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THE RELATIONSHIP BETWEEN COSTS AND STUDENT RETENTION IN SELECTED SASKATCHEWAN SCHOOL UNITS

by

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled THE RELATIONSHIP BETWEEN COSTS AND STUDENT RETENTION IN SELECTED SASKATCHEWAN SCHOOL UNITS . . . . . submitted by J. A. Volk . . . . . in partial fulfilment of the requirements for the degree of Master of Education.

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ABSTRACT

This study involved an examination of the relationship between per-pupil costs and pupil-retention in selected Saskatchewan school units. Total per-pupil costs and the components of per-pupil costs became the independent variable while pupil-retention was used as the dependent variable. Pupil-retention, as used in the study, is a measure of the "holding power" of a school or a measure of the success of a school in retaining students in school beyond the compulsory attendance age. The pupil-retention rate of a school is considered to be a measure of the effectiveness of the school.

The per-pupil costs were calculated from data obtained from the Auditors' Reports of the jurisdictions studied. These data were used to set up the components of the independent variable which included such costs as teachers' salaries, conveyance costs, administration costs and similar operational and capital costs. The data for the dependent variable, pupil-retention, were prepared from a study of enrolments over an eleven-year period in the jurisdictions studied. The study covered the period from 1957 to 1967 inclusive. The data thus collected and prepared were then submitted for statistical analysis by a computer.

The findings indicated that for all but one component of per-pupil costs no significant correlation existed between the variables studied. A statistically significant relationship between debt service and pupil-retention was in evidence. However, the findings of the study as a whole would indicate that there is no significant relationship

between per-pupil costs in education and pupil-retention as defined in this study. It would appear that increased spending in education does not necessarily increase the pupil-retention rate of schools. Thus, the hypothesis that an increase in per-pupil costs will result in greater pupil-retention is rejected and the null hypothesis is upheld.

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THE PROBLEM AND DEFINITIONS OF TERMS USED

INTRODUCTION

More and more, education is becoming "big business". Along with defense, health and welfare it has become one of the major spending departments of governments and will probably continue to demand an even greater portion of the tax dollar in the years ahead. The great concern that this is causing politicians, economists and educators has directed an increasing proportion of educational research to an appraisal and evaluation of the whole education process including the raw materials it uses and the products it produces. In the 1957 Quance Lectures Moffat noted:

> Studies are needed on the relationship between cost and quality, on the economic effects of various types of education, on the burden of taxation, the size of schools, and dozens of other topics.[1]

The information that could be provided by the kind of research that Moffat referred to would better enable administrators in education not only to justify the financial demands of education but also to put the resources that are at their disposal to more efficient use.

THE PROBLEM

If any topic in education has received more attention than the rising costs of education it has been the effectiveness of our education

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[1] H. P. Moffat, Educational Finance in Canada (Toronto: W. J. Gage Ltd., 1957), p. 90.

system. An investigation of these areas in education was the purpose of this study.

Statement of the Problem

The major purpose of this study was to examine the nature of the relationship between per-pupil costs and pupil-retention in a sample of rural Saskatchewan school units. Specifically, the study was designed to examine the relationship between pupil-retention and (1) total per-pupil costs; and (2) the components of total per-pupil costs: administration, debt service, buildings, teachers' salaries, instructional aids, instruction materials and supplies, operation and maintenance, conveyance and other costs.

Hypotheses

The following null hypotheses were tested in this study.

1. That increase in total costs per pupil will not result in greater pupil-retention.
2. That increased administration costs per pupil will not result in greater pupil-retention.
3. That increased debt service costs per pupil will not result in greater pupil-retention.
4. That increased building costs per pupil will not result in greater pupil-retention.
5. That increased teacher salaries per pupil will not result in greater pupil-retention.
6. That increased costs per pupil for instructional aids will not result in greater pupil-retention.
7. That increased instruction material and supply costs per

pupil will not result in greater pupil-retention.

8. That increased operation and maintenance costs per pupil will not result in greater pupil-retention.
9. That increased conveyance costs per pupil will not result in greater pupil-retention.
10. That increased "other costs" per pupil will not result in greater pupil-retention.

Significance of the Study

That studies in cost-effectiveness were necessary has already been mentioned. Parents, professional educators, politicians and economists are united in their efforts to keep students in school longer than ever before. Several reasons can be advanced for this trend. Many parents welcome the opportunity to transfer some of their parental responsibilities to so respectable an institution as the school. The schools are rendering a satisfactory but costly custodial service to parents. Parents feel that there are fewer opportunities for students to get into trouble when they are in the custody of the school. Teachers, too, feel that there is so much more to be taught in schools today and that more of the student's time is required to give him a more complete education. This thinking is particularly common among subject-matter-oriented teachers. Politicians become concerned when unemployment figures rise. Students are kept off the labor market by keeping them in school longer. That investment in education is a wise investment has been the contention of economists for many years. More education for more people is good for the country. Benson makes this observation:

> Nonetheless it has come to be recognized that there is a relationship between education in a society and the material progress of that society. Policy makers of public and private

> agencies are now likely to consider education (or "training", as it is sometimes called) a strategic variable in planning for economic improvement.[2]

The benefits claimed for an extended period of schooling for students have been widely acclaimed and accepted but resistance to the increased costs involved is mounting. One of the more recent attempts to better accommodate all students and to keep them in school longer is the construction of comprehensive schools. Comprehensive schools may indeed keep more students in school for a longer period of time but the operating costs of these schools appear to be high. Tax-payers and their elected representatives in government feel that educational spending must be curtailed and have adopted a variety of measures to keep educational costs down. Does it follow, then, that increased educational spending is the only way to retain students in school longer? Conversely, will curtailed spending in education result in more drop-outs? Indeed, is there a positive correlation between educational expenditures and pupil-retention? At a time when pupil-retention is considered to be so important and when educational spending is so closely scrutinized and of so much concern to everyone, a study of this problem can serve a useful purpose.

Description of the Sample

The sample used in this study consisted of ten of the sixty school units in rural Saskatchewan. These units were very similar in size, offered similar programs in similar sized schools and each unit contained one or two centers with populations between 500 and 4000

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[2] C. S. Benson, Perspectives on the Economics of Education (Boston: Houghton Mifflin Co., 1963), p. 3.

within its boundaries. No urban jurisdictions were included in this study. The ten units used in this study were given official names and numbers when they were organized. However, to conceal the identity of the school units used, they were numbered from one to ten in this study.

DEFINITIONS OF TERMS USED

Input

An input may be defined as a source of energy supplied to a production process which converts or transforms raw materials into outputs. In the manufacturing industry the coal, coke, catalysts, flux, etc., may be considered as inputs as may the gasoline required to operate an internal combustion engine. Many such inputs are measureable quantities and may be expressed in usable units such as pounds, tons or gallons. When the costs of these units are known, they are readily converted to useful financial units. Thus, the input units now have a cost value.

In education, inputs may be considered to be of two kinds: (1) non-financial inputs and (2) financial inputs. Non-financial input units refer to such units as a student's mental and physical contributions to the education process, the student's intelligence and home background and the education of the parents. These are not readily measured in money terms. Financial inputs, however, refer to those inputs which have a cost value and are often readily computed. The costs for these inputs are usually provided by the different levels of government. It is with these financial inputs that this study is concerned.

Capital and Operational Costs

A measure of the total financial input units for a school system, therefore, would be the total financial outlay of the system in a given time. This total financial outlay or the total cost includes all the funds spent on education by local, provincial and federal governments. The major areas of total educational costs may be considered to be capital costs together with debt service, and current or operational costs. Capital costs refer to building and equipment costs while debt service refers to principal and interest payments on loans and debentures. Current or operational costs are defined as total costs less capital costs and less debt service. In this study the term "capital costs" was used to denote both building costs and debt service.

Educational economists contend that operational costs serve as the most satisfactory cost measure for use in empirical studies in educational finance. Capital outlays are often irregular and do not respond quickly to the changes in demand for school services. Also, principal and interest payments on loans and debentures often reflect influences of past events on local spending, and therefore, are not a response to present demands for service. Operating expenditures, on the other hand, are more evenly spread over a period of years and are more indicative of the demands for school services at any given time. Both capital and operational costs were used as components of the input variable in this study.

Per-Pupil Costs

This study compared education costs and pupil-retention among different school administrative units. For this reason a unit smaller than "total costs" was desirable. The unit of per-pupil costs was

arrived at by dividing "total costs" by the number of pupils in the system.

Average Daily Attendance and Pupil Enrolment

Per-pupil costs may be calculated in several ways. In the two most common methods the total costs are divided by either the number of pupils enrolled or by the number of pupils in average daily attendance. In calculating pupil-retention ratios for the dependent variable in this study pupil enrolment was used, and therefore, pupil enrolment was also used in calculating per-pupil costs. Thus, the input or independent variable became costs per pupil enrolled.

Implicit Price Indexes

An examination of costs over a period of time must consider the variation in the value of money. In this study costs were compared from 1957 to 1967 inclusive, a total of eleven years. Hence, current dollar data were adjusted for differences in prices over time by using implicit price indexes for Government Expenditures on Goods and Services, 1957 = 100, calculated from the D.B.S., National Accounts, Income and Expenditure (Ottawa: Queen's Printer). It must be noted, however, that prices of various resources had not risen in equal proportions. Therefore, the current dollar values of each resource needed to be reduced by an index which reflected the resource's individual price change over the period surveyed. The indexes used were the following:

Capital costs. D.B.S. Price Index for Government Expenditures on Gross Fixed Capital Formation.

Administration costs. The General D.B.S. Index of Government

Current Expenditures on Goods and Services.

Instruction material and supplies and instructional aids. The D.B.S. Index of Wholesale Prices for Fully and Chiefly Manufactured Goods.

Plant operation and maintenance costs. The D.B.S. Index of New and Non-Residential Construction.

Conveyance costs. The Transportation Component of the D.B.S. Consumer Price Index.

Other costs. The General D.B.S. Index of Government Current Expenditures on Goods and Services.

Teachers' salaries. The index described under Assumptions of this chapter.

Pupil-Retention

An educational objective and hence a measure of a school's effectiveness which has become more and more important is "pupil-retention". Living in a technological age requires that students acquire special qualifications to take their place in society. These qualifications are both vocational and aesthetic. To be able to lead a wholesome and productive life in this complex society is perhaps as important as it is to earn a living. Normally, these qualifications are not acquired in the few years that students are obliged to attend school by compulsory attendance regulations. Therefore, one measure of the effectiveness of a school system would be its success in

retaining students beyond the compulsory attendance[3] period and in providing the higher levels of educational attainment required in the society of today. In this study the success of the school systems' holding power was measured by means of indexes of pupil-retention. Cheal suggests that years of schooling or pupil-retention is probably the most practical and most objective measure of a school's effectiveness.[4] Vaisey, too, supports this view:

> The emotional and social maturity of extra education is to some extent independent of the success with which a candidate tackles the course--it is a function of the time that he is exposed to education.[5]

As an indicator of pupil-retention in this study, retention rates were established by using students who were in grade two in 1957 as a base population and following them through to grade twelve in 1967. The 1967 grade twelve enrolment expressed as a percentage of its related grade two enrolment constituted the pupil-retention values for a jurisdiction. Grade two was used rather than grade one because of the varying admission ages to grade one used by the school units studied.

ASSUMPTIONS

This study was based on two major assumptions. One assumes the validity of a computed teachers' salary index and the other concerns

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[3] Saskatchewan School Attendance Act (Regina, Saskatchewan: 1966), Sec. 3.

[4] J. E. Cheal, Investment in Canadian Youth (Toronto: McMillan Company of Canada, 1963), p. 11.

[5] John Vaisey, The Economics of Education (London: Faber and Faber, 1962), p. 83.

student transfers.

Teachers' Salary Index

A unique index for converting teachers' salaries to 1957 dollar values is not available. The index used in this study is similar to the index developed by Woodhall and Blaug.[6] It employs both a cost component and a qualifications component. The cost component was arrived at by using the 1957 median salaries for Class II (undergraduate) and Class IV (graduate) as a base year for each school unit and equal to an index of 100. Class II and Class IV salaries were used because certificates are issued at these two levels only. The Standard Certificate is issued to teachers who qualify for Class II salary and the Professional Certificate is issued to teachers who qualify for salary at the Class IV level. Interim and Special Certificates are issued at other levels but their number is small. Another reason for using Class II and Class IV was that most of the undergraduate and graduate teachers are in these classes.

Indexes for the years 1958 to 1967 were computed by dividing the median salaries for those years by the 1957 median salaries. The indexes calculated in this manner were averaged for a "cost index". The "qualifications index" was calculated by letting the sum of the Class II teachers and the weighted Class IV teachers for 1957 equal an index of 100. The Class IV teachers were weighted in an attempt to find a teachers' salary index which would more adequately describe changes in teachers' salaries from year to year. An increase in a jurisdiction's

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[6] Maureen Woodhall and Mark Blaug, Productivity Trends in British Secondary Education (London: University of London, 1968), p. 16.

expenditures for teachers' salaries may result from (1) an increase in the number of teachers employed, (2) an increase in the teachers' salary grid and, (3) an improvement in the qualifications of the teaching staff. The weighting of graduate teachers is intended to reduce the distortion of the salary index by improved qualifications. In the calculations the Class IV teachers were weighted by doubling their number. Indexes for subsequent years were then calculated by dividing the sum of the Class II teachers and the weighted Class IV teachers for each year by the number of teachers calculated in this manner for 1957. Finally, the "cost index" and the "qualifications index" were averaged for the teachers' salary index for that particular school unit. Table I indicates how these indexes were arrived at for one school unit and the indexes calculated for the ten school units included in this study are listed in Table II.

Student Transfers

In the calculations of retention rates the effects of possible student transfers from one jurisdiction to another were not considered. There were two principal reasons for not taking student transfers into account in this study. Accurate information on student transfers was difficult to obtain. The information available often failed to indicate whether the student transferred to another school within the same jurisdiction, to another jurisdiction in the province or indeed out of the province. An analysis of such incomplete information would have done little to refine the figures used.

The effects of student transfers were assumed to be minimal because of the manner in which the school units studied were selected.

TABLE I

TEACHERS' SALARY INDEXES FOR ONE SCHOOL UNIT USING
COST COMPONENT AND QUALIFICATION COMPONENT
1957 - 1967

Year	Median Salary Cl. II	Median Salary Cl. IV	Cost Index Cl. II	Cost Index Cl. IV	Average Cost Index(A)	Number of Teachers in Class			Qualification Index(B)	Final Index (A+B)/2
						II	IV	II+(IVx2)		
1957	3500	4600	100	100	100.0	18	5	28	100	100
1958	3800	4900	108	106	107.0	25	6	37	132	120
1959	3850	5000	110	108	109.0	31	2	35	125	117
1960	3900	5200	111	113	112.0	41	5	51	182	147
1961	4000	5475	114	119	116.5	44	3	50	179	148
1962	4025	5825	115	127	121.0	49	7	63	225	173
1963	4125	6050	118	132	125.0	43	7	57	204	165
1964	4400	6450	126	140	133.0	40	7	54	193	163
1965	4600	6775	131	147	139.0	47	8	63	225	182
1966	4825	7200	138	157	147.5	51	12	75	268	208
1967	5150	7750	147	168	157.5	53	10	73	261	209

TABLE II

CALCULATED TEACHERS' SALARY INDEXES FOR TEN SCHOOL UNITS
USING COST COMPONENT AND QUALIFICATION COMPONENT
1957 - 1967

	Units									
Year	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10
1957	100	100	100	100	100	100	100	100	100	100
1958	107	99	105	104	110	113	102	120	119	113
1959	106	105	108	113	122	123	110	117	128	135
1960	114	118	116	105	141	119	115	147	131	141
1961	122	130	134	109	138	121	124	148	114	153
1962	138	135	143	116	162	133	147	173	133	139
1963	120	143	154	123	174	139	158	165	137	160
1964	154	161	185	139	197	157	148	163	144	165
1965	150	171	190	137	203	180	188	182	171	185
1966	165	173	201	160	203	176	203	208	185	176
1967	193	191	218	175	216	198	212	209	200	209

All of the units studied were rural units and not adjacent to large cities. It was assumed that the number of student transfers in the ten units would be relatively similar.

DELIMITATIONS

It is important that a study of this kind be done within a specific frame of reference. To do this the following delimitations were used.

The Dependent Variable

Of the many possible objectives in education only one, pupil-retention, was considered in this study.

The Period Studied

The study covered the period 1957 to 1967 inclusive. Difficulty in obtaining comparable records over a longer period of time and the time and expense involved in obtaining and tabulating this information made the study of a longer period all but prohibitive.

LIMITATIONS

The Size of the Sample

The use of but ten school jurisdictions imposed significant restrictions on the value of the statistical analysis made. It is possible that the sample may not have been a representative sample of the population. Furthermore, meaningful statistical analysis becomes difficult when working with but ten observations.

Data Used

Some of the data used for the components of the independent

variable may not have been complete. Expenditures for administration for example, did not include administrative allowances for principals and vice-principals. Undoubtedly, a portion of the money paid to school administrators such as principals is a legitimate administration expense. School unit records, however, gave no indication of the amount of time a principal or vice-principal spent on administrative duties. Therefore, in this study, principals' salaries were considered to be part of the instructional costs only.

Lack of Data on Student Transfers

The use of specifically selected school units was intended to reduce the effect of student transfers. It must be noted, however, that there may be some questions about the validity of this assumption. The reasons for not obtaining this information have already been given.

Gross Enrolment Figures

Another limitation was the use of gross enrolment figures in determining per-pupil costs. Costs for secondary school pupils are considerably greater than those for elementary pupils. Woodhall and Blaug point this out in their productivity study.

> We have assumed that in one year each age-cohort consumes inputs according to the proportion the cohort constituted of the total secondary population. This assumption is in fact incorrect, because older pupils on the average consume more inputs than those below the school-leaving age, but apart from this fact we have no information about the relative costs of educating pupils of different ages.[7]

Hence the data used in this study tended to underestimate costs per pupil.

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[7] Maureen Woodhall and Mark Blaug, Productivity Trends in British Secondary Education (London: University of London, 1968), p. 23.

ORGANIZATION OF THE REMAINDER OF THE THESIS

The second chapter is devoted to a review of the literature available on the subject of this study. This involves an examination of productivity in education as well as a study of several measures of school effectiveness and inputs in education. The controversial subject of measurement in education is also reviewed.

Chapter 3 deals with the collection and tabulation of data. Reference is made to methods used to collect and sort the data as well as to the methods of recording the data in the format required for its further analysis. Several tables are included in Chapter 3 to illustrate this procedure.

Chapter 4 outlines the analysis of the data and gives an interpretation of the results. It details the setting up of dependent and independent variables from the data collected and indicates the combinations that were to be tested by statistical analysis. The latter portion of Chapter 4 is devoted to an interpretation of the results of the statistical analysis on the data collected. An explanation of the results and their significance is included.

The final chapter reviews the results of Chapter 3 and Chapter 4 and suggests some implications that the results might have for education.

Chapter 2

REVIEW OF THE LITERATURE

In this chapter the results of some of the research carried out in the field of cost-effectiveness will be presented. An attempt is also made to explain the views of the writers and to interpret the results of their findings.

MEASUREMENT IN EDUCATION

The whole area of measurement in education has a long and controversial history. There are those who fear that any attempt to quantify educational outcomes has an undesirable effect on the quality of these outcomes. At the other end of the continuum are the strong adherents of educational measurement who feel that all outcomes can and must be measured quantitatively. The sensible approach appears to lie between these two extremes.

Productivity in Education

The competition for available resources has led concerned and responsible school administrators toward the introduction of cost-benefit, cost-effectiveness, productivity and performance budgeting systems. Productivity in education involves defining and measuring the output and input of resources required to produce it. Without a measure of educational productivity it is all but impossible to judge how effectively the resources of our schools are being utilized. There are those, however, who feel that this is no small task. Blaug, for

example, notes that:

> There are, however, serious conceptual difficulties that have so far barred the way to productivity measurement in education: educational output is difficult to define precisely, the inputs seem to defy standardization, and the process of transforming inputs into outputs is more complicated than in the average manufacturing industry.[8]

The distasteful industrial connotation of the word "productivity" has led educators to substitute "cost-effectiveness" or "efficiency" for this concept in education. But even these terms are alien to some educators' vocabulary for they fear that such economic concepts could not help but distort educational aims and goals. Some educators fear that measurement of the productivity of schools will involve emphasizing quantity. Vaisey, however, rejects this view:

> This phrase, 'increase the effectiveness of their work', of course has nasty connotations. An attempt to 'increase educational productivity' sounds dangerously like an attempt to mass-produce a well-instructed but fundamentally ill-educated nation. But it still remains the case that even theology can be effectively or ineffectively taught; and by 'increasing productivity' all that is meant is reducing the amount of effort by teachers and taught in acquiring a given amount of knowledge, or in acquiring an attitude, or in improving their physiques, or whatever the aim may be at any particular time. No judgement is passed as to the ends, merely as to the means of achieving them.[9]

Educators must recognize that to deny the possibility of measuring educational outcomes is in reality an admission that there is no way in which schools can determine how successful they are in achieving their goals.

Woodhall and Blaug made an extensive study of productivity trends

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[8] M. Blaug, Economics of Education (Oxford: Pergaman Press, 1966), p. 40.

[9] J. Vaisey, Education for Tomorrow (Middlesex: Penguin Books Ltd., 1962), p. 38.

in British Secondary schools.[10] Their definition of "productivity" is the ratio of some specified output to the resources required to produce it. The authors set up indexes for three measures of output and for four measures of input. The output measures used were, (1) the length of schooling, (2) examination results and, (3) life-time earnings prospects of the students. For measures of input the authors used (1) teachers' time, (2) pupils' time, (3) school buildings, and (4) educational goods and services. Indexes were set up for each of these measures of input and output, and were then used in the productivity formula already mentioned. The study covered the period 1950 to 1963. In summary the authors conclude:

> This study has shown that the inputs required to produce one school-leaver have risen steadily since 1950; there have, at the same time, been a number of increases in the quality of education provided in secondary schools, whether measured in terms of the lengthening of school life, examination results or enhanced life-time earnings prospects; but none of these improvements in quality matches the increased costs of education. By our definitions, productivity has declined between 1950 and 1963 at the rate of one to two per cent a year.[11]

The study does strike one optimistic note. It suggests that over the period studied there are strong indications that the quality of education received by students has improved even though this may not be commensurate with the increase in costs. These improvements in quality of education have not yet been measured accurately and would have the effect of weighting the inputs used. The study pleads for more research in this field so that changes in quality might be isolated and measured.

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[10] Maureen Woodhall and Mark Blaug, Productivity Trends in British Secondary Education (London: University of London, 1968), p. 2.

[11] Ibid., p. 29.

Measuring Intangibles

The fear of measurement in education is paralleled by the contention that many of the outcomes of the school defy measurement. Harris subscribes to this school of thought:

> We can measure retention of factual information with fair accuracy, and we can assess the acquisition of skills, but these are not the heart of the matter. The fundamental, long-range aims of educational institutions are concerned with the students' quality of thinking, their intellectual attitudes, their perceptiveness, their power to form independent judgements and to weigh values, their sense of personal responsibility. These characteristics are simply not measurable.[12]

Burkhead expresses a similar concern:

> There are other complications in the measurement of output in education. In one sense the student and his knowledge is the output of a school system. But the output of the schools measured in terms of the acquisition of language skills, of science skill, does not describe all that the schools contribute to the student and his knowledge. The education of young people is a process of maturation, and the schools are expected to, and do, contribute to this. Education in a mass society also consists of learning to adjust to, work with, and lead organized groups--the much maligned "life adjustment" goals of education.[13]

Nevertheless, there are those who feel that these so-called intangibles can, and indeed should, be measured. Perhaps our conventional methods of measurement lacked the speed, refinement and accuracy that is required for such measurements. However, the advent of the computer as an efficient and a reliable measuring instrument may revolutionize our thinking about one-time impossible tasks.

Educational psychologists have devised tests designed to measure moral and social values as well as tests which measure cultural awareness

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[12] S. E. Harris, Education and Public Policy (Berkely: McCutchan Publishing Corp., 1965), p. 150.

[13] J. Burkhead, Public School Finance (Syracuse: Syracuse University Press, 1964), p. 76.

and creativity. That little use has been made of these tests in our schools is an indication that educators have not explored all the possibilities in this field.

COST-QUALITY RELATIONSHIPS

The many empirical studies in cost-quality relationships in education support the assumption that there is a strong relationship between expenditure levels and quality education. Quality education is, of course, a relative term and is difficult to quantify and measure. The authors of the cost-quality studies which follow probably had several different purposes in mind. Some of the studies were conducted to find relationships between the success of people now and the type of education they received when they attended school. Changes in societal aims and objectives and changes in educational psychology, methodology and technology limit the values of these studies. To suggest that today's schools adopt the educational programme that claims responsibility for the success of today's adults is as absurd as it is simple. Many cost-quality studies, too, have examined the relationship between the expenditure level of a system and the success of its clients in later life. A brief review of several such studies follows:

Ginzberg and Bray[14]

This study involves an analysis of army rejects. Ginzberg and Bray found five out of every seven rejects came from one of the twelve states with the lowest educational expenditure per pupil during the

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[14]Eli Ginzberg and Douglas W. Bray, The Uneducated (New York: Columbia University Press, 1953), p. 54.

school life of these rejects. Their study also indicates that a comparatively brief period of intensive schooling is all that was required to bring illiterates up to operational efficiency.

Thorndike's Study[15]

This study involved a comparison of the 1930 social scene and the educational and social conditions of 1900. Thorndike developed a scale of "goodness of life for good people", called the G index, as an indicator of the 1930 social scene. For measures of conditions in 1900, Thorndike devised a five-item scale for educational conditions and another five-item scale as a measure of "personal qualities of residents" in 1900. The following is a summary of the statistical analysis of his results:

1. The average correlation of the educational items for 1900 with the 1930 G score was .41.
2. The average correlation of the "personal qualities of residents" in 1900 with the 1930 G score was .59.
3. The correlation of the current expenditure per-pupil in 1900 with the 1930 G score was .41.

The author showed these correlation coefficients to be statistically significant for this study. His findings could be summarized by saying that they suggest the obvious. Life, a quarter of a century hence, will be greatly influenced by the kind of people we are today and by the way in which we educate our children.

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[15]E. L. Thorndike, Education as Cause and as Synptom (New York: The MacMillan Company, 1939).

Clark's Study of Nations[16]

In this study the economic prosperity of a nation was compared with it's educational expenditure. Clark found a strong relationship between investments in education and economic status. In fact, he suggested that income will increase more rapidly than the costs of education. He also indicated that the wealthier countries tended to spend more on education and consequently become even wealthier.

Bowyer's Study[17]

Studies of the relationship between the percentage of wealth of states expended for education and the per capita wealth in the following years were conducted by Bowyer in the early 1930's. The states were divided into two groups according to per cent of wealth. In 1890, for example, he found that the states in the upper half were states that were spending the largest percentage of their wealth on education. He found, too, that changes in educational spending by the states shifted their position on the scale.

Most of the cost-quality studies mentioned in this section were made prior to the second half of this century. These studies appear to indicate that regardless of the method used for measuring the quality of education there is evidence of a strong relationship at all levels of expenditure. They also indicate that those school jurisdictions which spend more not only tend to add to the range of education provided but also tend to do a more adequate job of focusing on the needs of children

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[16]Harold F. Clark, Education Steps Up Living Standards (Washington, D.C.: Chamber of Commerce of the United States, 1945).

[17]Vernon Bowyer, Measuring the Economic Value of Education to the States (Washington, D.C.: American Educational Research Association, 1948).

with various abilities. The studies suggest that no schools have as yet reached the point of diminishing returns for money spent on education, for even the highest expenditure schools appear to be realizing acceptable returns on their investments in education.

The last two decades, however, have been characterized by a renewed and increased interest in this area of school finance. The apparent reservations about the findings already mentioned are undoubtedly prompted by the significant increases in educational spending. More money spent on education may well improve the quality of education but is the improvement commensurate with the increased costs required? Concern for unqualified spending in education is expressed by Paysant, who noted that:

> Experts in school finance have spent years attempting to demonstrate that there is a relation between expenditure for education and the quality of the education product. They have tried to prove that the higher the expenditure for education the higher the quality of the product. Recent studies, however, question this rather widely accepted assumption. More money must be spent on education, but unless it is spent in a particular manner, about which we have much to learn, there is no guarantee that quality will increase. Across the board increases in school budgets may not affect positively the educational product. There may be a limit beyond which additional spending has little impact.[18]

The concern by governments and administrators about the availability of education funds and about the returns for education dollars spent has given rise to an emphasis on accountability in education, efficiency in education and performance budgeting. This emphasis, initiated as an economic necessity may well be the instrument required to change outmoded and once sacred concepts about educational spending.

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[18] Thomas Paysant, Approaches to the Analysis of School Costs, an Introduction (Cambridge, Mass.: New England School Development Council, 1967), p. 2.

INPUT MEASURES

As has already been indicated, this study used per-pupil costs as the input variable. No attempt was made to use such inputs as teachers' time, pupils' time or parental aspiration for the students. Miner suggests that current costs are superior to capital costs in studies of this kind because they take into account the immediate need for services.[19] Increased enrolments require immediate increases in staff and supplies whereas the facilities that may be required would probably be several years being built. He contends, too, that amortization payments and interest payments tend to distort the present educational needs and costs of a school system since they often reflect the influence of past events on local spending. Burkhead, too, suggests that current costs are more satisfactory than capital costs in studies on educational expenditures when he says:

> In choosing the measure of expenditure to use in empirical studies it has been customary to limit the analysis to current outlays. This procedure has been followed here, and may be justified on the ground that capital expenditures are irregular and may not respond smoothly to the needs for facilities. Current expenditures, on the other hand, do respond more quickly to the year-by-year changes in the demand for school services.[20]

In this study the two components of capital costs and current costs make up the input variable of per-pupil costs.

MEASURES OF SCHOOL EFFECTIVENESS

A measure of the total effectiveness of a school is ultimately

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[19] J. Miner, Social and Economic Factors in Spending for Public Education (Syracuse: Syracuse University Press, 1963), p. 70.

[20] J. Burkhead, Public School Finance (Syracuse: Syracuse University Press, 1964), pp. 54-55.

a measure of the change it has brought about in the students that have passed through it. "Those who leave the education system, having participated in it and been changed by it, constitute the major output of the system."[21] This is reflected in both "in-school" and "after-school" performance by the pupils. The changes that an education system brings about in its clients are often difficult to measure as Mort suggests:

> What we need, of course, is a life test. The manufacturer can speed up life testing of the product so that ten years' wear can be compressed into a period of from two weeks to two months. No one has yet designed any comparable scheme for giving a "life test" to the product of our schools.[22]

Proficiency in Skills

A common and acceptable measure of a school's effectiveness is its success in teaching certain skills or performance in certain subjects. The degree to which this objective is realized can be measured by performance tests or examinations.

Success After School

Another measure of the school's effectiveness could be a measure of the student's success after he has left school. It is more difficult to measure this trait but as has already been indicated, tests to measure success after school have been devised.

Academic Achievement

In an attempt to study relationships between academic achievement

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[21] W. J. Manning, Toward a Breakthrough in Education (Edmonton: M. and M. Systems Research Ltd., 1970), p. 13.

[22] Paul R. Mort, Walter C. Reusser, and John W. Polley, Public School Finance (New York: McGraw-Hill Book Company Inc., 1960), p. 80.

and expenditures for instruction, Crandall undertook a study of twenty elementary school districts in California.[23] The districts were so selected that ten of them were among the highest in expenditures relating to instruction for a four-year period and ten were among the lowest but comparable in size. Standardized achievement tests were administered to the students in grades four through eight who had been in the district during the four years studied. Crandall analyzed his results by grouping on the basis of intelligence quotients using low, middle and high groups. The following is a summary of his major findings:

1. Higher total expenditures for instruction were positively associated with higher academic achievement in every I.Q. interval in the grades used.
2. The effect seemed to be cumulative. The advantages for students in high-expenditure districts ranged from two months in the fourth grade to five months in the eighth grade.
3. Higher expenditures in the categories of administration, instructional supplies, workbooks, health services, school clerks and principals were closely associated with higher academic achievement.

Pupil-Retention

The measure of a school's effectiveness with which this study is primarily interested in is that of pupil-retention. Cheal indicated

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[23]James H. Crandall, "A Study of Academic Achievement and Expenditures for Instruction" (unpublished doctoral dissertation, University of California, Berkely, 1961).

that the assumptions which underlie the use of pupil-retention as such a measure are (1) that the grade level on leaving school is related to an individual's immediate productivity in the labour force; (2) that the grade level on leaving school is related to ability and opportunity to benefit from further training, either formal or informal; and (3) that there is a significant relationship between further training and increased productivity in the labour force.[24]

That pupil-retention is indeed a valid measure of a school's effectiveness and that it is important enough to merit further study is supported by an increasing number of economists and educators. Cheal, for example, contends that of the statistics available, pupil-retention would be the only practical and objective measure of the effectiveness of a school.[25] Vaisey, too, suggests that emotional and social maturity are more a function of the time that a student is exposed to education than the success the student has had in mastering the courses.[26] In an analysis of trends in the productivity of British Secondary Educations, Woodhall and Blaug conclude that the ability to keep students in school beyond the school-leaving age is indeed a desirable objective of a school.[27]

With reference to pupil-retention as a measure of a school's

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[24] J. E. Cheal, Investment in Canadian Youth (Toronto: MacMillan Company of Canada, 1963), p. 46.

[25] Ibid., p. 11.

[26] J. Vaisey, The Economics of Education (London: Faber and Faber, 1962), p. 83.

[27] Maureen Woodhall and Mark Blaug, Productivity Trends in British Secondary Education (London: University of London, 1968), p. 7.

effectiveness one further point may be made. In some occupations a thorough knowledge of subject matter may be essential but in other cases the content of the courses taken in school may be of little real value for a particular occupation. Still, employers insist that applicants for many positions have completed high school or at least a specified level in high school. This would seem to indicate that education has a symbolic value as well as a functional value. Thus, keeping students in school for a longer period of time so that they may proceed to higher grade levels enhances the students' opportunities for employment when they leave school. The time spent in school and the grade level completed appear to be more significant than the mastery of the content of the course taken. Chansky alludes to this when he says:

> It is not so much that a high school graduate need be any more educated than the dropout, it is only that he must bear the parchment which symbolizes respectability. The educational significance of the diploma has become inflated. Merely scoffing at its symbolic value does not, however, render it less important as a social document.[28]

Schooling and I.Q. Scores

Almost three decades ago, Lorge conducted some research which has interesting implications for this study.[29] The research consisted essentially of testing a group of fourteen-year-old boys in 1921 with intelligence tests and retesting them in 1941, twenty years later. There was no significant difference for those boys whose level of

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[28] N. M. Chansky, Untapped Good (Springfield: Charles C. Thomas, Publisher, 1966), p. 8.

[29] L. Lorge, Schooling Makes a Difference (New York: Teachers' College, Columbia University, 1945), pp. 54-55.

education remained constant over the twenty-year period. However, there was a marked difference in scores for those boys who had raised their level of education during the period. Lorge concluded that years of schooling do affect intelligence test scores. If years of schooling do indeed raise I.Q. scores, pupil-retention becomes a very important task of the school. Also, it supports the view that the retention rate of a school is a measure of the school's effectiveness.

CONCLUSION

Measurement in education, productivity in education, and cost-quality relationships in education are concepts which have been of concern to educators for many years. It is not surprising, therefore, to find conflicting views on these subjects in educational literature. The conflicts surrounding educational measurement and educational productivity are both philosophical, or theoretical, and practical. Should the concepts of measurement and the criteria for productivity that are used in industry also be used in education? If so, what instruments of measurement and what criteria of productivity should be used? The quality question introduces another dimension to the measurement problem. Quality education is a relative term that is closely related to the objectives of education. Thus, it calls for a clear understanding of the objectives and for measuring instruments and techniques to evaluate the realization of these objectives. In this chapter, the views of the writers in this field have been examined. Also in this chapter, particular attention was given to the input of costs per pupil and pupil-retention as a measure of a school's effectiveness in realizing its objectives.

Chapter 3

COLLECTION AND TABULATION OF DATA

COLLECTION OF DATA

Several methods were used in obtaining the data required for this study. However, the two most commonly used were correspondence through the mail and personal contact. Personal contact was required when the information submitted by mail was not specific enough or not complete.

Sources of Data

The data required for this study were obtained from the Auditors' Report and Financial Statement prepared each year for every school unit, from Form 42 and from literature received from the Saskatchewan Teachers' Federation. In Saskatchewan, Form 42 is a master roll of the teachers employed by a school unit. It contains such information as years of training beyond high school, type of certificate, annual salary and other pertinent information. The Auditors' Reports and Form 42 for the years 1957 to 1967 inclusive were obtained from the Saskatchewan Department of Education and from the school units concerned.

Data Collected

The data collected consisted of student enrolments, teachers' salaries, the number of teachers in Class II and Class IV and the expenditures by school units during the period 1957 to 1967.

The enrolment data were collected by grades for the period 1957 to 1967 for each school unit studied. The total enrolment was used to convert total costs to per-pupil costs. The ten school units had a combined enrolment of 17,394 in 1957 and reached a peak enrolment in 1965 of 21,180. In 1967 the combined enrolment had fallen to 21,110.

The minimum and maximum salaries of teachers for Class II (undergraduate) and Class IV (graduate) were collected for each year for the period 1957 to 1967 for each of the school units studied.

The number of teachers in each of Class II and Class IV for each year of the period studied for each school unit were obtained and tabulated.

The amount spent each year over the period 1957 to 1967 by each of the units studied was collected under the following headings.

1. Current costs:
   - (a) administration
   - (b) teachers' salaries
   - (c) instructional aids
   - (d) instruction material and supplies
   - (e) plant operation and maintenance
   - (f) conveyance
   - (g) other costs
2. Capital costs:
   - (a) building
   - (b) debt service
3. Total costs

TABULATION OF DATA

The information obtained for this study was sorted, arranged and recorded in the manner described in this section.

Tables of Data

Table III serves as an example of the tabulation methods used for the per-pupil costs for one school unit. In the statistical analysis used in this study, the per-pupil costs were used as independent variables. The table includes total per-pupil costs for each of the eleven years as well as costs in nine major categories. All major expenditure categories and, of course, the total costs, show a gradual increase over the eleven-year period. Total costs increased from $344.91 per pupil in 1957 to $591.41 per pupil in 1967 with proportionate increases evident in most of the other categories. The most significant and most consistent increase occurred in conveyance costs. Undoubtedly, the extensive programme of centralization during this period accounted for the increases noted in this category.

The most inconsistent category of expenditure was found in building costs. Building requirements are, of course, not the same every year in a given jurisdiction. For the eleven-year period the building costs for the unit shown in Table III varied from a low of $2.46 per pupil in 1958 to a high of $128.00 per pupil in 1959. Building costs tend to be more uniform when averaged for the ten units as shown in Table IV.

By using the indexes already referred to in Chapter 1, the values in Table III were converted to constant dollars, 1957 = 100, for the same unit. The results are shown in Table IV. The values in

TABLE III

PER-PUPIL COSTS AS INDEPENDENT VARIABLES
IN CURRENT DOLLARS FOR ONE SCHOOL UNIT
1957 - 1967

Year	Total Costs	Debt Service	Bldg. Costs	Admin. Costs	Teachers' Salaries	Inst. Aids	Inst. Mat. and Supplies	Operation and Maintenance	Convey. Costs	Other Costs
1957	$344.91	$ 9.10	$80.20	$ 6.83	$163.81	$2.31	$3.83	$45.00	$29.90	$ .58
1958	275.56	8.32	2.46	6.67	173.28	2.70	3.72	43.00	31.50	.52
1959	405.69	7.04	128.00	7.07	172.20	2.22	3.82	43.70	37.30	.46
1960	324.81	10.50	41.10	6.76	171.65	2.46	3.20	42.20	43.50	.47
1961	397.74	9.79	99.10	7.04	181.91	2.70	4.13	45.00	45.70	.43
1962	435.41	18.00	105.00	6.79	194.96	2.61	4.64	47.50	54.90	.45
1963	370.44	19.60	14.00	7.98	209.15	5.90	5.42	49.50	58.50	.54
1964	400.38	20.40	25.30	8.47	219.33	6.31	8.10	50.50	60.90	.51
1965	485.31	20.30	74.80	9.49	242.90	8.72	5.87	54.60	66.90	.50
1966	461.71	19.20	15.60	10.00	265.44	8.34	7.66	55.70	73.90	1.81
1967	591.41	25.50	91.70	11.90	298.93	8.65	8.75	56.20	79.30	2.76

TABLE IV

PER-PUPIL COSTS AS INDEPENDENT VARIABLES
IN CONSTANT DOLLARS, 1957 = 100,
FOR ONE SCHOOL UNIT
1957 - 1967

Year	Total Costs	Debt Service	Bldg. Costs	Admin. Costs	Teachers' Salaries	Inst. Aids	Inst. Mat. and Supplies	Operation and Maintenance	Convey. Costs	Other Costs
1957	$344.91	$ 9.10	$80.20	$ 6.83	$163.81	$2.31	$3.83	$45.00	$29.90	$ .58
1958	264.81	8.14	2.41	6.41	166.00	2.70	3.72	42.31	30.56	.50
1959	377.69	6.70	121.73	6.58	152.00	2.19	3.76	41.82	34.99	.43
1960	290.05	9.78	38.26	6.04	163.74	2.42	3.15	39.37	40.28	.42
1961	340.86	9.04	91.47	6.03	167.44	2.63	4.02	41.81	42.18	.37
1962	361.82	16.16	94.29	5.64	168.29	2.50	4.44	43.18	50.78	.37
1963	296.72	17.09	11.34	6.39	171.17	5.52	5.07	43.56	54.11	.43
1964	309.49	17.05	21.15	6.55	157.68	5.86	7.52	42.52	55.72	.39
1965	316.55	16.26	59.91	7.07	177.39	7.95	5.35	43.35	59.01	.37
1966	324.58	14.80	12.03	7.03	165.89	7.39	6.79	42.00	63.63	1.27
1967	390.92	19.22	69.14	7.87	170.73	7.51	7.60	40.31	65.50	1.82

Table IV do not indicate the same range as those in Table III. Constant dollars make comparisons of expenditures over a period of years more meaningful since they take into account the effects of inflation upon the value of money. While Table III indicates an increase in total costs per pupil for the eleven year period to be $246.50, the increase in constant dollars is but $46.01 per pupil. Thus a change in the value of money, or inflation accounts for more than $200.00 of the $246.50 increase in this category. This would indicate that inflation was responsible for increases in excess of 80 per cent in the total per-pupil costs. Of the nine components of total costs per pupil, inflation appeared to have the least effect on instructional aids and instruction materials and supplies but had the greatest effect on teachers' salaries. The method of computation used for the teachers' salary index used on teachers' salaries may account at least in part, for this significant effect of inflation.

The differences in the effects of inflation on various expenditure categories can be attributed to the different indexes used. The indexes used were intended to reflect the resource's individual price change over the eleven-year period. The implicit price index for Gross National Expenditure which is derived by dividing the total of current dollars by the total of constant dollars rose to 126.7 in 1967 using 1957 = 100.

Total per-pupil costs for every category are listed in Table V. These figures represent the total expenditure by each of the ten units studied over an eleven-year period. The total amount spent on behalf of every student in attendance during the eleven years ranged from a high of $5,654.92 in one unit to a low of $4,274.05 in another. This

TABLE V

TOTAL PER-PUPIL COSTS IN CURRENT DOLLARS
FOR THE TEN SCHOOL UNITS
1957 - 1967

Unit	Total Costs	Debt Service	Bldg. Costs	Admin. Costs	Teachers' Salaries	Inst. Aids	Inst. Mat. and Supplies	Operation and Maintenance	Convey. Costs	Other Costs
1	$4675.00	$103.87	$502.32	$172.30	$2239.41	$44.35	$76.35	$546.30	$619.00	$11.30
2	4986.96	325.66	521.20	143.10	2387.98	47.28	68.06	534.70	779.30	8.90
3	4435.78	293.80	505.50	124.89	2109.03	50.96	55.96	520.60	602.43	6.72
4	4496.03	167.75	676.26	89.00	2292.95	52.92	59.14	532.90	582.30	9.03
5	5205.97	432.70	428.00	285.90	2631.97	70.81	77.92	650.80	697.50	31.61
6	5005.99	291.00	607.80	113.40	2320.56	32.10	96.90	616.70	558.80	2.79
7	5654.92	506.80	622.50	124.75	2690.05	132.09	56.49	630.60	810.60	21.25
8	4274.05	360.30	294.30	106.14	2130.40	30.06	83.53	541.60	674.60	6.86
9	4418.04	310.00	461.00	101.31	2213.97	55.87	69.71	473.40	623.50	5.72
10	4561.04	397.80	349.10	100.10	2410.83	37.58	79.63	467.10	619.50	4.14

represents a difference of $1,380.70 in current dollars, in the amount spent per pupil in an eleven-year period.

It is interesting to note the priorities set up by the different units. For example, the total costs for units 2 and 10 do not differ significantly but their spending priorities do. Unit 10 spent less than unit 2 in six of the nine component categories of the total costs. But, it is significant that of the three categories in which unit 10 spent more than unit 2, two of them were debt service and teachers' salaries. It would appear that unit 10 was able to either engage more highly qualified teachers or have a lower teacher-pupil ratio. Good quality teachers appear to be high on the list of priorities for unit 10 and the employment of a highly qualified staff may account in part for the greater debt service costs.

Unit 7 spent more per pupil over the eleven-year period than any other one unit in this study. However, it stands highest in spending in the component categories of debt service, teachers' salaries, instructional aids and conveyance costs only. Similarly, unit 8 which spent less per pupil than any one of the other units studied stands lowest in expenditures in building costs and instructional aids only. That boards differ significantly in their spending priorities is shown in Table V.

Table VI shows the average annual per-pupil cost, in current dollars for the eleven-year period for the ten jurisdictions. The differences in boards' spending priorities referred to in Table V are, of course, also in evidence in this table.

Teachers' salaries and operation and maintenance costs show the greatest similarity in spending by the boards. It is not surprising

TABLE VI

AVERAGE ANNUAL PER-PUPIL COSTS IN CURRENT DOLLARS FOR THE TEN SCHOOL UNITS 1957 - 1967

Unit	Total Costs	Debt Service	Bldg. Costs	Admin. Costs	Teachers' Salaries	Inst. Aids	Inst. Mat. and Supplies	Operation and Maintenance	Convey. Costs	Other Costs
1	$425.00	$ 9.44	$45.67	$15.66	$203.55	$4.03	$6.94	$49.66	$56.27	$1.03
2	453.36	29.61	47.38	13.01	217.09	4.30	6.19	48.61	70.85	.81
3	403.27	26.71	45.95	11.35	191.73	4.63	5.09	47.33	54.77	.61
4	408.73	15.25	61.48	8.09	208.45	4.81	5.38	48.54	52.94	.82
5	473.27	39.34	38.91	11.69	239.27	6.44	7.08	59.16	63.41	2.87
6	455.09	26.45	55.25	10.31	210.96	2.91	8.89	56.08	50.80	.25
7	514.09	46.07	56.59	11.34	244.55	12.01	5.14	57.33	73.69	1.93
8	388.55	32.76	26.65	9.65	193.64	2.73	7.59	49.24	61.42	.62
9	401.64	27.28	41.91	9.21	201.27	5.08	6.34	43.04	56.68	.52
10	414.64	27.07	31.74	9.13	219.18	3.42	7.24	42.46	56.32	.38

that teachers' salaries should show a strong similarity in the various jurisdictions since salary scales are based on qualifications and the teacher's experience. The salary scales for the units studied are very similar and the variations noted are largely attributed to differences in pupil-teacher ratios and in differences in qualifications of the teachers engaged by the different units.

Conveyance costs, too, do not vary significantly in the ten units. The selection of units similar in size, geography and topography probably accounts for this similarity.

It is likely that boards' spending habits will become even more similar as governments begin to scrutinize boards' expenditures more closely. In Saskatchewan, recognized costs for grant purposes are, to a large extent, determined by provincial average expenditures in the different categories. This practice would tend to make for more uniform spending habits by boards.

Table VII is similar to Table VI but differs in that the average costs are expressed in constant dollars, 1957 = 100. The observations made about Table VI also apply to Table VII but the range in differences is reduced by converting the values to constant dollars.

Table VIII shows the calculated retention rates to be used as the dependent variable in the statistical analysis. Only one set of data was used in the analysis since the two sets were significantly similar as indicated by calculated correlation coefficients. The correlation coefficient for the two sets of data was found to be in the order of .90 using the product-moment method and .88 using the method of rank correlation. The grade two to grade eleven values were arrived at by expressing the grade eleven (1966) enrolment as a per cent of its

TABLE VII

AVERAGE ANNUAL PER-PUPIL COSTS AS INDEPENDENT VARIABLES
FOR THE TEN SCHOOL UNITS FOR 1957 - 1967
IN CONSTANT DOLLARS, 1957 = 100

Unit	Total Costs	Debt Service	Bldg. Costs	Admin. Costs	Teachers' Salaries	Inst. Aids	Inst. Mat. and Supplies	Operation and Maintenance	Convey. Costs	Other Costs
1	$345.30	$ 9.20	$40.22	$12.79	$153.63	$3.67	$6.45	$43.49	$50.64	$ .84
2	370.31	25.51	42.54	10.75	158.73	4.01	5.78	41.94	64.34	.67
3	325.91	21.85	40.11	9.20	129.88	4.30	4.78	41.18	49.47	.51
4	333.17	13.03	54.72	6.59	165.85	4.45	5.02	42.49	47.88	.63
5	383.63	33.64	35.60	9.43	148.74	5.95	6.64	50.42	57.44	2.34
6	376.93	23.92	48.34	8.61	165.14	2.17	8.27	49.67	46.35	.22
7	415.77	40.10	49.06	9.14	153.71	10.92	4.99	49.58	66.86	1.46
8	316.29	28.07	24.70	7.96	124.39	2.55	7.12	42.92	55.21	.51
9	329.16	23.39	39.22	8.14	142.10	4.70	6.02	37.79	51.00	.43
10	336.19	28.45	28.50	7.54	144.67	3.37	6.83	37.04	49.68	.31

TABLE VIII

PUPIL-RETENTION RATES AS THE DEPENDENT VARIABLE

Unit	$\frac{(\text{1966 Grade 11 enr.})}{(\text{1957 Grade 2 enr.})} \times 100$	$\frac{(\text{1967 Grade 12 enr.})}{(\text{1957 Grade 2 enr.})} \times 100$
1	53.0	38.8
2	62.0	55.4
3	59.8	49.3
4	55.9	54.5
5	82.5	70.3
6	68.5	56.9
7	79.6	75.8
8	49.5	47.7
9	84.6	72.7
10	80.5	87.0

related grade two (1957) enrolment. The grade two to grade twelve values were calculated by expressing the grade twelve (1967) enrolment as a per cent of its related grade two (1957) enrolment. The grade two to grade twelve values were used in the statistical analysis. As would be expected, the retention rates at the grade twelve level were lower than at the grade eleven level since there were some drop-outs from grade eleven to grade twelve. However, the rate of drop-outs from grade eleven to grade twelve is very similar in the ten units studied. For this reason, little could be gained by using both sets of data in the analysis of the data.

Chapter 4

ANALYSIS OF DATA AND INTERPRETATION OF RESULTS

ANALYSIS OF DATA

The data collected were used to set up dependent and independent variables in the following manner:

Dependent Variables

The data collected provided for two dependent variables. However, the two sets of data were so similar that only one was used in the statistical analysis. The Pearson product-moment coefficient of correlation for the grade eleven and grade twelve retention rates which were presented in Table VIII was found to be in the order of .90. This is similar to the coefficient of correlation of .88 calculated by using Spearman's method of rank correlation. These values are significant at the .01 level of confidence (.735 is required for significance). In view of the high correlation between the two sets of data only the grade twelve retention ratios were used. These were defined as:

$X_{1.1}$. Pupil-retention: The grade twelve (1967) enrolment as a per cent of its related grade two (1957) enrolment. The values used for this variable appear in Table VIII.

Independent Variables

The following independent variables are defined as they were used in the statistical analysis.

$X_{2.1}$. Total costs per pupil: All the current and capital costs as indicated by the Auditors' Reports. Total costs are divided by the total enrolment to obtain per-pupil costs.

$X_{2.2}$. Current costs per pupil: $X_{2.1} - X_{2.3}$.

$X_{2.3}$. Capital costs per pupil: The sum of $X_{3.1}$ and $X_{3.2}$.

$X_{3.1}$. Debt service costs per pupil: The payment of principal and interest on loans and debentures.

$X_{3.2}$. Building costs per pupil: The money spent on buildings and new equipment.

$X_{4.1}$. Administration costs per pupil: The salaries and wages of non-professional office staff, office materials and supplies, and such expenses as postage and telephone.

$X_{4.2}$. Teachers' salaries per pupil: The gross salaries of all teachers, principals, supervisory assistants and supervisors of instruction.

$X_{4.3}$. Instructional aids per pupil: Texts, library and reference books, audio-visual aids and correspondence courses.

$X_{4.4}$. Instruction material and supplies per pupil: Academic, vocational and physical education supplies and materials.

$X_{4.5}$. Plant operation and maintenance costs per pupil: Salaries of janitors and repair crews, unemployment benefits, fuel, lights, water, janitor supplies, repair materials and supplies.

$X_{4.6}$. Conveyance costs per pupil: Bus drivers' and mechanics' salaries, gasoline and oil, repairs, garage operation and licence.

$X_{4.7}$. Other costs per pupil: Health services, festivals, bursaries and field days.

The values used to set up the independent variables $X_{2.1}$ to $X_{4.7}$ are shown in Table VII.

Combinations

The values obtained for the different variables were subject to multiple and partial correlation and regression analysis. Table IX shows the combinations that were tested. Sets I, II, and III were submitted for computer analysis and the results are listed in Table X.

INTERPRETATION OF RESULTS

Before proceeding to an interpretation of the analysis made, an assessment of the significance of the correlation coefficients calculated is necessary. Assuming the null hypothesis that the values of the correlation coefficients do not differ significantly from zero, tests of significance can be used which will uphold or reject the null hypothesis. The t-distribution serves as a reliable test of significance and was used along with the F-test. For this study and for the data used, a value of $r < 0.55$ cannot be interpreted as significantly different from zero. This lower limit of r was arrived at from a t-value of 1.860, which in turn, is significant at the .05 level with eight degrees of freedom.

In the combinations to be tested in Sets I, II and III reference is made to several independent variables. It should be noted that they

TABLE IX

COMBINATIONS TESTED

Set	Dependent Variable	Independent Variable
I	$X_{1.1}$	$X_{2.1}$
		$X_{2.2}$
		$X_{2.3}$
II	$X_{1.1}$	$X_{4.1}$
		$X_{4.2}$
		$X_{4.3}$
		$X_{4.4}$
		$X_{4.5}$
		$X_{4.6}$
		$X_{4.7}$
III	$X_{1.1}$	$X_{3.1}$
		$X_{3.2}$

TABLE X

PEARSON PRODUCT-MOMENT CORRELATION COEFFICIENTS
FOR SETS I, II AND III

Independent Variables (costs per pupil)	Corr. Coef. with Dependent Variable $X_{1.1}$
$X_{2.1}$ - total costs	.33
$X_{2.2}$ - current costs	.24
$X_{2.3}$ - capital costs	.42
$X_{4.1}$ - administration	-.44
$X_{4.2}$ - teachers' salaries	.05
$X_{4.3}$ - instructional aids	.43
$X_{4.4}$ - instructional material and supplies	.01
$X_{4.5}$ - operation and maintenance	.08
$X_{4.6}$ - conveyance	.21
$X_{4.7}$ - other costs	.20
$X_{3.1}$ - debt service	.66*
$X_{3.2}$ - building costs	-.13

*significant at the .05 level of confidence (0.55 required for significance).

are indeed independent variables for statistical calculations. However, for this study they are only components of the one independent variable, total costs per pupil. Statistically, the independent variable for this study becomes one of several independent variables.

Set I

In set I pupil-retention was used as the dependent variable. The independent variables were total costs per pupil, current costs per pupil and capital costs per pupil. The statistical analysis performed on Set I indicated that none of the independent variables was significantly correlated with the dependent variable.

Set II

Seven independent variables were used with the dependent variable in this Set. The independent variables are current cost components and again the dependent variable is pupil-retention. In this Set, too, the analysis indicates no significant relationship between the dependent variable and any one of the seven independent variables. The largest r is -0.44 but $|-0.44| < 0.55$ and hence is not significant.

Set III

In this set the dependent variable of pupil-retention is used with the two components of capital costs as the independent variables. Again, no significant relationship exists between building costs and pupil-retention but a significant positive correlation does exist between debt service and pupil-retention.

There is a significant correlation between the dependent variable and but one of the independent variables. The positive relationship

between debt service and pupil-retention, although not strong, does suggest that improved facilities may be directly responsible for retaining some pupils in school for a longer period of time. As one component of capital costs, debt service is probably a better indicator of a school jurisdiction's priorities in educational facilities than building costs. Building costs sometimes represent emergency programmes rather than a jurisdiction's spending habits and educational priorities.

Chapter 5

SUMMARY, CONCLUSIONS AND IMPLICATIONS

The intent of this study was to test the hypothesis that increased per-pupil expenditures will result in greater pupil-retention in schools. The results, although inconclusive, do have implications for professional administrators and school boards and may serve as guidelines in some areas of education finance.

SUMMARY

Specifically, the problem in this study was to examine the relationship between pupil-retention and (1) total per-pupil costs; and (2) several components of total per-pupil costs. Pupil-retention was used as a measure of a school's effectiveness and became the dependent variable in the statistical analysis. Per-pupil costs and its components, on the other hand, became the independent variables.

The Dependent Variable

Pupil-retention values were prepared by expressing the 1967 grade twelve enrolment in a jurisdiction as a per cent of its related 1957 grade two enrolment. These values were calculated for the ten school units studied from the data supplied by the school units.

The Independent Variable

The information obtained from school boards, the department of education and the Saskatchewan Teachers' Federation was used to calculate

the independent variable and its components. Annual expenditures by the school units for administration, instruction, transportation, etc., were converted to annual costs per pupil by dividing these expenditures by the number of pupils enrolled in the schools of the jurisdiction. The expenditures for the various categories were then averaged for the eleven years studied. This resulted in a set of ten values for each of the ten units to be used as the independent variables.

The Effects of Inflation

This study compared costs from 1957 to 1967 inclusive. An examination of costs over a period of time must consider the variation in the value of money. Therefore, the current dollar values were adjusted before they were used as the independent variables. This adjustment was made by using implicit price indexes for Government Expenditures on Goods and Services, 1957 = 100. The index for teachers' salaries was calculated by using a quality component and a cost component. An explanation of this index appears in Chapter 1.

The dependent variable, pupil-retention and the adjusted independent variables were then subjected to statistical analysis.

MAJOR FINDINGS

This study was designed to test ten null hypotheses which were stated in Chapter 1. All of them related to some component of per-pupil expenditures and pupil-retention. In all cases but one the null hypothesis was upheld. More specifically, this study upheld the following null hypotheses:

1. That increases in total costs per pupil do not result in greater pupil-retention.

2. That increased administration costs per pupil do not result in greater pupil-retention.
3. That increased building costs per pupil do not result in greater pupil-retention.
4. That increased teacher salaries per pupil do not result in greater pupil-retention.
5. That increased costs per pupil for instructional aids do not result in greater pupil-retention.
6. That increased instruction material and supply costs per pupil do not result in greater pupil-retention.
7. That increased operation and maintenance costs per pupil do not result in greater pupil-retention.
8. That increased conveyance costs per pupil do not result in greater pupil-retention.
9. That increased "other costs" per pupil do not result in greater pupil-retention.

The null hypothesis, however, that increased debt service costs per pupil do not result in greater pupil-retention, is not upheld. The statistical analysis of the data used indicated a correlation of 0.66 between debt service and pupil-retention. This correlation coefficient is significant at the .05 level of confidence.

Facilities

Educational facilities, and particularly buildings, account for a sizeable portion of a Unit Board's annual budget. The merits of elaborate buildings and facilities have been seriously questioned by Unit Boards and by educational administrators. This study would indicate that, if we accept pupil-retention as an educational objective,

this item deserves to receive high priority on Boards' budgets. It is conceivable, and indeed likely, that jurisdictions with better facilities tend to attract better teachers and therefore offer a better programme. That a more highly qualified teaching staff should account for increased educational output is more in keeping with the findings of other research in this field.[30]

Jurisdictional Variations

This study shows a significant difference in the amount per pupil spent by the ten jurisdictions studied. In 1967 this amount ranged from $523 per pupil in one jurisdiction to $786 per pupil in another. This fifty per cent difference in spending is not reflected in the pupil-retention variable. It would appear from this study that there is no linear relationship between educational spending and pupil-retention.

Jurisdictional Similarities

The amounts, measured in per-pupil expenditures, spent by the different jurisdictions vary greatly. However, the spending habits and the priorities of school units studied show a marked similarity, as shown in Table VI. The administration costs vary from two to three per cent of the total costs; operation and maintenance costs vary from approximately eleven to fourteen per cent of total costs; and instructional aids, instructional materials and supplies vary from 2.8 to 3.2 per cent of the total costs for all jurisdictions but one which spent 4.8 per cent on this item.

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[30] J. E. Cheal, Investment in Canadian Youth (Toronto: MacMillan Company of Canada, 1963), p. 52.

Statistical Analysis Used

The statistical analysis to which the collected data were subjected was of limited value because of the small number of jurisdictions used in the study. The value and the significance of regression analysis is directly related to the number of observations used. Hence, the statistical analysis employed in this study failed to show significant trends or relationships.

CONCLUSIONS

It is important to recognize that conclusions drawn from this study are subject to the same limitations as the study itself. They are relative to the study and any extension of the conclusions beyond this study must be done with extreme caution.

The Size and Nature of the Sample

The findings listed in this section refer to a relatively small and specifically selected sample. For this small but similar group of school units the relationship between the dependent and independent variables was all but significant. That the sample consisted of but ten school units was a significant limitation of the study. However, that the units were so similar in size, geography and location, too, may have had a significant effect on the results. A similar study with jurisdictions of different size, geography and location could produce a different set of results. Therefore, any extension of the findings to other situations must be done with caution.

Data Used

The findings of this study are, of course, directly related to

the data used. The data obtained for this study had one serious limitation. Administration costs do not include administrative allowances paid to principals and vice-principals. Undoubtedly, a portion of these allowances are legitimate administration expenses but school unit records include these allowances in the instructional portion of the budget under teachers' salaries. Thus, the findings in this study need to be considered in the light of this limitation.

Varying Costs per Pupil

In this study it was assumed that the yearly cost to educate one student would be the same for all students. This is, in fact, an incorrect assumption. It is generally conceded that it costs more to educate a secondary school student for one year than it does to educate an elementary school student for one year. The findings in this study are based on data which did not take different costs for different students into account.

In general, it may be said that certain restrictions in the application of the findings of this study must be recognized. These restrictions have been dealt with in this section.

IMPLICATIONS

The ten school units studied spent a total of $97,557,016 in the eleven year period, 1957 to 1967. The amount spent annually has been increasing regularly and is likely to continue to increase for several years. In 1957 the ten school units spent $6,076,445. In 1967 this amount had more than doubled to a figure of $12,647,220. Certainly, school boards need direction and guidance in spending amounts of this magnitude.

Further Research

Whatever limitations this study may have, it has pointed out the necessity for similar studies and additional research in related fields. This study was primarily concerned with the relationship between total per-pupil costs and its components and pupil-retention. The findings indicate a significant relationship between but one component of per-pupil costs and pupil-retention. This relationship is between debt service costs per pupil and pupil-retention. That this same relationship holds for large numbers of school jurisdictions and that it holds for urban as well as for rural jurisdictions could serve as an area for further research.

Research studies which involve expenditures over a period of time need to consider the change in the value of money. Except for teachers' salaries, implicit price indexes are readily available for most spending categories. The preparation of a suitable index for teachers' salaries, to be used in studies of this kind, could be a meaningful and interesting research project. The availability of such an index would facilitate cost-benefit studies involving teachers' salaries.

General Observations

A survey of the data collected would suggest that, although the amount of money spent on education has increased, areas of spending have remained relatively constant with but few exceptions. The more noteworthy exceptions, according to Table IV, are marked increases in the areas of debt service, conveyance costs and instructional aids, materials and supplies.

The increased spending for conveyance can, of course, be

attributed to the centralization programmes in rural school jurisdictions. The conveyance costs per pupil used in this study take into account, not only those students being conveyed, but all students in the jurisdiction. Greater centralization has resulted in more students being conveyed with a consequent increase in conveyance costs. It is highly probable that increased costs for conveyance due to greater centralization of schools are at least partly offset by the decrease in operation and maintenance costs.

The centralization of small schools may also serve as an explanation for the significant increase in debt service costs. Often, the conveying of students from one center to another necessitated additional plant facilities. Not infrequently, larger administrative units called for not only additional classrooms to house the students being conveyed but also complementary facilities such as music rooms, art rooms, and home economics laboratories for the broader programme that could be offered in the larger centers.

It is interesting to note that there was a marked increase in spending for instructional aids, supplies and equipment. There are probably two major reasons for increased spending in this area. First, the availability of these materials and the strong support for their use by educators has undoubtedly brought about a change in school boards' thinking about them. The positive research results on the value of the audio-visual equipment serves as but one example that would lead to more spending on this whole area. Secondly, the improvement in teacher qualifications would result in more teachers who would be knowledgeable in the uses of the instructional equipment and materials.

The advent of team teaching, the availability and use of

technological aids for the teacher and the purported provisions for individual differences in our school programmes would suggest an even greater shift in emphasis in educational spending. That this significant shift in emphasis has not occurred would indicate that boards are very reluctant to change their spending habits or that school programmes have really not changed enough to warrant a change in spending. Some of the more significant changes in school programmes are of recent origin and it is therefore highly probable that different spending trends may emerge in the next few years.

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APPENDICES

APPENDIX A (1)

EXPENDITURES FOR UNIT # 1
1957 - 1967

Year	Total Expend.	Debt Service	Capital Expend.	Admin.	Teachers' Salaries	Inst. Aids	Inst. Supplies	Operation Main.	Convey.	Other
1957	$340,959	$7,314	$18,561	$13,579	$176,439	$4,376	$4,591	$55,738	$34,077	$ 949
1958	377,244	6,951	21,510	15,449	202,637	2,346	5,591	55,563	36,981	988
1959	414,473	6,951	30,968	16,505	206,810	3,802	6,369	65,631	36,070	1,503
1960	539,931	17,423	139,104	19,043	216,634	4,269	5,851	62,226	43,898	1,176
1961	458,237	7,131	43,272	19,829	227,096	3,209	6,119	54,633	51,335	675
1962	483,878	7,064	65,893	16,117	238,609	3,401	5,725	50,593	64,914	1,619
1963	493,599	7,703	58,574	17,123	241,145	4,304	6,550	54,966	75,301	633
1964	525,421	7,023	102,715	18,367	239,743	3,809	8,153	47,970	81,082	1,441
1965	567,600	19,901	81,004	19,708	270,645	5,608	12,375	56,214	94,295	1,308
1966	741,348	21,501	8,645	22,334	297,173	7,526	12,088	65,215	97,824	1,037
1967	667,024	31,505	28,413	25,229	321,127	9,366	16,183	74,932	112,032	2,001

APPENDIX A (2)

EXPENDITURES FOR UNIT # 2
1957 - 1967

Year	Total Expend.	Debt Service	Capital Expend.	Admin.	Teachers' Salaries	Inst. Aids	Inst. Supplies	Operation Main.	Convey.	Other
1957	$504,785	$58,515	$45,607	$16,033	$232,958	$3,881	$5,651	$50,575	$77,396	$1,207
1958	555,320	29,791	89,197	19,248	254,097	3,884	5,014	53,375	81,872	1,151
1959	638,505	14,858	112,850	20,356	275,090	4,032	6,920	62,541	98,473	1,407
1960	626,469	25,180	69,781	21,541	310,610	4,580	7,115	73,536	94,689	1,483
1961	796,433	30,343	184,445	21,771	340,731	5,113	10,072	77,400	104,029	1,568
1962	760,091	47,910	84,268	20,376	363,786	6,641	11,174	82,531	113,235	775
1963	734,826	53,587	26,770	21,167	378,815	6,083	9,731	91,539	114,544	1,425
1964	782,308	54,506	27,815	21,628	402,962	14,735	11,051	88,176	130,038	1,328
1965	942,869	72,080	88,223	22,635	444,458	10,034	15,267	101,919	153,147	1,489
1966	1,023,506	77,048	93,351	26,733	492,165	8,653	15,486	111,616	170,422	1,160
1967	1,046,147	86,556	40,987	28,322	543,653	13,225	18,483	109,493	181,062	1,856

APPENDIX A (3)

EXPENDITURES FOR UNIT # 3
1957 - 1967

Year	Total Expend.	Debt Service	Capital Expend.	Admin.	Teachers' Salaries	Inst. Aids	Inst. Supplies	Operation Main.	Convey.	Other
1957	$395,846	$3,962	$53,072	$12,338	$194,246	$3,803	$4,136	$54,781	$44,543	$1,144
1958	443,723	4,071	43,728	13,102	223,753	3,605	5,969	62,209	51,002	1,119
1959	515,056	3,466	74,234	14,289	237,503	2,849	7,409	67,501	62,703	1,110
1960	648,460	9,113	141,104	17,410	265,231	2,797	7,705	69,414	78,418	1,020
1961	627,542	27,327	46,725	18,324	288,942	6,537	8,408	87,024	85,200	1,008
1962	665,574	43,896	56,319	18,309	337,243	8,335	7,383	80,081	91,327	1,129
1963	713,204	53,846	68,033	20,788	344,298	7,436	11,481	103,986	97,839	85
1964	790,068	68,971	91,325	21,184	379,486	16,233	11,309	77,810	114,472	1,218
1965	949,303	86,180	151,671	24,134	424,745	12,497	12,123	94,257	132,928	1,116
1966	938,570	108,037	90,179	25,595	452,749	10,584	9,411	95,632	141,018	1,200
1967	967,494	107,400	54,002	28,718	490,413	13,947	11,365	102,683	143,629	1,195

APPENDIX A (4)

EXPENDITURES FOR UNIT # 4
1957 - 1967

Year	Total Expend.	Debt Service	Capital Expend.	Admin.	Teachers' Salaries	Inst. Aids	Inst. Supplies	Operation Main.	Convey.	Other
1957	$697,744	$18,402	$162,273	$13,828	$331,396	$4,665	$7,744	$90,975	$60,431	$1,167
1958	599,050	18,070	5,351	14,493	376,713	5,873	8,088	93,475	68,401	1,134
1959	936,926	16,256	296,090	16,315	397,716	5,129	8,826	100,954	86,045	1,051
1960	798,060	25,750	100,945	16,596	421,754	6,035	7,865	103,565	106,812	1,148
1961	1,004,447	24,694	250,062	17,755	459,358	6,821	10,414	113,647	115,194	1,079
1962	1,105,106	45,552	266,777	17,232	494,825	6,621	11,771	120,555	139,202	1,133
1963	877,826	46,385	30,839	18,922	495,612	13,979	12,861	117,359	138,669	1,280
1964	933,302	47,498	58,951	19,759	511,249	14,720	18,903	117,729	141,966	1,196
1965	1,125,988	47,231	173,575	22,017	563,582	20,232	13,614	126,623	155,190	1,153
1966	1,066,314	44,231	36,116	23,170	613,026	19,248	17,678	128,505	170,720	4,184
1967	1,334,994	57,358	206,888	26,816	674,793	19,507	19,723	126,671	178,888	6,217

APPENDIX A (5)

EXPENDITURES FOR UNIT # 5
1957 - 1967

Year	Total Expend.	Debt Service	Capital Expend.	Admin.	Teachers' Salaries	Inst. Aids	Inst. Supplies	Operation Main.	Convey.	Other
1957	$728,392	$53,605	$174,419	$15,220	$307,325	$8,017	$7,650	$97,684	$83,288	$4,438
1958	725,627	53,229	88,698	17,035	358,346	5,618	7,304	99,276	89,046	5,434
1959	847,893	41,169	159,885	20,578	387,868	5,824	14,181	110,513	101,299	4,828
1960	956,999	60,670	160,523	22,795	432,900	7,299	13,322	132,444	119,036	617
1961	976,935	75,836	91,053	25,188	482,167	8,383	17,318	128,503	139,101	660
1962	1,008,363	96,836	50,424	25,910	521,760	11,174	17,398	129,304	142,770	5,523
1963	1,123,496	99,145	55,578	27,254	594,623	17,698	19,875	140,922	154,754	5,606
1964	1,237,786	103,840	50,726	33,956	666,191	18,598	22,665	142,581	182,930	7,163
1965	1,348,139	125,389	42,838	34,051	726,423	24,244	20,530	166,394	184,766	7,383
1966	1,495,750	143,020	38,727	36,593	790,497	26,717	21,099	172,303	205,164	8,912
1967	1,631,162	156,954	69,578	40,753	861,716	32,380	21,326	185,681	222,534	11,057

APPENDIX A (6)

EXPENDITURES FOR UNIT # 6
1957 - 1967

Year	Total Expend.	Debt Service	Capital Expend.	Admin.	Teachers' Salaries	Inst. Aids	Inst. Supplies	Operation Main.	Convey.	Other
1957	$777,334	$70,250	$116,907	$21,234	$341,043	$4,021	$13,691	$124,064	$68,596	$597
1958	834,782	69,282	49,313	22,300	412,972	3,138	13,205	138,401	76,819	736
1959	932,628	70,725	140,926	22,893	446,290	4,689	17,018	127,190	97,778	766
1960	902,225	67,266	28,407	22,612	464,211	4,710	16,600	108,215	107,316	431
1961	925,973	64,293	33,711	19,858	482,649	3,866	18,589	99,587	115,712	442
1962	987,413	51,049	174,017	21,147	489,530	4,889	17,922	107,384	118,716	58
1963	1,040,571	40,505	196,873	20,201	519,864	4,197	17,173	100,931	120,734	712
1964	1,095,151	42,744	220,154	20,674	550,450	5,875	16,070	111,448	123,459	754
1965	1,089,440	42,691	126,213	23,312	660,388	11,035	19,192	137,149	124,746	369
1966	1,196,030	43,542	111,905	24,303	643,576	13,297	32,099	143,521	143,660	439
1967	1,323,326	59,929	150,975	33,300	695,167	14,371	36,875	152,383	151,217	740

APPENDIX A (7)

EXPENDITURES FOR UNIT # 7
1957 - 1967

Year	Total Expend.	Debt Service	Capital Expend.	Admin.	Teachers' Salaries	Inst. Aids	Inst. Supplies	Operation Main.	Convey.	Other
1957	$754,136	$69,974	$84,366	$18,111	$347,820	$4,723	$18,585	$101,056	$101,337	$1,206
1958	899,016	69,370	162,306	17,309	403,648	4,715	18,304	106,298	108,695	1,122
1959	875,449	77,321	66,926	18,974	446,091	5,289	17,064	109,695	129,029	854
1960	1,068,996	86,428	166,075	21,935	491,897	5,408	24,593	117,069	150,648	1,343
1961	1,071,052	125,828	44,204	22,849	522,347	7,010	21,036	125,073	172,120	1,443
1962	1,160,614	130,654	111,709	26,481	549,040	25,306	5,773	119,973	180,625	968
1963	1,256,367	135,928	126,346	25,815	591,097	33,960	4,724	128,925	196,540	4,435
1964	1,404,579	130,482	177,272	32,400	652,695	35,314	4,789	143,454	205,294	7,396
1965	1,503,275	122,099	147,253	34,683	727,921	52,219	4,815	172,506	220,284	11,699
1966	1,670,368	118,442	174,514	34,596	818,921	62,313	4,847	186,914	229,411	19,004
1967	1,931,490	152,596	229,888	47,043	911,921	89,065	5,872	199,560	258,644	2,801

APPENDIX A (8)

EXPENDITURES FOR UNIT # 8
1957 - 1967

Year	Total Expend.	Debt Service	Capital Expend.	Admin.	Teachers' Salaries	Inst. Aids	Inst. Supplies	Operation Main.	Convey.	Other
1957	$699,396	$34,074	$88,031	$20,265	$355,791	$3,293	$13,598	$108,993	$68,286	$1,257
1958	786,838	46,247	98,147	22,431	400,624	5,071	16,628	121,430	71,266	882
1959	831,143	45,830	114,610	24,175	412,718	5,497	15,208	99,812	97,286	1,474
1960	983,963	76,507	206,029	23,779	432,572	6,289	17,222	110,377	103,554	1,433
1961	956,210	78,403	97,827	25,988	466,122	4,709	16,410	129,725	130,768	1,241
1962	965,785	88,933	7,733	26,434	510,623	5,459	13,901	124,748	147,550	1,346
1963	1,036,263	107,000	16,808	25,562	546,614	7,054	22,787	125,029	174,043	3,023
1964	1,115,892	110,378	16,033	27,068	564,853	10,107	21,079	139,768	213,852	2,637
1965	1,357,820	122,912	91,124	29,550	616,336	6,778	29,092	183,392	270,184	3,303
1966	1,411,349	129,532	14,704	28,774	707,110	15,000	34,055	160,569	300,917	3,085
1967	1,487,000	141,327	22,810	33,304	781,092	13,092	27,470	163,502	287,224	1,779

APPENDIX A (9)

EXPENDITURES FOR UNIT # 9
1957 - 1967

Year	Total Expend.	Debt Service	Capital Expend.	Admin.	Teachers' Salaries	Inst. Aids	Inst. Supplies	Operation Main.	Convey.	Other
1957	$622,614	$25,511	$216,583	$12,733	$249,920	$4,927	$7,626	$60,976	$38,773	$588
1958	554,196	30,917	74,910	14,145	291,671	4,377	8,185	74,020	44,353	536
1959	567,864	29,262	55,685	15,947	314,370	5,588	9,206	70,663	54,624	1,130
1960	581,582	29,426	46,744	16,313	322,385	6,269	7,320	73,493	61,967	986
1961	651,566	33,711	89,142	17,779	328,766	5,869	9,292	69,007	75,270	968
1962	639,657	45,901	70,822	17,524	323,931	5,373	9,873	72,353	89,141	833
1963	632,985	49,560	32,831	17,574	329,158	5,670	10,902	71,310	107,699	869
1964	691,018	50,349	41,274	18,929	341,637	7,106	10,937	66,936	130,800	891
1965	732,225	55,324	45,815	18,975	363,337	9,086	12,070	74,003	141,567	995
1966	852,566	77,399	44,876	18,597	410,953	23,516	16,679	83,626	156,401	1,223
1967	936,597	82,110	63,299	21,895	464,397	16,915	17,617	82,311	158,912	667

APPENDIX A (10)

EXPENDITURES FOR UNIT # 10
1957 - 1967

Year	Total Expend.	Debt Service	Capital Expend.	Admin.	Teachers' Salaries	Inst. Aids	Inst. Supplies	Operation Main.	Convey.	Other
1957	$555,239	$18,190	$98,793	$14,848	$292,811	$4,874	$10,202	$71,949	$21,463	$560
1958	543,709	28,925	44,307	16,264	312,284	4,927	12,054	66,165	37,652	740
1959	674,743	35,343	64,975	16,448	376,941	7,321	14,685	82,521	65,778	520
1960	720,457	27,976	75,184	17,684	402,705	6,856	15,813	81,000	85,375	676
1961	810,558	51,647	64,508	18,969	452,962	6,805	11,968	77,225	115,873	569
1962	885,264	75,789	77,758	19,387	450,524	7,469	16,551	84,959	130,058	675
1963	921,490	86,665	84,150	19,220	465,650	8,123	18,568	90,999	136,188	1,235
1964	923,420	92,340	29,298	21,777	497,615	7,540	12,518	92,210	155,864	863
1965	1,059,041	110,220	47,252	20,201	550,035	2,603	17,970	104,206	181,899	755
1966	1,210,250	114,282	65,102	22,293	616,167	16,741	17,072	120,840	198,290	1,146
1967	1,321,986	158,935	70.558	23,873	683,655	10,583	20,381	109,292	202,780	1,015

APPENDIX B (1)

MINIMUM AND MAXIMUM SALARIES FOR CLASS II
1957 - 1967

Unit	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
1	$2800	$3000	$3000	$3100	$3200	$3250	$3400	$3500	$3600	$3800	$4200
	4000	4400	4600	4800	4900	4950	5000	5400	5600	5800	6450
2	2800	3000	3000	3100	3200	3200	3400	3500	3600	3800	4200
	4000	4350	4500	4700	4850	4900	5000	5400	5600	5800	6400
3	2800	2900	3000	3200	3200	3200	3400	3500	3600	3700	4200
	4000	4300	4400	4800	4900	4900	5100	5400	5600	5800	6400
4	2800	2900	3000	3200	3200	3200	3300	3500	3600	3800	4200
	4200	4400	4500	4800	4900	4900	5200	5400	5600	5850	6450
5	2800	3000	3000	3200	3200	3300	3400	3500	3650	3850	4300
	4200	4400	4600	4800	4800	4900	5100	5400	5700	5900	6550
6	2800	2900	3000	3200	3200	3300	3465	3500	3600	3800	4300
	4200	4500	4600	4700	4800	4900	5145	5400	5600	5850	6500
7	2800	3000	3000	3100	3250	3250	3400	3500	3700	3950	4300
	4200	4400	4600	4800	4900	4900	5200	5400	5650	5850	6500
8	2800	3100	3100	3100	3200	3250	3350	3500	3600	3800	4200
	4200	4500	4600	4700	4800	4900	5000	5300	5600	5850	6450
9	2800	3000	3000	3100	3200	3200	3400	3500	3600	3800	4200
	4200	4600	4600	4700	4800	4800	5100	5400	5600	5800	6450
10	2800	2800	3000	3200	3200	3200	3400	3500	3600	3800	4200
	4200	4400	4600	4800	5000	5000	5200	5400	5600	5800	6400

APPENDIX B (2)

MINIMUM AND MAXIMUM SALARIES FOR CLASS IV
1957 - 1967

Unit	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
1	$3600	$3850	$3900	$4200	$4400	$4600	$4800	$5200	$5400	$5500	$6000
	5600	5950	6250	6600	6800	7000	7300	7900	8100	8800	9500
2	3600	3800	3800	4100	4300	4600	4800	5200	5400	5600	6000
	5600	5900	6200	6500	6800	7000	7300	7700	8100	8700	9500
3	3600	3700	3800	4300	4400	4600	4900	5200	5400	5500	6000
	5400	5900	6100	6600	6800	7000	7300	7900	8100	8300	9500
4	3600	3800	3900	4200	4300	4600	4800	5200	5400	5700	6000
	5600	5800	6000	6500	6700	6900	7300	7800	8100	8600	9600
5	3600	3800	4000	4200	4200	4600	4950	5300	5400	5700	6000
	5600	6000	6400	6800	6800	7000	7400	7900	8250	8900	9600
6	3600	3700	4200	4300	4300	4600	4830	5100	5400	5600	6200
	5600	5900	6200	6500	6800	7000	7350	7700	8100	8700	9600
7	3700	3700	3800	4200	4250	4250	4700	5300	5500	5500	6200
	5500	5900	6200	6600	6850	6850	7300	8000	8300	8800	9700
8	3600	3900	3900	4100	4200	4750	4800	5100	5400	5700	6000
	5600	5900	6100	6300	6750	7000	7300	7800	8150	8700	9500
9	3600	3800	3800	4200	4300	4300	4800	5200	5400	5600	6000
	5600	6000	6200	6400	6800	6800	7300	7800	8150	8800	9500
10	3600	3800	4000	4200	4200	4600	4900	5100	5400	5600	6000
	5600	5800	6200	6600	6900	7000	7300	7800	8100	8700	9500

APPENDIX C

ENROLMENT IN TEN SCHOOL UNITS
1957 - 1967

Unit	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	Total
1	1,148	1,150	1,192	1,201	1,246	1,223	1,192	1,160	1,186	1,134	1,146	12,988
2	1,416	1,486	1,569	1,631	1,697	1,711	1,725	1,785	1,762	1,789	1,803	18,374
3	1,493	1,531	1,706	1,719	1,751	1,768	1,789	1,803	1,757	1,754	1,739	18,810
4	2,023	2,173	2,308	2,454	2,523	2,537	2,371	2,333	2,321	2,309	2,255	25,607
5	1,934	2,024	2,165	2,354	2,400	2,435	2,486	2,438	2,435	2,366	2,307	25,344
6	1,754	1,938	2,011	2,100	2,106	2,226	2,261	2,419	2,481	2,503	2,513	24,312
7	2,075	2,173	2,282	2,370	2,375	2,475	2,471	2,532	2,531	2,468	2,459	26,193
8	2,384	2,457	2,460	2,671	2,740	2,765	2,722	2,856	2,863	2,833	2,842	29,692
9	1,597	1,640	1,650	1,701	1,656	1,693	1,739	1,711	1,705	1,726	1,732	18,550
10	1,570	2,244	2,110	2,068	2,081	2,081	2,097	2,140	2,158	2,228	2,314	23,091
Total	17,394	18,816	19,553	20,269	20,575	20,924	20,853	21,177	21,180	21,110	21,010	222,961

	GRADES Enrolment (preferably as of Sept. 1st)											No. of Class II and Class IV Teachers on Staff		
	2	3	4	5	6	7	8	9	10	11	12	Class II	Class IV	
957														
958														
959														
960														
961														
962														
963														
964														
965														
966														
967														

School Unit: _____