

RELATIONSHIP OF TEACHER SALARY
AND OTHER SELECTED VARIABLES
TO STUDENT ACHIEVEMENT

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1974

Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
DOCTOR OF EDUCATION
July, 1977

Thesis
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PREFACE

This study was conducted to determine if several factors relating to school district finance, had a relationship with the level of student achievement as measured by standardized tests. Multiple regression analysis was used to determine if these relationships do exist.

Personal bias and unfounded assumptions have led to many disagreements concerning possible relationships. Attempt was made in this study to either determine existing relationships through other literature and/or to control for their effect through design of the study.

The author wishes to express his appreciation to his major adviser, Dr. Richard Jungers, and other committee members, Dr. Carl Anderson, Dr. Ralph Brann, and Dr. Ken Kiser, for their assistance and cooperation in the preparation of this study. Appreciation is also expressed to Dr. David Perrin for his assistance in preparation of design and to Dr. Perrin and Dr. Jo Campbell for their assistance and patience in the interpretation of computer results.

Thanks is given to Donna, my wife, and Kathy and Billie Kay for the many pages they typed and re-typed to obtain a finished product.

Special gratitude is expressed to my wife, Donna, and our daughter Shawna for their patience, understanding, and sacrifices made during work on this study.

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CHAPTER I

INTRODUCTION

Reason for Study

The implications that a relationship exists between financial input to schools and the quality of education are widespread. This study was designed to determine if the assumed relationship was fact or fiction.

Pincus(1) stated that for several years, school administrators and state legislators have made statements concerning the inequities of the financing of public schools in the nation. He also showed that cases before the courts in California, Minnesota, Texas, and New Jersey affirmed that a system of school finance based on property taxes discriminates against the poor because it makes the quality of a child's education a function of the wealth of his parents and neighbors. These rulings imply that the quality of education suffers when a school district receives a low amount of money for operation of the school program. The rulings also indicate that students of "rich" districts have an unfair advantage and receive a higher quality education than those students in poorer districts. Johns(2) indicated that cost may not always be related to

quality. He stated that small schools tend to cost more per pupil than do larger schools and that the quality of the smaller schools is often found to be lower than that of larger schools.

Oklahoma Education Association President, Betty Roper(3), has said, "The most important element in a child's education is the classroom teacher." She further stated that adequate salaries and decent working conditions are absolutely necessary to attract and retain the most competent and skilled professionals in the classrooms. Governor David Boren in announcing his teacher salary plan for 1977-78 said, "In the long run, we must be competitive with neighboring states and other professions or face a decline in quality"(4). A 1970 survey by the United States Department of Labor stated that a second job for teachers cannot help but detract from a teacher's performance in the classroom(5). The number of second jobs may be reduced by an increase in teacher pay. According to Charles S. Benson(6) teachers cannot defend requests for higher pay on the basis of increases in teaching productivity because there are no generally accepted measures of system-wide change in education. It is, however, according to Johns (2), generally accepted that teachers must maintain an adequate standard of living if they are to work effectively.

The Coleman Report(7) indicates that the quality of teachers shows a stronger relationship to pupil achievement

than do the facilities of the school. It further shows that the relationship of quality teachers and student achievement is progressively greater at higher grades, indicating a cumulative impact of the quality of teachers on pupil achievement. Johns(2) indicated that state mandated minimum salaries have a tendency to place lesser qualified teachers in the poor districts because of the districts inability to offer high enough salaries to attract the more qualified teachers. Through all of these statements, money is associated with the quality of education. Further analysis was made to determine if this assumed association is valid.

Problem

This study was designed to determine if a relationship exists between teachers salary and student achievement. Additional variables to be studied that may influence student achievement are teacher experience, teacher education, size of school, per pupil expenditure, per pupil valuation, and student economic background.

Delimitations

This study was restricted to school districts within the state of Oklahoma. Information was used from only independent districts which administered the Iowa Tests of Educational Development to students in the eleventh grade during the 1975-76 school year.

The index of the number of families considered poor is based upon figures for the 1969-70 school year. These are the most current statistics available in which all school districts were uniformly measured for the number of poor families. Since that time, individual school districts have been allowed to select, from an approved list, their own method of determining the number of poor families within their district. This is used as a base for requesting Title I funds.

Hypotheses

There is no relationship between teacher salaries and student achievement.

There is no relationship between teacher experience and student achievement.

There is no relationship between the level of teacher education and student achievement.

There is no relationship between size of school and student achievement.

There is no relationship between per pupil expenditure and student achievement.

There is no relationship between district per pupil valuation and student achievement.

There is no relationship between student economic background and student achievement.

There is no relationship between teacher salaries and student achievement when the effects of teacher experience,

teacher education, size of school, per pupil expenditure, per pupil valuation, and student economic background are controlled.

There is no relationship between size of school and per pupil expenditure.

There is no relationship between per pupil expenditure and per pupil valuation.

There is no relationship between teacher salary and per pupil valuation.

Operational Definitions

Teacher salary was measured by the mean salary for each district of all classroom teachers of kindergarten through the twelfth grade.

Teacher experience was measured by the mean number of years of experience per district for the entire professional staff.

Teacher education was measured by the percentage of the professional staff that have earned a masters' degree or above.

Size of the school was measured by the average daily attendance (ADA) reported for the 1975-76 school year.

Per pupil expenditure was the current (1975-76) expenditure from the general fund excluding capital outlay, divided by the average daily attendance.

Per pupil valuation was the total district valuation (real property plus personal property plus public service)

divided by ADA.

Economic background was measured by the number of families within each district having a 1969 income classified as "poor" as identified by the Orshansky Index, divided by the district ADA for the 1969-70 school year.

Student achievement was measured by the mean of eleventh grade student scores on the Iowa Test of Educational Development (ITED) given during the 1975-76 school year.

Summary

Widely accepted is the assumption that the quality of education is dependent upon the level of spending of the school system. Actions resulting from some people accepting these assumptions, whether true or not, have led to many conflicts concerning financing of public schools. This study analyzed the effect of several variables as they relate to the quality of schools when this quality was measured by student scores on a standardized achievement test.

CHAPTER II

REVIEW OF SELECTED LITERATURE

History

The origin of our earliest schools in America can easily be traced, according to Mulhern(8), to the Protestant Revolution in Europe. These revolutions were started by reformers who were insistent that a knowledge of the Gospel was necessary in order to acquire personal salvation. If one was to possess such knowledge of the scriptures, it logically followed that he must have facility in reading in order to understand the commandments of God, which were recorded in the Gospel. One of the earliest pleas for the common school was made by Martin Luther. In 1524 he wrote "that not only had God imposed upon rulers the duty of instructing youth, but that it was also to their own best interest to do so"(8). He also advocated compulsory attendance at school for both boys and girls.

The "Deluder Satan Act" of 1647 which was the first law in America to require that schools be established, was also the first law in the world providing for education at the expense of the community. The right of the government

to control taxation for education then became a sore point in government activity. The policy of taxing the property of all the people to provide free schooling for all the children, as indicated by Eby(9), was contrary to the theory of parental right to determine the child's education.

When our United States Constitution was written, education was not mentioned, therefore education became a state function (if accepted) under the tenth amendment. The tenth amendment provided that "powers not delegated to the United States by the Constitution, nor prohibited by it to the states, are reserved to the States respectively, or to the people." Thomas Jefferson asserted repeatedly that popular education is the business of the state, and vital to its welfare(10). While at first, state constitutions made only brief mention of education, some states did pass laws concerning education.

In 1801 Massachusetts passed a law that allowed the local districts to levy a tax for school purposes and enabled individuals to determine what the rate of taxation should be. It then became necessary to convince the public of the value of public education. Horace Mann urged the establishment of state supported and controlled schools on the grounds that "in a Republic ignorance is a crime"(8). He reminded property owners that the state is a collective person, and that its property must bear the cost of saving youth from poverty and crime and of preparing them for

discharge of their social duties. According to Cubberly (11), by 1825 it had been clearly recognized by thinking men that the only safe reliance of a system of state schools lay in the general and direct taxation of all property for their support.

Property taxes were the most logical choice of taxes for support of the early schools. In the days when our schools began and taxation was developed, wealth was far more evenly distributed than it is today. The wealth of individuals was almost entirely visible and tangible wealth. Scientific and economic development of the country caused many communities to far exceed others in revenue collected. This, along with increased cost of education, caused many school districts to be unable to provide an "equal" education of their youth in relation to the quality of the education of more wealthy communities. This difference in quality eventually led to states developing plans to provide income to school districts in addition to the amounts collected locally. Each state developed their own plan based on what they considered "equitable". But in "light of modern knowledge, it is evident that almost every provision made for apportioning state funds for schools during the past century was inequitable or inadequate or both", as stated by Johns(2).

Education Production Studies

Over the years there have been many attempts to measure the quality of education and relate it to cost. These attempts fall into three main types. The early studies depended upon an efficiency index, such as that developed by Ayres(12). Efficiency included such things as the holding power of schools and the level of training of the teachers. Another type of study undertaken by Mort(13), looked at the program of the schools. It developed into a rating of schools on the basis of a carefully formulated rating instrument. The third type of study, according to Polley(14), used student achievement scores as a basis for rating the school system and relating this to quality. Most of the following literature review will be devoted to this third type of study. Two major studies of this type are the Coleman Report and the Fleischmann Report.

Coleman Report

The Coleman Report(15) indicates that schools are remarkably similar in the effect they have on student achievement when the socioeconomic background of students is taken into account. It further indicates that facilities and curriculum of schools account for relatively little variation in student achievement when measured by standardized test. Verbal skill test scores of teachers and educational background of teachers showed the highest

relationship of all teacher characteristics to student achievement, although a pupil attitude factor appears to have a stronger relationship to student achievement than do all the other school factors together. This pupil attitude factor is the extent to which an individual feels that he has some control over his own destiny. Charles Benson (16) has pointed out that Coleman's findings have been interpreted to mean that dollar input to schools do not make a difference in the amount pupils learn. Contrary conclusions arrived at from the same set of information were found by Hanuskek(17), Bowles(18), and Levin(19). They each found a statistically significant relationship between teacher experience and student achievement. Two other similar studies on different sets of data conducted by Hanuskek(20) and Winkler(21) also found relationships contrary to the Coleman Report. The results of these studies could be construed to indicate that a direct relationship exists between dollars input to a school and student achievement. Coleman has since issued a report known as Coleman Report II in which some statements concerning forced busing were retracted from the original report. He did not, however, change outputs concerning the relationship of dollars spent by a school and student achievement.

Fleischmann Report

Teachers play the major role in the education process. The Fleischmann Report(5) stated that from the education production functions completed, "teacher characteristics appear to be more important in shaping the educational experiences of students than other school variables." The report further indicated the most important teacher characteristics seem to be intelligence, experience and academic training. However, he also indicated that seniority (experience) is unrelated to educational need which may be measured by student achievement scores. This discrepancy and many others are found throughout the literature concerning the determinates of student achievement.

Since teacher intelligence has been shown to be related to student performance by both Coleman and Fleischmann, some people might promote state-wide administration of intelligence tests to prospective teachers. Intelligence tests, however, are not sufficiently reliable to be used for this purpose, and the correlation between intelligence and student achievement is by no means absolute. Fleischmann reported that although teacher experience is the next most important element in student achievement, it does not prove that more experience always makes a better teacher. The report also indicated that

superior teachers had earned advanced degrees, not merely taken course work beyond the bachelor's degree.

Other Experimental Studies

Jencks(22) found in his study of inequality, that increases in educational funding are not correlated with any significant increases in student achievement if achievement is measured by standardized tests. He also implied that learning is only minimally a function of facilities, teachers, or curriculum.

The Rand Corporation(23) in its review and synthesis of research findings on the effectiveness of education, concluded that increasing expenditures on traditional educational practices is not likely to improve educational outcome substantially. They also found that there seem to be opportunities for significant redirections, and in some cases reductions, in educational expenditures without deterioration in educational outcomes.

Research findings shown by Hornbostel(24), indicate that "high-expenditure schools generally do a better job of teaching the basic skills and of interrelating areas of knowledge than do low-expenditure schools." He also shows that high-expenditure schools far exceed low-expenditure schools in individualizing instruction, developing special talents of children, and using teaching processes designed to develop creativity.

The conclusion reached by the Advisory Commission on Intergovernmental Relations(25) from results of major studies of school spending and student achievement show a direct relation between school inputs and their related outputs.

Many other studies have been conducted to determine relationships which may increase student achievement. The following summary statements are results of a small sample of other studies.

Considering socioeconomic characteristics, assessed valuation, per pupil operating expenditure and educational treatments, "The factor most highly related with achievement was socioeconomic characteristics"(26).

"Reading ability is strongly and negatively related to the social class of students"(27).

The analysis indicated that the relationship of race, socioeconomic status, and experience teaching the unit, to student achievement were statistically significant(28).

"A significant relationship was found between achievement gains and Title I per-pupil expenditure for reading but not for math"(29).

"Mean school achievement in English is no more a function of per pupil expenditure, student aptitude, and socioeconomic status than it is a function of student aptitude and socioeconomic status"(30).

"College credits earned demonstrated a significantly positive relationship to student shop achievement"(31).

"The teacher's college credit hours beyond minimal level appear to be unrelated to greater student achievement"(32).

"Student achievement decreased with teacher practice"(33).

"The major factor explaining disparities in per pupil expenditures is teacher characteristics (salaries, years of teaching, and level of education)"(34).

Recruiting and retaining teachers with higher verbal scores is five to ten times as effective per dollar of teacher expenditure in raising achievement scores of students as the strategy of obtaining teachers with more experience(35).

Student achievement is either not related to class size, or is higher with larger classes(36).

Although this is only a small sample, the findings appear to provide only one well-defined, useful result--there is a relationship between socioeconomic status and student achievement. All other findings seem to be inconclusive in light of results of other studies on similar topics.

Economics Views

Fleischmann(37) indicated that because of the lack of experimentally proven data on the learning process it is currently fashionable in academic circles to assert that "more money for schools does not necessarily mean better education". This is not accepted, however, by all leaders in the area of school finance.

Arvid Burke(38) reported that if a major breakthrough in school finance was accomplished, that an increase in production of the educational enterprise must also accompany it. If production did not increase with the increased financing, inflationary pressures would be placed on the economy. Burke pointed out that productivity did increase at the rate of two to three percent for the past thirty years. He attributed the rise in productivity to

the fact that ninety percent of those individuals that produced, were educated in public schools. Increases in productivity therefore depend upon how much we improve the quality of schools and how much we raise the general educational level of the total population.

In an attempt to decide if more education is worthwhile, Surfrin(39) showed that the distribution of personal income on the average varies directly with education. Houthakker(40) found, from 1950 census data, that at every age bracket, higher incomes are associated with an increased number of years of schooling completed. The individuals with higher income, seemingly contribute more to social income than do individuals with lower incomes. Two more recent studies by Guthrie(41) and Bowles(42) showed that a substantial inequality of economic opportunity exists and that the present systems of financing public schools tend to reinforce social class distinction by transmitting economic status from one generation to the next.

Swearington(43) notes the shift of economic thought concerning education from seeing education as a benefit primarily to the individual and as a consumer expenditure to seeing education as an important and necessary social investment. One of the most important shifts in understanding and public sentiment, according to Miller(44) is away from the idea of the school as a public charity or

social service and toward the notion that education is an economically sound investment.

Equality of Schools

Johns(2) wrote that equality of educational opportunity is an objective to which practically every citizen has subscribed in theory for many years. Practical application of that theory, however, has not been adequate. The terms equal and equitable are used almost interchangeably in the literature. Even though these terms are used frequently, they have not been assigned a useable definition. Webster(45) defines equal as "of the same quantity, size, number, value, degree, intensity, quality" or as "having the same rights, privileges, ability, rank" or "evenly proportioned; balanced or uniform in effort or operation". Equitable is shown to be derived from equal and characterized by being fair, just, and impartial. When applied to the concept of school finance, these definitions seem to lead only to more difficulties in determining if a finance system provides for the same quantity and quality of education or if it is fair and just. What appears to be fair or just to one individual or to a school district may seem to be quite unfair and unjust to others. The concepts of fair or just then, depend on individual differences of opinion and hence are not useful at the present time, to formulate a structure for school finance that would be satisfactory to all individuals

involved. Likewise, quality of a school program has proved to be difficult, if not impossible, to determine using currently available techniques. The quantity of education then, has the greatest potential for being "equalized", even with the use of the nebulous concepts of equal and equitable. Assuming that equalization is desired, the problem then comes to the question of what is to be equalized. Pincus(1) list three possibilities--expenditure per pupil, school resources per pupil, and educational outputs. The extent or degree of equalization desired will lead to further problems in developing a school finance system.

If equal educational outputs are desired, this would indicate that all students should obtain equal, or at least similar scores on a standardized achievement test. This goal, if it were actually desired, would require larger expenditures for students classed as low-achievers or handicapped. This assumption that higher expenditures are needed has been strengthened by federal legislative action when they passed the Elementary and Secondary Act of 1965. This act provided aid to districts designed to improve the education of the children of the poor and to foster research and innovation in education. However, additional funding, of and by itself, does not insure improved educational outcomes. There is a great need to find educational factors that will improve the results of instruction. Should some of these improvement factors be

found, it is highly unlikely that equal achievement would be accomplished or even desired.

Implementation of a school finance system that would provide equal school resources per pupil would also cause many problems. To allow students to have access to equal teachers, materials, and facilities would be an ideal situation. The determination of what would be equal is presently impossible. The attributes of a "good" teacher are not available nor is there a method to determine if one teacher is "equal" to another. Equivalent facilities and materials could not be realized without expenditure levels beyond likely expectations. Methods of determining area cost differences would be difficult and open to controversy. These difficulties cause it to be unlikely that school resources per pupil can be equalized.

Educational expenditures per pupil is the last item listed by Pincus for which equalization may be desired. The major advantage of equalized expenditures per pupil is the ease and simplistic nature of measuring if education is "equal". Although this system seems simple and appropriate, it neglects differences in cost of needed educational resources and achievement results of students. Recent court decisions have indicated that equalized expenditures should be the minimum acceptable approach to school finance and that other factors may be used to produce a more "equitable" system.

Judicial Actions

The United States Supreme Court in responding to the Texas case, Rodriguez v. San Antonio Independent School District(46), indicated that the Fourteenth Amendment(equal protection) would not be used as a legal basis for school finance reform. Justice Powell stated that there was an apparent need for tax reform that was based on property tax but that the solutions should come from the legislatures and not from the federal courts. This, in effect, leaves the burden for school finance reform with the courts, legislatures, and individuals within each state. State court systems have been consistent in calling for reform of the school finance systems.

Appeals of the Serrano case in California have resulted in court requirement of legislative change by 1980. The court found that the California school finance system violated both the California and United States Constitution in that it "Invidiously discriminates against the poor because it makes the quality of a child's education a function of the wealth of his parents and neighbors"(47). Even with adjustments toward equalizing expenditures during the appeal process, the court found that the new system still permitted too much of a school district's revenue to be based on local property value(48). The court also called for virtual equalization of spending per student throughout the state(1).

Milliken v. Green(49) in Michigan stated that different school districts should no longer receive varying per capita revenues for any given tax rate. This is consistent with the concept of fiscal neutrality which means that the quality of public education may not be a function of wealth, other than the wealth of the state as a whole.

The New Jersey case, Robinson v. Cahill(50) found that their school finance system violated the state constitution because it resulted in children in some districts receiving an education that was less than "thorough and efficient" as the constitution required.

A superior court judge in Seattle has ruled in the Seattle School District No.1 v. State of Washington(51) case, that the Washington school finance system violated the state constitution. He gave the state legislature until 1979 to develop a new finance scheme which will ultimately lead to full state funding.

These court rulings have uniformly called for revision of school financing systems. Inherent in these rulings is the assumption that the quality of schools is dependent upon the level of finance provided. This assumed relationship has neither been proved nor disproved by experimental studies.

Summary of Literature

Although many studies and a large amount of writing have dealt with school factors which may affect student

achievement, there is little agreement on which factors do affect student achievement. Teacher intelligence was shown to have an effect, but accurate measurement of intelligence is not available. Socioeconomic background is related to student achievement and attempts by the federal government have been made to "bring up" the level of education of the socioeconomically deprived. Although teacher experience and education have not been shown to greatly influence student achievement, it is assumed that they contribute to the determination of teacher salary. Per pupil valuation is assumed to determine per pupil expenditure which should be reflected in the size of teacher salaries. The inter-relatedness of these variables was examined in the following chapters.

CHAPTER III

METHODS

Introduction

This report was designed to determine if there is a relationship between teacher salary and student achievement. Other factors included in the study are: teacher experience, teacher education, size of school, per pupil expenditure, per pupil valuation, and economic background of the students.

Data Collection

Information for the school year 1975-76 obtained from a computer print-out at the data processing center of the Oklahoma State Department of Education included figures for teacher salary, teacher experience, teacher education, size of school, per pupil expenditure, and per pupil valuation. Teacher salary was the mean salary for the district of all classroom teachers of kindergarten through the twelfth grade. Teacher experience was measured by the mean number of years teaching experience per district for the complete professional staff. Teacher education was measured by the percentage of the professional staff of each district that

have earned a masters' degree or above. Size of school was indicated by the average daily attendance for each school for the 1975-76 school year. Per pupil expenditure was the current (1975-76) expenditure from the general fund excluding capital outlay, divided by the average daily attendance (ADA). Per pupil valuation of the district was the total valuation (real property plus personal property plus public service) of the district divided by ADA.

The figures representing the economic background of the students were obtained from records of the Director of Title I Projects for the State Department of Education. These figures show the number of families within each district having a 1969 income classified as "poor" as identified by the Orshansky Index. The Orshansky Index is nationally accepted as a reliable indicator of poverty area determination. This number obtained from the Orshansky Index was divided by the ADA of the district for the 1969-70 school year and produced an index of low income families within each district.

Student achievement was defined as the district mean of eleventh grade student standard scores on the Iowa Test of Educational Development (ITED). This was obtained by mail from each district in response to a letter (Appendix A) requesting the needed information. Follow-up letters were sent to those not responding after three weeks. The ITED was chosen because it is the most widely used achievement test in the state of Oklahoma. This fact was confirmed by

a study conducted by Dr. Lloyd Slagle(52) of NEOSU during the 1975-76 school year. His study showed that over 40% of Northeastern Oklahoma high schools using any achievement test, were using Iowa Test of Educational Development which is published by Science Research Associates (SRA).

Data Analysis

A test for linearity was made of the relationship of student achievement to teacher salary, teacher experience, teacher education, size of the school, per pupil expenditure, per pupil valuation, and economic background of students. This test was made by entering both the variables and the variables with the squares of the variables into separate regression equations. Since the test for the significance of the difference between the two equations was non-significant, as derived from the equation shown in Appendix B, the relationship was determined to be of a linear nature. This was also the test used to determine if other studied relationships were linear. Since the relationship was determined to be of a linear nature, the correlation coefficient was used to measure the strength of the relationships.

To measure the relationship of teacher salaries to student achievement after the other variables had been considered, a linear regression was computed. Predictor variables for the linear regression equation were teacher experience, teacher education, size of school, per pupil

expenditure, per pupil valuation, economic background of students, and teacher salary. Teacher salary was introduced into the equation last, and allowed the degree of contribution to student achievement of each other variable to be determined prior to the introduction of teacher salary. This procedure also allowed for the contribution of teacher salary to be determined after influences of the other six predictor variables had been removed.

The test for linearity was made of the relationship of per pupil valuation to per pupil expenditure and teacher salary. Since the relationship was determined to be non-linear, the correlation ratio was used to measure the strength of the relationships.

The test for linearity of the relationship of the size of school to per pupil expenditure was also sufficiently non-linear ($\alpha=.05$) to justify using the correlation ratio to determine the strength of that relationship.

The results of the statistical tests are presented in the following chapters.

CHAPTER IV

ANALYSIS OF THE FINDINGS

Introduction

This study was designed to determine if a relationship exists between teacher salary and student achievement. Other variables included in the study are teacher experience, teacher education level, size of school, per pupil expenditure, per pupil valuation, and student economic background. This chapter contains results of the statistical analysis that were used to determine strength and direction of relationships found to exist between the variables studied.

Descriptive Statistics

Information for all variables other than student achievement was obtained from the State Department of Education. Student achievement results were obtained by writing to each school which had been using the Iowa Test of Educational Development during the past several years. Letters were sent to 69 schools on February 23. Forty-six of those schools returned the letter, which requested the student achievement test results. Follow-up letters caused

14 more letters to be returned. This is an 87% return from the schools to which letters were sent. Of the 60 returned, 43 schools reported giving the ITED to the eleventh grade during the 1975-76 school year.

The descriptive statistics of all variables considered are summarized in Table I.

TABLE I
DESCRIPTIVE STATISTICS

VARIABLE	MEAN	STANDARD DEVIATION	MINIMUM	MAXIMUM	CORR. WITH ACHIEVEMENT
Experience	10.930	2.539	6.000	18.000	0.01716
Education	37.421	11.329	17.700	81.300	0.32844*
Expenditure	844.116	164.361	600.000	1317.000	0.18951
Valuation	8017.090	5571.398	1874.000	25033.000	0.43420**
Economic Background	25.891	15.790	2.200	61.800	-0.50469**
Average Daily Attendance	3224.465	8593.727	200.000	57116.000	0.17519
Salary	9567.555	543.163	8730.000	11503.000	0.49520**
Achievement	15.416	1.775	11.100	19.000	1.00000

*p < .025
**p < .005

The table is a listing of the variables and their mean, standard deviation, minimum, and maximum. The table also contains the correlation coefficient of each variable with student achievement. The sample population is similar to the total of all independent schools of the state as indicated by the following statements. Experience of teachers ranges from 6 to 18 years with a mean of 10.9 and the state average is 10 years. The percent of teachers with a masters degree or more, varies from 17.7 to 81.3 percent and has a mean of 37.4 percent compared to 38.3 percent for the state. Expenditure per student ranges from \$600 to \$1,317 with a mean of \$844. The state average expenditure per student is \$855. The valuation varies from \$1,874 per student to \$25,033 per student with a mean of \$8,017. The index representing the economic level of families within each district varies from 2.2 up to 61.8 with a mean of 25.9. The size of the school which was measured by the average daily attendance ranges from 200 students up to 57,116 students with a mean of 3,224 students. The mean would be reduced to 1,937 students when the one large school system would be removed. The salary level for teachers is shown to range from \$8,730 up to \$11,503 with a mean of \$9,567 compared to a state average of \$9,710. Student achievement is shown to vary from a standard score of 11.1 to 19.0 with a mean of 15.4 compared to the norm of 15.0.

Analysis of Data

The results of the test for linearity of the relationships of student achievement to teacher salary, teacher experience, teacher education, size of school, per pupil expenditure, per pupil valuation, and economic background of students resulted in an F value of 1.0267 with 7 and 28 degrees of freedom, which was non-significant at the .05 level, indicating a linear relationship. This justified using the correlation coefficient to measure relationship strength.

The linearity test of per pupil valuation to per pupil expenditure and teacher salary, found the relationship to be of a non-linear nature. The test produced an F value of 3.930 with 2 and 38 degrees of freedom, which was significant at the .05 level. Because of the non-linear nature of the relationship, the correlation ratio was used to determine the strength of the relationships.

The test for linearity of size of school to per pupil expenditure found a significant deviation from linearity. The test resulted in an F value of 9.185 with 1 and 40 degrees of freedom, and was significant at the .05 level. This caused the strength of this relationship to be measured by the correlation ratio.

The matrix of correlation coefficients showing strength of possible relationships between all variables is presented in Table II(Appendix C). In this table, the

correlation ratio was inserted instead of the correlation coefficient for those relationships shown to be of a non-linear nature. Used to test the indicated hypothesis, the matrix contains the correlation coefficient between teacher salary and student achievement of .49520. When tested for significance with a one-tailed test, it was found to be significant at the .005 level. All other levels of significance were also determined with a one-tailed test with degrees of freedom equal to 42.

The correlation between teacher experience and student achievement is .01716 but is shown to be non-significant.

The correlation between the level of teacher education and student achievement is .32844 and is significant at the .025 level.

The correlation between per pupil expenditure and student achievement is .18951 and is non-significant.

The correlation between district per pupil valuation and student achievement is .43420 and is significant at the .005 level.

The correlation between student economic background and student achievement is -0.50469 and is significant at the .005 level.

The correlation ratio between size of school and per pupil expenditure is .00412 and is non-significant and is placed in the table instead of the correlation coefficient. The following correlation ratios are also substituted in the table instead of the correlation coefficients.

The correlation ratio between per pupil expenditure and per pupil valuation is .71404 and is significant at the .005 level.

The correlation ratio between teacher salary and per pupil valuation is .40820 and is significant at the .005 level.

As earlier indicated, the relationship between student achievement and other variables considered in this study was shown to be of a linear nature. Therefore, to determine the strength of the relationship between teacher salaries and student achievement, when the effects of teacher experience, teacher education, per pupil expenditure, per pupil valuation, and student economic background were controlled, two separate multiple regression programs were completed. The first program entered the variables in single steps, from best to worst, considering the amount of variance for which each variable accounted. The results of this program are presented in Table III(Appendix C). The table shows that student economic background was entered into the regression equation first. Economic background of students was followed by teacher education, per pupil valuation, teacher salary, size of school, and per pupil expenditure respectively. Teacher experience was shown to provide such a non-significant contribution to student achievement prediction that it is not considered to be part of the prediction equation. This order was used to determine the order in which variables were entered into

the next multiple regression program. One change was made in the order in which variables were entered on the second multiple regression program. This change placed teachers' salary last into the program. This change allowed the degree of contribution to student achievement of each other variable to be determined before the introduction of teacher salary. This procedure also allowed for the contribution of teacher salary to be determined after influence of the other six predictor variables had been controlled.

The degree of contribution of each variable to student achievement is shown in Table IV(Appendix C). Although the predictive ability, as indicated by the multiple R, increases with the input of each variable, the amount of increases become smaller as each variable is introduced. The multiple R is shown to increase from .50469 up to .67376. The correlation coefficient(simple R) is shown to vary from -.50469 to .49520. The standardized regression coefficients and regression weights for student economic background and teacher education are reported under the headings of "BETA" and "B" respectively. The significance level of these coefficients and weights was tested with an F test and showed that they were significant predictors of achievement at the .05 level. No other predictors of achievement were significant at the .05 level and, therefore, the associated regression weights and standardized regression coefficients were not reported for

these variables. The constant which is reported is for the two-predictor variable equation.

The contribution of teacher salary towards predicting student achievement decreased to a non-significant level when the influence of the other predictor variables was considered. This information is shown in Table V (Appendix C). The table shows that the correlation of teacher salary to student achievement is .49520 and is significant at the .025 level when no other variables are considered. When student economic background was placed in the computer, it had a correlation with student achievement of .50469. This and all other multiple R's are shown to have a strong significance level (.001 or .005). With the influence of economic background of students considered, the partial correlation of teacher salary to student achievement was brought down to .34821 and still significant at the .025 level. When teacher education was added, it resulted in a multiple R of .59599 and the partial correlation of teacher salary was again reduced, down to .25639 with a significance level of .2. When per pupil valuation was added it increased the multiple R to .65211 and the partial correlation of teacher salary to student achievement was reduced to .17189 but was shown to be non-significant as were later partial correlation coefficients. After size of school was considered, the multiple R was .65214 and the partial for salary was .20567. When per pupil expenditure was considered, the multiple R was equal to .65576 and the

partial for salary was .20488. After teacher experience was entered into the equation, the multiple R was found to be .65797 and the partial correlation for salary became .19259. When salary was added last into the equation, a multiple R of .67376 was shown.

Summary

Several significant relationships were found to exist between the variables studied. The order of importance of contribution of the variables toward predicting student achievement was student economic background, education level of teachers, per pupil valuation, teacher salary, size of school, per pupil expenditure, then teacher experience. Both teacher salary and per pupil expenditure were significantly related to district per pupil valuation but size of school had no significant relationship with per pupil expenditure. These findings are discussed in greater detail in the following chapter.

CHAPTER V

SUMMARY, CONCLUSIONS, RECOMMENDATIONS

Summary of the Study

Statement of Problem

This study was designed to determine if a relationship exists between teachers salary and student achievement. Additional variables to be studied that may influence student achievement are teacher experience, teacher education, size of school, per pupil expenditure, per pupil valuation, and student economic background.

Hypotheses

There is no relationship between teacher salaries and student achievement.

There is no relationship between teacher experience and student achievement.

There is no relationship between the level of teacher education and student achievement.

There is no relationship between size of school and student achievement.

There is no relationship between per pupil expenditure and student achievement.

There is no relationship between district per pupil valuation and student achievement.

There is no relationship between student economic background and student achievement.

There is no relationship between teacher salaries and student achievement when the effects of teacher experience, teacher education, size of school, per pupil expenditure, per pupil valuation, and student economic background are controlled.

There is no relationship between size of school and per pupil expenditure.

There is no relationship between per pupil expenditure and per pupil valuation.

There is no relationship between teacher salary and per pupil valuation.

Procedures

Results of student test scores on the Iowa Test of Educational Development were collected from individual school districts and all other variable information was collected from the Oklahoma State Department of Education.

A multiple regression analysis was used to determine the relationship of teacher salary to student achievement when effects of the other studied variables were statistically controlled. To test each of the other hypotheses, a correlation coefficient was determined.

Summary of the Findings

The relationship between teacher salaries and student achievement was found to be substantial(.49520) when considering only those two variables. This would indicate that in school districts which have high teacher salaries, that student achievement would also be found to be above the norm.

The relationship between teacher experience and student achievement was found to be small(.01716) and non-significant and would lead to the conclusion that there is no relationship between teacher experience and student achievement.

The relationship between the level of teacher education and student achievement was substantial either without (.32844) or with(.28052) the influence of the other variables considered. This would indicate that schools which have a high level of teacher education would be likely to also have high student achievement.

The relationship between size of school and student achievement was found to be non-significant and would tend to indicate that no relationship exists between size of school and student achievement.

The relationship between per pupil expenditure and student achievement was found to be non-significant and would indicate no relationship between per pupil expenditure and student achievement.

The relationship between district per pupil valuation and student achievement was significant(.43420) when considered alone, but was non-significant when influences of the other variables were considered. This would tend to indicate that in districts with high per pupil valuation, that high student achievement might be expected but that effects of other variables may diminish the effectiveness of prediction.

The high negative correlation(-.50469) of student economic background to student achievement indicates that in school districts which have a large percentage of the population which are "poor," that student achievement would be expected to be lower than would student achievement in more wealthy districts. This relationship was still significant(.29018) after effects of the other variables were controlled.

Although the relationship of teacher salary to student achievement was quite significant when considered alone, the relationship became non-significant when the effects of teacher experience, teacher education, size of school, per pupil expenditure, per pupil valuation, and student economic background was controlled. This would indicate that teacher salary is a function of, and is dependent on input from other variables. Thus, after effects of the other variables are controlled, there is no relationship between teacher salary and student achievement.

The relationship between size of school and per pupil expenditure was found to be quite small (.00412) and non-significant indicating that there is no relationship between size of school and per pupil expenditure.

The relationship between per pupil expenditure and per pupil valuation was found to be strong (.71404) which would mean that in school districts with high per pupil valuation, there would be a tendency to also have a high level of per pupil expenditure.

The relationship between teacher salary and per pupil valuation was also high (.40820). From this, the tendency would be to find higher teacher salaries in districts with a high per pupil valuation.

Conclusions

Several significant relationships were found to exist between student achievement and other variables considered in this study. Those variables having a significant relationship to student achievement are: student economic background, teacher salary, per pupil valuation, and level of teacher education. Only student economic background and level of teacher education were shown to have a significant relationship with student achievement when influences of the other variables were considered.

Other significant relationships were found when testing per pupil expenditure and teacher salary with per pupil valuation.

Teacher salary was shown to have a non-significant relationship to student achievement when the influence of student economic background, teacher education, per pupil valuation, size of school, per pupil expenditure and teacher experience level were controlled.

Implications

From the conclusions of this study, several implications for school administrators and financial planners become apparent. Since student economic background was shown by this and many other studies to have a strong relationship to student achievement, continued effort should be made to provide additional funds to those school districts in which there is a large percentage of low income families. The present source of "extra" money for poverty areas is the federal government. Additional funding from the state level should be made available. With these extra funds, school districts would have the opportunity to implement additional programs which could be designed to increase the achievement level of students from low income families.

Results of this study would indicate that school districts should strive toward obtaining teachers with advanced degrees and provide incentive for their present teachers to obtain advanced degrees. The study would also indicate that retaining teachers who do not hold advanced degrees or are not working toward one, would tend not to

give the desired increase in student achievement.

The funds that would be necessary to provide incentive for advanced education would put a large strain on the budgets of most school districts. In fact, most Oklahoma school districts would be unable to provide increases which would be sufficient incentive to encourage teachers to obtain advanced degrees.

Both of the previous suggestions would require monetary input that far exceeds presently available resources. Only after the public becomes fully aware of the economic value of education, will the hope of the needed increases in school revenue become a reality.

Present activity concerning school financing by the courts and state legislators have been directed toward equalization of per pupil expenditures. However, since district per pupil valuation was not shown to be significantly related to student achievement, equalized valuation per student would not lead toward more equalized student achievement. The close tie between district valuation, expenditures, and teacher salaries would indicate that the more wealthy districts do indeed spend more per student and more per teacher than do less wealthy districts. Unless this difference in spending (and hence increased salary) is shown to contribute to student achievement in some later study, it would indicate that attempts to equalize are founded only on personal bias without regard to educational needs of the public schools.

Recommendations

Effort should be made in future studies to determine appropriate activities or areas which can be shown to have a causal relationship in improving student achievement. Beginnings can be made by finding variables, whether considered in this study or not, which have significant correlational relationships with student achievement. By reducing the number of confounding variables through removing some of the variables which are highly inter-related or have a low correlation with student achievement, the efficiency of student achievement prediction may be increased.

This study involved the largest number of participating schools which was currently possible. Attempt should be made, in a future study, to use a larger number of school districts. With additional financial resources, student achievement tests could be given to a larger number of schools. Cost may be reduced by choosing a random sample of students from willing school districts to which the achievement test could be given.

By identifying variables which can be chosen to increase student achievement and funding programs designed around those close-linked variables, Oklahoma can begin to achieve a more equitable and efficient system of public schools.

A SELECTED BIBLIOGRAPHY

- (1) Pincus, John. School Finance in Transition.
Cambridge, Massachusetts: Ballinger Publishing
Company, 1974, pp. 1-99.
- (2) Johns, Roe L. and Edgar L. Morphet. The Economics
and Financing of Education, 2nd Ed. Englewood
Cliffs, N.J.: Prentice-Hall, Inc., 1969,
pp. 22, 324, 241.
- (3) Roper, Betty. "Roper's Lariat." The Oklahoma
Teacher, Vol. III, No. 14 (April 16, 1976), p. 2.
- (4) Killackey, Jim. "Yearly Teacher Salary Struggle
Already Shaping Up." The Sunday Oklahoman,
(January 23, 1977), p. A15.
- (5) Fleischmann, Manly. The Fleischmann Report on the
Quality, Cost, and Financing of Elementary and
Secondary Education in New York State, Vol. III.
New York: The Viking Press, 1972, p. 242.
- (6) Benson, Charles S. The Economics of Public Education,
2nd Ed. Boston: Houghton Mifflin Company, 1968,
p. 295.
- (7) Coleman, James S. Equality of Educational Opportunity.
Washington, D.C.: U.S. Government Printing
Office, 1966, p. 22.
- (8) Mulhern, James. A History of Education. New York:
The Ronald Press Company, 1946, pp. 275, 410.
- (9) Eby, Frederick. The Development of Modern Education,
2nd Ed. New York: Prentice-Hall, Inc., 1952,
p. 560.
- (10) Eby, Frederick and Charles Flinn Arrowood. The
Development of Modern Education. New York:
Prentice-Hall, Inc., 1934, p. 546.
- (11) Cubberly, Ellwood P. State School Administrator.
Cambridge, Massachusetts: Houghton Mifflin
Company, 1927, p. 414.

- (12) Ayres, Leonard P. An Index Number for State School Systems. New York: Russell Sage Foundation, 1920.
- (13) Mort, Paul R., William S. Vincent, and Clarence A. Newell. The Growing Edge, An Instrument for Measuring the Adaptability of School Systems. New York: Metropolitan School Study Council, 1946.
- (14) Polley, John W. Problems and Opportunities in Financing Education. Washington, D.C.: National Education Association, 1959, p. 131.
- (15) Coleman, James S. Equality of Educational Opportunity (Summary). Washington, D.C.: U.S. Government Printing Office, 1966, p. 21.
- (16) Benson, Charles S. Final Report to the Senate Select Committee on School District Finance, Vol. I. California: California Office of State Printing, June, 1972, p. 33.
- (17) Hanuskek, Eric A. "The Education of Negroes and Whites." (Unpub. Ph.D. dissertation, Massachusetts Institute of Technology, 1968).
- (18) Bowles, Samuel. "Towards an Educational Production Function" Education, Income, and Human Capital. New York: National Bureau of Economic Research, 1970, pp. 11-60.
- ✓ (19) Levin, Henry M. "A New Model of School Effectiveness," Do Teachers Make a Difference. Washington, D.C.: U.S. Government Printing Office, 1970, pp. 55-78.
- (20) Hanuskek, Eric A. "Teacher Characteristics and Gains in Student Achievement: Estimation Using Micro Data." American Economic Review, (May, 1971), pp. 280-288.
- (21) Winkler, Donald R. "The Production of Human Capital: A Study of Minority Achievement." (Unpub. Ph.D. dissertation, University of California, Berkeley, 1972).
- ✓ (22) Jencks, Christopher et al. Inequality: A Reassessment of the Effect of Family and Schooling in America. New York: Basic Books, 1972.

- (23) Averch, Harvey A. et al. How Effective Is Schooling? A Critical Review and Synthesis of Research Findings. Santa Monica, California: The Rand Corporation, 1972.
- (24) Hornbostel, Victor O. "School Finance Reform." Today's Education, (Nov.-Dec., 1973), p. 71.
- (25) Advisory Commission on Intergovernmental Relations. Financing Schools and Property Tax Relief-A State Responsibility. Washington, D.C.: U.S. Government Printing Office, 1973, pp. 247-261.
- (26) Dunnell, John P. "Input and Output Analysis of Sheurean Elementary School Districts." (Paper presented at American Educational Research Association Annual Meeting, New York, February, 1971.)
- (27) Keeler, Emmett and John McCall. Simultaneous Estimation of Teachers Mobility and Reading Scores. California: Rand Corporation, November, 1972.
- (28) Imperatore, William A. "Evaluation of a Conceptual Geography Unit for Kindergarten. Earth: Man's Home." (Ph.D. dissertation, University of Georgia, May, 1970).
- (29) Tallmadge, G. Kasten. An Analysis of the Relationship Between Reading and Mathematics Achievement Gains and Per-Pupil Expenditure in California Title I Project, Fiscal Year 1972. California: American Institute for Research in the Behavioral Sciences, March, 1973.
- (30) Fritze, Dean Ellsworth. "The Relationship Between Expenditure Per Pupil and Achievement in English" (Ed.D. dissertation, University of Minnesota, 1969).
- (31) Kapes, Jerome T. and Vladimir Pawlowski. Characteristics of Vocational-Technical Instructors and Their Relationships to Student Shop Achievement. Vocational Development Study Series, Monograph Number 17. Harrisburg, Pennsylvania: Pennsylvania Research Coordinating Unit for Vocational Education, April, 1974.

- (32) Rau, Gerald N. "The Relationship of Occupational Experience and Professional Preparation of Machine-Trade Teachers to the Achievement of Machine-Trade Students." (Ed.D. dissertation, Missouri University, 1971).
- (33) Clark, Christopher M. et al. Three Experiments on Learning to Teach. Research and Development Memorandum Number 140. California: California Stanford Center for Research and Development in Teaching, December, 1975.
- (34) Levin, Betsy et al. Present School Finance: Present Disparities and Fiscal Alternatives. Vol. II : Analysis of Individual States. Washington, D.C.: Urban Institute, January, 1972.
- (35) Levin, Henry M. Cost-Effectiveness Analysis and Educational Policy--Profusion, Confusion, Promise. Research and Development Memorandum Number 41. California: California Stanford Center for Research and Development in Teaching, December, 1968.
- (36) Pidgeon, D.A. New Patterns of Teacher Education and Laks General Analysis. Washington, D.C.; OECD Publications Center, 1974, p. 111.
- (37) Fleischmann, Manly. The Fleischmann Report on the Quality, Cost, and Financing of Elementary and Secondary Education in New York State. Vol. I. New York: The Viking Press, 1972, p. 53.
- (38) Burke, Arvid J. New Directions in Financing Public Schools. Washington, D.C.: Committee on Educational Finance, 1960, p. 36.
- (39) Surfrin, Sidney C. "The Economics and Politics of Public Education." Issues in Federal Aid to Education. New York: Syracuse University Press, 1962, p. 27.
- (40) Houthakker, H.S. "Education and Income." Review of Economics and Statistics. (February, 1959), pp. 24-28.
- (41) Guthrie, James W. et al. "Educational Inequality, School Finance and a Plan for the 70's." (Paper presented at National Education Association Annual Conference on School Finance, San Francisco, California, April, 1970).

- (42) Bowles, Samuel. "Schooling and Inequality from Generation to Generation." Journal of Political Economy, Vol. 3, Pt. 2 (May-June 1972), pp. 219-251.
- (43) Swearington, Eugene L. "Education as an Investment." Financing the Changing School Program. Washington, D.C.: N.E.A. Committee on Educational Finance, 1962. pp. 20-37.
- (44) Miller, Van. The Public Administration of American School Systems. New York: The MacMillan Company, 1965, p. 387.
- (45) Guralnik, David B. Webster's New World Dictionary, New York: William Collins + World Publishing Co., 1974, pp. 472-473.
- (46) Supreme Court of the United States, No. 71-1332, San Antonio Independent School District et al., Appellants v. Dimetrio P. Rodriguez et al., March 25, 1973.
- (47) Sirrano v. Priest, 96 California Reporter at 604.487, p., 2nd at 1244.
- (48) Sirrano Upheld; California Finance System Unconstitutional. Phi Delta Kappan. (March 1977) p. 585.
- (49) Milliken v. Green, 203 N.W. 2nd 457 (1972).
- (50) Robinson v. Cahill, 62 N.J. 473, 303 A. 2nd 273 (1973).
- (51) "Local Levies Unconstitutional in Washington State Schools." Phi Delta Kappan. (April, 1977), p. 656.
- (52) Slagle, Lloyd. "A Survey of Standardized Testing in Fifteen Northeastern Oklahoma Counties." Faculty Research, Publications, In-Service Activities at Northeastern Oklahoma State University. August, 1976, pp. 46-50.

APPENDIX A

LETTER REQUESTING ITED SCORES

M E M O R A N D U M

DATE: February 23, 1977

TO: Superintendents and/or Guidance Personnel

FROM: John H. Benson

SUBJECT: Request for Student Test Score Information

I am presently working on my dissertation for a doctorate in educational administration at Oklahoma State University and desire some information concerning test results for 1975-76. Because of recent discussions in the area of school finance, I am trying to determine if student achievement has any relationship to various financial factors of Oklahoma public school districts. The results may have some influence in future actions in the allocation of school funds. The information I am collecting will be shown only in summary form and your school will not be identified by either school name or number. For your convenience, a stamped and addressed envelope has been enclosed for return of the information to me.

For the year 1975-76, I would like to have the average composite standard score of the Iowa Tests of Educational Development (ITED) for each high school grade level in which you administered the test and the semester in which the test was given.

<u>Average Composite ITED Standard Score</u>	<u>Semester Given</u>
9 _____	Fall _____
10 _____	Spring _____
11 _____	
12 _____	

It would be greatly appreciated if you would fill in the requested information and return it to me as soon as possible.

John H. Benson, Grad. Asst.
College of Education

Dr. Richard P. Jungers, Adviser
College of Education

APPENDIX B

EQUATION FOR TEST OF LINEARITY

$$F = \frac{(R_2^2 - R_1^2) / (k_2 - k_1)}{(1 - R_2^2) / (N - k_2 - 1)}$$

$$df = k_2 - k_1, N - k_2 - 1$$

$R_1^2 = R^2$ from equation 1 (with variables only)

$R_2^2 = R^2$ from equation 2 (with variables + variables squared)

k_1 = number of independent variables from equation 1

k_2 = number of independent variables from equation 2

N = total number of subjects

APPENDIX C

LISTING OF COMPUTER OUTPUTS

TABLE II

CORRELATION COEFFICIENTS MATRIX

*p < .025

**p < .005

Correlation Ratio _____

	Experience	Education	Expenditure	Valuation	Economic Background	Average Daily Attendance	Salary	Achievement
Experience	1.00000	0.31109*	0.14493	-0.06232	0.27143*	0.01286	0.19837	0.01716
Education	0.31109*	1.00000	-0.03009	-0.03993	-0.02284	0.19585	0.31108*	0.32844*
Expenditure	0.14493	-0.03009	1.00000	<u>0.71404**</u>	-0.09967	<u>0.00412</u>	0.19016	0.18951
Valuation	-0.06232	-0.03993	<u>0.71404**</u>	1.00000	-0.41497**	0.12906	<u>0.40820**</u>	0.43420**
Economic Background	0.27143*	-0.02284	-0.09967	-0.41497**	1.00000	-0.17605	-0.44897**	-0.50469**
Average Daily Attendance	0.01286	0.19585	<u>0.00412</u>	0.12906	-0.17605	1.00000	0.60649**	0.17519
Salary	0.19837	0.31108*	0.19016	<u>0.40820**</u>	-0.44897**	0.60649**	1.00000	0.49520**
Achievement	0.01716	0.32844*	0.18951	0.43420**	-0.50469**	0.17519	0.49520**	1.00000

TABLE III
MULTIPLE REGRESSION EQUATION

VARIABLES IN THE EQUATION					VARIABLES NOT IN THE EQUATION				
VARIABLE	B	BETA	STANDARD ERROR B	F	VARIABLE	BETA IN	PARTIAL	TOLERANCE	F
Economic Background	-0.03279	-0.29161	0.01696	3.737	Experience	-0.00386	-0.00430	0.67720	0.001
Education	0.04383	0.27972	0.02080	4.442					
Valuation	0.00010	0.31294	0.00007	2.221					
Salary	0.00078	0.23854	0.00062	1.577					
Average Daily Attendance	-0.00002	-0.11559	0.00003	0.534					
Expenditure	-0.00107	-0.09948	0.00201	0.287					

TABLE IV
 MULTIPLE REGRESSION
 SUMMARY TABLE

*p < .05

VARIABLE	MULTIPLE R	R SQUARE	RSQ CHANGE	SIMPLE R	B	BETA
Economic Background	0.50469	0.25471	0.25471	-0.50469	-0.05593	-0.49745*
Education	0.59599	0.35520	0.10049	0.32844	0.04969	0.31708*
Valuation	0.65211	0.42524	0.07004	0.43420		
Average Daily Attendance	0.65214	0.42529	0.00004	0.17519		
Expenditure	0.65576	0.43002	0.00473	0.18951		
Experience	0.65797	0.43292	0.00290	0.01716		
Salary	0.67376	0.45395	0.02103	0.49520		
(Constant)					15.00496	

TABLE V
MULTIPLE AND SALARY COEFFICIENTS

Variable Entered	Multiple R	F	α level	Partial Salary Correlation	F	α level
---				.49520		.025
Economic Background	.50469	14.01223	.001	.34821	5.519	.025
Education	.59599	11.01743	.001	.25639	2.744	.200
Valuation	.65211	9.61818	.001	.17189	1.157	---
Average Daily Attendance	.65214	7.02996	.001	.20567	1.634	---
Expenditure	.65576	5.58288	.001	.20488	1.577	---
Experience	.65797	4.58053	.005	.19259	1.348	---
Salary	.67376	4.15672	.005			

VITA

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Doctor of Education

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