computed.

### Organization of the Study

This dissertation is organized into five chapters. Chapter I includes the introduction, statement of the problem, need for the study, limitations of the study, definition of terms, and a brief statement relative to the procedure to be used in the treatment of the data. Chapter II contains the review of research and related literature. Design and methodology of the study was outlined in Chapter III. The analysis of the data was reported in Chapter IV. Chapter V contains the summary of the study, findings, conclusions, and recommendations.

## CHAPTER II

### REVIEW OF THE LITERATURE

The public school system of the United States is confronted, not only with the problem of improving the quality of education for all, but also with the necessity to achieve greater equality of educational opportunity among those it is charged with serving. In keeping with the democratic ideology, these things should be accomplished with the consent of the majority of the people. It is difficult to envision a more formidable task.

The ideal of equalizing educational opportunity has a long history of lip service by educators and others, but during the past two decades concern about achieving it has broadened and intensified. Among the obstacles to equal educational opportunity are:

1. Tax producing resources are not equally spread over the country.
2. The relationship between the density of the population and tax producing resources varies throughout the country.
3. The taxpayers of different school districts vary in the degree to which they are willing to finance the schools.

Therefore, the extent to which financial support for education is dependent upon local property tax, the kind of educational opportunity that can be provided for each child is related to the amount of assessed property per child in each school district. An additional factor is the amount of necessary overhead related to school operation.

The disparities in assessed valuation per child contribute to inequalities in the quality of education that can be provided. In addition, the density of pupil population, as well as the size of school maintained, result in differences in the per pupil expenditure necessary to operate the school. Differences in the ratio of children to be educated and the economic resources available as a financial base affect the educational program. Edwards described the problem by saying:

For millions of children the opportunity for anything more than a modicum of meager, formal education is conditioned largely by place of birth. In communities where fertility is too low for family replacement, where the burden of child care and education is light, where economic resources are most abundant, and where the cultural-intellectual status of parents is high, we support education liberally. In communities where the birth rate is high and the economically productive age group is carrying a disproportionately heavy child population, where income per child is far below the national norm, where the plane of living is low, when the cultural heritage is the poorest, and where the home has least to contribute to cultural and intellectual growth, we support education niggardly.<sup>1</sup>

---

<sup>1</sup>Newton Edwards, Equal Educational Opportunity For Youth: A National Responsibility (Washington, D.C.: American Council in Education, 1939), p. 151.

There has been some progress during the past thirty years. School district reorganization, when several small areas are made into one taxable unit with a single administration, has helped. The establishment of minimum or "foundation" programs has made some contribution.

Federal aid to education has been an equalizing factor. Despite all this, differences are still enormous. The need for continuing study and analysis of existing approaches to providing financial support for public schools remains undiminished. The most significant of the studies directed towards determining the relationship between expenditure level and quality of education are cited in the sections that follow.

#### Studies Previous to the 1960's

In the past forty years there have been numerous studies designed to measure the cost quality relationship in education. Some used as a basis for evaluating educational quality, criteria relating to teacher qualifications, teacher-pupil ratio, number of units offered, administrative qualifications, and other process factors. It was assumed that the quality of the product was directly proportioned to the quality of the process as determined by externally developed criteria. Other studies relied on achievement tests and based the determination of product quality on the level of achievement of the student as determined by the standardized tests.

Process-Oriented Studies

In the early 1900's there was already some concern about the relationship between expenditure and results in education. However, there was greater concern about the length of terms, provision of supplies, provision of nurses, and other services than there was about the quality of education.

In 1920, Ayres developed what he called his "Index Number of State School Systems." In this index he used ten items, five which had to do with tangible characteristics of the program, such as length of school terms. He found that two sets of factors had an intercorrelation of .78. Ayres had the following to say about his study:

We can, however, secure from the data presented in this volume, convincing evidence that there is a real relationship between expenditure and results in education. We cannot prove that the higher paid teacher is individually more skilled than the lower paid one, but it can be shown as salaries increase, attendance improves, and more pupils are found in high school. It can further be shown that as salaries increase, expenditures for purposes other than salaries also increase and this results in better buildings and equipment.<sup>2</sup>

In 1930's, Ferrell combined six items of educational efficiency into what he termed, "an efficiency index for the purpose of studying its relationship to current expenditure per pupil." All but one of his six items were

---

<sup>2</sup>Leonard P. Ayres, An Index Number for State School Systems (New York: Russel Sage Foundation, 1920), p. 55.

strong cost items. His study was concerned with policies of school authorities which he considered important. The relationship of each expenditure item was shown.<sup>3</sup>

In 1935, Grace organized an "Inquiry into the Character and Cost of Public Education in the State of New York" for the purpose of finding out what the educational system was accomplishing, how well its total programs fit present day needs, and what the costs of that program are and should be. Forty-three school systems were graded on a five-point scale: highest, above average, average, below average, and lowest. No controls were placed on school size for various expenditure levels and no account was taken of the factors of sparsity and cost of living.

The following conclusions were reported:

Comparisons of per pupil costs in forty-three New York school systems with the rating of the school systems for general quality indicates that although the best education is not obtained without relatively high expenditure, high costs are no guarantee of good education. There seems to be a definite tendency for large school systems to be better than small ones, but there are enough exceptions to this generalization to show that large systems can be poor and small ones can be good.<sup>4</sup>

At a later date Paul R. Mort computed a coefficient of correlation of .27 in the relationship of cost to quality.

---

<sup>3</sup>Doctor T. Ferrell, Relation Between Current Expenditure and Certain Measure of Educational Efficiency in Kentucky County and Graded School Systems (Nashville, Tenn.: George Peabody College for Teachers, 1936), p. 34.

<sup>4</sup>A. G. Grace and G. A. Moe, State Aid and School Costs: The Regents Inquiry (New York: McGraw-Hill Book Company, 1938), p. 264.

When he used a unit cost factor to remove the small school and sparsity factor he computed a correlation of .50.<sup>5</sup>

Mort and Cornell explored the relationship between expenditure level and adaptability in taking on new improvements to educational practices or to meeting new needs, or new insights into old needs in thirty-six communities in Pennsylvania in 1938. An analysis was made of adaptability through a questionnaire sent to a large sample of districts in the state of Pennsylvania with reference to the presence or absence of twelve specific projects. This analysis was made in terms of statistics available for all these districts, such as wealth, school expenditure, and size. The materials were then subjected to statistical analysis for determining the relation of various factors to adaptability as a whole and the certain characteristics of certain of these factors. The results concluded that expenditure of below \$500 per classroom unit was not considered as capable of producing a dynamic educational mechanism except in possibly a small number of school districts in which there were combination of favorable factors and chance circumstances. Districts spending between \$2,000 and \$2,500 could be expected to achieve the superior qualities of adaptability. The conclusion was reached that the greater the expenditure

---

<sup>5</sup>Paul R. Mort, Cost-Quality Relationship in Education (New York: Bureau of Publications, Teachers College, Columbia University, 1952), p. 22.

per classroom unit, the greater the chances of adaptability.<sup>6</sup>

In 1942, Mort, Burke, and Fisk, continued this line of investigation of level of expenditure to adaptability by applying a new instrument, "A Guide for the Analysis and Description of Public School Services," to one hundred school systems in the State of New York. This study included only high expenditure schools that the Mort-Cornell "Guide" were unable to evaluate. The study concentrated on the educational materials that were being used in the three groups of schools with median expenditures of \$74, \$115, and \$150 and above." The ratings were none, little, some, much, and very much. The ratings for the \$75 schools on the thirty-nine classification of items drawn from the instrument were characteristically none or little. For the \$115 schools, twenty-eight were rated some or better, only one was rated "none," four were rated "much," none of them "very much." The schools spending \$150 or more were rated "very much" on thirty of the items. At this level only two of the items were rated "little," no items were rated "none."<sup>7</sup>

---

<sup>6</sup>Paul R. Mort and Francis G. Cornell, American Schools in Transition (New York: Bureau of Publications, Columbia University, 1941), pp. 178-189.

<sup>7</sup>Paul R. Mort, Arvid J. Burke and Robert S. Fisk, A Guide for the Analysis and Description of Public School Systems (Institute of Educational Research, Teachers College, Columbia University, 1942), pp. 13-47.

In 1941 the Commission on the Legal Structure of Rhode Island Public Education in a study directed by Paul R. Mort, applied the Mort-Cornell "Guide" to thirty-eight of the thirty-nine school districts in Rhode Island. The districts were divided into three groups on the basis of their expenditure per weighted pupil for 1939-40. A table of total scores and expenditures was given with a coefficient of correlation of .66 being computed from those scores that were tabulated. In computing current expenditure per unit, sparsity effects and the differential high school cost effect were eliminated. There was no correction for the cost of living. Expenditures ranged from \$23 to \$120 per weighted pupil. When the expenditures of individual towns and cities were computed with the total score on the instrument, it was found that all towns spending less than \$60 received low scores. A number of towns spending between \$60 and \$80 were given good scores. One school at the \$80 level received one of the very highest scores. After passing the \$90 level, however, no town or city fell below the average score.<sup>8</sup>

Ross in "Administration for Adaptability" concluded:

One thing may be sure in the study of adaptability. Quality is related to the amount of money spent. The most powerful of all the factors which influence the

---

<sup>8</sup>Paul R. Mort, "Cost-Quality Relationship in Education," Chapter 2, in Problems and Issues in Public School Finance, ed. by R. L. Johns and E. L. Morphet, (New York: Bureau of Publications, Teachers College, Columbia University, 1952), p. 24.

quality of schools is the level of financial support. These hundred factors have been studied for their effect on schools. Of all of them, the amount of money which a school district has to spend--for teachers, for supplies, equipment, apparatus, books--is the most important single factor.<sup>9</sup>

In 1954, Smith reported a study involving ninety percent of the Central Schools of New York State. He examined the relationships among quality of education and five of its conditions in relatively well-financed school districts.

Some of his conclusions were:

(1) The expenditure-quality relationship for the schools was strong and positive. There was no tapering-off on returns for money spent in the schools of highest expenditure.

(2) The size-quality relationship was strong and positive with evidence of a plateau from approximately 500 to 700 pupils in average daily attendance.

(3) The relationship between expenditure per pupil and quality of administration was positive and marked.

(4) The slight positive relationship between school size and expenditure per pupil became negligent when quality of administration was considered.<sup>10</sup>

In 1956, Furno reported a study attempting to determine the nature and character of the influence of expenditure level in school quality, over a twenty-five year period. Each year's current expenditure over a twenty-five year span

---

<sup>9</sup>Donald H. Ross, (ed), Administration for Adaptability, Vol. III (New York: Metropolitan School Study Council, 1951), p. 22.

<sup>10</sup>Stanley V. Smith, "Quality of Education Related to Certain Social and Administration Characteristics of Well-Financed Rural School Districts," (unpublished dissertation, Teachers College, Columbia University, New York, 1956), pp. 86-88.

was correlated with school quality as measured at the end of the time span. The procedure was carried out for two sets of independent data over two overlapping twenty-five year periods. Correlations between expenditure level for each year from 1921 to 1945 and adaptability as measured in 1955 were calculated. Similarly, correlations between expenditure level for each year from 1931 to 1955 and adaptability as measured in 1955 were computed. The 1945 evaluation consisted of forty-eight systems in New York while in 1955 the evaluation consisted of sixty-three communities. From Furno's findings it would appear that the expenditure level-quality relationship would be around .60. If the quality measurement period occurred during an inflationary era, the relationship tended to be depressed. However, when secular effects were taken into consideration and accounted for, the relationship was increased to its proper value, which appeared to be around .60. It would also appear that expenditure policy today could be expected to have effects over at least twenty-five years in the future.<sup>11</sup>

#### Product-Oriented Studies

In 1933, Powell published a study comparing high expenditure one teacher schools in New York with low-expenditure schools using results of achievement tests. He

---

<sup>11</sup>Orlanda F. Furno, "The Projection of School Quality From Expenditure Level," (unpublished doctoral dissertation, Teachers College, Columbia University, New York, 1956), pp. 66-78.

studied seventy-one schools dividing them into two different expenditure levels. He found that there were major differences favoring the higher expenditure group in all the tests.<sup>12</sup>

In 1938, Grimm studied twenty-four schools in Illinois comparing expenditure levels to achievement tests. Eighth grade students were tested in reading, health, geography, and intelligence. Seventh grade students were administered tests in reading, arithmetic, language and intelligence. He divided the schools into three groups according to the expenditure level. He found the middle group of schools was superior to the low group, but little difference was evident between the middle and high groups. Major differences were in the language and geography areas.<sup>13</sup>

In 1944, Norton and Fowler, in exploring the relation between expenditure per pupil, provision for education, and educational achievement in each of the eight states concluded:

The states which finance their schools generously get superior results in such matters as percentages of school age children actually in school, percentage

---

<sup>12</sup>Orrin E. Powell, Educational Returns at Varying Expenditure Levels: A Basis for Relating Expenditure to Outcomes in Education (New York: The MacMillan Co., 1939), pp. 93-96.

<sup>13</sup>Lester R. Grimm, Our Children's Opportunities in Relation to School Costs (Springfield, Ill.: Department of Research, Illinois Education Association, 1939), pp. 117-133.

of literacy achieved by the population as a whole, and in educational qualifications of the men in the Selective Service Tests. The opposite is true for states which finance their schools on a meager basis.<sup>14</sup>

In 1949, Woollatt completed one of the more thorough studies on the cost-quality relationship involving thirty-three metropolitan area school systems with relatively high expenditures. The study was designed to apply the use of the observation instrument, "The Growing Edge."<sup>15</sup> This is an instrument designed to show the relative responsiveness of communities to the challenge of what are considered better methods of teaching and operating schools. Adaptability was emphasized throughout. Woollatt's study indicated a direct relationship between these factors taken together and expenditure and between each one individually and expenditure. His figure between the quality measure and expenditure was .59. The quality measure was limited to four facets: (1) the teaching of skills in a real or realistic fashion and the teaching of a wider range of skills, (2) the teaching of areas of knowledge realistically, (3) the discovery and development of special aptitudes of individuals through test and try-out, and (4) the development of gross behavior

---

<sup>14</sup>John K. Norton and Eugene S. Lowler, An Inventory of Public School Expenditures in the United States (Washington: American Council of Education, 1944), p. 316.

<sup>15</sup>Paul R. Mort, William S. Vincent, and Clarence A. Newell, The Growing Edge (New York: Metropolitan School Study Council, 1946).

habits, like citizenship, character, and thinking, which are assumed to be developmental characteristics. Woollatt also calculated a Pearson  $r$  of .75 using the Pierce Community Index<sup>16</sup> and when developing a correlation between the Pierce Index and expenditure of these schools he had a coefficient of correlation of .48. The close relationship between community and quality of education was considered to be due to the fact that better communities tend to provide more money.<sup>17</sup>

In 1954, the Educational Conference Board of New York reported a study of the relation of public elementary school achievement to expenditure level. Achievement tests were administered to approximately five thousand students from 126 school systems.

Expenditure level of schools was determined by subtracting the cost of cafeteria, transportation, and tuition paid to other districts from the total current expenditure. The reading vocabulary, reading comprehension, and arithmetic sections of the Iowa Test of Basic Skills were administered to children of grades one through six. The Board summarized the results of the study with the following statement:

---

<sup>16</sup>Truman M. Pierce, Controllable Community Characteristics Related to the Quality of Education (New York: Bureau of Publications, Teachers College, Columbia University, 1947), pp. 8-13.

<sup>17</sup>Lorne H. Woollatt, The Cost-Quality Relationship on the Growing Edge (New York: Bureau of Publications, Teachers College, Columbia University, 1949), pp. 132-139.

The significant findings are: First, the schools differ widely in mastery of basic skills. Second, the schools that rank highest in mastery of the three R's usually have the most comprehensive programs for attaining other elementary school objectives. (It appears that schools that challenge pupils interest and make learning most meaningful, contribute most to mastery of the basic skills and do most to promote all objectives, cost the most.)<sup>18</sup>

In 1956, Bloom reported information gathered during two nationwide studies which were completed for the purpose of developing norms for the Tests of Educational Development. The G.E.D. tests were developed in 1943 for the educational and vocational counseling of youth in the armed forces. Since that time, most states have employed the G.E.D. tests as a basis for granting high school equivalency certificates to individuals with scores above set levels. When establishing the original norms in 1943, eight hundred fourteen schools with 35,330 seniors participated. However, during the early 1950's, questions were raised about the appropriateness of those norms in view of the possible changes in the schools between 1943 and 1955. At the request of the Commission on Accreditation of Service Experiences of the American Council on Education, the University of Chicago and Benjamin S. Bloom contracted to carry out this normative study. In 1955, Bloom tested 38,773 seniors from eight hundred thirty-four schools. While the primary purpose for

---

<sup>18</sup>New York State Educational Conference Board, What Do Good Schools Do For Children? (Albany, N.Y.: The Board, 1954), p. 2.

administering the tests was the development of norms, other observations were also made. In relation to test scores and per pupil costs of public education in the several states, Bloom made the following comments:

In 1951, the national average expenditure per pupil in average daily attendance for public education from state and local sources was \$217. The average expenditure per pupil varied from \$85 in one state to \$324 in another. If we compare the sixteen states which are the lowest, we find that 69 percent of the top states spend more money per pupil than the national average, while only 25 percent of the bottom states reach this level of financial support for public education.<sup>19</sup>

A more thorough analysis of the information collected during the 1943 and 1955 G.E.D. testing programs was published by Bloom and Statler in 1957. They reported the following generalizations:

(A) The differences among the states on the tests of General Educational Development are as great in 1955 as they were in 1943. Although they had the same amount of formal education, the high school seniors in the lowest states are at a great disadvantage when contrasted with the senior in the top states.

(B) The differences among the states on the G.E.D. tests are highly related to differences among the states in financial support for education and in the level of formal education in the adult population. These relations, which are clearly present in the 1955 study, are also evident in the 1943 study.

(C) High school seniors from the great majority of states have improved on the G.E.D. tests from 1943 to 1955, although the amount of improvement varies from state to state.

---

<sup>19</sup> Benjamin S. Bloom, "The 1955 Normative Study of the Tests of Educational Development," School Review, 64: 110-124, March, 1965, p. 120.

(D) The relative shifts in the ranks of the states on the G.E.D. tests are related to the relative increases both in financial support for education and in the level of education among the adult population.<sup>20</sup>

They further noted that while other variables may be associated with the changes in the achievement tests, the level of educational outcome of the public schools, as measured by the performance of high school seniors on the G.E.D. tests, is related to the level of educational input in terms of financial support for education and the value placed upon education as reflected by the educational status of the adult population.

#### Studies During the Past Decade

In the late 1950's another variable began to appear in the cost-quality studies being conducted. Researchers began to be more concerned with such factors as size of school, community expectancy, and the culture, economic, educational and ethnic background of the students. It became apparent that it would be difficult to measure quality education solely through the use of test scores without considering student background as an important variable. Thus, studies relative to the cost-quality relationship began to involve several other factors during this period of time.

---

<sup>20</sup> Benjamin S. Bloom and R. C. Statler, "Changes in the States on Tests of General Educational Development from 1943 to 1955," School Review, 65: p. 220, Summer, 1957.

In 1959, Samuel Goodman published another study of the Quality Measurement Project of the New York State Department of Education, still continuing to pursue the subject of quality of education. One hundred school systems--city, village, central, union free, and common, with 10,000 children--participated in a mass testing program in which group intelligence and achievement tests were used over a period of three years as the students moved from grade to grade. Some of these conclusions were:

1. When pupils were classified through either an intelligence or a socio-economic index, school systems tend to be uneven in effectiveness in teaching basic skills.

2. There was a product-moment correlation of .51 between pupil expenditure for instructional purposes and composite achievement scores for pupils in grade seven.

3. There was a partial correlation of .31 between expenditure levels and composite grade seven scores when socio-economic status had been partialled out.

4. There was a product-moment correlation of .85 between expenditure levels and the percent of teachers in the system that had five or more years of training.

5. There was a product-moment correlation of .51 between expenditure level and the ratio of special staff.

6. There was a correlation of .32 between expenditure and the achievement of pupils of high socio-economic status; but for pupils of average socio-economic status, this correlation was only .04 and for pupils of low socio-economic status the correlation was -.18.

7. There was a correlation of .36 between the percent of staff with five or more years of training

and the achievement of pupils of high socio-economic status and  $-.18$  with pupils of low socio-economic status.<sup>21</sup>

In 1961, Crandall conducted a study designed to determine the relationship between academic achievement and per pupil expenditure for instruction of elementary school students in California. He compared the academic achievement of pupils in selected high and low expenditure elementary school districts in California. The 1957-58 California Achievement Test Scores and the latest California Test of Mental Maturity I.Q. were recorded for each of the students. He investigated specific areas of expenditure for instruction in relation to academic achievement in reading, arithmetic, language and total test. Crandall concluded that students in high expenditure school systems consistently exceeded pupils from low expenditure districts in academic achievement at every I.Q. interval in each of the fourth through eighth grades.<sup>22</sup>

In 1961, Gray categorized forty Iowa Public secondary schools into four size groups, each containing ten schools:

|                 |         |         |       |
|-----------------|---------|---------|-------|
| 1,000 and above | 400-999 | 150-399 | 0-149 |
| (A)             | (B)     | (C)     | (D)   |

---

<sup>21</sup>Samuel Goodman, The Assessment of School Quality (Albany, N.Y.: State Department of Education, 1959), pp. 131-135.

<sup>22</sup>James Henry Crandall, "A Study of Academic Achievement and Expenditure for Instruction," (unpublished doctoral dissertation, University of California, Berkeley, California, 1961), p. 144.

Gray found a positive relationship between size of school and the number of units of educational opportunity among the four size groups. He found an inverse relationship between size of school and cost of these units when instructional salary was used as the cost factor. The annual pre-tuition cost among the four groups was significantly different at the .05 level. The B group was found to be costing the least and the D group was costing the most.

Gray found very small differences in standard scores favoring the larger schools on the Iowa Tests of Educational Development, the differences not being significant at the .05 level. No significant differences were found in college freshman grade points earned. The B group obtained a slightly higher grade point average than did the A group. The D group was lowest on this measure. The B and C group sent about nine percent more graduates on to college than did the A and D groups. This difference was not significant. No indication was given as to the percent of students that completed college.

In the area of extracurricular activity participation, Gray found a significant difference in the amount of student participation among the four size groups. Students from B and C scored higher on this measure and valued their participation more than did the students from the A and D groups.

There was a significantly larger turnover of staff in small schools and a significantly smaller number of teachers teaching in their major field of preparation in small schools. No significant difference was found in the number of periods taught per day by teachers among the four groups of schools.

There was a statistically significant difference in the amount of counseling and guidance services among the four size categories with the top three groups in size having significantly more counseling time for students than the D group. The A, B, and C groups were found to be providing a librarian while the D schools were not. The C schools provided more librarian time per student than the A and B groups.

Gray concluded in his study that D groups of schools did not excel in any of the factors investigated in relation to the three other groups. There appeared to be an increase in quality as the school size increased with a plateau being reached in most factors at an enrollment of around 400 students.<sup>23</sup>

In 1961, Simpson reported a study concerning quality factors in Macomb, Oakland and Wayne County schools in Michigan. He used factor analysis to identify relationships of correlation coefficients which were established for fifty

---

<sup>23</sup>Stuart Calvin Gray, "A Study of the Relationship Between Size and a Number of Qualitative and Quantitative Factors of Education in Four Sizes of Secondary Schools in Iowa," (unpublished doctoral dissertation, University of Iowa, 1961), pp. 73-96.

selected variables. Simpson found that expenditure per pupil was the most important factor influencing educational quality. He concluded that the most important measure of expenditure level was instructional expenses per pupil, .91; followed by the cost variables of per pupil expenditures for teachers' salaries, .89; per pupil disbursements for net operation of school program, .87; maintenance and operating expenses per pupil, .79; per pupil expenditures for small items in the operational budget, .73.<sup>24</sup>

Simpson also found that the dropout rate was a good quality indicator. Percentage of graduates continuing their education was a poor measure of quality.

The expenditure level for education accounted for 40.1 percent of the total variation among the sixty-seven districts. Over \$240 per pupil invariably indicated an adequate school program, while less than \$200 indicated the opposite program type. Sparse-rural type of districts tended to spend less and have inferior programs as compared to more urban neighbors.<sup>25</sup>

Swanson used the Associated Public School Systems time scale to analyze the relationship between population and quality over the whole spectrum of district census

---

<sup>24</sup>Robert James Simpson, "Selected Relationships Among Reported Expenditures and Programs in Metropolitan School Districts," (unpublished doctoral dissertation, Wayne State University, 1961), p. 194.

<sup>25</sup>Ibid., pp. 188-189.

populations from one thousand to one million. His analysis showed a strong positive relationship up to 28,000 population. This relationship diminishes until at 67,000 population, further increase in population is not likely to reflect an increase in school quality. In reviewing previous literature he indicated there was agreement among researchers that the chief detriment to quality was small enrollments in the high schools. His conclusion was:

Three decades of institute research indicate that the most favorable conditions for achieving good school quality exist in communities from 20,000 to 50,000 in population. Below and above this range special arrangements are necessary in order to achieve the best possible quality in education.<sup>26</sup>

McKenna in his analysis of professional staff characteristics that relate to quality education concludes that research over the past twenty-five years has identified seven sound predictors, namely: (1) origin of staff, (2) foreign travel, (3) domestic travel, (4) literary interests, (5) amount of training, (6) breadth of training, and (7) professional interests. Promising factors are (1) age, (2) sex, (3) recency of training, (4) training for administration, (5) practice teaching, (6) length of experience, (7) experience in other school systems, (8) professional

---

<sup>26</sup> Austin D. Swanson, "Relations Between Community Size and School Quality," IAR Research Bulletin, Vol. 2, No. 1, (October, 1961), pp. 1-3.

participation, (9) home visitation, (10) parent-teacher conferences, and (11) use of community resource people.<sup>27</sup>

In 1962, Sollars completed a study involving thirty elementary schools in Ohio attempting to determine (1) the relationship of school size to selected cost indicative, (2) the relationship of school size to certain school characteristics indication of program quality, and (3) whether there was a desirable size range for elementary schools. Each size stratum encompassed 150 pupils, with three schools representing each category.

Some of the more meaningful findings of Sollars study were:

1. The total of all cost indicators decreased as school size increased.
2. The advantages shown by all principal indicators increased as school size increased.
3. The advantages shown by institutional indicators were greatest in the 300-499 pupil range.
4. In general the advantages shown by teacher indicators increased in the 0-399 pupil size category. The peak of the advantages of teacher indicators occurred in schools of the 500-799 pupil range. There was an upward turn in schools of 800 or more.<sup>28</sup>

---

<sup>27</sup>Bernard McKenna, "Characteristics of Quality in Professional Staff," IAR Research Bulletin, Vol. 2, No. 1, (New York: Teachers College, Columbia University, October, 1961), p. 8.

<sup>28</sup>Ralph Damon Sollars, "The Relationship of Size of Elementary Schools to Operational Cost and Program Quality," (unpublished doctoral dissertation, Ohio State University, Ohio State University, 1962), pp. 88-90.

The indications were that when all indicators were considered the 300-499 pupil range was the size category in which the favorable indicators approached the maximum and the unfavorable approached the minimum. The study also indicated that the schools in the 0-99 stratum were paying the greatest amount of money per pupil for their educational program.

Weinheimer conducted a study making a statistical comparison of selected quantitative characteristics related to quality in six school districts in Michigan with his historically differential expenditures per pupil. Great care was taken to assure consistency, within acceptable limits, relative to enrollments, growth trends, location, level of income of constituents, ethnic background, and kinds and amounts of community services and facilities available. The Chi-square method of analysis was used for the data related to teacher and community characteristics while the T test was used to compare the high and low expenditure per pupil districts.

Weinheimer reached the following specific conclusions:

1. The factors pertaining to personnel including such items as length of training experience, level of training, areas of teaching competence and salaries paid show a positive sensitivity to level of expenditure for education.
2. The class size criteria and level of support were found to be measures with considerable sensitivity.
3. There were no significant differences between the high and low expenditure districts when considering the amount of domestic and foreign travel, literary and professional interest, and the origin of the staff.

4. As the dollar costs increased in the high expenditure districts, the percents of the budgetary items as compared with the total budget did not necessarily increase proportionately.<sup>29</sup>

In 1966, Coleman published a report concerning the equality of educational opportunity in the United States that involved 4,000 public schools and 645,000 pupils. All teachers, principals, and district superintendents in the 4,000 schools participated, as did all pupils in the third, sixth, ninth, and twelfth grades. Data were gathered relative to each pupil's personal socio-economic background, level of education of parents, academic achievement, academic aspirations, and attitude toward staying in school. Concerning the relationship between achievement and the effect of school factors, Coleman reached the following conclusions:

School to school variations in achievement, from whatever source (community differences, variations in the average home background of the student, or variations in school factors), are much smaller than individual variations within the school, at all grade levels, for all racial and ethnic groups. This means that most of the variation in achievement could not possibly be accounted for by school differences, since most of it lies within the school. A reasonable conclusion is that our schools have great uniformity insofar as their effect on the learning of pupils is concerned. The data also suggests that minorities that begin with an educational disadvantage continue to exhibit this disadvantage throughout the twelve grades of school. The school appears unable to exert

---

<sup>29</sup>Norman Peter Weinheimer, "Analysis of Selected Cost-Quality Factors in Education as Related to Selected School Districts in Michigan," (unpublished doctoral dissertation, Michigan State University, 1964), pp. 182-184.

independent influences to make achievement levels less dependent on the child's background.<sup>30</sup>

Considering all the results of the report together, one implication stood out above all: Schools bring little influence to bear on a child's achievement that is independent of his background and general social context, and that the very lack of an independent effect means that the inequalities imposed on children by their home neighborhood and poor environment are carried along to become the inequalities with which they confront adult life at the end of school.

Rajpal in his study of the public secondary schools of Iowa examined the relationship between selected characteristics of educational quality and measures of educational expenditure. The schools were divided into eight size categories with the smallest including high school with enrollment of 51-100 and the largest, 801-6,000. As measures of educational quality, Rajpal included teaching experience of staff, curriculum units offered, scores on standardized tests, and section size. After a thorough analysis of the data, Rajpal reached the following conclusions:

An increase in expenditure per pupil usually results in an increase in a variety of quality characteristics of education. More money invested generally means higher returns. The data shows increases in the quality of education in large size school districts over small size school districts.

---

<sup>30</sup> James S. Coleman, Equality of Educational Opportunity (Washington, D.C.: U.S. Department of Health, Education and Welfare, 1966), pp. 296-297.

The implications of this study have indicated that organization into larger administrative units could be associated with increases in quality measures, reduced expenditure levels, or both.<sup>31</sup>

In the fall of 1965 the New York State Education Department through its Offices of Research and Evaluation undertook a large-scale testing program. The purpose of the testing was to establish nominative achievement data for the State of New York and to provide through the use of computers, a swift automated method of producing the norms and the reports which were to flow from the comparison of school system data to norms. Approximately 21,000 pupils were tested with the Iowa Tests of Basic Skills, in both the fifth and eighth grades. The 99 school systems, which are still involved in the venture at the present time, encompass wide ranges in variety of community type, location, and size.

Several student background variables were also pursued including parent's educational background, father's occupation, the student's I.Q., and each school's approved operating expense. A relationship was developed between the achievement variables and the student background variables through the use of a correlation matrix, regression analysis and a "T" test. A preliminary publication indicated the following conclusions:

---

<sup>31</sup>Puran Lai Rajpal, "A Study of Relationship Between Expenditure and Quality Characteristics of Education in Iowa Public Schools," (unpublished doctoral dissertation, University of Iowa, 1967), pp. 122-123.

Though many of the findings are not startlingly new, they reinforce those of the past. That the mixture of parents comprising a community is important to the academic attainments of the community and its schools, is once again affirmed. This is reflected in all the analysis by the continued appearance of parents' education and occupation variables in dominant positions. Intelligence of the pupils within a system is also an important consideration when studying school system achievement levels. Social, economic, and educational backgrounds of the student's parents are fairly independent of change by school administrators. I.Q. which has been shown to rise slowly during school years is possibly more affected by the school than are the student background variables. That a seemingly poor but positive relationship has been found to exist between expenditures and academic achievement should not disappoint those who believe financial consideration to be of paramount importance in developing a strong educational program. The basic support level in New York State is possibly high enough so the addition of funds over the State base figure may add very little to student achievement levels.<sup>32</sup>

#### Summary of Related Literature

Studies previous to 1960 seemed to fall in two categories. One group tended to be process-oriented while the other was product-oriented. The process-oriented studies defined quality in terms of the amount and number of services provided. The product-oriented studies defined quality in terms of achievement as measured by standardized tests.

The process-oriented studies seemed to support the concept of a positive relationship between expenditure and services provided. There were also strong indications that

---

<sup>32</sup>Charles M. Armstrong, Lynne P. Curtis, and Gerald H. Wohlfert, "Scholastic Achievement and Relevant Factors," (The University of The State of New York, November, 1967), p. 6.

low expenditure schools were slow schools in making changes, but high expenditure schools were relatively fast moving when it came to taking on known improvements to educational practices or to meeting new demands, or bringing new insights to old needs.

The product-oriented studies indicated that the level of educational outcome, as measured by achievement tests, had a strong relationship to the level of educational input in terms of financial support for education. In most studies, major differences were found favoring the high expenditure groups in all of the tests.

The cost-quality studies completed in the last decade have indicated an emphasis on the socio-economic community factors. Such factors as size, community expectancy, cultural, economic, educational, and ethnic background do have a recognizable impact on educational quality and a major impact on academic achievement of students.

All of the review indicates there is a relationship between expenditure level and the character of education offered throughout the national scale. There is also strong indication that the socio-economic community factors have a significant relationship with the performance of students. However, as the level of support increases past \$600 per pupil, the relationship is still positive but seemingly declines. With the continued increase of per pupil expenditure comes a need for further research of this relationship.

## CHAPTER III

### METHODS AND PROCEDURES

#### Selection of Instrument for Measuring Achievement

Examination of all Title V applications that were submitted to the Oklahoma State Department of Education revealed that the most widely administered instrument for the purpose of measuring academic achievement in the State of Oklahoma was the Iowa Test of Educational Development. Other than its broad use among Oklahoma Schools, factors contributing in the selection of the ITED for use in this study were:

1. The tests are standardized and revised annually.
2. They provide test results in usable standard score form.
3. They are designed to measure each student's ability to use as well as to retain facts.
4. They provide measures of general knowledge, understanding, and adequacy of background in four critical areas of basic social concepts, natural science, English, and mathematics, and combine them into usable composite scores.
5. They measure each student's ability to use the basic tools of learning.

Typical of the review of the Iowa Test of Educational Development in the Fifth Mental Measurements Yearbook was that of J. Murray Lee, who made the following statement:

The Iowa Tests of Educational Development are excellent. They measure some of the more important objectives which all high schools are attempting to attain. The manuals are complete and helpful. A major use of the tests is to reveal the pattern of the student's development and to show growth from year to year. A second major use is to provide the faculty with a more dependable and objective basis for evaluating important phases of the total educational offering of the school. Lindquist, his associates, and the publisher should be highly commended for the careful construction and standardization of the tests, the completeness of statistical data and reports of studies of the tests, the completeness of the analysis of results made available to the school and the individual pupil and for providing a scoring and reporting service which relieves the teachers of the clerical work.<sup>1</sup>

The ninth grade was chosen as the level to be used in the study because a high percentage of dropouts leave school during the three high school years with some schools having a much higher ratio of dropouts than others. Samples drawn from higher grade levels would therefore be distorted; on the other hand, ninth grade students have been attending the local system long enough for the schools to have made an impact on their achievement level.

As the data were collected, it became obvious that the small number of schools with an average daily attendance larger than 2,000 that administered the same achievement

---

<sup>1</sup>Oscar Krisen Buros, Fifth Mental Measurements Yearbook (Highland Park, N.J.: The Graphic Press, 1959), p. 17.

tests would make it necessary to limit the study to school districts with an average daily attendance between 500 and 1,550. There were thirty-two districts in this group that administered the Iowa Test of Educational Development at the ninth grade level. This constitutes the sample of school districts to be used in the study.

### Grouping of Schools

Data for the initial selection of districts were obtained from the Guidance and Counseling Division of the Oklahoma State Department of Education as well as from the annual statistical report submitted by each school to the Finance Division of the Oklahoma State Department of Education. After the thirty-two schools that administered the Iowa Test of Educational Development at the ninth grade level were designated, the selected school districts were ranked according to the average daily attendance for the year 1967-68. These school districts were then divided in two size categories as listed in Tables I and IV. This was designed to minimize the effect of school district size as an influencing factor in the expenditure-academic achievement relationship.

McPhail found that in Oklahoma in 1964-65, schools with an ADA of 301-600, 37 of 100 spent over \$400 per pupil, schools with ADA of 601-1,200, 8 of 72 spent over \$400 per

pupil, and in schools with an ADA ranging from 1,201-2,000 only 1 of 30 schools spent more than \$400 per pupil.<sup>2</sup>

Hanson in 1963 used a theoretical construct of "economy of scale" to study the relationship between district size and unit costs. The construct stated that as a small enterprise becomes a larger unit, costs decline.<sup>3</sup> In 1963, the Research Division of National Educational Association carried out an extensive study of size, cost, and educational opportunities in secondary schools of New York State.<sup>4</sup> It revealed that small schools in comparison with large schools provided fewer educational advantages in areas such as: (1) course offerings, (2) activities, (3) services, (4) book volumes in the library, (5) percentage of teachers with Masters Degrees or beyond, at a proportionately higher cost. Since school district size seems to be related to expenditure per pupil, the thirty-two districts contained in the sample for this study were divided into two groups on the basis of ADA. One group consisted of school districts with an ADA of 500-900 while the other contained schools with an ADA of

---

<sup>2</sup>Gene Douglas McPhail, "School District Size and Per Pupil Expenditure," (unpublished doctoral dissertation, University of Oklahoma, 1966), p. 36.

<sup>3</sup>Neils William Hanson, "Economy of Scale in Education: An Analysis of Relationship Between District Size and Unit Costs in the Public Schools," (unpublished doctoral dissertation, Stanford University, 1963), p. 152.

<sup>4</sup>National Education Association Research Division, "Efficient School Size," (Research News, 1963-65, February, 1963).

950-1,550. Even within these ranges, there was a tendency for the smaller schools to have a higher per pupil expenditure than schools in the upper range.

#### Expenditure Per Pupil

Expenditure level is measured in terms of the number of dollars of educationally effective expenditure per some measure of amount of services to be supplied. The usual approach is to consider the pupil as the basic unit of measure. However, there are classes of expenditure that are not directly related to the quality of instruction a student will receive. Their purpose is to offset environmental conditions that would otherwise interfere with education.

Added expenditure for transportation reflects an increased level of support for education in the community. It should not be counted in determining the expenditure level of the school district.

Another factor that can distort reality in current expenditure is the inclusion of expenditures that are not recurring. Capital outlay and debt service are the most usual examples of items in this category.

For purposes of this study, expenditure for transportation, capital outlay, and debt services were not included in computation of per pupil expenditure. That figure was obtained by dividing the total expenditure (with the above removed) by the average daily attendance.

### Socio-Economic Conditions

The unequal distribution of the number of children to be educated is particularly significant when considered in relation to levels of income. As early as 1939, Newton Edwards made the following comment:

Throughout the United States, with few exceptions, areas characterized by low plain of living are also characterized by a high fertility and by high ratios of children of school age to adults in the economically productive age group.<sup>5</sup>

This is a condition that continues to exist today.

The socio-economic background of students has been measured in many different ways. However, the most valid statistic, the individual per capita income of the families of the children in the study, is almost impossible to compile due to the reluctance of the parents to disclose this type of information. There are two pieces of data relative to the socio-economic background of students that were available: (1) The average per capita income of each individual in the county, and (2) the percent of poverty-level families (less than \$3,000 net yearly income) in the school district.

The per capita income was established by dividing the total county income by the population. This information was accumulated by the Bureau of Business Research of the

---

<sup>5</sup>Newton Edwards, Equal Educational Opportunity for Youth, A National Responsibility (Washington: American Council on Education, 1939), p. 151.

University of Oklahoma. The percent of poverty students was taken from reports submitted by school superintendents to the ESEA Title I Division of the State Department of Education.

### Test Scores

Each of the thirty-two school districts that were selected for the study was contacted to obtain the test scores on the Iowa Tests of Educational Development at the ninth grade level. At the same time permission was received to use the results as a part of the study. The mean standard scores on the composite test battery was obtained for each school district.

### Statistical Design

The original objective of this study was to examine the relationship between expenditure per pupil and academic achievement, as measured by the Iowa Test of Educational Development, in selected school districts in Oklahoma. However, further analysis created concern that the socio-economic background of students could make substantial contribution toward their achievement level. This necessitated the gathering of two additional pieces of data to establish the variables socio-economic background: (1) per capita income, and (2) percent of low income students. The statistical design of the study had to be constructed with three independent variables: (1) The expenditure per pupil,

(2) per capita income, and (3) percent of low income students with the dependent variable being academic achievement.

Individual relationships of the variables were measured through the computation of a Pearson Product moment correlation coefficient. A multiple regression analysis was used as the statistical instrument in determining the validity of predicting composite achievement scores from expenditure per pupil, per capita income, and the percent of low income students. Williams defines a regression analysis as the estimation or prediction of one variable from the values of other given variables.<sup>6</sup> However, the multiple regression analysis design (R value) is not a test of statistical significance. An analysis of variance (F value) was used as the method to determine the statistical significance of predicting the dependent variable from the three independent variables. Kerlinger stated, "A statistical test like F says in a relatively indirect way that there is or is not a relation between the independent variables and the dependent variable."<sup>7</sup>

The data of the four variables were punched on cards and the statistics were computed at the Oklahoma University Computer Center in Norman, Oklahoma.

---

<sup>6</sup>E. J. Williams, Regression Analysis (New York: John Wiley & Sons, Inc., 1959), p. 2.

<sup>7</sup>Fred N. Kerlinger, Foundations of Behavioral Research (New York: Holt, Rinehart and Winston, Inc., 1967), p. 200.

The following general research hypothesis was developed from the information relative to the regression analysis:

$H_{0_1}$ . There is no statistically significant difference between the correlation found through a multiple regression analysis using expenditure per pupil, per capita income and percent of low income students to predict scores on the Iowa Test of Educational Development at the ninth grade level and correlation of 0.

For the purpose of examining individual relationships of each independent variable to academic achievement, the following subsidiary hypotheses were established:

$A_1$  There is no statistically significant relationship between expenditure per pupil and the composite scores on the Iowa Test of Educational Development in selected school districts in the State of Oklahoma when the influence of size is held constant.

$A_2$  There is no statistically significant relationship between per capita income and composite scores on the Iowa Tests of Educational Development in selected school districts in the State of Oklahoma when the influence of size is held constant.

$A_3$  There is no statistically significant relationship between the percent of low income students and composite scores on the Iowa Test of Educational Development in selected school districts in the State of Oklahoma when the influence of size is held constant.

## CHAPTER IV

### PRESENTATION AND ANALYSIS OF DATA

The data concerning the relationship of expenditure per pupil and socio-economic conditions to academic achievement in selected school districts in the State of Oklahoma has been presented and analyzed in the following pages. Individual relationships were measured through the use of the statistic, the Pearson product-moment correlation coefficient. However, with samples this small some theoretical problems had to be taken into account when the Pearson  $r$  statistic was near the borderline of significance. In such cases the hypothesis must be accepted or rejected with reservation. The ability to predict the dependent variable (academic achievement) from three independent variables (expenditure per pupil, per capita income, and percent of low-income students) were calculated through the use of a multiple regression analysis.

The data for this study were obtained from three primary sources: (1) Records of the Oklahoma State Department of Education, (2) Oklahoma University Bureau of Business Research, and (3) student cumulative folders. The data were presented separately for two groups--those having an average

daily attendance between 500-900, and those schools having an average daily attendance between 900-1,550. The data were presented in table form with a discussion of the results of each table. Each table containing the raw data was followed by an analysis and interpretation of the results of the statistical procedure used.

TABLE I  
AVERAGE DAILY ATTENDANCE  
500-900

| School | Expenditure<br>Per Pupil | Per Capita<br>Income | Percent of<br>Low Income<br>Students | Composite<br>Achievement<br>Score |
|--------|--------------------------|----------------------|--------------------------------------|-----------------------------------|
| 1      | 701.68                   | 3,817.               | .03                                  | 12.2                              |
| 2      | 436.43                   | 2,262.               | .61                                  | 10.4                              |
| 3      | 438.28                   | 2,426.               | .27                                  | 12.1                              |
| 4      | 466.99                   | 2,739.               | .10                                  | 13.3                              |
| 5      | 434.49                   | 2,780.               | .17                                  | 13.4                              |
| 6      | 429.77                   | 1,454.               | .61                                  | 9.8                               |
| 7      | 372.38                   | 2,128.               | .36                                  | 12.4                              |
| 8      | 390.39                   | 2,133.               | .39                                  | 13.6                              |
| 9      | 464.39                   | 2,598.               | .26                                  | 11.1                              |
| 10     | 393.21                   | 2,843.               | .03                                  | 12.9                              |
| 11     | 429.09                   | 2,612.               | .10                                  | 11.6                              |
| 12     | 517.10                   | 2,286.               | .35                                  | 8.9                               |
| 13     | 451.10                   | 2,058.               | .65                                  | 10.3                              |
| 14     | 635.82                   | 2,220.               | .10                                  | 13.0                              |
| 15     | 390.39                   | 2,729.               | .38                                  | 11.9                              |
| 16     | 388.73                   | 1,988.               | .43                                  | 11.1                              |
| 17     | 416.01                   | 2,891.               | .22                                  | 14.2                              |

An analysis of the data in Table I is presented in Table II.

TABLE II  
RESULTANT ANALYSIS OF DATA FOR SCHOOLS  
RANGING IN A.D.A. FROM 500-900

| Variable                       | Mean     | Standard Deviation | Correlation With Achievement Score |
|--------------------------------|----------|--------------------|------------------------------------|
| Expenditure per pupil          | 456.25   | 88.35              | -0.04469                           |
| Per capita income              | 2,468.47 | 512.91             | +0.45234                           |
| Percent of low income students | 0.30     | 0.20               | -0.61290                           |
| *                              |          |                    |                                    |

\*An assumption that must be met in the computation of a multiple regression analysis is the linearity of the data. A polynomial fit was computed and the data were found to be linear.

The Multiple Regression coefficient for the three variables was 0.6992. However, the number was less than 100 requiring the following formula to be used in a correction factor for bias:

$$R^2 = 1 - (1 - R^2) \left( \frac{W-1}{N-m} \right)$$

The corrected R equaled 0.7724.

#### Interpretation of Table II

In the schools ranging from 500-900 in A.D.A., there was almost no relationship (.04) between expenditure per

pupil and the composite achievement score. The relationship was not significant at the .05 level and the null hypothesis ( $A_1$ ) was accepted.

Per capita income had a fairly strong relationship (+.45) with the composite achievement score. However, (.46) was necessary for the relationship to be significant at the .05 level; the null hypothesis ( $A_2$ ) was accepted, with reservations. A correct prediction could be expected to occur 20 percent of the time when using per capita income as the sole predictor.

The percent of low income students was found to have the strongest relationship (-.61) with composite achievement scores. The null hypothesis ( $A_3$ ) was rejected and the relationship found to be significant at the .01 level. When using the percent of low income students as the one criterion, composite achievement scores could be predicted with 37 percent accuracy.

The corrected multiple correlation of the three variables with the composite achievement score was .7724. However, the strong relationship was accounted for by the per capita income and the percent of low income students. Expenditure per pupil could have been omitted in the schools with an ADA between 500-900 without loss of predictability. Using variables per capita income and percent of low income students, composite achievement scores could be predicted with 60 percent accuracy.

TABLE III  
ANALYSIS OF VARIANCE FOR THE REGRESSION (500-900)

| Source  | Degree of Freedom | Sum of Squares | Mean Squares | F Value |
|---------|-------------------|----------------|--------------|---------|
| Between | 3                 | 16.75497       | 5.58499      | 4.07563 |
| Within  | 13                | 17.81441       | 1.37034      |         |
| Total   | 16                | 34.56938       |              |         |

With a value of 4.07563, the F test was found to be significant at the .05 level and the null hypothesis ( $H_{01}$ ) was rejected.

TABLE IV  
AVERAGE DAILY ATTENDANCE (950-1,550)

| School | Expenditure Per Pupil | Per Capita Income | Percent of Low Income Students | Composite Achievement Score |
|--------|-----------------------|-------------------|--------------------------------|-----------------------------|
| 1      | 509.35                | 2,926.            | .26                            | 12.7                        |
| 2      | 465.31                | 2,615.            | .18                            | 14.8                        |
| 3      | 471.35                | 3,213.            | .21                            | 13.5                        |
| 4      | 527.85                | 2,709.            | .45                            | 11.9                        |
| 5      | 420.39                | 1,865.            | .34                            | 9.8                         |
| 6      | 457.51                | 2,601.            | .38                            | 13.2                        |
| 7      | 436.09                | 2,428.            | .27                            | 10.2                        |
| 8      | 436.40                | 2,220.            | .18                            | 12.2                        |
| 9      | 440.12                | 1,934.            | .20                            | 12.9                        |
| 10     | 407.96                | 2,929.            | .35                            | 13.1                        |
| 11     | 434.48                | 2,729.            | .20                            | 14.3                        |
| 12     | 398.44                | 2,687.            | .14                            | 12.8                        |
| 13     | 412.14                | 1,988.            | .38                            | 10.5                        |
| 14     | 407.44                | 3,306.            | .15                            | 13.3                        |
| 15     | 521.19                | 3,068.            | .12                            | 13.5                        |

An analysis of the data in Table IV is presented in Table V.

TABLE V  
RESULTANT ANALYSIS OF DATA FOR SCHOOLS  
RANGING IN ADA FROM 950-1,550

| Variable                       | Mean     | Standard Deviation | Correlation With Achievement Score |
|--------------------------------|----------|--------------------|------------------------------------|
| Expenditure per pupil          | 456.40   | 52.32              | +0.26035                           |
| Per capita income              | 2,614.53 | 453.02             | +0.60773                           |
| Percent of low income students | 0.25     | 0.10               | -0.50729                           |

The Multiple Regression coefficient for the three variables was 0.6955. However, the number was less than 100, requiring a correction factor for bias to be computed. The corrected  $\bar{R}$  equaled 0.7104.

#### Interpretation of Table V

In schools ranging in average daily attendance from 950-1,550, there was little relationship (.26) between expenditure per pupil and the composite achievement scores. The relationship was not significant at the .05 level and the null hypothesis ( $A_1$ ) was accepted. A correct prediction could be expected to occur only seven percent of the time using expenditure per pupil as the sole predictor.

The per capita income has the strongest individual correlation with the composite achievement score with a Pearson  $r$  of .60. The relationship was significant at the .05 level and the null hypothesis ( $A_2$ ) was rejected. Using per capita income as a predictor, composite achievement scores could be predicted with 36 percent accuracy.

The percent of low income students is also highly correlated with composite achievement scores with a Pearson  $r$  of  $-.51$ . The relationship was statistically significant at the .05 level, therefore, the null hypothesis was rejected. Composite achievement scores could be predicted with 25 percent accuracy.

The corrected multiple correlation of the three variables with the composite achievement score was .7104. Using the three independent variables, composite achievement scores could be predicted with 60 percent accuracy.

TABLE VI  
ANALYSIS OF VARIANCE FOR THE REGRESSION (950-1,550)

| Source  | Degree of Freedom | Sum of Squares | Mean Squares | F Value |
|---------|-------------------|----------------|--------------|---------|
| Between | 3                 | 14.14736       | 4.71579      | 3.43613 |
| Within  | 11                | 15.09655       | 1.37241      |         |
| Total   | 14                | 29.24391       |              |         |

With an  $F$  value of 3.43613 the conclusion was reached that there was a direct relationship between expenditure per

pupil, per capita income, and percent of low income students with the composite achievement score at the .05 level of significance. The null hypothesis ( $H_{01}$ ) was rejected.

The following table lists the correlations compared by variables according to school size.

TABLE VII  
CORRELATIONS COMPARED BY VARIABLES  
ACCORDING TO SCHOOL SIZE

| Variable                       |         |         |
|--------------------------------|---------|---------|
| Expenditure per pupil          | -.00469 | +.26035 |
| Per capita income              | +.45234 | +.60773 |
| Percent of low income students | -.61290 | -.50729 |

It can readily be seen from Table VII that per capita income is the best predictor of composite achievement score for schools of the size 950-1,550, while percent of low income students is the best predictor for schools of the size 500-900 A.D.A. However, when the two variables are combined they have a good predictive ability in schools of both sizes.

#### Summary

In summarizing the analysis of the data of this study, the following statements could be made:

1. Expenditure per pupil is a very poor predictor of composite achievement score in schools of the size 500-900 A.D.A. and schools of the size 950-1,550.

2. Per capita income is a good predictor of composite achievement score in both school sizes. However, it is a better predictor in the large schools than in the smaller schools ( $+.60773$  as compared to  $+.45234$ ).

3. Percent of low income students is also a good predictor of composite achievement score. However, it is a better predictor in the small schools than in the larger schools ( $-.61290$  as compared to  $-.50729$ ).

## CHAPTER V

### SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

This study was designed to examine the relationship between expenditure per pupil and the socio-economic background of students with academic achievement in selected public schools in Oklahoma. The purpose of the study was to provide further information in our quest to establish factors that have some influence on the academic success of students in Oklahoma schools.

#### Summary

Cost-quality studies in education have generally described quality in terms of quantity of education and the amount of service provided. With these criteria for quality, the relationships have been consistently positive. Most of these studies, however, have not measured outcomes of increased offerings and services except by enumeration and description of the services.

In the area of relationships between the costs of a school program and achievement in the skill subjects, a few studies, most of them having been conducted in the past two decades, have been reported. These investigations, described

in detail in Chapter II, have had limitations in terms of control and design. Two of the major restrictions which have been placed in the interpretation of the results of most of these studies, come from their failure to account for the children's capacity for achievement in the academic subjects and their socio-economic background. The present study has also failed to consider one of these factors.

All of the investigations, including the present one, have recognized fully that achievement in the skill subjects alone is surely an inadequate measure of total quality in a school program. The academic skills are, however, an extremely important part of the total school program, and lack of success in these skills can be virtually an insurmountable obstacle to further academic education for students. Consequently, the present study was primarily designed to examine the relationship between academic achievement and expenditure for instruction; but also to study the implications that the factor of socio-economic background of students might have on achievement. Two major limitations a person must consider when analyzing the implications of the study are (1) no effort has been made to determine the effect additional expenditures would have on the lower socio-economic school districts, and (2) the variable of the student's capacity for achievement in the academic areas has not been considered.

Thirty-two Oklahoma school districts were chosen for the investigation on the following bases: (1) All districts

administered the Iowa Test of Educational Development at the ninth grade level, and (2) all districts averaged between 500-1,550 in average daily attendance during the year 1967-68. The districts were widely distributed through the state and expressed a willingness to participate in the study. The school districts were divided into two size groups, (1) those with an ADA between 500-900, and (2) those with an ADA of 950-1,550, for the purpose of reducing the factor of school size when considering per pupil expenditures.

Between January, 1969, and December, 1969, the data for this study were collected in the following manner:

1. Expenditure per pupil was collected from the financial information each school district had reported to the State Department of Education. The items, "capital outlay," "transportation," and "building fund," were not considered in computing expenditure per pupil.

2. The percent of low income students was taken from proposals the various schools had submitted to the State Department of Education when making application for Title I funds under the Elementary and Secondary Education Act of 1965.

3. Per capita income was taken from the 1968 Oklahoma Data Book prepared by the Bureau of Business Research of the University of Oklahoma.

4. Composite achievement scores were compiled through the cooperation of school officials and the use of student records in each of the thirty-two school districts.

The data of the four variables were punched on cards and the statistics were computed at the Oklahoma University Computer Center in Norman, Oklahoma. The mean standard deviation, Pearson product-moment correlation coefficient, multiple correlation coefficient, and the analysis of variance for the regression were obtained.

### Findings

The research hypotheses of the study were enumerated and evaluated as follows:

$H_{01}$ . There is no statistically significant difference between the correlation found through a multiple regression analysis using expenditure per pupil, per capita income, and percent of low income students to predict scores on the Iowa Test of Educational Development at the ninth grade level and a correlation of 0.

This hypothesis was not supported by the evidence of the study. The null hypothesis was rejected and the relationship was found to be significant at the .05 level in both school sizes. A stronger relationship was found in the schools with an average daily attendance of 500-900 than in schools with an average daily attendance of 950-1,550.

$A_1$ . There is no statistically significant relationship between expenditure per pupil and the composite scores on the Iowa Test of Educational Development in selected school districts in the State of Oklahoma when the influence of size is held constant.

The hypothesis was supported by the evidence of the study. The relationship was non-significant at the .05 level, therefore, the null hypothesis was accepted.

A<sub>2</sub>. There is no statistically significant relationship between per capita income and composite scores on the Iowa Tests of Educational Development in selected school districts in the State of Oklahoma when the influence of size is held constant.

In schools with an average daily attendance of 500-900, the hypothesis was supported by the evidence of this study. The relationship was non-significant at the .05 level, however, the Pearson r statistic was near the borderline of significance. The null hypothesis was accepted with reservation.

In schools with an average daily attendance of 950-1,550, the hypothesis was not supported by the evidence of this study. The relationship was significant at the .05 level, therefore, the null hypothesis was rejected.

A<sub>3</sub>. There is no statistically significant relationship between the percent of low income students and composite scores on the Iowa Test of Educational Development in selected school districts in the State of Oklahoma when the influence of size is held constant.

In schools with an average daily attendance of 500-900, the hypothesis was not supported by the evidence of

this study. The relationship was significant at the .01 level, therefore, the null hypothesis was rejected.

### Conclusions

The findings of this study have resulted in the following conclusions:

1. Expenditure level in the thirty-two school districts involved in this study was not a good predictor of composite achievement scores.

2. Per capita income in the thirty-two school districts involved in this study was a good predictor of composite achievement scores.

3. Percent of low income students in the thirty-two school districts involved in this study was a good predictor of composite achievement scores.

4. When combined, expenditure level, per capita income, and percent of low income students were a good predictor of composite achievement scores. However, expenditure level could have been omitted with little loss of predictability.

The study provided evidence to support the following general conclusions:

1. The level of financial support in education does not assure that all of the presently accepted factors related to quality education will be attained in the same proportionate degree in all districts.

2. The factors of quality in education need to be more refined for better identification.

3. There are factors over which the schools have little or no control that are highly related to the achievement level of students.

The seemingly poor relationship that has been found to exist between expenditures and academic achievement should not be interpreted as meaning that an increase in expenditure will not result in an improvement in the overall quality of the educational program. It does indicate that there are some family and community characteristics that have a strong relationship to achievement that the public schools in Oklahoma have not overcome at this time.

#### Recommendations

Only thirty-two school districts in Oklahoma were used in the study because of a lack of uniformity in instruments used to measure academic achievement. Therefore, the conclusions were limited to that restricted population. However, the study suggests several recommendations for further research.

1. This study has shown there still exists a wide range in the composite achievement scores in the public schools in Oklahoma. The profession has the responsibility to both promote and support research to account for these differences.

2. This study has made no effort to compare the achievement level of small schools and large schools. Oklahoma, like many other states, needs a better district organization. A study of the relationship of school size to academic achievement would be of assistance in providing additional evidence to support further school district reorganization.

3. There are implications in this study to indicate a need for further study of cost-quality relationship factors in the State of Oklahoma with an emphasis on the process instead of the product. The study would include class size, qualifications of staff, availability of guidance services, adequacy of library facilities, methods of teaching, adequacy of materials, and physical plant facilities.

4. There were further implications of a critical need for more comprehensive, in-depth study of the relationship of family income, mother and father's educational level, parent's occupation, family status, (living with both actual parents), and parent's attitude toward education with academic achievement.

5. Future research should attempt to develop uniform instruments applicable to all parts of Oklahoma which will assure a consistency of kinds of data necessary for studies relative to factors having a relationship to academic achievement. With the improved computer techniques, with further refinement of such approaches to measuring school quality as

were proposed under the national assessment project, the possibilities for more meaningful investigation of quality should become increasingly better.

6. The relationship of expenditure and achievement should be studied taking into account the natural capacity of students to achieve as an independent variable.

A great amount of time, effort, and money is still needed to assure a more sophisticated approach in establishing the factors that contribute to academic achievement. The isolation of variables will continue to be a problem when attempting to establish relationships. However, short-cuts should eventually be found that will provide information leading to the ultimate objective of educational quality.

## BIBLIOGRAPHY

### Books

- Ayres, Leonard P. An Index Number For State School Systems.  
New York: Russell Sage Foundation, 1920.
- Bureau of Business Research. Oklahoma Data Book. Norman,  
Okla.: College of Business Administration, University of Oklahoma, 1968.
- Clark, Harold Florian. Cost and Quality in Public Education.  
Syracuse, N.Y.: Syracuse University Press, 1963.
- Coleman, James S. Equality of Educational Opportunities.  
Washington: U.S. Department of Health, Education,  
and Welfare, 1966.
- Cyr, Frank W.; Burke, Arvid J.; and Mort, Paul R. Paying  
For Our Public Schools. Scranton, Pa.: International  
Textbook Company, 1938.
- Edwards, Newton. Equal Educational Opportunity for Youth:  
A National Responsibility. Washington, D.C.:  
American Council on Education, 1939.
- Goodman, Samuel. The Assessment of School Quality.  
Albany, N.Y.: State Department of Education, 1959.
- Grace, A. G., and Moe, G. A. State Aid and School Costs:  
The Regents Inquiry. New York: McGraw Hill Book Co.,  
1938.
- Grimm, Lester R. Our Children's Opportunities in Relation  
to School Costs. Springfield, Ill.: Department of  
Research, Illinois Education Association, 1938.
- Guilford, J. P. Fundamental Statistics in Psychology and  
Education. New York: McGraw Hill Book Company,  
Inc., 1942.
- Harris, Chester W., ed. Encyclopedia of Educational Research.  
New York: The MacMillan Company, 1961.

- Johns, Roe L., and Morphet, Edgar L. Financing the Public Schools. Englewood Cliffs, N.J.: Prentice Hall, Inc., 1960.
- Kelley, Francis J. Multiple Regression Approach. Carbondale, Ill.: Southern Illinois University Press, 1969.
- Keppel, Francis. The Necessary Revolution in American Education. New York and London: Harper & Rowe, 1966.
- Kerlinger, Fred N. Foundations of Behavioral Research. New York: Holt, Rinehart and Winston, Inc., 1967), p. 200.
- Lawler, Eugene Stallcup. A Technique for Computing the Amount of New Aid Required for State Equalization Programs. New York: Bureau of Publications, Teachers College, Columbia University, 1932.
- Miller, Van, and Spalding, Willard B. The Public Administration of American Schools. Yonkers, N.Y.: Work Book Company, 1958.
- Morphet, E. L.; Johns, R. L.; and Reller, T. L. Educational Administration: Concepts, Practices and Issues. Englewood Cliffs, N.J.: Prentice-Hall, 1959.
- Mort, Paul R.; Burke, Arvid J.; and Fish, Robert S. A Guide for the Analysis and Description of Public School Systems. New York: Institute of Educational Research, Teachers College, Columbia University, 1942.
- Mort, Paul R., and Cornell, Francis G. American Schools in Transition. New York: Bureau of Publications, Columbia University, 1941.
- Mort, Paul R. "Cost-Quality Relationship in Education." Problems and Issues in Public School Finance. New York: Bureau of Publications, Teachers College, Columbia University, 1952.
- Mort, Paul R., and Reusser, Walter C. Public School Finance: Its Background, Structure and Operation. New York and London: McGraw-Hill Book Company, Inc., 1941.
- Mort, Paul R. State Support for Public Education. Washington, D.C.: The American Council on Education, 1933.
- Mort, Paul R.; Vincent, William S.; and Newell, Clarence A. The Growing Edge. New York: Metropolitan School Study Council, 1946.

National Education Association. Financing Education for Our Changing Population. Washington, D.C.: National Education Association.

New York State Educational Conference Board. What Do Good Schools Do For Children? Albany, N.Y.: The Board, 1954.

Norton, John K., and Lowler, Eugene S. An Inventory of Public School Expenditures in the United States. Washington, D.C.: American Council of Education, 1944.

Pierce, Truman M. Controllable Community Characteristics Related to the Quality of Education. New York: Bureau of Publications, Teachers College, Columbia University, 1947.

Plackett, R. L. Principles of Regression Analysis. London: Oxford University Press, 1960.

Powell, Orrin E. Educational Returns at Varying Expenditure Levels: A Basis for Relating Expenditure to Outcomes in Education. New York: The MacMillan Co., 1939.

Ross, Donald H. Administration for Adaptability. New York: Metropolitan School Study Council, 1951.

Williams, E. J. Regressions Analysis. New York: John Wiley and Sons, Inc., 1959.

Woollatt, Lorne H. The Cost-Quality Relationship in The Growing Edge. New York: Bureau of Publications, Teachers College, Columbia University, 1949.

#### Articles

Bloom, Benjamin S., and Statler, R. C. "Changes in the States on the Tests of General Educational Development from 1943 to 1955." School Review, 65: 204-221, Summer, 1957.

Bloom, Benjamin S. "The 1955 Normative Study of the Tests of Educational Development." School Review, 64: 110-124, March, 1956.

McKenna, Bernard. "Characteristics of the Quality in Professional Staff." IAR Research Bulletin, Vol. 2, No. 1, October, 1961.

National Education Association, Research Division. "Efficient School Size." Research News, February, 1963.

Swanson, Austin D. "Relations Between Community Size and School Quality." IAR Research Bulletin, Vol. 2, No. 1, October, 1961.

#### Unpublished Material

Crandell, James Henry. "A Study of Academic Achievement and Expenditure for Instruction." Unpublished doctoral dissertation, University of California, Berkeley, California, 1961.

Dollars, Ralph Damon. "The Relationship of Size of Elementary Schools to Operational Costs and Program Quality." Unpublished doctoral dissertation, The Ohio State University, 1962.

Ferrall, Doctor T. "Relation Between Current Expenditure and Certain Measures of Educational Efficiency in Kentucky County and Graded County Systems." Nashville, Tennessee, George Peabody College for Teachers, 1936.

Furno, Orlando F. "The Projection of School Quality from Expenditure Level." Unpublished doctoral dissertation, Teachers College, Columbia University, New York, 1956.

Gray, Stuart Calvin. "A Study of the Relationship Between Size and a Number of Qualitative and Quantitative Factors of Education in Four Sizes of Secondary Schools in Iowa." Unpublished doctoral dissertation, State University of Iowa, 1961.

Hanson, Nels William. "Economy of Scale in Education: An Analysis in Relationship Between District Size and Unit Costs in the Public Schools." Unpublished doctoral dissertation, Stanford University, 1963.

McPhail, Gene Douglas. "School District Size and Per Pupil Expenditure." Unpublished doctoral dissertation, University of Oklahoma, 1966.

Rajpal, Puran Lai. "A Study of Relationship Between Expenditure and Quality Characteristics of Education in Iowa Public Schools." Unpublished doctoral dissertation, University of Iowa, 1967.

- Simpson, Robert James. "Selected Relationships Among Reported Expenditures and Programs in Metropolitan School Districts." Unpublished doctoral dissertation, Wayne State University, 1961.
- Smith, Stanley V. "Quality of Education Related to Certain Social and Administration Characteristics of Well-Financed Rural School Districts." Unpublished doctoral dissertation, Teachers College, Columbia University, New York, 1956.
- Weinheimer, Norman Peter. "Analysis of Selected Cost-Quality Factors in Education as Related to Selected School Districts in Michigan." Unpublished doctoral dissertation, Michigan State University, 1964.
- Wohlferd, Gerald H.; Armstrong, Charles M.; and Curtis, Lynne P. "Scholastic Achievement and Relevant Factors." Unpublished Report, New York State Department of Education, 1967.

APPENDIX

COPY OF CORRESPONDENCE

September 18, 1969

Dear Fellow Educator:

I am seeking information about your school system that will enable me to complete a dissertation at the University of Oklahoma. I am attempting to develop a relationship between the socio-economic background of students; expenditure per pupil, and academic achievement as measured by the Iowa Test of Educational Development, in school districts in the State of Oklahoma. Only school districts that administer the ITED at the 9th grade level will be used in the study.

Your assistance is needed in supplying the mean standard score for your ninth grade students for this past year. This information should be provided for you by the agency that graded your tests. The school systems to be used will not be named in the dissertation. There will be no comparisons made between individual schools, nor will there be comparisons between larger and smaller schools. The names of the schools will not be disclosed to any group or individual. The statistical data will be available to you upon your request.

If you will assist me by supplying this information, it will certainly be appreciated.

Sincerely yours,

Leonard Campbell  
Director of Personnel  
Moore Public Schools

School \_\_\_\_\_

Mean Standard Score (ITED) \_\_\_\_\_

I would like a copy of the statistical data. Yes \_\_\_\_\_ No \_\_\_\_\_