SUPPORT OF PUBLIC EDUCATION IN WASHINGTON STATE RELATIVE TO EQUALIZATION OF EDUCATIONAL OPPORTUNITY

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SUPPORT OF PUBLIC EDUCATION IN WASHINGTON STATE RELATIVE TO EQUALIZATION OF EDUCATIONAL OPPORTUNITY

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CHAPTER I

THE NATURE OF THE PROBLEM AND RESEARCH OBJECTIVES

Education in the United States of America has progressively changed emphasis from programs directed toward a select student population to programs for all students. During this transitional process, it became evident that although more students were provided educational opportunities those opportunities were not equal.

Throughout the states, concern has been expressed that there ought to be more equalization[1] of educational opportunity[2] between school districts. Attempts to equalize opportunity have been made through various types of state grants-in-aid with varying degrees of success.

I. The Problem

Statement of purpose. The purpose of this study was

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[1]Equalization is used with educational opportunity and means the ability (in terms of materials and/or resources) of local authorities to provide equal educational services commensurate with other school districts. The services provided by districts need not be identical but the ability to provide equivalent services or situations should be available.

[2]Educational opportunity is for this study measured by expenditure per weighted pupil enrolled October 1, 1965 where current expenses for the school year 1965-66 exclusive of transportation, lunchroom, abatements, community services and that portion of accounts 1300 and 1400 not attributed to per pupil costs were considered.

to investigate the variation in educational opportunity in Washington State under certain hypothetical manners of distributing state grants-in-aid such as: (a) when factors in the state school distribution formula[3] are eliminated or mixed in different, predetermined and specified proportions, and (b) when a given increase in state support is distributed under circumstances where local effort[4] in relation to local ability to pay[5] is used as a factor in the formula.

Importance of the study. The importance of the study is illustrated by the fact that of the total public school revenues in Washington for the 1966-67 school year approximately 55.7% was derived from state sources, 32.5% from local sources, 3.7% from county sources and 8.1% from federal sources.[6] With the major source of school district revenue coming from

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[3]School distribution formula is defined as the means used by a state to allocate grants-in-aid to school districts.

[4]Local effort is measured by the difference between the regular 14 mill levy (required mill rate) and the total levy (local burden) for current maintenance and operation. Local effort is also referred to as the excess mill levy or the special levy.

[5]Local ability to pay is measured by a given district's assessed valuation per weighted pupil adjusted by a weighting determined by the Washington State Tax Commission (adjusted valuation).

[6]The latest available sources and percentages of revenue for Washington State Public Schools were obtained from the Research Division in the office of the Washington State Superintendent of Public Instruction.

the state, a fair and equitable distribution of these funds is essential to provide an equalization of educational opportunity for all children of the state. Such equalization of educational opportunity is implied as necessary to meet the requirements of Article IX of the Washington State Constitution which states: "It is the paramount duty of the state to make ample provision for the education of all children residing within its borders, without distinction of preference on account of race, color, caste or sex."[7]

Since adopting a school distribution formula in 1895[8] to equalize educational opportunity in Washington State, the formula has been revised periodically by legislative action. Alterations in the distribution formula were necessitated by changing conditions in state and local revenue sources. Providing funds to finance schools is a dynamic process--one vulnerable to shifts in economic and political conditions. These political and economic conditions influence the sources and amounts of revenue available for education. Consequently, there is a need to analyze periodically the state distribution formula to determine its effectiveness in equalizing educational opportunity.

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[7]Washington State Constitution, Article IX, section 1.

[8]The Barefoot School Boy Law was passed in 1895 and allocated $6.00 per census child (2/3 of per-pupil costs at that time) from state funds.

In 1965 the Washington State Legislature effected the most recent changes in the state school distribution formula. Among the most significant changes in the formula was the addition of weighting factors which took into account experience and educational level of staff, programs for disadvantaged children, remote and necessary elementary districts, and small districts enrolling fewer than 250 students. In addition, a specified proportion of revenue received from Public Law 874 funds, Federal Forest funds, and the county real estate excise tax was required to be deducted from the guaranteed support level.[9] Weighted pupil enrollment based on average number belonging was substituted for average daily attendance, which had previously been used to define need.

Success of the formula was predicated on an increase in guaranteed support level which would more closely approximate the average expenditure level per weighted pupil in Washington State. Even though the desired amount of guaranteed support was not attained, Usitalo found the 1965 formula to equalize educational opportunity to a higher degree in selected school districts than was the case in

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[9]Guaranteed support level is defined as the number of dollars per weighted pupil considered by the state to be a minimum expenditure; the state supplements the revenue derived from the required 14 mill levy and certain other revenues of local school districts in order to guarantee that each district reaches this level.

those districts under the distribution formula in effect prior to the 1965 formula change.[10]

Increased expenditure per weighted pupil combined with an inadequate guaranteed support level has caused a sharp increase in the number of school districts dependent upon special (excess mill) levies for current maintenance and operation and has also caused a steady increase in the number of dollars raised from special levies (7,000,000 in 1957 to 62,634,000 in 1967).[11] Several factors have influenced an increase in expenditure level per weighted pupil. Some of these factors include inflation, improvements in the educational program, increased operating costs, increased enrollments on the secondary level, greater pupil holding power and increased equipment and facility requirements.

The 1965 state distribution formula was not designed to compensate for variations in assessment practice between counties. Neither was the formula designed to compensate for an excess mill levy voted by a district where the need, in that district in relation to all other districts, required a

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[10]Richard J. Usitalo, "An Analysis of School Fund Distribution in the State of Washington" (unpublished Doctor's dissertation, The University of Oregon, Eugene, 1966), p. 174.

[11]Louis Bruno and George Eisentrout, Citizens' Handbook, Washington Public School Administration and Finance, (Olympia, Washington: State Superintendent of Public Instruction, 1968), pp. 8-9.

local effort out of proportion to the local ability to pay.

However, a variation of real and personal property assessment level does exist between counties in the state. The percent of assessed value to true value in 1965 varied from 13.8% in San Juan County to 24.7% in Ferry County.[12]

An even greater variation in assessed valuation per pupil exists between school districts within counties. In 1965 the variation in assessed valuation per pupil in King County ranged from $42,508.36 per pupil in Lester School District to $3,643.63 per pupil in Federal Way School District.[13] Educational opportunity will continue to show wide variation in Washington State as long as these conditions exist. Therefore, it is important that the 1965 distribution formula be analyzed relative to existing factors and also relative to the following factors: (a) unequal assessment practice between counties and (b) imbalance between need and ability to pay for school services. It was the purpose of the study to make such an analysis.

Limitations of the study. The study was subject to three limitations of which the reader must be cognizant.

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[12]Washington State Tax Commission, "County Ratio Equalization Study", Research Division release, August 31, 1966.

[13]King County Superintendent of Schools, "King County School District Enrollment, October, 1965, Assessed Valuations Per Child", January 21, 1966.

1. The utilization of a simulation model makes certain assumptions relative to cause and effect factors and these facotrs can vary only within the limits selected by the experimenter. Under actual conditions, these factors and others may vary in different ways from those selected in the study.

2. The scope of the study was limited to the variables used and the inter-relationship among these variables. Many variables which may bear on equalization of educational opportunity were not included in the current distribution formula and were not included in the formula mixes developed by the experimenter to analyze the distribution formula. The variables which generally are considered significant in various state distribution formulae have been included.

3. The scope of the study was limited to the selected combinations and variations identified in the study. A greatly increased number of combinations within and variations to the basic 1965-66 formula could be made.

Definition of terms. Terms and symbols used in the study are included in Appendix A, entitled "A Glossary of Terms and Symbols". In addition, for reader convenience,

each term and symbol is explained in a footnote on the page where it is first used in the study.

II. Objectives of the Research

The objectives of the research were to: (a) identify those factors in the distribution formula which have the greatest influence on the variation of educational opportunity and (b) test the impact of including factors for local effort in relation to local ability to pay on the variation of educational opportunity (with the thought that these procedures might partially offset variations in educational opportunity caused by differences in assessment practices and assessed valuation among school districts). Currently, the distribution formula takes into account need and local ability to pay for the regular 14 mill levy. The local effort and the local ability have not been considered in the 1965 distribution formula with regard to excess levies.

The objectives of the research were included in the following questions:

1. What factors in the 1965 distribution formula exert the greatest influence on the variation of educational opportunity among selected school districts in Washington State?
2. Will certain predetermined and specified mixes (combinations) of existing factors under certain

hypothetical manners of distributing state grants-in-aid reduce the variation of educational opportunity in the districts under study?

3. Can the variation of educational opportunity be reduced by introducing a factor for local effort in relation to local ability to pay and by applying these factors in various predetermined and specified ways in the distribution formula?

III. Research Procedures

Steps taken. The following steps were included in the design and execution of the research that is reported:

1. Formulating research design and simulation formulae
2. Collecting data
3. Developing programs for computer processing
4. Processing and analyzing data
5. Presenting and interpreting findings
6. Summarizing results of research
7. Making recommendations

Step location in dissertation. A review of literature utilized to provide background relative to the problem and to formulate the research design and simulation formulae are included in Chapter II, Review of the Literature.

Description of the research design and simulation

formulae, the source and procedure of data collection, and the programs for computer processing, are treated in Chapter III, Procedures Used in the Research.

The data analysis and findings are presented and interpreted in Chapter IV, Presentation and Interpretation of Data Analysis and Findings.

Summarization of the study and recommendations relative to future distribution formulae and future research on the subject are included in Chapter V, Summary and Recommendations.

CHAPTER II

REVIEW OF THE LITERATURE

Financing public education by local, state and national governments requires the acquisition of funds and the distribution of funds. The degree to which these funds are acquired and distributed in an equitable manner determines the degree of equalization of educational opportunity attained. Historically, the state has assumed major responsibility to assure a minimum guaranteed level of education and to provide a degree of equality of opportunity. To provide this assurance, states have used various means of distributing state acquired funds while, at the same time, taking into account funds received by local school districts from other sources. The literature was reviewed to determine past procedures and most current ideas regarding the distribution of state-acquired funds for education. The ideas and procedures most relevant to the study were used as a frame of reference for the problem. Where different points of view or arguments prevail, both sides are presented so that the reader might fully understand the limitations of the study.

I. Acquisition of Funds

The Acquisition of Funds section of Chapter II includes a brief history of school revenue from private,

church and public sources at the various levels of government. Some generally accepted principles of taxation are reviewed relative to their affect on a tax or tax system. Finally, and more specifically, the present Washington State local, county, state and federal revenue sources are discussed.

Historical development of acquiring school funds. The development of free public education in the United States was a significant part of the history of the American democratic system of government. America's struggle to establish tax-supported, publicly-controlled schools constituted a unique system of education among nations of the world and has become an important part of the heritage of the United States. Rosenstengel and Eastmond wrote: "How America's schools were to be financed and controlled is undoubtedly one of the most momentous decisions ever made. And it was not made easily."[1] Cubberley described the dissension resulting from the struggle as: "Excepting the battle for the abolition of slavery perhaps no question has ever been before the American people for settlement which caused so much feeling or aroused such bitter antagonisms."[2]

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[1]William Everett Rosenstengel and Jefferson N. Eastmond, School Finance Its Theory and Practice (New York: The Ronald Press Company, 1957), p. 26.

[2]Elwood P. Cubberley, Public Education in the United

The fight for free public education in the United States took place mainly during the second quarter of the nineteenth century. However, prior to and since this period of history, school finance has been a matter of great interest to the American people.

Early colonists brought with them basic ideas and traditions regarding their future and the future of their children. Because these ideas and traditions varied among countries the approaches to educate children in early colonial America also varied. However, most colonists felt education was the responsibility of either the home or the church.

The colony of Massachusetts, on the other hand, viewed education as a community benefit and felt all such benefits should be supported by the community as a whole. Early Massachusetts Colony laws[3] were developed to provide public support for beneficial services. Rosenstengel and Eastmond emphasized the importance of these early laws as follows:

> Taken together, these distinctively American laws of colonial Massachusetts provided for compulsory education at public expense with the state asserting the right to set and enforce standards. It thus becomes apparent that these laws provide the foundation for the present system of finance and control of the American school

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States (rev. ed.; New York: Houghton Mifflin Company, 1934), p. 164.

[3]Further exposition of these laws may be found in: Rosenstengel and Eastmond, op. cit., pp. 27-9.

systems.[4]

State school systems came into being as the spirit of democracy grew in America and people began to think of free secular education for all. Mort, Reusser, and Polley pointed out the importance of the state in public school education by stating:

> Our National Constitution gives no recognition whatever to education as a problem of the federal government. So far as the National Constitution is concerned, it is left to the states to decide whether education is to be at public or private expense.[5]

During the free school movement each state faced situations unique unto itself. Yet, each state had some common elements in the movement to finance schools publicly. Rosenstengel and Eastmond identified one of these common elements in the following statement.

> In general, the legislatures granted communities permission to organize school districts and levy taxes on all property within the boundaries of the district. The citizens of the district had the right to vote whether or not a tax would be levied on the property. At first, state aid was given from permanent endowment funds. Later, many states proffered aid that was derived from tax sources.[6]

With the establishment of state school systems and the right to tax on a state level to partially finance

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[4]Ibid., pp. 27-8.

[5]Paul R. Mort, Walter C. Reusser, and John W. Polley, Public School Finance Its Background, Structure and Operation, (New York: McGraw-Hill Book Company, Inc., 1960), p. 4.

[6]Rosenstengel and Eastmond, op. cit., p. 33.

education, states were in a position to enforce educational requirements or standards in local districts. This enforcement was possible when states began to grant substantial aid to schools and to withhold grants if state requirements were not met. "After these controls had been achieved, further progress was only a matter of improving the adequacy and methods of school finance and of upgrading and extending the system," wrote Rosenstengel and Eastmond.[7]

The power and status of states to require prescribed standards for education within the state boundaries have been well established. States in the 1960's play a major role in financing and prescribing the kinds of educational programs carried on in local districts. Norton spoke to the current role of the state in school finance as:

> During the twentieth century the percentage of school revenue raised by the state level of government rapidly increased. This percentage in recent years, however, has leveled at about 40 percent.[8]

Research by the National Education Association verified Norton's statement. "Despite the sharp increase in federal funds for education in the past two years, revenues from local sources in 1966-67 still account for 52 percent

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[7]Ibid., p. 34.

[8]John K. Norton, Dimensions in School Finance, National Education Association Committee on Educational Finance (Washington: National Education Association, 1966), p. 129.

of total estimated revenues; state sources for 40 percent; and federal government for the remaining 8 percent."[9]

Lindman described the increased federal participation as:

> Federal payments to public schools for current expense purposes have been increasing consistently during recent years. In total annual amounts, federal contributions have increased 20-fold since 1940. As a percent of public-school current expenditure, the increase was from 1.7 percent in 1940...[10]

Public schools today receive funds from several sources: (a) local, (b) county, (c) state, (d) federal, (e) non-tax, and (f) non-revenue. The percent of revenue received from these sources varies from district to district, county to county, and state to state.

Principles of Taxation. Many principles of taxation have been defined by tax experts. Some of these principles are satisfied by one type of tax while other principles are satisfied by other types of taxes. In general, no single principle is satisfied by all types of taxes. Conversely, because some of the principles are in conflict with other

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[9]National Education Association, N. E. A. Research Bulletin, Volume 45, Number 1, March, a report prepared by the Research Division (Washington: National Education Association, 1967), p. 3.

[10]Erick L. Lindman, "The Local-State-Federal School Finance Partnership," Trends in Financing Public Education, The Eighth National Conference on School Finance, 1965 (Washington: National Education Association, 1965), p. 46.

principles it is impossible for any tax to be levied which satisfies all of them.

Some commonly accepted principles of taxation are listed below with a brief statement identifying the main point of each.[11]

1. Ability to Pay. Each eligible taxpayer should contribute to the support of government according to his ability. A tax should be progressive, that is, the tax rate increases as the income or property base increases. Therefore, persons, firms, and corporations should remain in the same relative economic position after the tax is collected as before.
2. Benefits Received. Persons, property, and taxable institutions should pay for government according to the benefits received.
3. Adequacy of Yield. A tax or tax system should provide the funds required by every level of government to provide the essential goods and services.
4. Stability and Flexibility. Tax yields, in order to provide for needed services, should be

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[11]Further exposition of these and other principles of taxation may be found in: Roe L. Johns and Edgar L. Morphet, Financing the Public Schools (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1960), p. 118.

sufficiently stable to cover fluctuations in the economy without using deficit financing, and should be sufficiently flexible to rise rapidly when the costs of government rise rapidly. To adapt to the economy a tax system should not be rendered rigid due to constitutional or other restrictions on the rates or types of taxes levied.

5. Ease of Administration and Payment. The cost of collecting a tax should not be excessive and the payment of the tax should be made as convenient to the taxpayer as possible. Hidden taxes should be avoided and the possibility of tax evasion should be minimized.

It can be readily seen that different types of taxes satisfy, in part, different principles of taxation. For example: a graduated net income tax would satisfy the Ability to Pay principle but would only partially satisfy the Benefits Received principle. Conversely, a bridge toll would satisfy the Benefits Received principle but not the Ability to Pay principle.

When considering a new tax or a revision to an existing tax the total tax system, local, state, and federal should be taken into account. Jarvis, Gentry, and Stephens suggest four points which should be kept in mind when considering a tax system. They are:

1. The tax structure in the nation exists as a system of taxes. No tax is levied in isolation; when levied it is affected by, and in turn affects, the administration of other taxes.

2. All taxes have desirable and undesirable features. In a tax system, it is expected that the desirable features of one tax will offset to some degree the undesirable features of another.

3. Taxes are levied at three levels of government: (a) federal, (b) state, and (c) local. When assessing a tax in terms of tax criteria and principles, it is well to keep in mind the level at which it is levied and administered.

4. In the last fifty years, the American people have come to accept a theory of government which places great emphasis on the "social benefit" of government expenditures. For example, public education is intended to produce citizens who can make useful contribution to the society in which they live. The benefits which the individual receives through public education are only secondary to this primary purpose.[12]

The principles of taxation and the points to consider when developing tax systems were reviewed because certain taxes in Washington State fail to meet some of the principles and because the breadth of the tax base is restricted due to the constitutional limitation on a graduated net income tax tax.[13]

[12]Oscar T. Jarvis, Harold W. Gentry, and Lester D. Stephens, Public School Business Administration and Finance (West Nyak, New York: Parker Publishing Company, Inc., 1967), p. 6.

[13]In 1930 the voters adopted the 14th Amendment to the State Constitution. This amendment became Article VII, Section 1, of the Constitution. Violation of this Article is the basis upon which the State Supreme Court has declared a graduated income tax unconstitutional. The article provides (in part): "All taxes shall be uniform upon the same class

The failure to satisfy some important principles creates a need for the state school distribution formula to compensate for certain inequities. These needs and inequities are discussed in this chapter under the various sources of school district revenue and in Chapter III under the research design and simulation formulae section.

Local revenue sources. According to Jones,[14] "The largest single source of revenue collected locally by school districts is the property tax. In most school districts, more than four-fifths of revenues collected locally come from this source...." Although important to the operation of a school district program the local non-tax, local non-revenue and local tax other than property tax sources of funds are not germane to the study and for that reason have not been treated in depth in the literature review. The property tax

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of property within the territorial limits of the authority levying the tax. The word 'property' as used herein shall mean and include everything, whether tangible or intangible, subject to ownership." The court has ruled that income is property and a tax on income is a property tax and therefore subject to the uniformity clause of Article VII. In Culliton v. Chase (1933), the court ruled that an income tax which provides for a graduated tax by fixing the rate of taxation so that it becomes greater as the amount of taxable income increases, violates the requirement that all taxes be uniform on the same class of property. The classification of income for purposes of applying a graduated tax rate was held to be an arbitrary classification of property.

[14]Howard R. Jones, Financing Public Elementary and Secondary Education (New York: The Center for Applied Research in Education, Inc., 1966), p. 58.

was treated in greater depth due to the dependence of local school districts on this source of revenue.

The property tax and certain other non-property taxes may be levied by school districts and other local governmental units only if granted power to do so by the state legislature. After such power has been granted the local governments can generally levy a specified rate of tax without a vote of the people, but any amount above the specified rate must be endorsed by a certain designated majority of the electors. Election laws in the State of Washington are unique in several ways and are discussed in more detail later in this chapter.

Some other local governmental non-property taxes authorized by a minority of state legislatures include local income taxes, local sales taxes and rental taxes on hotel rooms or restaurant meals. In addition to tax revenues from local levies other local non-tax revenues are available to some school districts. Some of these revenues are tuition fees for out-of-district students who attend the district schools, fees for use of certain equipment, fees for registration in special courses such as driver education programs, rental from property, fines, and other reimbursement items. Finally, certain non-revenue funds are collected, for example, from the sale of lunches.

Mort, Reusser, and Polley described the property tax

as, "...a tax on wealth, both tangible and intangible, levied at a uniform rate in the taxing jurisdiction upon a value known as assessed valuation."[15] In general, the property tax is not complex. Each parcel of property in a taxing jurisdiction is given a value by assessors. The resulting values are entered on a tax roll. The total of all these values form the total assessed valuation of the jurisdiction. Once taxing authority has been granted by the electorate or designated legal body of that jurisdiction the tax is levied. Each owner of property in the jurisdiction must then pay his proportionate share of the levy which is expressed in mills, cents, or dollars. Property tax rates are paid yearly by the person who holds title to the land or house or personal property, such as machinery, livestock or business inventory.

In Washington State the rates are limited by the State Constitution[16] to 40 mills on a dollar which may be levied against property and which shall be assessed at 50% of true and fair value. Therefore, state and local governments and schools together may not levy more than 40 mills on property in their area without a special approval by the voters.

The forty mills allowed in the Washington Constitution are divided among the various local governments and the state

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[15]Mort, Reusser, and Polley, op. cit., p. 131.

[16]Washington State Constitution, Amendment 17, Article VII.

governments as follows:

Within Cities and Towns		Outside Cities and Towns	
State	2 mills	State	2 mills
County	8 mills	County	8 mills
School	14 mills	School	14 mills
City	15 mills	Roads	10 mills
Floating	1 mill	Floating	6 mills
	40 mills		40 mills

In the case of Washington State school districts the local board of directors can levy 14 mills against the taxpayers of the district without a vote of the people. If additional local property tax funds are needed to operate the schools they must be authorized by the voters through a special or excess mill levy.[17] The Washington State Constitution[18] specifies the following requirements relative to special levy and bond elections:

To approve a levy which exceeds the regular 14 mills, 40% of those who voted in the last general election must vote on the issue, and at least 60% of those voting must approve. Special or excess levies can be approved for one year only.

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[17]An excess mill or special levy was defined as a tax levied against the property tax of a school district by an amount that exceeded the regular 14 mill constitutional limit following approval by the electorate.

[18]Washington State Constitution, op. cit., Section 2.

These levies are spread in a tax year[19] following.

Voters may also approve the issue of general obligation bonds for specified capital purposes but not for the replacement of equipment. Of those who voted in the last general election 40% must vote on the issue and 60% of those voting must approve. The millage levy needed for the payment of interest and principal will be added to the tax levy in addition to the 14 mills, in the case of school districts, until the bonds are paid. It is the responsibility of the board of directors of a local school district to be sure sufficient mills are levied to service and retire the bonds.

Although the Washington Constitution calls for an assessed value on property of 50% of true and fair value, assessors in different counties assess at varying percentages as was indicated in Chapter I by the range from 13.8% in San Juan County to 24.7% in Ferry County. Variations in assessment practice is not unique to Washington State but is a problem to some degree in all states. These variations[20] create serious inequities and injustices between taxpayers of

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[19]The tax year in Washington State extends from January 1, to December 31. A levy approved in March, 1965 would be spread against the 1966 tax year while a levy approved in November 1965 would be spread against the 1967 tax year.

[20]For further examination of variations in assessment practice in the United States and reasons for these variations see: Rosenstengel and Eastmond, op. cit., pp. 84-5, and Mort, Reusser, and Polley, op. cit., p. 133.

different counties in a state and between taxpayers within a single county. Two main causes of these variations are: (a) the lack of uniform methods of assessing property, and (b) the difficulty of assessing different kinds of property, such as real property (residential, business, industrial, farm, vacant, undeveloped, etc.) and personal property (tangible and intangible).

From 1961 through 1966 county assessors in Washington State have shown an improvement toward minimizing the injustices caused by variation in assessment practice. According to Washington State Tax Commission[21] data the Indicated County Ratios[22] changed as follows: (a) range in 1961 from 13.4% to 24.8% and in 1966 from 15.7% to 25.3%, (b) difference in 1961 = 11.4% and in 1966 = 9.6%, (c) average in 1961 = 19.7% and in 1966 = 20.8%.

The preceding reference pertains mainly to real property. However, in general, property placed on the tax rolls falls into three categories: real property, tangible personal property, and intangible personal property.

Jones defined real property as "land and buildings and

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[21]Washington State Tax Commission, County Ratio Equalization Study, (Olympia: Research Division, August 31, 1966), p. 1. (Mimeographed.)

[22]Indicated County Ratio is a term used by the Washington State Tax Commission to show the ratio of assessed value to true value of property in Washington State.

other improvement on the land. It is property which is fixed in its location."[23] Burkhead reports that "residences make up about 54 percent of the value of locally assessed real estate, and single family dwellings comprise about 90 percent of residences."[24] The remaining 46 percent is made up largely of farm, industrial, and commercial property.

Tangible personal property is property which has an inherent value of its own and can be moved should the owner change his residence.[25] Benson states, "Broadly defined, tangible personal property includes motor vehicles, household goods, clothing, jewelry, business equipment, business inventories, farm equipment, and farm animals."[26]

Intangible personal property is wealth encompassed in "bank deposits, stocks, bonds, account receivable, and other monies or claims to ownership or control."[27]

A comparison of local tax revenue per capita yield places Washington relatively low among the states of the nation. In 1966 with a per capita yield from local taxes of

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[23]Jones, op. cit., p. 60.

[24]Jesse Burkhead, State and Local Taxes for Public Education (Syracuse: Syracuse University Press, 1963), p. 35.

[25]Jones, loc. cit.

[26]Charles S. Benson, The Economics of Public Education (Boston: Houghton Mifflin Company, 1961), p. 155.

[27]Ibid.

$101.74 Washington ranked 34th nationally and 10th among the 11 continental western states.[28] In the section concerning State Revenue Sources a comparison is made relative to per-capita yield from state taxes. The state comparison shows Washington's rank in a considerably more favorable position.

County revenue sources. In some states intermediate or county units of government have been granted authority by the state to collect taxes for the purpose of education. In Washington the counties collect a real estate excise tax in the amount of 1% on the price of real estate sales in the county. By law[29] the county tax is allocated to schools for school operation, except for a small portion kept by the county to cover the costs of collecting the tax. A tax such as the 1% real estate excise tax is classified as a conveyance tax.[30]

State Revenue Sources. The primary responsibility for

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[28]George Kinnear, Washington's Tax System: A Comparison, (Olympia: Washington State Department of Revenue, 1966), p. 6. (Mimeographed.)

[29]Two state statutes authorize the 1% tax collection on the price of real estate sales: RCW 28.45.040, 1951, First Extraordinary Session provides for resolution and payment; RCW 28.41.070, 1951, guarantees a payment to schools in the amount of $.17 per pupil in average daily attendance.

[30]League of Women Voters of Washington, Tax Facts: Where the Money Comes From (Seattle: League of Women Voters of Washington, 1966), p. 6.

public education in the United States rests with the state governments.[31] The reason for the primary responsibility resting with the states was explained by Jones as:

> The delegates to the Constitutional Convention which founded the United States made no express provision for federal activity in education. Under the Tenth Amendment to the Constitution, education not being a power delegated to the federal government by the Constitution itself, was 'reserved to the states respectively, or to the people.' Federal activities in the educational field, which have grown through the years, are performed under the expanding interpretations granted the general welfare clause of the Constitution.[32]

Five rather distinct purposes of state support have been discussed extensively in school finance literature. These purposes stated by Lindman are:

1. To promote improvements in school practices by making state aid payments contingent upon adoption of these practices by local school districts.

2. To compensate school districts for unusually expensive aspects of the school program, such as pupil transportation.

3. To guarantee a minimum level of support per child for all school districts based upon uniform tax effort as illustrated by the foundation program.

4. To provide an incentive for greater local tax effort, as illustrated by the state support programs in Wisconsin and Rhode Island.

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[31]For a detailed treatment of the subject see: Robert L. Drury and Kenneth C. Ray, Principles of School Law, (New York: Appelton-Century-Crofts, Inc., 1965), Chapters 1-3; Lee O. Garber, The Yearbook of School Law, 1965, (Danville, Illinois: The Interstate Printers and Publishers, 1965), Chapter 1.

[32]Jones, op. cit., p. 85.

5. To broaden the school tax base to include revenues derived from state-administered non-property taxes.[33]

In order to accomplish these purposes it is necessary for the state to obtain revenue. Unlike local revenue whereby the property tax is the main source, state revenue is derived from a combination of tax sources.[34] For reader convenience a comparison[35] between Washington State and all states in the state tax collections by type of tax is made in Table I. From the comparison in Table I it is evident that Washington State places major reliance on the sales tax as a revenue source. The percent of sales tax to total state tax revenue ranges from 19.9% in Oregon to 84.4% in Illinois with Washington ranking second high.

By contrast Washington derives no revenue from taxing income, either individual or corporate. Forty of the fifty states receive revenue from some form of income tax. The percent of income tax revenue to total state tax revenue ranges from 0.8% in South Dakota to 59.5% in Oregon.

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[33]Erick L. Lindman, "State School Finance Reflects Its Times," Long-Range Planning in School Finance, (Washington, D. C.: National Education Association, Based on proceedings of the Sixth National School Finance Conference, April 7-9, 1963), p. 38.

[34]For a detailed review of tax revenue sources for state funds for each state of the union see: National Education Association, Committee on Educational Finance, C E F Report (Washington, D. C.: National Education Association, May, 1967), pp. 1-24.

[35]Ibid., p. 6.

TABLE I

MAJOR STATE TAX COLLECTIONS IN 1966
(AS PERCENT OF TOTAL TAX REVENUE)

State Taxes	As % of total state tax revenue for all states		As % of total tax revenue for Washington State	
General sales and gross receipts	26.8		55.2	
Motor fuels	15.7		12.8	
Tobacco products	5.2		4.2	
Alcoholic beverages	3.4		4.0	
Insurance	2.8		1.6	
Others	4.1		3.8	
TOTAL ALL SALES		58.0		81.6
Individual income	14.7		---	
Corporation net income	6.9		---	
TOTAL ALL INCOME		21.6		---
Motor vehicle and operators' licenses	7.6		5.3	
Other licenses	4.3		2.6	
TOTAL ALL LICENSES		11.9		7.9
TOTAL ALL OTHER		8.5		10.5
TOTAL COLLECTIONS		100.0		100.0

Income and sales taxes constitute the main source of state revenue. However, a few states receive substantial revenue from severance taxes and from property taxes. Examples of these are: (a) Louisiana 27.2% from severance taxes, and (b) Nebraska 34.3% from property taxes.

Recent legislatures in Washington State have debated the need for a broader tax base. Some form of income tax received most consideration, but due to the Constitutional limitation no income tax has been enacted. A Constitutional change will be required before the tax base can be broadened to include income as a possible tax source. The Washington State Constitution can be amended[36] in two ways.

First, a proposed amendment must be approved as a joint resolution by two-thirds of the membership of the House and by two-thirds of the membership of the Senate. After this step the proposed amendment must be submitted to the voters at the next state general election. The amendment becomes law if approved by a simple majority of those voting on the amendment.

Second, the Constitution may be amended (or completely rewritten) by a constitutional convention. This requires:

1. Agreement by two-thirds of the members of each

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[36]Washington State Research Council, The Research Council's Handbook, State and Local Government in Washington (Olympia: Washington State Research Council, 1964), p. 138.

house of the Legislature that the question of a convention should be submitted to the voters at the next general election.

2. Agreement by a simple majority of all those voting at the general election that a convention should be called.

3. Provision for the mechanics of holding a convention must be made by the next succeeding legislature.

4. Amendments proposed by the convention must be submitted to the voters for their approval or rejection.

A constitutional convention has not been held in Washington State since the present Constitution was adopted in 1889. The 1967 Legislature did not act to place the issue of a constitutional convention before the voters. However, voters have another means of calling for such a convention. This means is through the power of initiative.[37]

Steps have been taken by voters to use the power of initiative. An initiative petition for submission to the

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[37]The initiative is the direct power of the voters to enact new laws and/or change existing laws. It was provided in 1912 by the Seventh Amendment to the State Constitution. There are two types of initiatives; the initiative to the people and the initiative to the Legislature. For further detail relative to the procedure of using the initiative approach see: Washington State Research Council, op. cit., pp. 136-7.

people is being circulated to place Initiative Measure 241 before the voters in the November 5, 1968 general election. Initiative Measure 241 calls for a State Constitutional Convention in 1970. Until such time a constitutional change has been enacted it is likely the main source of state tax revenue in Washington will continue to be sales.

In 1966 with a per capita yield from state taxes of $233.73 Washington ranked 3rd nationally. Washington's total state tax revenue for 1966, as a percent of 1965 personal income, was 8.1% which ranked 4th among all states.[38]

Federal revenue sources. The federal government today constitutes what is probably the last major untapped source of revenue for public school education in the United States. Federal grants for education have been made for specific purposes and in specific amounts, but relatively speaking, these funds represent a very minor portion of the source to date.[39]

It is felt by many people that if schools are to go beyond present levels of quality and adequately discharge

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[38]National Education Association, Committee on Educational Finance, C E F Report (Washington, D. C.: National Education Association, May, 1967), p. 22.

[39]For a detailed review of the federal government's participation in financing public school education historically and currently see: Norton, op. cit., pp. 214-32., Burkhead, op. cit., pp. 236-87.

the responsibilities placed on them, the financial resources of all levels of government must be made available. Other people fear losing local control of their schools if the federal government becomes a greater revenue source.

The justification for the demand that all levels of government participate in supporting schools is based on the knowledge that public education has a profound influence on the way of life of our country; it is no mere local concern. In addition to recognizing the public schools' basic role in the American political system and national security, the Educational Policies Commission emphasized:

> There is an intimate relationship between schooling and the economic health of a nation and of its citizens. Prosperity demands productivity, and productivity demands trained talent. Education develops the intellectual and manual skills which underlie the productive abilities of individuals and nations today. Nations with the highest general level of education are those with the highest economic development. Schools, even more than natural resources, are the basis of prosperity.[40]

If schools are to achieve the levels of quality required to keep the United States economically strong it is very likely that the federal government must play a more realistic role in educational finance. The question remains, how desperate must the financial situation become before the

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[40]National Education Association and American Association of School Administrators, Educational Policy Commission, National Policy and the Financing of the Public Schools, (Washington, D. C.: National Education Association, 1959), p. 7.

attitudes and emotions which preclude greater utilization of national resources for public education are modified. Once these attitudes and emotions are modified federal support is likely to be more general[41] and continuous rather than categorical[42] and of a crash program type.

II. Distribution of Funds

As pointed out previously local districts receive funds for maintenance and operation of schools from three main governmental sources: Local, state, and federal. The local and state sources provide the major amount of revenue. Due to dependency on the property tax, variations in assessment practice, inequality of wealth behind each pupil and different attitudes relative to school support, it has been impossible for local school boards to equalize educational opportunity for all children in the state. Consequently, it has become the task of the state to provide whatever equalization it can.

Because the state has assumed this important responsibility the Distribution of Funds section of Chapter II deals

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[41]The term "general" is used here to mean grants-in-aid granted to state or local governments without designation of purpose or restriction of expenditure other than in broad areas such as for operation or for construction.

[42]The term "categorical" is used here to mean grants-in-aid given to state or local governments for specific purposes and programs to encourage their development.

mainly with equalization of educational opportunity through state distribution of funds. A brief historical review of and reasons behind grants-in-aid and distribution formulae is included. Finally, the distribution formula adopted by the 1963 Washington State Legislature is reviewed.

Historical development of distributing school funds. In the Eighteenth Century when the Constitutional Convention decided to leave education "to the states or to the people," tax-supported education was limited to the older New England states. Most original states had not adopted the concept of public education. Only seven of the twelve states that adopted constitutions at that time even mentioned education and only three of these defined the term.

As a result of land-grant[43] policy adopted by the Continental Congress in 1787, states forming in the wilderness west of the Alleghenies became more committed to public education than the majority of older states.

In 1795 New York state granted funds to municipalities to be used for schools and to be supplemented locally by half the amount. The law, enacted to operate for five years, was successful but not renewed. A commission was appointed in

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[43]An example of land-grants is the earmarking of land for school purposes in every township of the Northwest Territory. This policy was extended eventually to all the new states and brought to them a total land area equal to 150 Rhode Islands.

1811 to study the problem of school finance. In 1812, as a result of the commission's recommendation, a law was passed which created a system of local school government, gave the new government agencies taxing power, and required them to match the state grants. This law had wide influence on methods of state finance and methods of local fiscal control.

Apart from the New York example public education in the East was in the doldrums. Some bright spots appeared when in 1803 Ohio provided in its constitution for right of entry of pupils to any school profiting from the federal land grants and when Indiana, in its constitution, called on the legislature to set up a complete system of public schools as soon as circumstances permitted. Circumstances in Indiana did not "permit" until thirty years had elapsed.

By 1830 the shape of public education began to appear. Rhode Island, New Jersey, and Pennsylvania called for public tax support and Rhode Island and Pennsylvania added small amounts of incentive aid. New states followed with tax-supported education and used federal land-grant revenue as a stimulus for local action.

By the middle of the Nineteenth Century Horace Mann, Henry Barnard, Caleb Mills, John Pierce and other educational leaders helped clarify the concept, purpose and need for public education. As a result all states adopted the concept to some degree. In 1890 only eleven states provided less

than 15% support from state and federal funds, twelve states provided 15-19%, eight states 30-49%, and ten states more than 50%.[44] The pattern of 1890 still survives in broad outline at least as is shown by comparable statistics for 1956 as analyzed by Mort, et al: "Of the eighteen (states) in the two higher-percentage groups in 1890, only two are now found in the lower-percentage group. Of the twenty-nine in the two lower-percentage groups, only seven are now found in the higher-percentage group. Clearly the posture of the several states in regard to state support had already become fairly well fixed by 1890."[45]

Since 1890 periodic changing conditions subjected the system of school financing to great stress. Among these conditions were enrollment expansion, inflation, depression, and the desire for quality education. Mort, et al[46] pointed out the historical trend that in good times (periods of growth and inflation) local districts generally provide an increasing portion of operating funds, while during bad times (periods of depression) the state portion of operating budget revenues increases. Perhaps out of more experience policies will evolve that will keep these two agencies of the people

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[44]Mort, Reusser, and Polley, op. cit., p. 196.

[45]Ibid., p. 197.

[46]Ibid., pp. 198-9.

and perhaps the third, the federal government, in a firmer partnership to meet variations in economic and population growth periods.

Throughout the period of struggle for public education leaders emerged to give direction and purpose. In the area of school finance and particularly in the area of state financing of schools certain men played major roles. Some of these men are included here.

The first extensive analysis of state-aid practice was made by Cubberley during a time when economic and growth conditions were favorable in many districts but decadent in some others. He discovered two basic principles in the maze of varying practices. These principles were equalization and reward for effort. His views were summarized by the following statement:

> Theoretically all the children of the state are equally important and are entitled to have the same advantages; practically this can never be quite true. The duty of the state is to secure for all as high a minimum of good instruction as is possible, but not to reduce all to this minimum; to equalize the advantages to all as nearly as can be done with the resources at hand; to place premium on those local efforts which will enable communities to rise above the legal minimum as far as possible; and to encourage communities to extend their educational energies to new and desirable undertakings.[47]

Cubberley's ideas influenced state support for about fifteen years. Times then changed and greater extremes

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[47] Ibid., p. 17.

existed between school districts. More local districts were unable to meet the demands of education and variations in educational opportunity increased.

During this period of changing economy one of the most creative and stimulating thinkers in his field, Harlan Updegraff,[48] built upon the Cubberley ideas. He proposed a plan for New York which called upon the state to provide financial conditions such than any effort on the part of a community of less than average wealth would yield tax returns equal to those of the same effort exercised by the communities of average wealth. This was the merging of the equalization principle and the payment-for-effort principle. It has had and undoubtedly will continue to have a far reaching influence on state distribution formulae.

Under the changing conditions following Cubberley's and Updegraff's work Strayer and Haig prepared a report which contained the conceptual basis[49] of much of the present day practice in equalization. The basic idea is generally referred to as the "Strayer-Haig formula," or the "foundation program plan."

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[48]Mort, Reusser and Polley, op. cit., pp. 208-9.

[49]George D. Strayer and Robert M. Haig, Financing of Education in the State of New York, A Report Reviewed and Presented by the Educational Finance Inquiry Commission Under the Auspices of the American Council on Education, (New York: The Macmillan Company, 1923), pp. 173-4.

The foundation program basically assured every district in the state a predetermined satisfactory minimum offering per pupil. All districts would be expected to tax themselves at a tax rate equal to the rate the richest district must tax itself to meet the guaranteed satisfactory minimum per pupil. The deficiency amount resulting from the application of the required tax rate would be paid to the district by the state. The Strayer-Haig formula adopted Cubberley's basic concept of equalization, but held that any program granting reward for effort was inconsistent with the aim of equalization.[50]

The last major person in the development of state-aid programs in this review is Paul Mort. Known as a pioneer in the development of thoughts on grants-in-aid at state and federal levels, Mort and associates advanced a number of refinements in the basic Strayer-Haig plan. These refinements[51] include:

1. The Adaptability Principle. This principle holds that a certain sum of money beyond the state mandated minimum or an average expenditure is necessary for districts to extend programs in

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[50] Ibid., p. 175.

[51] For further expansion on Paul Mort's refinements on the Strayer-Haig formula see: Benson, op. cit., pp. 210-12, and Mort, Reusser and Polley, op. cit., pp. 50-1.

desired directions and adopt new, improved practices.

2. The Weighted-Pupil Measure. Regular and special programs in different size districts and at different grade levels require different costs per pupil. Mort determined weighted-pupil ratios to give allowance for these unusual costs.
3. The Key-District Concept. The largest wealthy district should be used to determine the foundation program tax rate rather than the wealthiest district in order to avoid using some "freak district" with abnormal wealth behind each pupil as the determinant.
4. Local Tax Leeway. This principle suggests that once the key district is selected and its tax rate computed it is appropriate to adjust the foundation program tax rate slightly downward, so that almost all districts--except perhaps the very rich, small districts--receive some state aid.

These principles or variations thereof are included in many of the state distribution formulae in use today. Continued study by school finance specialists, state legislatures, state offices of education and local school boards have led to further experimentation to find improvements to existing formulae.

Methods and patterns of state support. The United States Office of Education distinguishes among grants-in-aid to school districts on two criteria: (a) whether the grant is general or special purpose and (b) whether the program is equalizing or flat. A grant is general purpose if the funds are "allocated to boards of education with very little instruction as to the use to be made of the funds."[52] Special purpose grants, on the other hand, may be expended only on designated objects or functions. Burkhead distinguished between equalizing or flat grants by determining: "whether a measure of local resources is used in determining allocations among the districts."[53] Equalized value of taxable property per public school pupil is the most commonly used measure of local resources.

Presently, the taxonomy of grants-in-aid does not identify how local needs are determined. Such distinctions are especially important with regard to the stimulation and equity aspects of grants. Burkhead suggests that a taxonomy might include:

I. Use of Proceeds

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[52]Albert R. Munse and Eugene P. McLoone, Public School Finance Programs of the United States, 1957-58, (Washington: U. S. Office of Education, 1960), p. 35.

[53]Jesse Burkhead, Public School Finance, Economics and Politics, (Syracuse, New York: Syracuse University Press, 1964), p. 208.

A. General Purpose

B. Special Purpose

II. Resource Measure

A. Equalizing

B. Nonequalizing

III. Needs Measure

A. Unit Costs

1. Fixed

2. Variable

B. Percentage of Local Expenditures[54]

The Use of Proceeds and Resource Measures stand as defined by the U. S. Office of Education. The Needs Measures are distinguished by whether grants are based on unit costs or percentage of local expenditures. "Under the unit approach, the state government undertakes to decide, in effect, how much various types of educational services should cost, with estimates generally adjusted for size of district and sparsity of population. On the other hand, the percentage formulae rely upon a local determination of need."[55]

Experience of the last three or four decades has provided some guidelines which are gaining acceptance in programs of financing schools. Some of these guidelines were

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[54] Ibid., p. 209.

[55] Ibid.

identified by Jones[56] and are paraphrased as follows:

1. A foundation program should be defined and should be expressed in dollar terms.

   a. All major elements of education that should be available to every child should be included in the program.

   b. Lay citizens as well as professional educators should participate in making the decisions as to the nature and level of support program that the state must have.

   c. The dollar figure expressed in per pupil or classroom unit terms should be objective so that any person following the stipulated formula would arrive at the same results.

   d. The formula should be simple enough for lay citizens and legislators to understand its operation.

2. The state and the local school district should share in securing the funds to fulfill the foundation program.

3. The ability of a local school district to contribute to the dollar amount required in the foundation formula must be determined, and there must be a mandatory local effort.

4. The state must provide at least the difference between the amount raised by the mandatory local tax effort and the total dollar amount required for the foundation program for the school district.

5. Local school districts should be encouraged to tax themselves beyond the mandatory local tax effort required in the foundation program in order to provide educational opportunities beyond the foundation program.

6. The state plan of financing schools should encourage local responsibility for school administration

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[56]Jones, op. cit., pp. 28-39.

and should avoid specific controls enforced through the finance plan.

7. There should be periodic evaluation and modification of the state finance plan in the light of experience and in response to emerging educational needs.

State distribution formulae. State distribution formulae endeavor to raise the quality of the education program in the state and to equalize the opportunity of all students to have available to them these quality programs. The term "quality" as it relates to educational programs has been considered by researchers in many studies. Although it was recognized that many factors affect the quality of programs the cost per pupil remains the most accurate measure to date.

Vincent referred to the educational cost-quality relationship as:

> The relation between cost and quality in education has been investigated over a long period of time, and by many able researchers. The earliest studies go back to the turn of the century. The results are impressive: the overwhelming evidence from studies of the relation between cost and quality show that, in school as in most other places, when you spend more you get more.[57]

Norton reinforced Vincent's view by stating, "A number of lines of research indicate that higher per pupil expenditure is a major and essential factor in achieving

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[57]William S. Vincent, Does Money Make a Difference, Associated Public School Systems, (New York, Columbia University Press, 1958), p. 1.

quality education, regardless of one's definition of quality."[58]

The Committee on Tax Education and School Finance of the National Education Association[59] in studying the relationship between cost and quality arrived at certain conclusions. Among these conclusions were:

1. There is a factual basis for dealing with the relationship between quality in education and its level of cost.

2. The cost-quality relationship in education is not a simple one.

3. The evidence now available as to the relationship of level of per-pupil expenditure to the quality of education found in a school system is neither final nor complete, but it is highly significant.

4. A higher quality education is generally provided in school systems which spend larger amounts per pupil.

5. More money does not automatically produce better schools, but educational quality generally increases as per-pupil expenditure increases.

Burkhead expressed concern that the cost-quality relationship is not adequate to use as the criterion for measuring equalization of educational opportunity. He wrote:

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[58]John K. Norton, Does Better Education Cost More?, A Report of Committee on Educational Finance, (Washington, D. C.: National Education Association, 1959), p. 41.

[59]National Education Association, Committee on Tax Education and School Finance, Does Better Education Cost More?, (Washington, D. C.: National Education Association, 1959), pp. 41-44.

It would appear that perhaps one-third of the factors affecting the quality of the schools have some relationship to expenditure levels; but if all schools in the United States had the same expenditure level, there would still be enormous differences in the quality of education. In fact, there are some reasons to believe that quality differences would be reduced very little even if expenditure levels were equated. We are a very long way from a complete understanding of the casual factors that explain variations in the quality of education.[60]

At first, the goal of equal educational opportunity for all pupils within a state to achieve both vertical and horizontal equity[61] was translated into equal resources for each pupil which, in turn, became a fixed dollar amount per pupil in the foundation program. Since, it has been recognized that not all costs vary directly with the number of pupils. Burke said:

> ....the objective of state policy is not to equalize educational opportunities in a literal sense but to improve educational opportunities for all children. The question becomes one of learning what is the range of educational opportunities within the state, discovering why some localities lag so far behind others, and devising means for lifting the communities at the lower end of the scale while at the same time fostering continued progress by communities at the upper end of the scale of ability and willingness....What the state can and should do in raising the foundation level of educational opportunities is to create conditions which will remove the financial obstacles to improved education in all

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[60]Jesse Burkhead, Public School Finance, Economics and Politics, op. cit., p. 87.

[61]Arvid J. Burke, Financing Public Schools in the United States, (New York: Harper and Brothers, Publishers, 1957), p. 565.

localities.[62]

McLoone called attention to inequities which arise from varying social backgrounds. He said: "Today to achieve both vertical and horizontal equity, equal educational opportunity for a pupil to develop to his full potential means a different dollar amount per pupil, that is, resources in whatever amount it takes to overcome environmental (socio-economic) differences among pupils."[63] Some of these differences are in motivation, preparation for learning, verbalization, and other similar characteristics. Local school districts and state educational systems have been encouraged by the federal government to develop programs to reduce these environmental differences. Encouragement has come by way of categorical grants-in-aid as exemplified by the Head Start[64] and the Elementary and Secondary Education Act[65] programs.

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[62]McLoone described horizontal equity as the equal treatment of equals and vertical equity as the unequal treatment of unequals. For further treatment of these definitions refer to: Eugene P. McLoone, "Evaluating the Weighting Factors in Use," Trends in Financing Public Education, Eighth National Conference on School Finance, (Washington, D. C.: National Education Association, 1965), pp. 63-79.

[63]Ibid., p. 63.

[64]For detailed information on the Head Start program refer to Economic Opportunity Act P. L. 88-452, Title II, passed 1964.

[65]For detailed information on the Elementary and Secondary Education Act program refer to Elementary and

Environmental differences are not as commonly met by state distribution formulae as are other conditions which cause need for varying amounts of financial aid. Most common among these other conditions which receive weighted[66] consideration in state formulae are those associated with differences among grade levels, those associated with school district size and those associated with the training and experience of teachers. The first, grade level differentiation, adjusts a cost per pupil variation generally found between kindergarten, elementary, junior high and high school grade levels. The second, district size,[67] adjusts the per pupil cost variation which exists between districts of low and high population intensity. The third, teacher experience, provides more funds for districts with more experienced

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Secondary Education Act P. L. 89-10, Title I, II, III, IV and V, passed 1965, and P. L. 90-247, Title VI, passed 1967.

[66]Albert R. Munse, "Weighting Factors in State Foundation Programs" Trends in Financing Public Education, Eighth National Conference on School Finance, (Washington, D. C.: National Education Association, 1965), pp. 56-62.

[67]The theoretical relationship between district size and cost per pupil was found to have substantial empirical support--enough to warrant consideration of a compensatory factor in the distribution formula. For further detail refer to Nels W. Hanson, "The Size-Cost Relationship in Public Schools," Trends in Financing Public Education, Eighth National Conference on School Finance, (Washington, D. C.: National Education Association, 1965), p. 133; and George D. Strayer, Jr., Guidelines for Public School Finance, Report of a Nation-wide Survey of State and Local Finance by National Advisory Committee of School Finance, (Bloomington, Indiana: Phi Delta Kappa, 1963), p. 14.

and/or more highly educated staffs.

State foundation and equalization programs utilize need as a basic measure for distributing grants-in-aid. The measurement of need in a given program is associated basically with the number of children in attendance or enrolled in the school district. Burke identified the means by which need is most often measured as: "....the number belonging, net enrollment, average membership, or average daily attendance."[68] Because education most often takes place in instructional groups measures of educational need have been expressed as, "classroom units and as the equivalent in terms of a specified weighted number of pupils in attendance,"[69] which was referred to as a classroom unit. The measurement of need should be relatively easy to calculate once given the number of students enrolled in or attending school at each grade level.

Local ability to support schools is also a measure utilized in state distribution formulae to equalize the distribution of state funds. Since approximately 98 percent of all local tax revenue for schools is derived from property taxes it is necessary to consider the importance of the

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[68]Arvid J. Burke, Guides to the Improvement of State School Finance Programs, Report of the Committee on Tax Education and School Finance, (Washington, D. C.: National Education Association, 1958), p. 18.

[69]Ibid.

equalizing the value of taxable property per unit of educational need. Johns points out, however, that the solution is not simple for the following reasons:

1. It is argued by some that the extra costs of municipal government in large cities reduce the taxpaying ability of those cities to support schools.

2. It is argued that income is a better measure of local taxpaying ability than property valuation.

3. Some states do not have adequate machinery for determining the equalized value of property in local school districts; therefore, some other measure of local taxpaying ability is needed.[70]

Lindman[71] speaking to the validity of point 1 above argued that rural school districts do not have as high a property tax burden for nonschool local government costs as municipal districts, and that municipal districts varied among themselves in the ratio of municipal costs to school costs. Johns[72] suggests that the solution to the municipal cost variation problem will probably be found in increased grants-in-aid to municipalities rather than in modifying the measures of local ability to pay for school support in state

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[70]Roe L. Johns, "Indirect Measures of Local Ability To Support Schools," Trends in Financing Public Education, Eighth National Conference on School Finance, (Washington, D. C.: National Education Association, 1965), p. 92.

[71]Erick L. Lindman, "School Support and Municipal Government Costs," Long Range Planning in School Finance, Sixth National Conference on School Finance, (Washington, D. C.: National Education Association, 1963), pp. 129-34.

[72]Johns, loc. cit.

formulae.

It is sometimes argued that the extra costs of educating culturally disadvantaged persons living in big cities are not recognized in state formulae. If these costs exist they might more appropriately be met by weighting the measure of need rather than modifying the measure of local ability.

Income as a measure of ability to support schools has received increased consideration in recent years. The point is made that past, present and/or future income is used to pay taxes; therefore, income is a valid measure of ability. James, Thomas, and Dyck[73] under U. S. Office of Education, Cooperative Research Project Number 1241 and Kimbrough and Johns[74] under a similar project Number 2842 derived correlations between family income and per-capita market value of property, and between per-capita personal income and per-capita equalized valuation of property respectively. Both studies found that per-capita personal income and per-capita market value of property measure somewhat different aspects of taxpaying capacity. Further, it was concluded that

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[73]H. Thomas James, J. Alan Thomas, and Harold J. Dyck, Wealth, Expenditure and Decision-Making for Education, U. S. Office of Education, Cooperative Research Project #1241, (Stanford, California: Stanford University, 1963), pp. 7-8.

[74]R. B. Kimbrough and Roe L. Johns, The Relationship of Socioeconomic Factors, Educational Leadership Patterns and Elements of Community Power Structure to Local School Fiscal Policy, U. S. Office of Education, Cooperative Research Project #2842, (Florida: University of Florida, 1967).

personal income was not presently administratively feasible because local boards of education lack the power to levy a local tax highly correlated with personal income.

The findings of the two research projects referred to above do not necessarily show that the equalized value of taxable property should not be used as a measure of local ability, but perhaps the findings do suggest that a considerably higher percentage of the school budget should be derived from state and federal taxes. Hutchins referred to state participation as: "No specific proportion of state money that should be allocated in proportion to the lack of wealth has been announced, but observations of new developments indicate that as much as 70 percent of equalization can be desirable."[75]

Johns'[76] third point on lack of machinery in some states to adequately equalize property values is a valid concern. Those states that have a designated agency to equalize property values, and do the job in a reasonably accurate manner, provide an equitable base from which a state formula can operate. Unfortunately, some states have failed to establish a state authority for determining equalized

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[75]Clayton D. Hutchins, "New Developments in State School Finance Systems" Pamphlet, Financing Education For Our Changing Population, Committee on Educational Finance, (Washington, D. C.: National Education Association, 1961), p. 80.

[76]Johns, loc. cit.

valuations. These states have had to rely on various forms of economic indices to either check the validity of reported valuations or to establish equalized valuations. The economic index approach has not proven as adequate as direct equalization by a state agency. Johns concluded:

"....despite the use of the most advanced methods, it is not feasible to estimate the equalized valuation of property in a school district by an economic index as accurately as by determining equalized valuation directly."[77]

Burke[78] summarized various state procedures for determining equalized valuations as:

1. Local assessments made under little or no state supervision.

2. Standards for assessment set by state with some supervision.

3. State tax commission determine ratio of assessed valuation to true value in each taxpaying jurisdiction.

4. State use economic index based upon retail sales, motor vehicle registrations, postal receipts, and other items.

Effort produced by a local community to support its schools is another measure taken into account in state distribution formulae. Relative levels of local effort are difficult to determine in many states due to variations in

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[77]Ibid., p. 99.

[78]Burke, op. cit., p. 72.

assessment practices. For example, a high millage levy in a district may or may not represent a high effort depending on that district's assessment ratio in comparison to all districts in the state and on the per-capita income of people residing in the district. Some districts in a state may levy two to eight times as much as other districts. In many cases this difference could be attributed to effort.

The range in actual local effort, although greatly influenced by the attitude of the people toward their schools, is materially affected by two other factors identified by Johns and Morphet as: "(1) the amount of state aid provided and the plan used for apportioning the state funds, and (2) the number of small districts in the state."[79] Other things being equal, states that have a large proportion of small districts of widely varying wealth and that provide very limited funds from state sources to help pay for schools, will have the greatest range in local effort.

Some other factors which contribute to the variation in local effort are the aspirations local citizens have for the youth of the community, median family income, percent of occupied housing, median years of schooling, percent of labor force unemployed, percent of population non-white, percent of county population living on rural farms, and percent of

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[79]Johns and Morphet, op. cit., pp. 160-61.

students attending private schools.[80]

State grants-in-aid constitute many forms of "fiscal incentives" to local school districts. That is, local authorities are induced to do certain things in their programs they might not otherwise do without state support. Of the general purpose grants, according to Benson[81] there are two main types: the foundation program plan (Strayer-Haig) and the percentage-equalizing subvention (or matching grants on an equalizing basis). A question to ask about these two plans is, which offers greater incentive to the poorer districts? Benson answered the question as:

> ....one must say that foundation program plans, as standardly administered, offer a financial incentive to the richer districts of a state and a financial disincentive to the poorer districts. The percentage equalizing plan reduces the price of educational services more uniformly in all districts and, hence, offers a more widely distributed type of financial incentive.
>
> It might thus be good policy to incorporate some form of equalized matching provision in the general aid programs in most--I do not say all--states.[82]

Perhaps the best example of an equalizing state grant with an incentive for the local district is Rhode Island's program. According to the State Board of Education in Rhode

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[80]James, Thomas, and Dyck, op. cit., pp. 110-15.

[81]Charles S. Benson, "Fiscal Incentives in State Aid Provisions," Trends in Financing Public Education, Eighth National Conference on School Finance, (Washington, D. C.: National Education Association, 1965), p. 51.

[82]Ibid., p. 54.

Island:

> ....any legislation designed to support schools must do two things. First, it must guarantee an adequate minimum education for all children in Rhode Island. Second, in doing the first, it must also guarantee that no school system is discouraged from moving on toward its destiny as rapidly and effectively as possible--with the approval and aid of the state.[83]

Equalization aid is designed to help the poor communities which have inadequate local tax resources to overcome the financial deficiency by paying a greater amount to the poorer communities in order to equalize the tax burden. In Rhode Island, Boyer wrote:

> Whatever decisions are made locally bind the State to "pay its share" of the cost whatever it may be.
>
> The result is a program whereby each school district sets its own "foundation program." Since the State's share of each community varies with the taxable wealth behind each pupil, the less the local wealth per pupil the higher the State's share.[84]

Washington State distribution formula. The 1965 session of the Washington State Legislature enacted a new school distribution formula[85] for the apportionment of state funds to school districts. Full implementation of the

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[83]E. Gil Boyer, Financing Tomorrow's Schools Today--The Story of Rhode Island's School Finance Program, (Providence, Rhode Island: Oxford Press, Inc., 1961), p. 22.

[84]Ibid., p. 24.

[85]Washington State Legislature, Chapter 154, Extraordinary Session, 1965, Schools--Distribution and Apportionment of State Funds.

formula required a four-year span before the formula could become totally operative. The gradual implementation time was written into the law so as not to disrupt school district operation and function too abruptly.

The Washington formula includes many of the factors incorporated in other state formulae. A review of the principles upon which the formula was developed serves as a base for understanding:

1. Every child should have a chance for a relatively equal educational opportunity regardless of the location or wealth of his school district. (The minimum foundation level guarantees an amount of revenue per child.)

2. The Legislature is responsible for maintaining a proper balance among all sources of revenue available to school districts. (This is an attempt to require equal local tax effort.)

3. State funds should be apportioned on as objective and easily computed a basis as possible.

4. The State should exercise a minimum amount of control over local school programs.

5. The State should encourage efficient organization and operation of school districts toward economy and improved educational opportunity.

6. Allowances should be made for some range in districts' revenues for differences in costs not otherwise covered, or for local program differences. (Factors for size of districts, differences among staffs as to training and experience, and for concentrations of disadvantaged children have been incorporated into the formula.)[86]

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[86]Louis Bruno, The School Distribution Formula Weighting Factors--Memorandum to Central Budget Agency from State

In the 1965-66 school year, $200,114,920.00 were distributed from state funds to meet the total guarantee of $271,901,857.00. The average state support to meet the guarantee was 73.6% or $224.48 per pupil.

Chapter III treats the Washington formula in detail relative to all factors utilized for equalizing educational opportunity. In brief, the formula does attempt to equalize local ability to pay by establishing assessment ratio between assessed value and true value for property in each county for the required 14 mill rate. The formula does not recognize effort to equalize ability to pay for local funds raised through special levies. With special levies increasing in amount and rate yearly the absence of this factor has caused low assessed valuation districts to make greater and greater relative effort in order to maintain relative position with higher assessed valuation districts.

Superintendent of Public Instruction, (Olympia, Washington: State Superintendent of Public Instruction, December 8, 1966), pp. 1-2.

III. Summary

Chapter II has been divided into two main sections: the Acquisition of Funds and the Distribution of Funds. The Acquisition of Funds was treated historically and currently. Historically, a long and difficult fight took place in America over free public education. The national Constitution does not recognize education, but instead leaves education as the responsibility of the states. Therefore, states adopted public education at varying rates and in varying degrees.

Some basic principles of taxation include factors such as ability to pay, benefits received, adequacy of yield, stability and flexibility, and ease of administration and payment. No one tax can satisfy every principle for some principles are in conflict with others.

Sources of revenue include local, county, state, federal and non tax sources. The largest single local revenue source is the property tax. This tax is often inequitable due to unequal property assessment practice. To gain equity it is necessary to assess all property equally and to equalize ability to pay in low assessed valuation areas.

Washington State has some of the most restrictive property tax regulations among all states. The 40 mill law combined with property taxed at less than 50% of true value cause the greatest barriers.

County revenue in Washington for public education is

derived from a tax of 1% on all real estate sales. This tax is called the Real Estate Transaction Tax.

The main purposes of state tax revenue is to improve programs, to compensate school districts, to guarantee a minimum expenditure level, to create local incentive, and to broaden the tax base. The main source of state revenue in Washington is derived from the sales tax. Some other states utilize the income tax as a major source.

The federal government represents the last major untapped source for school revenue. Federal aid is distributed through two major ways, general and categorical. The main argument for categorical aid is to create incentive to develop certain programs. General aid, however, provides more opportunity for local control of program and is preferred as a distribution method.

Since local and state sources provide the major amount of school revenue these sources are the main means for equalizing educational opportunity among school districts. However, due to local district dependency on the property tax as its major tax source and due to variations in assessment practice, inequality of wealth behind each pupil and different attitudes relative to school support, it has been impossible for local school boards to equalize educational opportunity. Consequently, it has become the task of the state to provide whatever equalization it can. Chapter II

has dealt mainly with equalization through the distribution of state funds.

Historically, public support for education was slow in developing and not until the latter part of the nineteenth century was the concept better understood and fairly widely practiced. Through the struggle for public support leaders emerged. Mann, Barnard, Mills, and Pierce helped explain and promote the concept while Cubberley, Updegraff, Strayer, Haig, Mort and others developed ways whereby public funds could be distributed to obtain greater equalization of educational opportunity. Cubberley set forth two principles: equalization and reward for effort. Undegraff built upon these principles and introduced the merging of the equalization and payment-for-effort principles. By so doing effort on the part of communities with less than average wealth realized tax returns equal to those of communities making the same effort but with average wealth. Strayer-Haig followed with the "foundation program plan" which basically assured every district a predetermined satisfactory minimum offering per pupil. Finally, Mort advanced a number of refinements to the distribution of state funds. Mort's refinements included the adaptability principle, the weighted-pupil measure, the key-district concept and the local tax leeway principle.

Types of grants-in-aid were identified in a taxonomy by Burkhead as: general and special purpose, equalizing and

non equalizing, and costs by unit or percentage of local expenditure. Guidelines for state finance programs include: (a) foundation programs should be expressed in dollar terms, (b) both state and local funds should be used in the foundation program, (c) there should be a mandatory local effort, (d) the state must provide the difference between the local effort and the determined guaranteed amount, (e) local districts should be encouraged to tax beyond the required local effort, (f) local control should be perpetuated, and (g) periodically the state finance plan should be evaluated and necessary modifications made.

The relationship of cost to quality is generally accepted to be positive. It is recognized, however, that many factors (internal and external) affect the quality of education in individual districts. Consequently, state distribution formulae should compensate for differences which exist and which are beyond the control of the local school board. Some of these differences are determined by the district's need, ability to pay, and effort to finance its own programs.

The Washington State distribution formula includes many factors incorporated in other state formulae. The formula does attempt to equalize ability to pay by establishing an assessment ratio between assessed value and true value for property in each county for the required mill rate.

However, the formula does not recognize effort or equalize ability to pay for local funds raised through special levies. This latter factor should be considered in the evaluation of the formula.

CHAPTER III

PROCEDURES USED IN THE RESEARCH

Research procedures were developed to determine the variation in educational opportunity[1] in Washington State under certain hypothetical manners of distributing state grants-in-aid such as: (a) when factors[2] in the state school distribution formula are eliminated or mixed in different predetermined and specified proportions and (b) when a given increase in state support is distributed under circumstances where local effort[3] in relation to local ability to pay[4] is used as a factor in the formula.

The objectives of the research were to: (a) identify those factors in the distribution formula which have the greatest influence on the variation of educational opportunity and (b) test the impact of including factors for local effort in relation to local ability to pay on the variation

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[1]For the definition of educational opportunity see footnote number two, Chapter I of this study.

[2]Factors are those elements included in the distribution formula which affect the number of dollars per pupil allocated to local districts, e.g. enrollment, assessed valuation, guaranteed support level, regular millage rate, Federal Forest Funds, handicapped programs.

[3]For the definition of local effort see footnote number four, Chapter I of this study.

[4]For the definition of local ability to pay see footnote number five, Chapter I of this study.

of educational opportunity.

The objectives of the research would be satisfied by answering the following questions:

1. What factors in the 1965 distribution formula exert the greatest influence on the variation of educational opportunity among selected school districts in Washington State?

2. Will certain predetermined and specified mixes (combinations) of existing factors under certain hypothetical manners of distributing state grants-in-aid reduce the variation of educational opportunity in the districts under study?

3. Can the variation of educational opportunity be reduced by introducing a factor for local effort in relation to local ability to pay and by applying this factor in various predetermined and specified ways in the distribution formula?

I. Formulating Research Design and Simulation Formulae

The three questions developed to satisfy the objectives of the study served as the basis for the research design. In each case, factors in the Washington State Distribution formula were manipulated either by deleting all or some of them, changing some of their values, or by introducing new factors which affected them.

The state distribution formula for the school year 1965-66, when broken into its basic factors, is best described by formula. The factors and their symbols are:

$$A_i = uN_i - rC_i - \sum_{j=1}^{6} R'_{ij} + \sum_{j=1}^{6} S_{ij}$$

where A_i is the state grants-in-aid distributed to a given

district including flat grants and equalization grants; u is the guaranteed support level;[5] N_i is the number of weighted pupils[6] in a given district; r is the regular school millage rate[7] (required mill rate); C_i is the assessed value of a given district as determined by the county assessor; R'_{ij} where j=1,...6 are the receipts from the following sources: R'_{i1} = 1% county real estate transaction tax, R'_{i2} = that portion of Public Law 874 funds which are required deductions, R'_{i3} = that portion of Federal Forest Funds which are required deductions, R'_{i4} = public utility district revenue, R'_{i5} = in-lieu-of tax revenue, and R'_{i6} = non high receipts; S_{ij} where j=1,...6 are other state receipts for special programs from the following sources: S_{i1} = handicapped program, S_{i2} = driver education, S_{i3} = vocational technical programs, S_{i4} = adult education, S_{i5} = transportation, S_{i6} = institutions.

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[5]For the definition of guaranteed support level see footnote number nine, Chapter I of this study.

[6]Weighted pupils are measured by applying the factors adopted by the Washington State Board of Education for the 1965-66 school year; e.g.: kindergarten = .5, elementary = 1.0, secondary = 1.3, vocational = .2 per hour, and other values for staff experience, staff preparation, culturally disadvantaged or migrant pupils, small schools, and grandfather and emergency districts.

[7]Regular school millage rate or required mill rate refers to the 14 mills required to be levied by a local school district in order to qualify for state equalization funds to bring the district revenue up to the guaranteed support level.

In order to answer question one: "What factors currently utilized in the distribution formula exert the greatest influence on the variation of educational opportunity among selected school districts in Washington State?" the preceding distribution formula was used. Selected factors in the formula were tested for their effect on educational opportunity by holding constant at the 1965-66 revenue level the total amount of state aid available for distribution to school districts included in the study (A), the required mill rate (r), and the assessed valuation (C_i). In order to hold the total amount of state aid (A) constant it was necessary to solve for the guaranteed support level (u) as selected factors were tested. Factors included for testing were R'_{i1} through R'_{i6} and S_{i1} through S_{i6}. These factors were tested by eliminating one at a time while holding the others constant at the 1965-66 revenue level. As individual factors were eliminated the state grants-in-aid (A_i) and the expenditure per weighted pupil (E_i)[8] for each individual district were computed. E_i represents educational opportunity in individual districts and the variation of educational opportunity determines the degree to which educational opportunity

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[8] E_i is the total expenditure of funds per weighted pupil in a given district less expenditures for transportation, lunchroom, abatements, community services, and that portion of accounts 1300 and 1400 not attributed to per pupil costs as determined from district reports to the State Superintendent for the 1965-66 school year.

is equalized in the state. Table II, "Plan for Computing State Aid and Expenditure Per Weighted Pupil in Individual Washington State School Districts by Eliminating Selected Variables from 1965-66 State Grants-in-Aid Formula," indicates the factors and constants required to compute the $\underline{A_i}$ and $\underline{E_i}$ in each of the fifteen formulae.

Formula 1 (f_1) was computed for each district in the study and provides actual 1965-66 state aid and expenditure data. Formulae 2 through 15 ($f_2,...f_{15}$) were compared with formula 1 to determine which selected factors cause a significant variation in educational opportunity.

To measure the variation, a standard deviation was computed from the educational opportunity in groups of districts for each formula f_1 through f_{15}. A t-test[9] was used to measure the level of significance in variation between the standard deviations in the simulated and actual formulae. A formula which produces less variation between its standard deviation and that of f_1 does provide greater equalization

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[9]Because formulae f_1 through f_{15} have a majority of factors in common and because the population in the study is the same for each formula the amount of state aid per district and the expenditure per weighted pupil per district in each formula are likely to be highly correlated. A t-test formula for correlated data is used. A complete description of the t-test formula can be found in: George A. Ferguson, Statistical Analysis in Psychology and Education, (New York: McGraw-Hill Book Company, Inc., 1966), pp. 183-4.

TABLE II

PLAN FOR COMPUTING STATE AID AND EXPENDITURE PER WEIGHTED PUPIL IN INDIVIDUAL WASHINGTON STATE SCHOOL DISTRICTS BY ELIMINATING SELECTED VARIABLES FROM 1965 - 1966 STATE GRANTS-IN-AID FORMULA

Formula	A	Ai	U	Ni	r	Coi	$R'i_1$	$R'i_2$	$R'i_3$	$R'i_4$	$R'i_5$	$R'i_6$	Si_1	Si_2	Si_3	Si_4	Si_5	Si_6	Ei
f_1	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
f_2	•	—	—	•	•	•	▲	•	•	•	•	•	•	•	•	•	•	•	—
f_3	•	—	—	•	•	•	•	▲	•	•	•	•	•	•	•	•	•	•	—
f_4	•	—	—	•	•	•	•	•	▲	•	•	•	•	•	•	•	•	•	—
f_5	•	—	—	•	•	•	•	•	•	▲	•	•	•	•	•	•	•	•	—
f_6	•	—	—	•	•	•	•	•	•	•	▲	•	•	•	•	•	•	•	—
f_7	•	—	—	•	•	•	•	•	•	•	•	▲	•	•	•	•	•	•	—
f_8	•	—	—	•	•	•	▲	▲	▲	▲	▲	▲	•	•	•	•	•	•	—
f_9	•	—	—	•	•	•	•	•	•	•	•	•	▲	•	•	•	•	•	—
f_{10}	•	—	—	•	•	•	•	•	•	•	•	•	•	▲	•	•	•	•	—
f_{11}	•	—	—	•	•	•	•	•	•	•	•	•	•	•	▲	•	•	•	—
f_{12}	•	—	—	•	•	•	•	•	•	•	•	•	•	•	•	▲	•	•	—
f_{13}	•	—	—	•	•	•	•	•	•	•	•	•	•	•	•	•	▲	•	—
f_{14}	•	—	—	•	•	•	•	•	•	•	•	•	•	•	•	•	•	▲	—
f_{15}	•	—	—	•	•	•	•	•	•	•	•	•	▲	▲	▲	▲	▲	▲	—

* 1965 - 1966 data
▲ Eliminate from formula
— Compute new figure

Other Funds: All other district revenue received by a given district as reported to the State Superintendent of Public Instruction.

of educational opportunity. Significance of variation was computed for all school districts in the study and for subgroups of school districts based on enrollment and whether the districts have or do not have high schools.

A total of 278 school districts representing all sizes of districts in the State of Washington was considered in the study. For purpose of comparison between district sizes, the data were compiled in eight groups with the base enrollment[10] ranges (full time equivalents) shown in Table III.

From these enrollment groups, districts were separated into non high school groups (Kindergarten or grade one up to grade nine) and into complete program school groups (Kindergarten or grade one through grade twelve). Table IV, "School Districts by Groups to be Tested for Variation in Expenditure Per Pupil" shows the composition of these groups.

Only districts qualifying as Grandfather or Emergency Districts were eliminated from the study and are not reflected in the 278 districts in Table IV. The Grandfather and Emergency Districts[11] were excluded because their revenue is not

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[10]Base enrollment is measured by the number of students in a school district as of October 1, 1965 where kindergarten pupils are counted .5 and all other students 1.0. Base enrollment may also be referred to as full time equivalents (F.T.E.).

[11]The 1965 Legislature provided that no district under the new distribution formula should receive less than 95% of the total revenue per weighted pupil, excluding special levies, which such districts realized during the 1964-65

TABLE III

SCHOOL DISTRICT GROUPS BY

BASE ENROLLMENT

Group	Total Base Enrollment	Number of Districts
A	1 - maximum	278
B	9,000 - maximum	12
C	5,000 - 8,999	20
D	2,000 - 4,999	43
E	1,000 - 1,999	40
F	225 - 999	88
G	100 - 224	23
H	1 - 99	52

TABLE IV

SCHOOL DISTRICTS BY GROUPS AND CATEGORY TO BE TESTED FOR VARIATION IN EXPENDITURE PER PUPIL

Category of Groups	Number of Districts in Groups A-H							
	A	B	C	D	E	F	G	H
All districts	278							
Sub-groups of all districts		12	20	43	40	88	23	52
Non-high school districts	83							
Sub-groups of non-high school districts				1	1	14	16	51
Complete program districts	195							
Sub-groups of complete program districts		12	20	42	39	74	7	1

comparable to revenue of all other districts under the 1965-66 state distribution formula.

To answer question two: "Will certain predetermined and specified mixes (combinations) of existing factors under certain hypothetical manners of distributing state grants-in-aid reduce the variation of educational opportunity in the districts under study?" the factors in existence in the 1965-66 distribution formula that cause a significant variation in educational opportunity when eliminated from the formula as found in the solution to question one, and other factors in the formula were mixed in certain combinations. These combinations are identified as formulae f_{16} through f_{30} in Table V, "Distribution of State Grants-in-Aid Under Certain Hypothetical, Predetermined and Specified Formula Mixes."

The same enrollment and categorical groupings and the same tests for variation used to answer question one were used to test each formula developed to answer question two.

For the purpose of manipulating data to derive specified mixes for answers to question two as indicated in

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school year (Subsection 7, Section 1, Chapter 171, Extraordinary Session, 1965). These districts are called Grandfather Districts. In addition, the Legislature provided the State Superintendent of Public Instruction authority to make an emergency adjustment in the event of unavoidable cost or unexpected variation in anticipated revenues for a period not to exceed two years (Section 4, Chapter 154, Extraordinary Session, 1965). These districts are called Emergency Districts.

TABLE V

DISTRIBUTION OF STATE GRANTS-IN-AID UNDER CERTAIN HYPOTHETICAL, PREDETERMINED AND SPECIFIED FORMULA MIXES

Formula	A	Ai	U	Ni	r	Ci	$R'i_1$	$R'i_2$	$R'i_3$	$R'i_4$	$R'i_5$	$R'i_6$	Si_1	Si_2	Si_3	Si_4	Si_5	ri-r	OTHER FUNDS					Di	Ri	Ei
																			r Ci	Ci	$R''i$	Fi	Si			
f_1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	*	*	*	*
f_{16}	—	—	*	*	*	(1)	*	*	*	*	*	*	*	*	*	*	*		(1)	(1)	*	*	*	*	—	—
f_{17}	*	—	—	*	*	*	*	(2)	*	*	*	*	*	*	*	*	*		*	*	(3)	*	*	*	—	—
f_{18}	*	—	—	*	*	*	*	*	(2)	*	*	*	*	*	*	*	*		*	*	(3)	*	*	*	—	—
f_{19}	*	—	—	*	*	*	*	(2)	(2)	*	*	*	*	*	*	*	*		*	*	(3)	*	*	*	—	—
f_{20}	—	—	(4)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	(6)	*	*	*	*	*	*	—	—
f_{21}	—	—	(5)	*	*	*	*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	*	*	—	—
f_{22}	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	(5)	*	*	*	*	*	*	—	—
f_{23}	—	—	(5)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	—	*	*	*	*	*	*	*	*
f_{24}	*	—	—	*	(7)	(1)	*	*	*	*	*	*	*	*	*	*	*	(7)	(1)(7)	(1)	*	*	*	*	—	—
f_{25}	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	(8)	*	*	*	*	*	*	—	—
f_{26}	*	—	—	*	*	(1)	*	*	*	*	*	*	*	*	*	*	*	(8)	(1)	(1)	*	*	*	*	—	—
f_{27}	*	—	—	*	*	(1)	*	*	*	*	*	*	*	*	*	*	*	—	(1)	(1)	*	*	*	*	*	*
f_{28}	—	—	*	*	*	(1)	*	*	*	*	*	*	*	*	*	*	*	(8)	(1)	(1)	*	*	*	*	—	—
f_{29}	—	—	*	*	*	(1)	*	*	*	*	*	*	*	*	*	*	*	—	(1)	(1)	*	*	*	*	*	*
f_{30}	—	—	(9)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	—	*	*	*	*	*	*	—	—

* 1965-1966 data
— Compute new figure

(1) Adjust Ci_1 to 50%
(2) Adjust to 85%
(3) Hold at 100%
(4) Double U_{f_1}
(5) Increase U & (ri-r) by 50%
(6) Eliminate (ri-r)
(7) Adjust r to 7 mills
(8) Reduce (ri-r) by 50%
(9) U + amount needed to eliminate all but 10% of the special levy districts. $\frac{(ri\text{-}r)\ Ci}{Ni}$

Table III the basic formula for the district expenditure is:

$$E_i' = A_i + (r_i - r)\ C_i + R_i'' + F_i + S_i' + rC_i - D_i$$

where in a given district E_i' is the total expenditure of funds in a given district less expenditures for transportation, lunchroom, abatements, community services, and that portion of budget accounts 1300 and 1400 not attributed to per pupil costs as determined from district reports to the State Superintendent for the 1965-66 school year; A_i is the state grants-in-aid; $r_i - r$ is the special levy mill rate; C_i is the assessed value as determined by the county assessor; R_i'' is the total revenue from Public Law 874; F_i is the total revenue from Federal Forest Funds; S_i' is all other revenue sources such as other federal funds and other revenue as indicated in budget accounts 60, 70, 80 and 90; r is the required mill rate; and D_i is all expenditures for transportation, lunchroom, abatements, community services, and that portion of budget accounts 1300 and 1400 not attributed to per pupil costs.

Educational opportunity (E_i, expenditure per weighted pupil) is determined by dividing E_i by N_i.

Formulae $f_{31},\ldots f_{33}$ were used to answer question three: "Can the variation of educational opportunity be reduced by introducing a factor for local effort beyond the required 14 mill support level in conjunction with a factor for local ability to pay and by applying these factors in various

predetermined and specified ways in the distribution formula?" Table VI, "Formula Mixes Recognizing Local Effort and Local Ability to Pay" indicates the manner in which the factors were manipulated. Formula 31 (f_{31}) reflects the $\underline{A_i}$ and $\underline{E_i}$ where additional state aid is distributed evenly per weighted pupil without recognizing ability and effort. Formulae 32 and 33 (f_{32} and f_{33}) utilize the same total additional state aid but apply the funds in different ways. The basic distribution formula for matching special levies by recognizing effort in relation to ability to pay follows:

$$A_i = uN_i + u'N_i \left[\frac{\frac{p}{m}}{\sum_{i=1}^{k'} \left(\frac{p}{m}\right)} \right] - rC_i - \sum_{j=1}^{6} R'_{ij} + \sum_{j=1}^{6} S_{ij}$$

where in a given school district A_i is the state grants-in-aid; u is the guaranteed support level; N_i is the number of weighted pupils; u' is the additional amount of state aid available for distribution; p is the measure of relative effort[12] $\left[p = \frac{r_i - r}{\frac{\sum_{i=1}^{k'} (r_i - r)}{k'}} \right]$ where $\underline{r_i - r}$ is the excess mill levy in each district and k' is the number of excess mill

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[12]Relative effort is measured by the ratio of a given district's excess mill levy (local effort) to the average excess mill levy (average local effort) in the excess mill districts studied. Average local effort is measured by dividing the sum of the excess mill levies in the districts included in the study by the number of excess mill districts in the study.

TABLE VI

FORMULA MIXES RECOGNIZING LOCAL EFFORT AND LOCAL ABILITY TO PAY

Formula	N	Ai	U	U'	Ni	r	Ci	$R'i_1$	$R'i_2$	$R'i_3$	$R'i_4$	$R'i_5$	$R'i_6$	Si_1	Si_2	Si_3	Si_4	Si_5	r Ci	Ci	R''i	Fi	S'i	Ci/Ni	ri-r	Ei	Ei/Ni
f_{31}	—	—	(1)	X	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	X	X	—	—
□ f_{32}	(2)	—	(3)	✓	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	—	—
□ f_{33}	(2)	—	*	✓✓	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	—	—

* 1965-1966 data — Compute new figure

X Not applicable □ Matching formula

(1) Increase $100.00 over U f_1

(2) Same as f_{31}

(3) Increase D20.00 over U f_1

✓ Increase matching ratio $50.00 per pupil

✓✓ Increase matching ratio $30.00 per pupil

districts; and m is the measure of relative ability to pay[13]

$$m = \left[\frac{\frac{Ca_i}{N_i}}{\frac{\sum_{i=1}^{k} \frac{Ca_i}{N_i}}{k}} \right]$$ where Ca_i is the adjusted value of a given district as determined by the Washington State Tax Commission which considers the various county assessment ratios and where the symbols in the remainder of the formula are the same as the state distribution formula described on page 3.

Formulae in Tables II, V, and VI which produce an expenditure per weighted pupil (E_i) significantly less varied than the 1965-66 formula were considered better able to provide equalization of educational opportunity. The formula which significantly creates the least variation was considered the best of those formulae studied to provide equalization of educational opportunity.

II. Collecting Data

Data were obtained from the Office of the Washington

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[13]Relative ability to pay is measured by the ratio of a given district's adjusted valuation per weighted pupil (local ability to pay) to the average adjusted valuation per weighted pupil of all excess mill districts in the study (average local ability to pay). Average local ability to pay is measured by dividing the sum of the adjusted valuations per weighted pupil of all excess mill districts in the study by the number of excess mill districts in the study.

State Superintendent of Public Instruction and the Washington State Tax Commission. The data from the State Superintendent of Public Instruction are actual revenue and expenditure figures reported by local school districts in their annual reports to the Superintendent of Public Instruction for the 1965-1966 school year. The tax commission data are actual tax ratios determined by the commission for each county in the state.

The Washington State Legislature, in balancing the state biennial budget, utilized $42,500,000.00 of funds by a bookkeeping entry, which in effect, reduced 1/6 of the state revenue payment to schools for the 1965-66 school year. The legislation required the payment of the July and August warrants for teachers to be paid out of the 1966-67 budget year. Previously, these July and August warrants were dated prior to July 1 and therefore paid out of the fiscal year the services were rendered. By deferring the two monthly payments to the 1966-67 school year and maintaining the new payment schedule in subsequent years, a one-time saving of $42,500,000.00 was realized. Should the payment schedule ever revert back to full payment during the year services are rendered it would require funds amounting to 7/6 of the state revenue contribution.

In order for this study to deal with an annual twelve-month expenditure for school districts, it was necessary to use

the actual state contribution to each school (5/6 of entitled amount) and add to it the 1/6 deferred payment. Therefore, it was necessary to add the 1/6 deferred payment amount to the actual expenditure (10 month) which then provided a twelve month expenditure level for each district. It was recognized that this approach assumed the same proportionate expenditure of the 1/6 revenue as of the 5/6 revenue, which might not have been the actual case in each district had the money been available. However, it was felt that this assumption was sound for this study because each district was treated in the same manner and because salaries represented approximately 80% - 85% in most school budgets and therefore this major portion of the 1/6 amount would be expended at exactly the same level as the 5/6 amount.

Another assumption required to treat all districts in an equal manner was that district revenue from the regular 14 mill levy and from special levies is collected at the ratio of 35% of the Fall collection (1965 tax year) and 65% of the Spring collection (1966 tax year). It was recognized that districts may experience an actual collection ratio differ-ent from the one being utilized. However, the Office of the State Superintendent of Public Instruction has found the 35% - 65% ratio to be average and uses the ratio for state calculations, estimates, and for distribution of state funds to school districts in the distribution formula.

III. Developing Programs for Computer Processing

Appendix B, Format of Data Received from the State Superintendent of Public Instruction and from the Washington State Tax Commission, is included to assist the reader in understanding the form of the collected data and the manipulation and formulation required to develop computer programs. Data from one school district is included in Appendix B. To show these data for all 278 districts in the study requires more space than is practical.

Sample data manipulation is shown for the basic formulae to determine A_i (state aid in a given district), A (total state aid distributed in 1965-66), R_i (total revenue available for expenditure in a given school district), and E_i' (total expenditure of funds less expenditures for transportation, lunchroom, abatements, community services, that portion of budget accounts 1300 and 1400 not attributed to per pupil costs, and funds for an ending cash balance).

Determination of A_i (total state aid entitled a given district) follows:

$$A_i = uN_i - rC_i - \sum_{j=1}^{6} R'_{ij} + \sum_{j=1}^{6} S_{ij}$$

where the indicated factors appear in Appendix B as:

1. u — $305.00 guarantee per pupil (established by State Board of Education)
2. N_i — p. 72, col. 9 (weighted enrollment)
3. uN_i — p. 72, col. 10 (guaranteed support)

4. r p. 73, col. 4 (required mill rate)
5. C_i p. 73, col. 2 and col. 3 (assessed value)
6. R'_{i1} p. 73, col. 9 (1% Real Estate Tax)
7. R'_{i2} p. 74, col. 2 and col. 3 (Public Law 874)
8. R'_{i3} p. 74, col. 4 (Federal Forest Funds)
9. R'_{i4} p. 74, col. 5 (Public Utility Districts)
10. R'_{i5} p. 73, col. 8 (In-lieu-of tax)
11. R'_{i6} p. 73, col. 7 (Non-high school receipts)
12. S_{i1} p. 83, col. 2 (Handicapped)
13. S_{i2} p. 81, col. H (Driver Education)
14. S_{i3} p. 83, col. 5 (Vocational-Technical)
15. S_{i4} p. 83, col. 3 (Adult Education)
16. S_{i5} p. 65, col. 9 (Transportation)
17. S_{i6} p. 83, col. 4 (Institutions)

To compute R_i (total revenue available for expenditure) the following steps were required:

$R_i = R_i^* + Ba_i^* + Dp - Wo$ where in a given district R_i^* is the total receipts received from July 1, 1965 to June 30, 1966; Ba_i^* is the ending cash balance as of June 30, 1965; Dp is the 1/6 (17%) deferred payment of state aid distributed in July and August of the 1966-67 school year for service rendered in the 1965-66 school year; and Wo are the warrants outstanding as of July 1, 1965 for 1964-65 expenditures. Three of these factors appear in Appendix B as:

1. $R_i^* + Ba_i^*$ p. 81, col. A

2. Wo p. 81, col. B

The deferred payment (Dp) was computed as: Dp = .17 $(A_i - S_{i2})$ where S_{i2} are the funds paid a given district for driver education at 6/6 (100%) value. Values for S_{i2} appear on p. 81, col. H of Appendix B.

The total funds available for expenditure in a given district for a twelve month period were computed as: $E_i'' = E_i''' + Dp$ where in a given district E_i'' is the total expenditure of funds for a twelve month period for the school year 1965-66; E_i''' is the total expenditure of funds for a ten month period for 1965-66. E_i''' data are obtained from pp. 45-53, col. 2, of Appendix B.

The ending cash balance (Ba_i) for a given district of unencumbered and unexpended funds as of June 30, 1966 was computed as: $Ba_i = R_i - E_i''$.

Lunchroom, abatements, community services, and that portion of accounts 1300 and 1400 not attributed to per pupil costs for a twelve month period (Lr) were calculated by the formula: $Lr = E_i'' - Nc$ where Nc is the net cost of school operation for a twelve month period in 1965-66 in a given district and is found on pp. 45-53, col. 3 of Appendix B.

Transportation expenses (T_i) for the twelve months in a given district were determined by: $T_i = T_i' + .17\ (T_i'')$ where T_i' is the cost of transportation service for ten months in a given district and is found on pp. 45-53, col. 6 of Appendix

B, and T_i'' is the total state transportation allotment for a given school district for a twelve month period and is found on p. 65, col. 9 of Appendix B.

The total expenditure in a given district for a twelve month period less expenditures for transportation, lunchroom, abatements, community services, that portion of accounts 1300 and 1400 not attributed to per pupil costs and funds for an ending cash balance (E_i') was computed by the formula:

$E_i' = R_i - Lr - T_i - Ba_i$.

To determine the amount of educational opportunity or expenditure per pupil in a district the computation $E_i' \div N_i$ was made.

Subsequent formulae in Tables II, V, and VI were determined by manipulating the data in a similar manner to the basic formula described on the preceding pages. Other $\underline{E_i}$ or $\underline{r_i - r}$ quantities for formulae f_2 through f_{15} in Table II, f_{16} through f_{30} in Table V, and f_{32} and f_{33} in Table VI were computed against f_1 in Table II, f_1 in Table V, and f_{31} in Table VI respectively for the correlation coefficient, standard deviation, mean difference and significance of variation by a t-test. Tables II, V, and VI indicate by symbol the known and unknown information required to compute $\underline{E_i}$ or $\underline{r_i - r}$.

IV. Summary

Research procedures were developed to accomplish the purpose of the study.

The purpose was to investigate the variation in educational opportunity in Washington State under certain hypothetical manners of distributing state grants-in-aid such as: (a) when factors in the state school distribution formula are eliminated or mixed in different predetermined and specified proportions and (b) when a given increase in state support is distributed under circumstances where local effort in relation to local ability to pay is used as a factor in the formula.

The objectives of the research were to: (a) identify those factors in the distribution formula which have the greatest influence on the variation of educational opportunity and (b) test the impact of including factors for local effort in relation to local ability to pay on the variation of educational opportunity. The objectives of the research were satisfied through the derivation of answers to three questions:

1. What factors in the 1965 distribution formula exert the greatest influence on the variation of educational opportunity among selected school districts in Washington State?

2. Will certain predetermined and specified mixes (combinations) of existing factors under certain hypothetical manners of distributing state grants-in-aid reduce the variation of educational

opportunity in the districts under study?

3. Can the variation of educational opportunity be reduced by introducing a factor for local effort in relation to local ability to pay and by applying this factor in various predetermined and specified ways in the distribution formula?

The three questions used to satisfy the objectives of the study served as the basis for the research design. In formulae designed to answer each question the factors in the Washington State distribution formula were manipulated either by deleting all or some of them, changing some of their values, or by introducing new factors which affect them. Tables II, V, and VI show by symbol the various formulae manipulation. A t-test for correlated data was used to determine the level of significance of variation in the standard deviation of educational opportunity for each formula tested. A significant decrease in variance indicated more equalization of educational opportunity.

A total of 278 school districts representing all sizes of districts in the State of Washington was considered in the study. For purpose of comparison between district sizes the data were compiled in eight groups with the base enrollment ranges shown in Table III.

From these enrollment groups districts were separated into non high school groups (Kindergarten or grade one up to grade nine) and into complete program school groups (Kindergarten or grade one through grade twelve) as shown in

Table IV.

Data were obtained from the Office of the Washington State Superintendent of Public Instruction and the Washington State Tax Commission. The data from the state superintendent were for a ten month period of operation which represented 5/6 of the total revenue and expenditures in school districts. Consequently, these data required readjustment in all formulations to the full 6/6 level.

The data as collected from the state superintendent are shown in Appendix B. Section III of Chapter III shows examples of data manipulation required to utilize it in the simulated formulae designed to answer questions 1, 2 and 3 in order to satisfy the objectives of the study.

CHAPTER IV

PRESENTATION AND INTERPRETATION OF DATA ANALYSIS AND FINDINGS

Data collected as a result of research procedures described in Chapter III are arranged according to the formulae shown in Tables II, V and VI respectively. All formulae were processed and analyzed. Only those formulae which produce a significant reduction in the variation of educational opportunity are presented and interpreted in detail.

Basic data for the study are included in Appendix C. These data include the guaranteed support level (u), mean per weighted pupil expenditure (M), standard deviation (σ), correlation (r), and t-test results (t) for all formulae and all enrollment groups. Only f_1, f_1 and f_{31} from Tables II, V and VI do not show r and t, for it is these formulae against which other formulae in the respective tables were tested.

I. Processing and Analyzing Data

Because all formulae (f_1 through f_{33}) had a majority of factors in common and because the population in the study was the same for each formula, the amount of state aid per district and the expenditure per weighted pupil per district in each formula were highly correlated. Therefore, a t-test

formula for correlated data (see footnote 9, Chapter III for formula source) was used to determine the level of significance of variation between standard deviations of educational opportunity when comparing formulae f_2 through f_{30} with f_1 and f_{32} and f_{33} with f_{31}.

Where differences between standard deviation of educational opportunity were found between a given set of formulae and f_1 or f_{31}, it would be expected that larger values of differences in standard deviation would yield larger probabilities that these differences did not occur by chance (i.e., reach a given level of significance). However, because of the nature of the t-test for correlated data, this does not always occur. An actual example of this situation better clarifies the point. The standard deviation for all 278 districts in f_1 is 106.08. For all 278 districts, the standard deviation in f_4 is 108.08 and in f_3 is 108.05. Although the value of the standard deviation in f_4 is greater than in f_3, the t-test result in f_4 is 1.66 (not a significant difference) and in f_3 is 3.68 (significantly different at the .01 confidence level). This apparent ambiguity is explained by the coefficient of correlation in each formula. The correlation in f_4 is .982 and in f_3 is .997. The effect of the correlation on the t-test can be seen by an analysis of the formula which follows:

$$t = \frac{(\sigma x^2 - \sigma y^2)\ \sqrt{n-2}}{\sqrt{4\ (\sigma x)^2(\sigma y)^2\ (1-r^2_{1-2})}}$$

Because the correlation (r) is in the denominator of the formula and because it is squared and subtracted from one, then the larger the r, as in f_3, the smaller the denominator and hence, the greater the t. Conversely, the smaller the r, as in f_4, the larger the denominator and hence, smaller the t. This means that small differences in the variance of highly correlated data is more likely to be significantly different (i.e., probably not due to chance) than small differences in less highly correlated data.

Table IV in Chapter III shows three categories of school districts: all districts, non-high school districts and complete program districts. These categories were used so that variations in expenditure per pupil could be studied for the district with complete programs (Kindergarten or first grade through grade twelve) and those districts that have elementary programs only. Each of these categories was then sub-divided into seven groups (B-H) by base enrollment for purposes of studying the differences among the districts of various sizes. Program costs vary and reflect district size and type of program offered.

Weighting factors employed by the State Superintendent of Public Instruction for computing the weighted enrollment were used in this study. Remote and necessary elementary

districts with enrollment of less than 100 pupils receive added weightings as do high school districts with enrollments of less than 250 pupils as shown in Appendix D. These weightings assist in increasing the per pupil expenditure between 50% and 100% in some extremely small districts in formulae where the guaranteed support level is substantially increased. The smaller district groups are affected by the weighting factor more than larger district groups.

The expenditure per weighted pupil increases sharply in districts with high wealth behind each pupil when the assessed valuation increases substantially as in formulae f_2, f_{12} and f_{14} in Table V. All groups have some high-assessed-valuation-per-weighted-pupil districts, but generally they fall in the smaller districts.

Table II Data

Table II formulae f_1 through f_{15} comprise the first phase of this statistical analysis of the 1965 Washington State school distribution formula. These formulae were designed to answer the question, "What factors in the 1965 distribution formula exert the greatest influence on the variation of educational opportunity among selected school districts in Washington State?" For reader convenience, Table VII summarizes the function of each formula f_1 through f_{15}. For a complete review of each formula, refer directly

TABLE VII

IDENTIFICATION OF FORMULA f_1 THROUGH f_{15}, TABLE II

Formula	Content*
f_1	Actual 1965-66 revenue and expenditure
f_2	1% county real estate transaction tax revenue
f_3	Public Law 874 funds
f_4	Federal Forest funds
f_5	Public utility district revenue
f_6	In-lieu-of tax revenue
f_7	Non-high school receipts
f_8	f_2 through f_7 combined
f_9	Handicapped funds
f_{10}	Driver education funds
f_{11}	Vocational-technical funds
f_{12}	Adult education funds
f_{13}	Transportation funds
f_{14}	Institutions and other state receipts
f_{15}	f_9 through f_{14} combined

*Formulae f_2 through f_{15} are variations of formula f_1 where the indicated factor is not deducted from the guaranteed support level as required by the 1965 state distribution formula and as deducted in formula f_1.

to Table II.

Table VIII shows a summary of the formulae which cause a significant variation in the standard deviation of educational opportunity when compared with f_1. A single and double asterisk in Table VIII represents a significant variation at the .05 and .01 confidence levels respectively. Asterisks in the negative column under each formula indicate a significantly reduced variation in the standard deviation of educational opportunity compared with f_1. Conversely, asterisks in the positive column under each formulae indicate a significantly increased variation in the standard deviation of educational opportunity when compared with f_1. For the purpose of this study, only those formulae which reduce the variation significantly (increase the equalization of educational opportunity) were interpreted in depth.

It should be noted that in all formulae applications f_2 through f_{15} the total state aid paid to all districts is held constant at the actual f_1 level. Therefore, as various factors (R'_{i1} through R'_{i6}) are eliminated as reductions from the guaranteed support level, more funds are distributed to those districts where the factors apply. This increased distribution to certain districts causes the guaranteed support level for all districts to be reduced. Consequently, in formulae f_2 through f_8 the guaranteed support level is from \$0.19 to \$23.48 per weighted pupil below that of f_1.

TABLE VIII

SIGNIFICANT VARIATION IN EDUCATIONAL OPPORTUNITY FOR ALL DISTRICTS IN GROUPS A THROUGH H RESULTING FROM FORMULAE f_1 - f_{15}

	f_1		f_2		f_3		f_4		f_5		f_6		f_7		f_8		f_9		f_{10}		f_{11}		f_{12}		f_{13}		f_{14}		f_{15}	
	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+
ALL DISTRICTS																														
A						**										**	**				**					**				
B						*	**									*	*		*		**						**		**	
C																	**													
D						**										**														
E				*		**										**											**		**	
F								**						*		**	**						*							
G						*																								
H			**		*				**		**						**		**		**		**				**			
NON-HIGH DISTS.																														
A											**								**		**		**			*	**			
F								**								**														
G																														
H									**		**						**		**		**		**				**			
COMPLETE PROGRAM																														
A				*		**		**						*		**	**				**						*		**	
B						*	**									*	*		*		**						**		**	
C																	**													
D						**										**														
E				*		**										**											**		**	
F								**						*		**	**						*							
G																														
H																														

* Significant at .05 level
** Significant at .01 level

− Less variation
\+ More variation

Conversely, in formulae f_9 through f_{15} where the additive factors (S_{i1} through S_{i6}) are eliminated from the formula the districts providing the special program receive less state aid. Therefore, more money is available for distribution to all districts and the guaranteed support level increases. The increase in guaranteed support over f_1 resulting from the application of formulae f_9 through f_{15} ranges from \$1.03 to \$37.27 per weighted pupil. As previously indicated, the data for each formula are recorded in Appendix C.

Formula f_1. Formula f_1 represented the actual revenue and expenditure of funds per weighted pupil in each district during the 1965-66 school year. The 1965 state distribution formula was used to allocate state funds. Formulae f_2 through f_{15} were compared with f_1.

Formula f_2. Formula f_2 determined the expenditure per weighted pupil in each school district when the 1% county real estate transaction tax revenue was not deducted from the guaranteed support level. The 1965 distribution formula required that revenue received by districts from the county tax source must be deducted from the guaranteed support level when computing the state grants-in-aid.

Through the application of formula f_2, the mean expenditure per weighted pupil (M) in the various groups decreased approximately one dollar in the larger school districts,

remained approximately the same in the medium size districts and increased sharply, approximately $26.00, in the smallest districts. No significant difference occurred through the application of f_2 except in Groups H and E in the All District category and Groups A and E in the Complete Program category. In Groups A and E, the variation in standard deviation was significantly greater at the .05 confidence level while in Group H the variation in standard deviation was significantly less at the .01 confidence level. With the variation in the majority of groups and categories either not significantly different or significantly greater, the equalization of educational opportunity decreased. Therefore, formula f_2 was not considered an improvement over f_1 and was rejected from further consideration.

Formula f_3. Formula f_3 determined the expenditure per weighted pupil in each school district when Public Law 874 funds were not deducted from the guaranteed support level as required in the 1965 distribution formula.

In Groups A through G, application of formula f_3 altered the range of the mean expenditure per weighted pupil (M) from a minus $.54 to a plus $1.02. In Group H, the M increased approximately $26.40. A significant difference occurred in Groups A, B, D, E, G and H in the categories indicated in Table VIII. No significant difference occurred in the remaining groups. The significant difference in

Groups A, D and E at the .01 level of confidence and Groups B and G at the .05 level of confidence indicated more variation in the standard deviation of educational opportunity and therefore a reduction in equalization of educational opportunity. In Group H, the variation was significantly less, at the .05 level of confidence, showing an increase in equalization of educational opportunity. These results mean that when no Public Law 874 revenue is deducted from the guaranteed support level in the distribution formula less equalization of educational opportunity results. Normally, by virtue of these results, formula f_3 would be considered not relevant to the study and be rejected for further consideration. However, due to results found in the application of formulae f_4, f_5, f_{17}, f_{18} and f_{19} the results of formula f_3 will be considered in greater depth later in this chapter.

Formula f_4. Formula f_4 determined the expenditure per weighted pupil in each school district when Federal Forest funds were not deducted from the guaranteed support level as required in the 1965 distribution formula.

The mean expenditure per weighted pupil (M) in Groups B through G remained at approximately the same level. In Group A, the M increased approximately $2.50 and in Group H, approximately $17.00. A significant variation in equalization of educational opportunity occurred in Groups B and F in the All District category, in Group F, the Non-high School

category and in Groups A, B and F in the Complete Program category.

In formula f_4, a greater number of significant variations indicated less equalization of educational opportunity. However, the variation in Group B indicated more equalization of educational opportunity. This apparent reversal in results could occur by chance because when a batch of tests for significance are run, one might be significant in the reverse direction by chance. Also, this apparent reversal in results could occur because Group B contained only the larger districts where few Federal Forest funds were received. Those that were received could narrow the variation in expenditure per weighted pupil.

Normally, with formula f_4 results, which indicate that by removing Federal Forest funds as deduction from the state distribution formula the equalization of educational opportunity is decreased, the formula would be rejected for further consideration. However, for the reason stated in the discussion of formula f_3, formula f_4 will also be considered in greater depth later in this chapter.

Formula f_5. Formula f_5 determined the expenditure per weighted pupil in each school district when public utility district revenue was not deducted from the guaranteed support level as required in the 1965 distribution formula.

The mean expenditure per weighted pupil (M) in Groups

B through G increased from no change to $.54. In Group A, it increased approximately $1.00 and in Group H approximately $27.00. No significant difference occurred through the application of f_5 except in Group H in the All District and Non-high School categories. In Group H, the variation in the standard deviation was significantly less at the .01 level of confidence. Therefore, in Group H equalization of educational opportunity increased. Group H districts being the only districts affected significantly, but not sufficiently to affect the significance of the total group in each category, formula f_5 would normally be rejected for further consideration. However, for the reason stated in formula f_3, formula f_5 will also be considered in greater depth later in this chapter.

Formula f_6. Formula f_6 determined the expenditure per weighted pupil in each school district when in-lieu-of tax revenue was not deducted from the guaranteed support level as required in the 1965 distribution formula.

The mean expenditure per weighted pupil (M) in Groups A through G remained approximately the same, while in Group H it increased approximately $27.00. A significant difference occurred only in Groups A and H in the categories indicated in Table VIII. In these groups, the variation in the standard deviation was significantly less at the .01 level of confidence, indicating greater equalization of educational

opportunity. Formula f_6 was considered relevant and will be considered in greater depth later in this chapter.

Formula f_7. Formula f_7 determined the expenditure per weighted pupil in each school district when non-high school receipts were not deducted from the guaranteed support level as required in the 1965 distribution formula.

The mean expenditure per weighted pupil (M) in Groups A through H varied less than $.65. A significant difference occurred only in Groups A and F in the categories indicated in Table VIII. In Groups A and F, the variation in the standard deviation was significantly more at the .05 level of confidence. Formula f_7 was rejected due to the decrease in the equalization of educational opportunity.

Formula f_8. Formula f_8 determined the expenditure per weighted pupil in each school district when the factors considered in formulae f_2 through f_7 in combination were not deducted from the guaranteed support level as required in the 1965 distribution formula.

The mean expenditure per weighted pupil (M) in Groups B through G varied less than $1.00, in Group A approximately $2.00 and in Group H approximately $16.00. A significant difference occurred in Groups A, B, D, E and F indicating a reduction in the equalization of educational opportunity. Therefore, formula f_8 was rejected from further consideration.

Formulae f_9, f_{10}, f_{11}, f_{12} and f_{14}. These formulae produced significantly reduced variations in the standard deviations of educational opportunity. These formulae determined the expenditure per weighted pupil in each school district when the special programs, handicapped education, driver education, vocational-technical education, adult education, and institutions respectively and individually were not financed by the state. Most of these variations, as indicated in Table VIII, were significant at the .01 level of confidence. The indicated reduction in standard deviations means that by removing these as state support programs, greater equalization of educational opportunity occurs. Consequently, these formulae were relevant to the study and will be given further consideration later in this chapter.

Formula f_{13}. Formula f_{13} determined the expenditure per weighted pupil in each school district when the transportation program was not financed by the state.

The mean expenditure per weighted pupil (M) in Groups B through G varied less than $2.50. Group H, however, increased approximately $38.00. It should be noted that the large increases in the mean expenditure per weighted pupil in Group H was due to all but one of the districts being elementary districts and the manner in which the guaranteed state support level (u) was computed. In these districts, u increased approximately $31.00 because state funds normally

distributed to some districts for transportation were redistributed. This increase in u, when multiplied by the substantial enrollment weighting factor for small elementary districts, increased the expenditure per weighted pupil sharply. Even with the large increase in u and E_i, the standard deviation did not vary significantly.

Group A in the All District and Non-high School Districts did experience a significant variation in the standard deviation of educational opportunity while all other groups showed no significant variation. As a result of these findings, formula f_{13} was rejected from further consideration.

Formula f_{15}. Formula f_{15} determined the expenditure per weighted pupil in each school district when the factors considered in formulae f_9 through f_{14} in combination were not included as state support for the special programs but instead those dollars were applied to the guaranteed support level.

The results produced significantly less variation at the .01 confidence level in the standard deviation of educational opportunity. Therefore, formula f_{15} provided greater equalization of educational opportunity. The formula will be considered in greater depth later in this chapter.

Table V Data

Table V formulae f_{16} through f_{30} comprised the second

phase of this statistical analysis of the 1965 Washington State school distribution formula. These formulae were designed to answer the question, "Will certain predetermined and specified mixes (combinations) of existing factors under certain hypothetical manners of distributing state grants-in-aid reduce the variation of educational opportunity in the districts under study?" For reader convenience, Table IX summarizes the function of each formulae f_{16} through f_{30}. For a complete review of each formula, refer directly to Table V.

Table X shows the formulae which cause a significant variation in the standard deviation of educational opportunity when compared with f_1. Asterisks used in Table X indicate the same results as those used in Table VIII and described previously in this chapter.

Formula f_1. Formula f_1 represented the actual revenue and expenditure of funds per weighted pupil in each district during the 1965-66 school year. The 1965 state distribution formula was used to allocate state funds. Formulae f_{16} through f_{30} were compared with f_1. Formulae f_{23}, f_{27} and f_{29} compared the special levy requirement with the special levy requirement in f_1. All other formulae compared the expenditure per weighted pupil with f_1. The same t-test for correlated data was used to test the variation in standard deviation for the special levy comparison as for the expenditure

TABLE IX

IDENTIFICATION OF FORMULAE f_{16} THROUGH f_{30}, TABLE V

Formula	Content
f_1	Actual distribution of State funds in 1965-66 school year
f_{16}	Actual with assessed valuation (C_i) adjusted to 50% and $\underline{u}$ held constant
f_{17}	Actual with Public Law 874 (R'_{i2}) adjusted to 85% reduction
f_{18}	Actual with Federal Forest funds (R'_{i3}) adjusted to 85% reduction
f_{19}	Actual with $\underline{R'_{i2}}$ and $\underline{R'_{i3}}$ adjusted to 85% reduction
f_{20}	Actual with guaranteed support (r) doubled to \$610.00 and special levy (r_i-r) eliminated
f_{21}	Actual with guaranteed support (u) increased by .5 to \$457.50
f_{22}	Actual with $\underline{r_i-r}$ increased by .5
f_{23}	Actual with guaranteed support (u) increased by .5 and $\underline{E_i}$ held constant to find effect on $\underline{r_i-r}$
f_{24}	Actual with $\underline{C_i}$ adjusted to 50% and regular levy (r) adjusted to 7 mills
f_{25}	Actual with $\underline{r_i-r}$ reduced by 50%
f_{26}	Actual with $\underline{C_i}$ adjusted to 50% and $\underline{r_i-r}$ reduced by 50% with $\underline{A}$ held constant to find effect on $\underline{E_i}$
f_{27}	Actual with $\underline{C_i}$ adjusted to 50% and total State aid (A) held constant to find effect on $\underline{r_i-r}$

TABLE IX (continued)

Formula	Content
f_{28}	Actual with C_i adjusted to 50% and r_i-r reduced by 50% with $\underline{u}$ held constant to find effect on $\underline{E_i}$
f_{29}	Actual with C_i adjusted to 50% and $\underline{u}$ held constant to find effect on $\underline{r_i-r}$
f_{30}	Actual with $\underline{u}$ adjusted by amount needed to eliminate all but 10% of the special levy districts

TABLE X

SIGNIFICANT VARIATION IN EDUCATIONAL OPPORTUNITY FOR ALL DISTRICTS IN GROUPS A THROUGH H RESULTING FROM FORMULAE f_{16}-f_{30}

	f_1		f_{16}		f_{17}		f_{18}		f_{19}		f_{20}		f_{21}		f_{22}		f_{23}		f_{24}		f_{25}		f_{26}		f_{27}		f_{28}		f_{29}		f_{30}	
	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	−	−	+	−	+	−	−
ALL DISTRICTS																																
A				**			**		**		**					**				**	**			**	**			**	**			
B				*				**				**				*				*								*	**			
C				**												**				**	*			*	**			*	**			**
D				**	*				*							**				**				*	**			*	**		**	
E				**					*							**				**									**			
F				**			*		*		**					**				**	**			**				**	**			**
G				**												*				**									**			*
H				**			**		**		**					**				**	**			**				**			**	
NON-HIGH DISTS.																																
A				**			**		**		**					**				**	**			**				**	**		**	
F				**																*				**				**	**		**	
G				**												**				**				*				*	**			
H				**			**		**		**					**				**	*			**				**			**	
COMPLETE PROGRAM																																
A				**			*		**							**				**	**			**	**			**	**			
B				*				**				**				*				*								*	**			
C				**												**				**	*			*	**			*	**			**
D				**	*				*							**				**				*	**			*	**		**	
E				**					*							**				**									**			
F				**			*		*		**					**				**	**			**				**	*			**
G																													**			**
H																																

* Significant at .05 level
** Significant at .01 level

− Less variation
+ More variation

per weighted pupil comparison.

Formula f_{16}. Formula f_{16} determined the expenditure per weighted pupil in each school district when the guaranteed support level (u) remains at $305.00, the total state aid (A) was variable, and the assessed valuation (C_i) was adjusted to 50% of true and fair value. The actual 1965 distribution formula utilized the assessed valuation determined by the county assessors as shown in Appendix E.

The mean expenditure per weighted pupil (M) in all groups increased from approximately $40.00 in Group F to $220.00 in Group H with an $84.00 average increase for all districts (278). Because the revenue from the regular 14 mill levy increased more than twice the actual amount and because this amount in the distribution formula was deducted from the guaranteed level when determining the state grant to districts, the state aid decreased sharply. Local revenue increased even more sharply in all special levy districts. Therefore, revenue available for expenditure increased and hence, the increase in expenditure per weighted pupil.

Table X indicates that all Groups A through H evidenced a significantly greater variation in the standard deviation of educational opportunity which means formula f_{16} produced a reduction in equalization of educational opportunity. This reduction was due to the greater dependency on local revenue which amplified the existing inequities caused

by variations in assessment level per pupil between and within counties.

Formula f_{16} was rejected for further consideration because it decreased rather than increased the equalization of educational opportunity.

Formula f_{17}. Formula f_{17} determined the expenditure per weighted pupil in each school district when the guaranteed support level (u) had to be determined, when the total state contribution to all school districts (A) was maintained at the actual 1965-66 level, and when 85% of Public Law 874 (R'_{i2}) funds was reduced from the guaranteed support level in determining the state grant per district. (The 1965 distribution formula deducted 40% of Public Law 874 funds from the guaranteed support level in determining the state grant per district.)

The mean expenditure per weighted pupil (M) in all district groups decreased between $4.00 and $8.00 for those districts collecting Public Law 874 funds the state support revenue decreased. Conversely, those districts not collecting these funds received more state support. However, the total funds available for expenditure by all districts decreased because most districts not receiving some Public Law 874 funds were the smaller districts. The decrease in revenue in the larger districts, therefore, offset the gains of the smaller districts.

As a result of formula f_{17} application, only Group D showed a significant variation in the standard deviation of educational opportunity at the .05 level of confidence Variation in all other groups was not significant. The variation in Group D, although directed toward greater equalization of educational opportunity; was not sufficiently conclusive to consider the results further. Of the twenty possible groups where significance could occur in Table X, it occurred in only two groups (Group D in all districts and Group D in complete program districts). Two of twenty possibilities or 10% could occur by chance. Therefore, formula f_{17} was rejected for further consideration.

Formula f_{18}. Formula f_{18} determined the expenditure per weighted pupil in each school district when the guaranteed support level (u) had to be determined, when the total state contribution to all school districts (A) was maintained at the actual 1965-66 level, and when 85% of Federal Forest funds (R'_{i3}) was reduced from the guaranteed support level in determining the state grant per district. (The 1965 distribution formula deducted 40% of Federal Forest funds from the guaranteed support level in determining the state grant per district.)

The mean expenditure per weighted pupil (M) in the Groups B through H tended to decrease more as the district size diminished; Group B districts reduced approximately

$1.00 per weighted pupil and Group H districts reduced approximately $12.00 per weighted pupil. Group A districts' (all 278 districts) mean expenditure per weighted pupil decreased approximately $6.00.

As a result of formula f_{18}, Groups A, B, F and H were found to vary significantly as shown in Table X. Groups A, F and H reflected greater equalization of educational opportunity while Group B reflected less equalization. The results derived from formula f_{18} were relevant to the study and will be pursued in greater depth later in this chapter.

Formula f_{19}. Formula f_{19} determined the expenditure per weighted pupil in each school district when the guaranteed support level (u) had to be determined, when the total state contribution to all school districts (A) was maintained at the actual 1965-66 level, and when 85% of Public Law 874 (R'_{i2}) funds and 85% of Federal Forest funds (R'_{i3}) was reduced from the guaranteed support level in determining the state grant per district.

Formula f_{19} reflected the combined results of formula f_{17} and f_{18}. The variation in the standard deviation of educational opportunity was significant in Groups A, D, E, F and H and indicated greater equalization of educational opportunity. As a result, formula f_{19} will be reviewed in greater depth later in this chapter.

Formula f_{20}. Formula f_{20} determined the expenditure per weighted pupil in each school district when the guaranteed support level (u) was doubled to $610.00, when the total state contribution to all school districts (A) had to be determined, and when all special levies (r_i-r) were eliminated.

The mean expenditure per weighted pupil (M) varied between an increase of $260.00 to $285.00 in all groups except Group B which increased only $198.00. The smaller increase in Group B was due mainly to the fact the larger districts were more dependent upon special levies which, when eliminated by f_{20}, caused the expenditure level to decrease.

As a result of formula f_{20}, Groups A, B, F and H were found to vary significantly as shown in Table X. Groups A, F and H reflected greater equalization of educational opportunity while Group B reflected less equalization. The results derived from formula f_{20} were relevant to the study and will be pursued in greater depth later in this chapter.

Formula f_{21}. Formula f_{21} determined the expenditure per weighted pupil in each school district when the guaranteed support level (u) was increased by 50% to $457.50, when the total state contribution to all school districts (A) had to be determined and when special levies remained as actually approved for the 1965-66 school year.

Through the application of formula f_{21}, the mean

expenditure per weighted pupil (M) increased in all Groups by exactly $152.50. Within each group, each school district's revenue increased by this same amount. Consequently, a perfect coefficient of correlation resulted (1.00) and the t-test equaled zero. Therefore, formula f_{21} was rejected for it caused no increase or decrease in the equalization of educational opportunity.

Formula f_{22}. Formula f_{22} determined the expenditure per weighted pupil in each school district when all factors were held constant except the special levy (r_i-r) which was increased by 50%.

The mean expenditure per weighted pupil (M) in all groups increased with the least increase, approximately $9.00, occurring in Group E and the greatest increase, approximately $30.00, occurring in Group B. The largest and smallest districts' expenditures increased the most when formula f_{22} was utilized, which suggests these districts depended more heavily on special levies as a means of obtaining revenue.

All groups experienced a significant variation in the standard deviation of educational opportunity. In each group, the standard deviation was greater than f_1 and reflected a decrease in equalization of educational opportunity. Therefore, formula f_{22} was rejected for further consideration.

Formula f_{23}. Formula f_{23} determined the number of mills required in special levy school districts, when the guaranteed support level (u) was increased by 50% to $457.50, when the total state contribution to all school districts (A) had to be determined, and when the expenditure per weighted pupil in each district (E_i) was held constant. The variation in the standard deviation of special levy mills was compared with f_1 to determine the significance of the variation.

No standard deviation or t-test results were evident due to the application of formula f_{23}, because with the application of 1.5 $\underline{u}$ and the holding of the per weighted pupil expenditure at the f_1 level, all special levies were eliminated. This formula demonstrated how, through the application of a sufficiently large guaranteed support level, special levies can be eliminated and the same programs provided by local districts.

Because formula f_{23} was not designed to measure the difference in educational opportunity, it was not intended to be considered further in the study.

Formula f_{24}. Formula f_{24} determined the expenditure per weighted pupil in each school district when the guaranteed support level (u) had to be determined, when the total state contribution to all school districts (A) was maintained at the actual 1965-66 level, when the assessed valuation (C_i) was adjusted to 50% of true and fair value, and when the

regular 14 mill levy (r) was reduced to 7 mills.

The mean expenditure per weighted pupil (M) increased from $44.00 in Group E to $187.00 in Group H with the average of all groups (Group A) increasing $72.00. Group B increased $103.00. From these increases, it was evident that the large districts and some very small districts, being more dependent upon special levies or very sensitive to increased assessed valuation, received a substantial increase in revenue from formula f_{24}. With the assessed value increased to 50% and the regular millage reduced by 50%, districts did derive more funds from the regular levy, especially those districts where the assessed valuation was less than 25% of true and fair value. (Many small districts received more than the guaranteed support level). These funds were deducted from the guaranteed support level, and would mean that without a special levy and without a relatively high assessed valuation per pupil, districts would maintain about the same level of revenue as in formula f_1. However, for special levy districts, the revenue would increase (due to the increased assessment) two to three times, depending upon the county assessment ratio.

Because the special levy influenced the revenue for expenditure in f_{24}, all groups evidenced a significant variation in the standard deviation of educational opportunity as shown in Table X. The standard deviation was greater due to

the amplification of the previously referred to inequities of special levy and hence, the equalization of educational opportunity decreased. Therefore, formula f_{24} was rejected for further consideration.

Formula f_{25}. Formula f_{25} determined the expenditure per weighted pupil in each school district when the guaranteed support level (u) was held constant at $305.00 and when the special levy (r_i-r) was reduced by 50%.

The mean expenditure per weighted pupil (M) decreased from $8.00 in Group E to $30.00 in Group B and $16.00 in Groups C and H. Again, the districts with special levies were influenced the greatest by formula f_{25}. Groups A, C, F and H indicated a significant variation in the standard deviation of educational opportunity as shown in Table X. The standard deviation was reduced and hence, the equalization of educational opportunity increased. Therefore, formula f_{25} was relevant to the study and will be considered in greater depth later in this chapter.

Formula f_{26}. Formula f_{26} determined the expenditure per weighted pupil in each school district when the guaranteed support level (u) had to be determined, when the total state contribution to all school districts (A) was maintained at the actual 1965-66 level, when the assessed valuation (C_i) was adjusted to 50% of true and fair value, and when the

special levy (r_i-r) was reduced by 50%.

The mean expenditure per weighted pupil (M) increased in all groups from a minimum of $87.00 in Group C to a maximum of $506.00 in Group H with an overall average in Group H of $166.00. Here again, special levies influenced the results substantially although the results were also influenced in the regular and special levies by the increase in assessed valuation. The increase in the assessed valuation of 2 to 3 times, depending upon the county assessment ratio, raised the revenue in some districts, particularly the smaller ones, to the point where no state aid was received.

Groups A, C, D, F, G and H indicated a significant variation in the standard deviation of educational opportunity as shown in Table X. The increase in standard deviation indicated a reduction in the equalization of educational opportunity. Therefore, f_{26} was rejected for further consideration.

Formula f_{27}. Formula f_{27} determined the number of mills required in special levy districts when the guaranteed support level (u) had to be determined, when the total state contribution to all school districts (A) was maintained at the actual 1965-66 level, when the assessed valuation (C_i) was increased to 50% of true and fair value and when the expenditure per weighted pupil was held constant at the f_1 level. The variation in the standard deviation of special

levy mills was compared with f_1 to determine the significance of the variation.

These levies were reduced sufficiently to cause a significant reduction in the standard deviation of the mean of the special levies in Groups A, C and D. Although these results do not deal with the expenditure per weighted pupil they will be briefly discussed later in this chapter.

Formula f_{28}. Formula f_{28} determined the expenditure per weighted pupil in each school district when the guaranteed support level (u) was held constant, when the total state contribution to all school districts (A) had to be determined, when the assessed valuation (C_i) was increased to 50% of true and fair value, and when the special levy (r_i-r) was reduced by 50%.

The mean expenditure per weighted pupil (M) in all groups increased with the least increase, approximately $19.00, occurring in Group C and the greatest increase, approximately $171.00, occurring in Group H with the increase for all groups combined being $57.00 as shown in Table X.

A significantly large variation in educational opportunity was found. Therefore, formula f_{28} was rejected from further consideration. Here again, the assessment level influenced the regular levy and the remaining special levy to the point where the inequities of assessment still caused significantly large variations.

Formula f_{29}. Formula f_{29} determined the number of mills required in special levy districts when the guaranteed support level (u) was held constant, when the total state contribution to all school districts (A) had to be determined, when the assessed valuation (C_i) was increased to 50% of true and fair value, and when the expenditure per weighted pupil (E_i) was held constant at the f_1 level. The variation in the standard deviation of special levy mills was compared with f_1 to determine the significance of the variation.

As in formula f_{27}, the levies were reduced sufficiently to cause a significant reduction in the standard deviation of the mean of the special levies in all Groups that still have special levies after they are reduced. Formula f_{29} will be briefly discussed later in this chapter.

Formula f_{30}. Formula f_{30} determined the expenditure per weighted pupil in each school district when the guaranteed support level (u) was increased to $389.50, the amount necessary to eliminate all but 10% of the special levies, when the total state contribution to all school districts (A) had to be determined, and when the special levies in the remaining 10% of the districts were reduced by $84.50 per pupil, the amount added to the $305.00 u in f_1.

The mean expenditure per weighted pupil in all groups varied from a reduction of $26.00 in Group B to an addition of $3.00 in Group F with the average reduction for all

districts being $16.00. A significant variation at the .01 confidence level was found in Groups A, C, D, F, G and H with Groups A, D, F and H showing a reduction in standard deviation variance and with C, F and G showing an increase as indicated in Table X.

Because formula f_{30} had conflicting results as far as significance was concerned, the formula will be examined further later in this chapter.

Table VI Data

Table VI formulae f_{31} through f_{33} comprised the third phase of this statistical analysis of the 1965 Washington State school distribution formula. These formulae were designed to answer the question, "Can the variation of educational opportunity be reduced by introducing a factor for local effort in relation to local ability to pay and by applying this factor in various predetermined and specified ways in the distribution formula?" For reader convenience, Table XI summarizes the function of each formula f_{31} through f_{33}. For a complete review of each formula, refer directly to Table VI.

Table XII shows the formulae which cause a significant variation in the standard deviation of educational opportunity when compared with f_{31}. Asterisks used in Table XII indicate the same results as those used in Table VIII and

TABLE XI

IDENTIFICATION OF FORMULAE f_{31} THROUGH f_{33}, TABLE VI

Formula	Content*
f_{31}	Guaranteed support level (u) increased $100.00
f_{32}	Guaranteed support level (u) increased $50.00, matching funds (u') increased equivalent of $50.00 per weighted pupil in all districts, and total state support (A) held at f_{31} level
f_{33}	Guaranteed support level (u) increased $70.00, matching funds (u') increased equivalent of $30.00 per weighted pupil in all districts, and total state support (A) held at f_{31} level

*Formulae f_{31} through f_{33} vary from formula f_1, the actual 1965-66 school year distribution formula, as indicated.

TABLE XII

SIGNIFICANT VARIATION IN EDUCATIONAL OPPORTUNITY FOR ALL DISTRICTS IN GROUPS A THROUGH H RESULTING FROM FORMULAE f_{31} - f_{33}

	f_{31}		f_{32}		f_{33}	
	−	+	−	+	−	+
ALL DISTRICTS						
A				**		*
B						
C				**		**
D				**		**
E				**		**
F				**		**
G				**		*
H						
NON-HIGH DISTS.						
A						
F				*		
G				**		*
H						
COMPLETE PROGRAM						
A				**		**
B						
C				**		**
D				**		**
E				**		*
F				**		**
G						
H						

* Significant at .05 level
** Significant at .01 level
− Less variation
\+ More variation

described previously in this chapter.

Formula f_{31}. Formula f_{31} represented the actual revenue and expenditure of funds per weighted pupil in each district during the 1965-66 school year plus additional state money in the amount of $100.00 per weighted pupil (u = $405.00). As proved in formula f_{21}, adding additional guaranteed support funds did not alter the order of districts. Consequently, f_{31} correlated perfectly with f_1. Therefore, f_{32} and f_{33} could be tested against f_{31}.

Formula f_{32}. Formula f_{32} determined the expenditure per weighted pupil in each school district when the guaranteed support level (u) was increased $50.00 per weighted pupil (u = $355.00), when the equivalent of $50.00 per weighted pupil was allocated for special levy matching purposes (u'), and when the total state support (A) was held constant at the f_{31} level.

Application of formula f_{32} altered the mean expenditure per weighted pupil (M) from a $6.00 increase in Group B to a $27.00 decrease in Group A. All groups except B and H experienced a significantly increased variation in the standard deviation of educational opportunity as indicated in Table XII. In Groups B and H, there was no significant difference.

The result from the application of formula f_{32} was a

decrease in the equalization of educational opportunity and, therefore, the formula was rejected from further consideration.

Formula f_{33}. Formula f_{33} determined the expenditure per weighted pupil in each school district when the guaranteed support level (u) was increased $70.00 per weighted pupil (u = $375.00), when the equivalent of $30.00 per weighted pupil was allocated for special levy matching purposes (u'), and when the total state support (A) was held constant at the f_{31} level.

Application of formula f_{33} altered the mean expenditure per weighted pupil (M) from a $4.00 increase in Group B to a $16.00 decrease in Group A. All groups except B and H experienced a significantly increased variation in the standard deviation of educational opportunity as indicated in Table XII. In Groups B and H, there was no significant difference.

The result from the application of formula f_{33} was a decrease in the equalization of educational opportunity and, therefore, the formula was rejected from further consideration. Although formulae f_{31} through f_{33} were rejected for further consideration, the concept of the state matching excess mill levies will be discussed later in this chapter.

II. Presenting and Interpreting Findings

Only formulae which significantly produce greater equalization of educational opportunity or which do not produce significant results but which contribute to the interpretation of those formula which were significant are presented and interpreted in depth in the remainder of this chapter. Those formulae include f_3, f_4, f_5, f_6, f_9, f_{10}, f_{11}, f_{12}, f_{14} and f_{15} in Table II, f_{18}, f_{19}, f_{20}, f_{25}, f_{27}, f_{29} and f_{30} in Table V. The concept set forth in Table VI will also be discussed. All other formulae either produced no significant difference, a significant difference in the direction of less equalization of educational opportunity, or did not contribute to the interpretation and therefore were rejected from further consideration and discussion.

Table II Formulae

Table II formulae which significantly produced greater equalization of educational opportunity alter the 1965 distribution formula only to the extent that a specific factor was deleted from the distribution formula while the total state aid to all districts was maintained at the actual level for the 1965-66 school year. By holding the total state aid (A) constant, the guaranteed support level (u) was recomputed which in turn affected the expenditure per weighted pupil in each district.

To better understand the effect of deleting factors from the 1965 state distribution formula, a review of the formula is helpful. The formula for total state grants-in-aid follows:

$$A = \sum_{i=1}^{k} A_{ik} = \sum_{i=1}^{k} \left(uN_i - rC_i - \sum_{j=1}^{6} R'_{ij} + \sum_{j=1}^{6} S_{ij} \right)$$

where A is the total grants-in-aid paid by the state to all districts; A_i is the state grants-in-aid distributed to a given district including flat grants and equalization grants; u is the guaranteed support level; N_i is the number of weighted pupils in a given district; r is the regular school millage rate (required mill rate); C_i is the assessed value of a given district as determined by the county assessor; R'_{ij}, where j=1,...6, are the receipts from the following sources: R'_{i1} = 1% county real estate transaction tax, R'_{i2} = that portion of Public Law 874 funds which are required deductions, R'_{i3} = that portion of Federal Forest funds which are required deductions, R'_{i4} = public utility district revenue, R'_{i5} = in-lieu-of tax revenue, and R'_{i6} = non-high receipts; S_{ij}, where j=1,...6, are other state receipts for special programs from the following sources: S_{i1} = handicapped program, S_{i2} = driver education, S_{i3} = vocational-technical programs, S_{i4} = adult education, S_{i5} = transportation, S_{i6} = institutions; and k is the number of districts in the sample for any group or category.

When the total state support (A) was held constant, the effect on the guaranteed support level (u) by deleting any one of the R_i''s was opposite to the effect when one of the S_i's was deleted. When an R_i was deleted, districts with revenue from this source received more state aid because the amount of the source was not deducted from the guaranteed support level. With more state money distributed to these receiving districts, the u had to be reduced in order to maintain A constant. Conversely, when an S_i was deleted, districts with these special programs would receive less state money and the u would rise to utilize all the state grant.

Table XIII compares the guaranteed support level between significant formulae in Table II in all groups. The Table shows the situation described above in that f_6 represents R_{i5}' (in-lieu-of tax revenue). In this case, the u is lower than f_1 except in Group H. The remaining formulae represent the S_i (special programs). In these formulae, u is greater than or equal to u in f_1. One exception under f_6 is noted. The exception is in the Group H districts which are all, except one, elementary districts. All base line data from the office of the State Superintendent were processed in precisely the same manner. Yet, the exception exists in Group H. This exception can not be interpreted from available data.

TABLE XIII

COMPARISON OF GUARANTEED SUPPORT LEVEL BETWEEN SIGNIFICANT FORMULAE IN TABLE II IN ALL GROUPS AND CATEGORIES

Group	Guaranteed Support Level							
	f_1	f_6	f_9	f_{10}	f_{11}	f_{12}	f_{14}	f_{15}
All Districts								
A	305.00	304.81	316.80	306.19	312.24	306.03	307.09	342.27
B	305.00	304.49	319.19	306.12	319.42	306.13	305.52	344.07
C	305.00	304.77	316.87	306.02	308.82	306.18	305.00	336.36
D	305.00	304.98	314.35	306.28	305.00	305.75	306.12	337.83
E	305.00	304.96	312.48	306.02	305.00	305.37	315.90	349.36
F	305.00	304.92	312.68	305.94	305.00	305.30	307.62	347.85
G	305.00	304.71	313.08	305.00	305.00	305.00	305.00	344.37
H	305.00	334.33	341.95	334.33	334.33	334.33	334.33	403.92
Non-high School								
A	305.00	309.17	319.25	309.39	309.29	309.32	309.29	353.90
F	305.00	304.90	314.57	305.26	305.00	305.07	305.00	347.74

TABLE XIII (continued)

Group	Guaranteed Support Level							
	f_1	f_6	f_9	f_{10}	f_{11}	f_{12}	f_{14}	f_{15}
G	305.00	304.54	315.30	305.00	305.00	305.00	305.00	347.88
H	305.00	332.51	340.21	332.51	332.51	332.51	332.51	403.33
Complete Program								
A	305.00	304.72	316.75	306.13	312.30	305.96	307.05	342.02
B	305.00	304.49	319.19	306.12	319.42	306.13	305.52	344.07
C	305.00	304.77	316.87	306.02	308.82	306.18	305.00	336.36
D	305.00	304.98	314.29	306.31	305.00	305.76	306.15	337.78
E	305.00	304.96	312.42	306.04	305.00	305.38	316.15	349.70
F	305.00	304.92	312.45	306.02	305.00	305.33	307.94	347.86
G	305.00	305.00	309.31	305.00	305.00	305.00	305.00	338.42

Before further examining each formula which produced significantly reduced variation in the standard deviation of educational opportunity, attention is called to Table XIV which compares the mean expenditure per weighted pupil between significant formulae in Table II in all groups and categories and Table XV which compares the standard deviation of educational opportunity between significant formulae in Table II in all groups and categories. These tables contain data which will assist the reader in interpreting the formulae under review.

Formula f_6. Formula f_6, where in-lieu-of tax revenue was not deleted from the guaranteed support level produced significantly less variation in the Non-high School category and in Group H in the All District category. This variation may be attributed to the greater value of $\underline{u}$ in Group H compared to the other groups. From the greater $\underline{u}$, a greater increase in expenditure per weighted pupil resulted. This increase caused the differences in expenditure per weighted pupil to be less varied and hence, the greater equalization of educational opportunity.

Formula f_9. Formula f_9, where handicapped program funds were deleted as payment by the state, produced significantly less variation in Groups A, B, C, F and H. In all of these groups, the expenditure per weighted pupil increased.

TABLE XIV

COMPARISON OF MEAN EXPENDITURE PER WEIGHTED PUPIL BETWEEN SIGNIFICANT FORMULAE IN TABLE II IN ALL GROUPS AND CATEGORIES

Group	Mean Expenditure Per Weighted Pupil							
	f_1	f_6	f_9	f_{10}	f_{11}	f_{12}	f_{14}	f_{15}
All Districts								
A	417.71	417.62	421.12	417.97	424.07	418.31	417.02	413.52
B	449.52	449.46	450.44	449.29	453.67	449.47	449.61	452.61
C	415.70	415.71	415.95	415.48	415.72	415.73	415.70	416.02
D	387.15	387.15	387.14	386.86	387.15	387.05	386.78	386.24
E	396.78	396.79	396.93	396.52	396.78	396.76	395.59	395.32
F	415.59	415.63	415.69	415.50	415.59	415.64	416.01	415.75
G	396.09	396.06	395.69	396.09	396.09	396.09	396.09	398.87
H	465.63	492.40	493.31	492.40	492.40	492.40	492.40	503.90
Non-high School								
A	431.54	435.62	437.47	435.68	435.63	435.65	435.63	433.00
F	399.42	399.52	399.07	399.42	399.42	399.44	399.42	397.50

TABLE XIV (continued)

Group	Mean Expenditure Per Weighted Pupil							
	f_1	f_6	f_9	f_{10}	f_{11}	f_{12}	f_{14}	f_{15}
G	384.92	384.83	385.00	384.92	384.92	384.92	384.92	385.46
H	456.77	482.89	483.98	482.89	482.89	482.89	482.89	495.92
Complete Program								
A	411.82	411.64	415.13	411.67	418.02	412.20	409.96	409.32
B	449.52	449.46	450.44	449.29	453.67	449.47	449.61	452.61
C	415.70	415.71	415.95	415.48	415.72	415.73	415.70	416.02
D	387.04	387.03	387.03	386.74	387.04	386.92	386.66	386.12
E	397.20	397.22	397.37	396.93	397.20	397.19	395.96	395.68
F	418.65	418.62	418.97	418.49	418.65	418.69	418.98	419.19
G	421.63	421.63	421.44	421.63	421.63	421.63	421.63	421.74

TABLE XV

COMPARISON OF STANDARD DEVIATION OF EDUCATIONAL OPPORTUNITY BETWEEN SIGNIFICANT FORMULAE IN TABLE II IN ALL GROUPS AND CATEGORIES WITH SIGNIFICANT LEVELS INDICATED

Group	Standard Deviation							
	f_1	f_6	f_9	f_{10}	f_{11}	f_{12}	f_{14}	f_{15}
All Districts								
A	106.08	106.08	104.64 --	106.08	105.14 --	105.98	104.18 --	109.65 --
B	44.70	44.76	40.82 -	44.44 -	35.03 --	44.01	42.60	27.80
C	33.82	33.89	30.47 --	33.97	33.22	33.49	33.82	28.41
D	50.21	50.20	49.86	50.18	50.20	50.44	48.52	48.64
E	56.08	56.09	55.69	55.93	56.08	56.04	31.66 --	31.43 --
F	88.43	88.39	86.79 --	88.51	88.43	88.29 -	86.31	85.68
G	60.28	60.07	61.53	60.28	60.28	60.28	60.28	65.19
H	189.90	183.80 --	187.17 --	183.80 --	183.80 --	183.80 --	183.80 --	184.97
Non-high School								
A	148.29	147.67 --	146.66	147.72 --	147.71 --	147.71 --	147.71 --	160.02

TABLE XV (continued)

Group	Standard Deviation							
	f_1	f_6	f_9	f_{10}	f_{11}	f_{12}	f_{14}	f_{15}
F	47.72	47.54	47.35	47.86	47.72	47.74	47.72	46.53
G	50.46	50.19	50.53	50.46	50.46	50.46	50.46	52.99
H	180.78	177.15 --	175.66 --	177.15 --	177.15 --	177.15 --	177.15 --	179.01
Complete Program								
A	81.03	81.06	79.43 --	81.06	79.98 --	80.92	77.36 -	75.24 --
B	44.70	44.76	40.82 -	44.44 -	35.03 --	44.01	42.60 --	27.80 --
C	33.82	33.89	30.47 --	33.97	33.22	33.49	33.82	28.41
D	50.79	50.79	50.45	50.77	50.79	51.02	49.09	49.22
E	56.73	56.74	56.31	56.59	56.73	56.69	32.05 --	31.83 --
F	93.86	93.84	91.96 --	93.97	93.86	93.71 -	91.57	90.81
G	71.97	71.97	73.15	71.97	71.97	71.97	71.97	78.04

- Significantly less variation at .05 level

-- Significantly less variation at .01 level

The increase was not large, for the total funds distributed for the handicapped program were not large by comparison with the total state funds granted for all programs.

Interpreting the results of formula f_9 indicated that the present state distribution formula was fulfilling the job for which it was intended. The handicapped program is a special program offered by certain districts for students requiring these services. Some districts offer their programs for neighboring districts. Handicapped programs are more expensive to operate and for this reason students attending these classes are weighted more than those in regular classes. With additional state funds offered to handicapped program districts, it was assumed that the variation in expenditure per weighted pupil should be greater. Formula f_9 verified this assumption. By removing the handicapped funds from the distribution formula, less variation in the standard deviation of expenditure per weighted pupil (greater equalization of educational opportunity) resulted. Although significance was indicated in groups of varying sizes, the larger districts in Groups B and C exercised the greater influence over Group A as noted in the Complete Program category. This too was expected, since the larger districts tended to offer more handicapped programs to more students.

Formula f_{10}. Formula f_{10}, where driver education

program funds were deleted from the state distribution formula, produced significantly less variation in the standard deviation of educational opportunity in Groups B and H.

For reasons established in the discussion of formula f_9, it would be expected that f_{10} would produce a significant difference in more groups. Driver education, however, is a relatively new program and was not offered in many districts in the 1965-66 school year. Those districts offering it offered a relatively modest program. Consequently, in most groups, the removal of these funds from state support did not appreciably alter the mean expenditure per weighted pupil or the guaranteed support level as shown in Tables XIV and XIII respectively. Therefore, the variation was not significant. In Group B, however, larger driver education programs were offered and their removal from state support had the same impact on Group B as discussed in formula f_9.

Formula f_{11}. Formula f_{11}, where vocational-technical funds were deleted from the state distribution formula, produced the same result as f_{10}. Group B districts again reflected significantly less variation in the standard deviation of expenditure per weighted pupil. The influence of Group B tended to affect Group A and made a significant variation, also. These results indicated Group B districts as a whole offered more vocational-technical programs than other groups of districts as a whole.

Formula f_{12}. Formula f_{12}, where adult education funds were deleted from the state distribution formula, indicated a tendency to reduce the variation in the standard deviation of educational opportunity significantly. In this instance, the tendency originated from the Group F districts. The influence of Group F was not sufficiently great to affect Group A significantly. Other groups, as shown in Table XV, evidenced a reduction in standard deviation but not enough to make a significant difference.

Formula f_{14}. Formula f_{14} eliminated state support of funds for institutions and other state receipts. As a result of f_{14} application, a significant variation in the standard deviation of educational opportunity was noted in Groups B, E and H. When non-high school districts were eliminated, the significance was also noted in Group A as shown in the Complete Program category. Only a relatively few districts received funds for staffing and conducting school programs in state institutions. Therefore, where these programs did occur, the elimination of support funds for them tended to reduce the variation in the standard deviation of educational opportunity.

Formula f_{15}. Formula f_{15} eliminated collectively from state support all the special programs eliminated singularly in formulae f_9 through f_{14}. Due to the influence of one

program on the other, the results of significance in f_{15} were not necessarily the cumulation of f_9 through f_{14}. Only Groups B and E showed a significant variation in the All District category while Group A was also significant in the Complete Program category.

The purpose of Table II formulae was to answer the question, "What factors currently utilized in the distribution formula exert the greatest influence on the variation of educational opportunity among selected school districts in Washington State?" The factors which, when eliminated from the formula, caused the greatest influence on the variation in a direction where greater equalization of educational opportunity is achieved were: (1) in-lieu-of tax revenue, (2) handicapped programs, (3) driver education programs, (4) vocational-technical programs, (5) adult education programs and (6) institution programs. With the exception of in-lieu-of tax revenue, these were all special programs which, when included in the distribution formula, provided more categorical state aid to some districts and therefore, reduced the guaranteed support to all districts when the total state aid was held constant. Reduced general state aid reduced the expenditure per weighted pupil. Under these conditions, this reduction in general aid supported the intent of the 1965 distribution formula. Special programs cost more to operate and should receive additional state

help. This special aid caused greater variation in expenditure per weighted pupil.

Conversely, formulae f_2, f_3 and f_4 (1% county real estate transaction tax, Public Law 874 and Federal Forest funds) showed a significantly greater variation in educational opportunity. These results also verified that the 1965-66 distribution formula did accomplish its intent. When districts did not, for example, deduct the required portion of Public Law 874 funds, those districts derived an advantage over other districts, which was reflected in a decrease in the equalization of educational opportunity.

Table V Formulae

Each Table V formula, which significantly produced greater equalization of educational opportunity, altered the total district revenue.

To better understand how various formula application affect the expenditure per weighted pupil, the basic formula for district expenditure follows:

$$E_i' = A_i + (r_i - r)\, C_i + R_i'' + F_i + S_i' + rC_i - D_i$$

where in a given district E_i' is the total expenditure of funds less expenditures for transportation, lunchroom, abatements, community services, and that portion of budget accounts 1300 and 1400 not attributed to per pupil costs as determined from district reports to the State Superintendent

for the 1965-66 school year; A_i is the state grants-in-aid; (r_i-r) is the special levy mill rate; C_i is the assessed value as determined by the county assessor; R_i'' is the total revenue from Public Law 874; F_i is the total revenue from Federal Forest funds; S_i' is all other revenue sources such as other federal funds and other revenue as indicated in budget accounts 60, 70, 80 and 90; r is the required mill rate; and D_i is all expenditures for transportation, lunch-room, abatements, community services, and that portion of budget accounts 1300 and 1400 not attributed to per pupil costs.

Educational opportunity (expenditure per weighted pupil) was determined by dividing E_i' by N_i, where N_i is the total number of weighted pupils in a given district.

Formulae f_{18}, f_{19}, f_{20}, f_{25} and f_{30} all indicated significantly less variation in the standard deviation of expenditure per weighted pupil, while formulae f_{27} and f_{29} indicated significantly less variation in the standard deviation of millage.

To assist the reader in interpreting the formula under review, Tables XVI and XVII are presented. Table XVI compares the mean expenditure per weighted pupil between significant formulae in Table V in all groups and categories. Table XVII compares the standard deviation of educational opportunity between significant formulae in Table V in all

TABLE XVI

COMPARISON OF MEAN EXPENDITURE PER WEIGHTED PUPIL BETWEEN SIGNIFICANT FORMULAE IN TABLE V IN ALL GROUPS AND CATEGORIES

Group	Mean Expenditure Per Weighted Pupil					
	f_1	f_{18}	f_{19}	f_{20}	f_{25}	f_{30}
All Districts						
A	417.71	411.85	406.17	692.82	405.13	401.94
B	449.52	449.06	443.53	647.99	419.54	423.52
C	415.70	414.77	407.25	689.11	399.90	399.12
D	387.15	385.87	378.02	669.45	375.80	374.24
E	396.78	393.88	388.79	684.72	388.25	388.62
F	415.59	407.90	402.30	700.36	405.48	418.93
G	396.09	391.32	387.53	676.39	383.74	372.04
H	465.63	453.20	448.57	724.66	449.90	442.01
Non-high School						
A	431.54	420.97	416.99	706.08	420.08	405.14
F	399.42	386.38	382.40	689.94	392.18	383.24

TABLE XVI (continued)

Group	Mean Expenditure Per Weighted Pupil					
	f_1	f_{18}	f_{19}	f_{20}	f_{25}	f_{30}
G	384.92	382.13	380.63	665.71	372.81	374.22
H	456.77	444.10	439.37	724.56	444.30	442.01
Complete Program						
A	411.82	407.96	401.56	687.18	398.76	401.15
B	449.52	449.06	443.53	647.99	419.54	423.52
C	415.70	414.77	407.25	689.11	399.90	399.12
D	387.04	385.75	377.95	669.76	375.90	374.37
E	397.20	394.31	389.08	684.71	388.46	388.62
F	418.65	411.97	406.07	702.33	407.99	423.85
G	421.63	412.32	403.30	700.81	408.72	363.29

TABLE XVII

COMPARISON OF STANDARD DEVIATION OF EDUCATIONAL OPPORTUNITY BETWEEN SIGNIFICANT FORMULAE IN TABLE V IN ALL GROUPS AND CATEGORIES

Group	Standard Deviation					
	f_1	f_{18}	f_{19}	f_{20}	f_{25}	f_{30}
All Districts						
A	106.08	98.42 --	97.50 --	90.30 --	97.02 --	82.15 --
B	44.63	45.08 ++	39.56	154.29 ++	39.86	43.36
C	33.82	34.52	33.94 -	26.55	26.98 -	42.69 ++
D	50.20	50.32	45.42 -	46.84	46.21	34.47 --
E	56.08	54.75 -	51.33 -	53.43 --	53.41 --	56.25 ++
F	88.43	82.34	81.40	79.03	82.76	113.32 +
G	60.28	61.94 --	59.49 --	56.44 --	55.59 --	68.74 -
H	189.90	173.90	174.14	140.12	171.95	115.48
Non-high School						
A	148.29	133.76 --	133.48 --	116.72 --	138.57 --	89.39 --
F	47.72	32.98	32.42	49.50	47.45	19.59

TABLE XVII (continued)

Group	Standard Deviation					
	f_1	f_{18}	f_{19}	f_{20}	f_{25}	f_{30}
G	50.46	53.69 --	53.14 --	39.88 --	41.40 -	55.45 --
H	180.78	162.86	162.85	141.49	168.87	115.48
Complete Program						
A	81.03	78.39 -	76.81 --	75.62	71.49 --	80.26
B	44.70	45.08 ++	39.56	154.29 ++	39.86 -	43.36 ++
C	33.82	34.52	33.94 -	26.55	26.98 -	42.69 --
D	50.79	50.91	45.95 -	47.36	46.75	35.28
E	56.73	55.38 -	51.95 -	54.11 -	54.07 -	56.25 ++
F	93.86	88.04	87.13	83.30	87.63	119.84 ++
G	71.97	73.37	69.41	77.28	73.07	105.97

- Significantly less variation at .05 level + Significantly more variation at .05 level

-- Significantly less variation at .01 level ++ Significantly more variation at .01 level

groups and categories. Whereas results from data for Group H in Table II formulae are not interpretable from available data, the results of Group H data in Table V formulae are interpretable.

Formula f_{18}. Formula f_{18} determined the expenditure per weighted pupil in each school district when the guaranteed support level (u) had to be determined, when the total state contribution to all school districts (A) was maintained at the actual 1965-66 level, and when 85% of Federal Forest funds (R'_{i3}) was reduced from the guaranteed support level in determining the state grant per district. (Formula f_1, representing the 1965 distribution formula, deducted 40% of Federal Forest funds from the guaranteed support level in determining the state grant per district.)

As a result of formula f_{18} application: (a) Federal Forest fund districts received less state support than in f_1, (b) the guaranteed support level (u) for all pupils increased slightly and (c) the mean expenditure per weighted pupil in the larger districts remained about the same, but was reduced in the smaller districts. The degree to which the expenditure level drops depended upon the number of Federal Forest fund districts having a greater number of dollars deducted from the guaranteed level of state support in relation to the smaller increased in the guaranteed state support level.

Formula f_{18} proved that by requiring a greater

reduction (85% of Federal Forest funds from the guaranteed support level, a greater equalization of educational opportunity resulted. The converse was proven in formula f_4 of Table II where less equalization of educational opportunity was found with no reduction of Federal Forest funds from the guaranteed support level.

As shown in Table XVII, Groups A, F and H showed a significant increase in equalization of educational opportunity. Group B, however, was an exception which showed a significant decrease in educational opportunity. One reason the large districts in Group B experienced a relatively small reduction was that many of these were King County districts which received a relatively small proportion of the Federal Forest funds available to the county. County commissioners have the authority to distribute these funds for school district use or road use. King County Commissioners distribute a larger portion of the funds for roads. Therefore, the large districts in Group B in King County and the other populated counties were not as dependent upon Federal Forest funds. One or two other large districts which normally receive a substantial portion of forest funds may experience a sufficiently reduced amount of state support to cause a greater standard deviation of educational opportunity. Conversely, many of the small districts receive a larger portion of their overall revenue from these funds. When 85% rather

than 40% was reduced from the guaranteed support level, it affected the smaller districts more.

The findings of formulae f_4 and f_{18} coupled with the findings in formulae f_3 and f_{17} suggested that a similar conclusion may be drawn for Public Law 874 funds. Because only one group showed a significantly greater equalization of educational opportunity in f_{17} it was not considered sufficiently significant to consider conclusive. However, a trend toward less variation in the standard deviation of educational opportunity was indicated. Possibly by deducting a percentage other than 85%, more equalization of educational opportunity would result. This is a possibility worthy of examination in a follow-up study.

Formula f_{19}. Formula f_{19} determined the expenditure per weighted pupil in each school district when the guaranteed support level (u) had to be determined, when the total state contribution to all school districts (A) was maintained at the actual 1965-66 level, and when 85% of Public Law 874 funds (R'_{i2}) and 85% of Federal Forest funds (R'_{i3}) were reduced from the guaranteed support level in determining the state grant per district.

As a result of f_{19} (which amounts to the combined application of formulae f_{17} and f_{18}), Groups A, D, E, F and H showed a significant increase in the equalization of educational opportunity. These results further substantiate the

need for a follow-up study to find the optimum percentage deduction of Public Law 874 funds from the guaranteed support level in the distribution formula to achieve the most equalization of educational opportunity. Further, it adds evidence that the greater reduction (85% rather than 40% or no deduction) for both funds is required to obtain greater equalization of educational opportunity when all other aspects of the formula remain unchanged.

Formula f_{20}. Formula f_{20} determined the expenditure per weighted pupil in each school district when the guaranteed support level (u) was doubled to $610.00, when the total state contribution to all school districts (A) had to be determined, and when all special levies (r_i-r) were eliminated.

It was anticipated that by eliminating special levies and substantially increasing the guaranteed support level over the actual expenditure level in f_1 a much greater equalization of educational opportunity in most groups would result. This was only partially the case. In Groups A, F and H a significantly greater equalization did result. In Group B, the converse was true where a significantly reduced equalization resulted. In the other groups, there was no significant difference. However, the trend to reduce the variation in standard deviation of educational opportunity was clearly evident. Through the application of formula f_{20},

a district that did not vote a special levy would receive a greater increase in per pupil expenditure than a district that did vote a special levy. The difference in increase of expenditure per weighted pupil would be equivalent to the number of dollars per weighted pupil voted in the special levy.

Results of formula f_{20} were sufficiently clear to conclude that greater equalization of educational opportunity would take place when the guaranteed support level was increased to an amount greater than the actual mean expenditure per weighted pupil and when all excess mill levies were eliminated.

Formula f_{25}. Formula f_{25} determined the expenditure per weighted pupil in each school district when the guaranteed support level (u) was held constant at $305.00 and when the special levy (r_i-r) was reduced by 50%.

Groups A, C, F and H all experienced significantly greater equalization of educational opportunity. All other groups except Group G in the Complete Program category experienced a non-significant reduction in the variation of the standard deviation of educational opportunity.

Results from the application of f_{25} indicated that certain inequities were inherent in special levy financing. When special levies were reduced by half, so were the inequities reduced. Therefore, a greater equalization of

educational opportunity resulted.

It can be concluded that by reducing the money raised from special levies by 50% all size groups of districts would experience greater equalization of educational opportunity.

Formula f_{30}. Formula f_{30} determined the expenditure per weighted pupil in each school district when the guaranteed support level (u) was increased to $389.50, the amount necessary to eliminate all but 10% of the special levies; when the total state contribution to all school districts (A) had to be determined; and when the special levies in the remaining 10% of the districts were reduced by $84.50 per weighted pupil, the amount added to the $305.00 $\underline{u}$ in f_1.

A completely mixed result was determined through the application of f_{30}. A significant variation at the .01 or .05 confidence level, as shown in Table XVII was found in Groups A, C, D, F, G and H; with Groups A, D, F and H showing a reduction in standard deviation variance and with Groups C, F and G showing an increase. The remaining groups were equally split in the direction of greater or lesser variance.

It was anticipated that all enrollment groups would have indicated greater equalization of educational opportunity through the application of formula f_{30}. These anticipated results were based on the reasoning that by increasing the guaranteed support level (u) by $84.50, the amount required to eliminate all but 10% of the special levies in

the 1965-66 school year, and by deducting this same amount from the remaining 10% of the special levies, the revenue available for expenditure would evidence less variation between districts than when all levies were in effect and the state guaranteed less support. Whether the anticipated reduction in variation of expenditure per weighted pupil would have been significantly less was to be tested.

Since these anticipated results were not evident, an analysis of the formula used to process the data may be helpful in understanding the results. The formula follows:

$$E_{i30} = E_{i1} - \frac{(r_i - r)\ C_i}{N_i} + \$84.50 + Z_i$$

where, in a given district, E_{i30} is the expenditure per weighted pupil resulting from the application of formula f_{30}, E_{i1} is the expenditure per weighted pupil wich actually resulted from the application of formula f_1, \$84.50 is the amount required to eliminate all but 10% of the special levies, $r_i - r$ is the special levy, N_i is the weighted pupil enrollment and Z_i is the amount of special levy per weighted pupil equal to or greater than \$84.50 per weighted pupil.

Through the application of formula f_{30} described in the preceding data processing procedure; (a) districts with special levies greater than or equal to \$84.50 per weighted pupil (10% of the special levy districts) experienced an $E_{i30} = E_{i1}$; (b) districts with special levies less than

$84.50 per weighted pupil experienced an $E_{i30} = E_{i1} + \frac{(r_i-r)\ C_i}{N_i}$;

(c) districts without special levies experienced an $E_{i30} = E_{i1}$ + $84.50. Therefore, those districts which made the greatest effort experienced no improvement in expenditure level while those districts which made no effort experienced the greatest improvement in expenditure level. These changes in expenditure level may have been sufficiently different to cause the unanticipated, mixed results (i.e., some groups and categories showed significantly more equalization of educational opportunity while other showed significantly less). The number of districts which received more aid and the groups and categories they fell in would influence the significance and direction of the variation.

Further, by the previously described application of formula f_{30}, all districts were treated as though they were entitled to the additional $84.50 guaranteed state support. This application of formula f_{30} was inconsistent with the 1965-1966 distribution formula in one respect. Actually, only those districts which received guaranteed state support in the 1965-1966 school year should have been entitled to the total improvement in guaranteed support. Those districts whose local deductible revenue exceeded the 1965-1966 guaranteed support level should not have received the additional state support. Only if the additional guaranteed support exceeded the district's local deductible revenue should the

district have received additional support, and then only in the amount per weighted pupil the guaranteed support did exceed the deductible local revenue. Consequently, formula f_{30}, as processed, increased the revenue available for expenditure in these districts beyond their entitled amount which may be part of the cause for the actual results being different from the anticipated results.

Due to the mixed nature of the results, formula f_{30} was rejected for further consideration in this study.

Formulae f_{27} and f_{29} indicated a significantly less variation in the standard deviation of millage. To assist the reader in interpreting the formula under review, Table XVIII compares the mean millage and standard deviation of millage between significant formulae in Table V in all groups and categories.

Formula f_{27}. Formula f_{27} determined the number of mills required in special levy districts when the guaranteed support level (u) had to be determined, when the total state contribution to all school districts (A) was maintained at the actual 1965-66 level, when the assessed valuation (C_i) was increased to 50% of true and fair value, and when the expenditure per weighted pupil was held constant at the f_1 level. The variation in the standard deviation of special levy millage was compared with f_1 to determine the significance of the variation.

TABLE XVIII

COMPARISON OF MILLS AND STANDARD DEVIATION OF MILLAGE BETWEEN SIGNIFICANT FORMULAE IN TABLE V IN ALL GROUPS AND CATEGORIES

Group	Mills			Standard Deviation		
	f_1	f_{27}	f_{29}	f_1	f_{27}	f_{29}
All Districts						
A	9.75	.72	3.90	6.77	.665	2.67
B	16.02	0.0	5.32	6.80	0.0	2.82
C	12.03	2.74	5.16	9.07	1.37	3.54
D	10.55	.74	3.72	6.32	.39	2.21
E	8.70	0.0	2.88	4.89	0.0	1.88
F	8.18	0.0	3.52	5.52	0.0	1.97
G	9.19	0.0	3.74	7.30	0.0	3.52
H	5.85	0.0	0.0	3.18	0.0	0.0
Non-high School						
A	6.54	0.0	1.16	4.27	0.0	.933
F	7.50	0.0	2.36	5.14	0.0	.14

TABLE XVIII (continued)

Group	Mills			Standard Deviation		
	f_1	f_{27}	f_{29}	f_1	f_{27}	f_{29}
G	6.15	0.0	.72	4.54	0.0	-- .55
H	5.85	0.0	0.0	3.18	0.0	0.0
Complete Program						
A	10.54	.76	4.13	7.03	-- .67	-- 2.63
B	16.02	0.0	5.32	6.80	0.0	-- 2.82
C	12.03	2.74	5.16	9.07	-- 1.37	-- 3.55
D	10.44	.69	3.95	6.45	-- .38	-- 2.08
E	8.70	0.0	2.88	4.89	0.0	-- 1.88
F	8.27	0.0	3.66	5.57	0.0	- 2.03
G	21.31	0.0	6.76	.67	0.0	-- 2.51

- Significantly less variation at .05 level

-- Significantly less variation at .01 level

Because the regular levy produces more funds when the assessed valuation increases, because these increased funds are reduced from the guaranteed support level and because the total state contribution for all districts is held at the f_1 level, the guaranteed support level (u) increases. Consequently, more state funds are available to those districts with low assessed valuation per weighted pupil while those with higher assessed value receive a smaller proportion of state funds. With more money provided all districts from the regular levy and with the expenditure per pupil held constant, the special levies are reduced.

Through the application of formula f_{27}, levies in Groups B, E, F, G and H were completely eliminated. In Groups A, C and D, levies were reduced to a mean millage of .72, 2.74 and .74 mills respectively. All variations in the standard deviation of millage were significantly reduced at the .01 level of confidence.

It can be concluded that in the 1965-66 school year special levies could have been eliminated almost completely through the increase in the assessed value to 50% of true and fair value, provided that the total state dollars available for distribution to local districts were maintained at the f_1 level. This does not say, however, that greater equalization of educational opportunity would result from formula f_{27}. A follow-up study should be made to determine the resulting

degree of equalization of educational opportunity.

Formula f_{29}. Formula f_{29} determined the number of mills required in special levy districts when the guaranteed support level (u) was held constant, when the total state contribution to all school districts (A) had to be determined, when the assessed valuation (C_i) was increased to 50% of true and fair value, and when the expenditure per weighted pupil (E_i) was held constant at the f_1 level. Like formula f_{27}, the variation in the standard deviation of special levy mills was compared with f_1 to determine the significance of variation.

Because more local funds are raised through the regular levy, because these increased regular levy funds are deducted from the guaranteed support level to determine the state grant and because the guaranteed support level is held constant at $305.00, the total number of state dollars is reduced. Therefore, with the expenditure per weighted pupil held at the f_1 expenditure level, the special levies are reduced but, not to the extent they were in formula f_{27}.

Table XVIII indicates that only in Group H were all the levies eliminated. However, in every other group a significant variation at either the .01 or .05 confidence level existed. Formula f_{29} should also be tested in a follow-up study to determine the degree to which it equalizes educational opportunity.

The purpose of Table V formulae was to answer the question, "Will certain predetermined and specified mixes (combinations) of existing factors under certain hypothetical manners of distributing state grants-in-aid reduce the variation of educational opportunity in the districts under study?" As reported, formulae f_{18}, f_{19}, f_{20} and f_{25} did answer the question affirmatively.

Table VI Formulae

Formulae in Table VI produced significantly less equalization of educational opportunity. However, the concept of equalizing excess mill levies may achieve greater equalization of educational opportunity if applied in a different manner. Consequently, it is discussed further here.

Formulae f_{32} and f_{33}. These formulae apply to the question, "Can the variation of educational opportunity be reduced by introducing a factor for local effort in relation to local ability to pay and by applying this factor in various predetermined and specified ways in the distribution formula?" The basic distribution formula developed, which in essence matches special levies by recognizing effort in relation to ability to pay follows:

$$A_i = uN_i + u'N_i\left[\frac{\frac{p}{m}}{\sum_{i=1}^{k'}\left(\frac{p}{m}\right)}\right] - rC_i - \sum_{j=1}^{6} R'_{ij} + \sum_{j=1}^{6} S_{ij}$$

where in a given school district A_i is the state grants-in-aid; u is the guaranteed support level; N_i is the number of weighted pupils; u' is the additional amount of state aid per weighted pupil available for distribution; p is the measure of relative effort $p = \frac{(r_i - r)}{\frac{k'}{\sum_{i=1} (r_i - r)}{k'}}$ where $\underline{r_i - r}$ is the excess mill levy in each district and k' is the number of special levy districts; m is the measure of relative ability to pay $m = \frac{\frac{Ca_i}{N_i}}{\frac{k'}{\sum_{i=1} \left(\frac{Ca_i}{N_i}\right)}{k'}}$ where Ca_i is the adjusted value of a given district as determined by the Washington State Tax Commission which considers the various county assessment ratios, N_i is the weighted enrollment in the special levy districts and the remainder of the formula is the same as that described for the regular state distribution formula.

Table XIX shows what occurs to the standard deviation when $\underline{u}'$ is reduced. A sample computer run was made for Group A in the All District category where u was valued at $325.00 and u' the equivalent of $80.00 expenditure per weighted pupil. From this run, it was noted that the variation in the standard deviation of educational opportunity was

TABLE XIX

COMPARISON OF STANDARD DEVIATION OF EDUCATIONAL OPPORTUNITY BETWEEN SIGNIFICANT FORMULAE IN TABLE VI IN ALL GROUPS AND CATEGORIES

Group	Standard Deviation			
	f_{31}	f_x*	f_{32}	f_{33}
All Districts				
A	106.08	124.54 ++	114.25 ++	109.49 +
B	44.70	---	65.82 ++	54.54 ++
C	33.82	---	68.73 ++	52.44 ++
D	50.20	---	83.21 ++	66.19 ++
E	56.08	---	90.92 ++	71.69 ++
F	88.43	---	136.97 ++	112.28 +
G	60.28	---	112.24	85.14
H	189.90	---	212.75	195.87
Non-high School				
A	148.29	---	150.55 +	148.45
F	47.72	---	79.18 ++	62.71 +
G	50.46	---	96.30 ++	73.10 +
H	180.78	---	205.70	187.90
Complete Program				
A	81.03	---	96.01 ++	88.00 ++

TABLE XIX (continued)

Group	Standard Deviation			
	f_{31}	f_x*	f_{32}	f_{33}
B	44.70	---	65.82 ++	54.54 ++
C	33.82	---	68.73 ++	52.44 ++
D	50.79	---	84.75 ++	67.25 ++
E	56.73	---	90.28 ++	71.66 ++
F	93.86	---	145.99	119.53
G	71.97	---	116.49	90.94

\+ Significantly more variation at .05 level of confidence

++ Significantly more variation at .01 level of confidence

* f_x is a special test computer run with $\underline{u}$ = \$325.00 and $\underline{u}'$ equivalent to \$80.00 per weighted pupil

significantly greater than in f_{31}. Consequently, formula f_{32} was designed where u = $355.00 and u' the equivalent of $50.00 expenditure per weighted pupil. Finally, f_{33} was designed where u = $375.00 and u' the equivalent of $30.00 expenditure per weighted pupil. In each succeeding case, the variation in standard deviation decreased but still remained significantly larger than in f_{31}.

It appears that as $\underline{u}'$ is reduced the variation in the standard deviation is also reduced. It is believed that this reduction in the standard deviation would continue to occur until $\underline{u}'$ = o at which time the difference in standard deviation would also be reduced to zero.

From these results, it was clear that formulae f_{32} and f_{33} would not improve the equalization of educational opportunity under the conditions tested.

It is suggested, however, that these formulae may serve as a basis for further study which might lead to an improvement in the equalization of educational opportunity. Formulae f_{32} and f_{33} establish a direct ratio between effort and ability to pay. Perhaps an improvement in the equalization of educational opportunity would occur by varying the amount of effort or ability to pay recognized for matching purposes, i.e., (a) where a specified percent of the numerator (p) is considered matchable, (b) where the special levy (r_i-r) is held at or below a predetermined ceiling, (c) where

the denominator (m) is adjusted to varying percentages of true and fair value, or (d) where certain combinations of the preceding three examples are tried.

Due to the possible potential of formulae f_{32} and f_{33} being revised in a manner whereby equalization of educational opportunity is improved, it is recommended that these formulae be subjected to further experimentation in a future study.

III. Summary and Conclusions

Data collected as a result of research procedures described in Chapter III were arranged according to the formulae shown in Tables II, V and VI. All formulae were processed and analyzed, but only those formulae which produced a significant reduction in the variation of the standard deviation of educational opportunity (greater equalization of educational opportunity) or which did not produce significant results but which contributed to those formulae which were significant were presented and interpreted in detail.

Basic data for the study were included in Appendix C. Tables VII through XIX, included in the body of Chapter IV, extracted from Appendix C pertinent data relating specifically to the formulae being analyzed and interpreted.

Results from those formulae which, after careful processing, analyzing, presenting and interpreting indicated a

significant equalization or trend toward equalization of educational opportunity were used to form the following conclusions, which recognize some of the strengths and weaknesses of the 1965 distribution formula and from which recommendations for further study are drawn.

Table II formulae indicate that:

1. Significantly greater equalization of educational opportunity is obtained by use of formulae where handicapped programs, driver education programs, vocational-technical programs, adult education programs and institutional programs are eliminated from the 1965 state distribution formula.
2. Significantly less equalization of educational opportunity is obtained by use of formulae where 1% county real estate transaction tax revenue, Public Law 874 funds and Federal Forest funds are eliminated from the 1965 state distribution formula.
3. No significant difference in equalization of educational opportunity is obtained by use of formulae where in-lieu-of tax revenue, public utility district revenue, non-high school receipts and transportation funds are eliminated from the 1965 state distribution formula.
4. The 1965 distribution formula does effectively

accomplish a goal for which it was designed. Special, more costly educational programs, offered in certain school districts and partially financed by the state, should and do cause significantly less variation in the expenditure per weighted pupil. Conversely, the deduction of a portion of local revenue (i.e., 85% of Federal Forest funds) from the state guaranteed support level causes significantly greater equalization of educational opportunity.

Table V formulae indicate that:

1. Significantly greater equalization of educational opportunity is obtained when 85% of Federal Forest funds are deducted from the guaranteed support level rather than when 40% of these funds are deducted as done in the 1965 state distribution formula.
2. A tendency toward greater equalization of educational opportunity is obtained when 85% of Public Law 874 funds are deducted from the guaranteed support level rather than when 40% of these funds are deducted as done in the 1965 state distribution formula.
3. Significantly greater equalization of educational opportunity is obtained when the special levies

are eliminated and when the guaranteed support level is increased to an amount greater than the actual mean expenditure per weighted pupil as in formula f_{20} where the guaranteed support level was doubled to $610.00.

4. Significantly greater equalization of educational opportunity is obtained when the 1965-66 special levies are reduced by 50% and the state guaranteed support level is maintained at the 1965 level.

Table VI formulae indicate that:

1. Significantly reduced equalization of educational opportunity is obtained through the application of those special levy matching formulae (f_{32} and f_{33}) tested.

CHAPTER V

SUMMARY AND RECOMMENDATIONS

It is the purpose of this chapter to provide a summary of the previous chapters, to show the more important findings and conclusions resulting from a statistical analysis of the 1965-66 Washington State distribution formula relative to equalization of educational opportunity in selected school districts in Washington, and to make some recommendations for further research.

I. Problem Investigated

Purpose. This study investigated the variation in educational opportunity in Washington State under certain hypothetical manners of distributing state grants-in-aid such as:

1. when factors in the state school distribution formula are eliminated or mixed in different, predetermined and specified proportions, and
2. when a given increase in state support is distributed under circumstances where local effort in relation to local ability to pay is used as a factor in the formula.

Questions investigated. To accomplish the purposes established, specific questions were stated and means were

devised for answering them. The questions were:

1. What factors in the 1965 distribution formula exert the greatest influence on the variation of educational opportunity among selected school districts in Washington State?
2. Will certain predetermined and specified mixes (combinations) of existing factors under certain hypothetical manners of distributing state grants-in-aid reduce the variation of educational opportunity in the districts under study?
3. Can the variation of educational opportunity be reduced by introducing a factor for local effort in relation to local ability to pay and by applying this factor in various predetermined and specified ways in the distribution formula?

Definition of terms. Terms and symbols used in the study were included in Appendix A, entitled "A Glossary of Terms and Symbols." In addition, for reader convenience each term and symbol was explained in a footnote on the page where it was first used in the study.

Limitations of the study. The study was subject to three limitations. These limitations were:

1. The utilization of a simulation model makes certain assumptions relative to cause and effect

factors and these factors can vary only within the limits selected by the experimenter. Under actual conditions these factors and others may vary in different ways from those selected in the study.

2. The scope of the study was limited to the variables used and the inter-relationship among these variables. Many variables which may bear on equalization of educational opportunity were not included in the current distribution formula mixes developed by the experimenter to analyze the distribution formula. The variables which generally are considered significant in various state distribution formulae were included.
3. The scope of the study was limited to the selected combinations and variations identified in the study. A greatly increased number of combinations within the variations to the basic 1965-66 formula could have been made.

Background of the problem. A review of literature was presented in order that the specific problem investigated could be placed in its proper perspective with relation to the overall problem of financing schools. Some of the more important points brought out in the review were:

School finance can be divided into two main sections: the acquisition of funds and the distribution of funds. The

acquisition of funds was viewed from the historical and current standpoint. Historically, a long and difficult fight took place in America over free public education. The national Constitution does not recognize education, but instead leaves education as the responsibility of the states. Therefore, states adopted public education in varying rates and in varying degrees.

Some basic principles of taxation include factors such as ability to pay, benefits received, adequacy of yield, stability and flexibility, and ease of administration and payment. No one tax can satisfy every principle, as some principles are in conflict with others.

Sources of revenue include local, county, state, federal and non-tax sources. The largest single local revenue source is the property tax. This tax is often inequitable due to unequal property assessment practice and due to low effort in relation to ability to pay. To gain equity it is necessary to assess all property equally and to equalize ability to pay in low assessed valuation areas.

Washington State has some of the most restrictive property tax regulations among all states. The 40 mill limitation law combined with property taxed at less than 50% of true value causes the greatest barrier.

County revenue in Washington for public education is derived from a tax of 1% on all real estate sales. This tax

is called the Real Estate Transaction Tax.

The main purpose of state tax revenue is to improve programs, to compensate school districts, to guarantee a minimum expenditure level, to create local incentive, and to broaden the tax base. The main source of state revenue in Washington is derived from the sales tax. Some other states utilize the income tax as a major source.

The federal government represents the last major untapped source of school revenue. Federal aid is distributed through two major ways, general and categorical. The main argument for categorical aid is to create incentive to develop certain programs. General aid, however, provides more opportunity for local control of program and is preferred as a distribution method.

Since local and state sources provide the major amount of school revenue, these sources are the main means for equalizing educational opportunity among school districts. However, due to local district dependency on the property tax as its major tax source and due to variations in assessment practice, inequality of wealth behind each pupil and different attitudes relative to school support, it has been impossible for local school boards to equalize educational opportunity. Consequently, it has become the task of the state to provide whatever equalization it can.

Historically, public support for education was slow in

developing and not until the latter part of the nineteenth century was the concept better understood and fairly widely practiced. Through the struggle for public support, leaders such as Mann, Barnard, Mills and Pierce helped explain and promote the concept while Cubberley, Updegraff, Strayer, Haig, Mort and others developed ways whereby public funds could be distributed to obtain greater equalization of educational opportunity. Cubberley set forth two principles: equalization and reward for effort. Updegraff built upon these principles and introduced the merging of the equalization and payment-for-effort principles. By so doing, effort on the part of communities with less than average wealth realized revenues equal to those of communities making the same effort but with average wealth. Strayer-Haig followed with the "foundation program plan" which basically assured every district a predetermined satisfactory minimum offering per pupil. Finally, Mort advanced a number of refinements to the distribution of state funds. Mort's refinements include the adaptability principle, the weighted-pupil measure, the key-district concept and the local tax leeway principle.

Types of grants-in-aid were identified in a taxonomy by Burkhead as: general and special purpose, equalizing and non-equalizing, and costs by unit or percentage of local expenditure. Guidelines for state finance programs include: (a) foundation programs should be expressed in dollar terms,

(b) both state and local funds should be used in the foundation program, (c) there should be a mandatory local effort, (d) the state must provide the difference between the local effort and the determined guaranteed amount, (e) local districts should be encouraged to tax beyond the required local effort, (f) local control should be perpetuated and (g) periodically the state finance plan should be evaluated and necessary modifications made.

The relationship of cost to quality is generally accepted to be positive. It is recognized, however, that many factors (internal and external) affect the quality of education in individual districts. Consequently, state distribution formulae should compensate for differences which exist and which are beyond the control of the local school board. Some of these differences are determined by the district's need, ability to pay, and effort to finance its own programs.

The Washington State distribution formula includes many factors incorporated in other state formulae. The formula does attempt to equalize ability to pay by establishing an assessment ratio between assessed value and true value for property in each county for the required mill rate. However, the formula does not recognize effort or equalize ability to pay for local funds raised through special levies. This latter factor should be considered in the evaluation of the

formula.

II. Design of the Study

The three questions developed to satisfy the objectives of the study served as the basis for the research design. In each case, factors in the Washington State Distribution formula were manipulated either by deleting all or some of them, changing some of their values, or by introducing new factors which affected them. Tables II, V and VI show by symbol the various formulae manipulation.

Table II Formulae

Formulae f_1 through f_{15} of Table II were developed to determine factors in the 1965 distribution formula which exert the greatest influence on the variation of educational opportunity.

Formula f_1. Formula f_1 represented the actual revenue and expenditure of funds per weighted pupil in each district during the 1965-66 school year. The 1965 state distribution formula was used to allocate state funds. Formulae f_2 through f_{15} were compared to it.

Formulae f_2 through f_8. Formulae f_2 through f_8 determined the expenditure per weighted pupil in each school district when the factors such as the 1% real estate transaction

tax revenue, Public Law 874 funds, Federal Forest funds, public utility district revenue, in-lieu-of tax revenue, and non-high school receipts were individually and collectively eliminated as a deduction from the guaranteed support level in the 1965 distribution formula. The 1965 formula required that revenue received by districts from the county tax source must be deducted from the guaranteed support level when computing the state grants-in-aid.

Formulae f_9 through f_{15}. Formulae f_9 through f_{15} determined the expenditure per weighted pupil in each school district when factors such as handicapped funds, driver education funds, vocational-technical funds, adult education funds, transportation funds and institutional funds were individually and collectively eliminated as state supported programs. Special programs such as those listed require additional funds to operate. The 1965 distribution formula provided for this extra support.

Tables VII and VIII. Table VII summarizes the function of each formula f_1 through f_{15}. Table VIII shows the formulae which caused a significant variation in the standard deviation of educational opportunity when compared with f_1 and the groups and categories in which this variation occurred.

Table V Formulae

Formulae f_1 and f_{16} through f_{30} of Table V were developed to determine which hypothetical manners of distributing state funds improve the equalization of educational opportunity.

Formula f_1. Formula f_1 represented the actual revenue and expenditure of funds per weighted pupil in each district during the 1965-66 school year. The 1965 state distribution formula was used to allocate state funds. Formulae f_{16} through f_{30} were compared to it.

Formulae f_{16} through f_{30}. Formulae f_{16} through f_{30} each represented a different manipulation in state or local revenue sources.

Tables IX and X. Table IX summarizes the function of each formula and indicates which factors are held constant and which ones are treated as variables. Table X shows those formulae which caused a significant variation in the standard deviation of educational opportunity when compared with f_1 and the groups and categories in which this variation occurred.

Table VI Formulae

Formulae f_{31} through f_{33} of Table VI were developed to

determine whether a greater equalization of educational opportunity could be obtained by introducing a factor for local effort in relation to local ability to pay.

Tables XI and XII. Table XI summarizes the function of each formula and indicates which factors are held constant and which ones are treated variables. Table XII shows those formulae which caused a significant variation in the standard deviation of educational opportunity when compared with f_{31} and the groups and categories in which this variation occurred.

Treatment of Data

For each formula tested, a t-test for correlated data was used to measure the level of significance of difference in the standard deviation of educational opportunity between simulated and actual formulae. A significant decrease in variance indicated significantly greater equalization of educational opportunity.

A total of 278 school districts representing all sizes of districts in the State of Washington was considered in the study. For purpose of comparison between district sizes, the data were compiled in eight groups with the base enrollment ranges shown in Table III.

From these enrollment groups, districts were separated into non-high school groups (Kindergarten or grade one up to

grade nine) and into complete program school groups (Kindergarten or grade one through grade twelve) as shown in Table IV.

Data were obtained from the Office of the Washington State Superintendent of Public Instruction and the Washington State Tax Commission. The data from the state superintendent were for a ten month period of operation which represented 5/6 of the total revenue and expenditures in school districts. Consequently, these data required readjustment in all formulations to the full 6/6 level.

The data as collected from the state superintendent are shown in Appendix B. Section III of Chapter III shows examples of data manipulation required to utilize the data in the simulated formulae designed to answer questions 1, 2 and 3 in order to satisfy the objectives of the study.

III. Findings and Conclusions

Although the information presented in this study may be representative, in some respects, of all of the districts of the state, the findings which follow pertain only to the 278 districts in the enrollment groups studied and to the 1965-1966 school year. Any reference to individual districts within the groups or to a population larger than this may lead to false conclusions. Significance at the .01 and .05 confidence levels are shown in Tables VIII, X and XII.

High-Influence Factors

A significantly greater equalization of educational opportunity was found in formulae where handicapped programs (f_9), driver education programs (f_{10}), vocational-technical programs (f_{11}), adult education funds (f_{12}) and institutional programs (f_{14}) were individually eliminated from the 1965 state distribution formula. These findings indicate that the 1965 state distribution formula was functioning as it was designed to function. Because special programs cost a district more to operate, the state has encouraged these programs by offering additional, categorical grants. By so doing, the difference in expenditure per weighted pupil is greater and therefore, the equalization of educational opportunity (E_i) is reduced. When formulae f_9, f_{10}, f_{11}, f_{12} and f_{14} were applied (the factor removed as additive funds in the distribution formula) significantly greater equalization of educational opportunity resulted.

A significantly greater equalization of educational opportunity was found also in formula (f_6) where in-lieu-of tax funds were eliminated from the 1965 state distribution formula. A significantly reduced equalization of educational opportunity was found in formulae where 1% county real estate transaction tax revenue (f_2), Public Law 874 funds (f_3), and Federal Forest funds (f_4) were individually eliminated as deductions from the guaranteed support level in the 1965

distribution formula. These findings further substantiate that the distribution formula is functioning as designed. When these funds, which are local funds, are not required to be deducted from the guaranteed support level, a greater variation in the standard deviation of educational opportunity results. Conversely, when the funds are deducted as required by the 1965 distribution formula a greater equalization of educational opportunity is evident.

No significant difference was found when using formulae dealing with public utility district revenue (f_5), non-high school receipts (f_7), and transportation funds (f_{13}). The direction of the variation of the standard deviation was consistent with the intent of the state distribution formula.

Effects of Predetermined Mixes of Factors

A significantly reduced equalization of educational opportunity was found in formulae f_{16}, f_{22}, f_{24} and f_{26}. Due to this reduction, these formulae were considered not relevant to the interest of the study and were, therefore, rejected from further consideration.

No significant difference was found in formulae f_{17}, f_{21} and f_{23}. These were also disregarded from further consideration although the trend noted in f_{17} was used to further discuss the results in f_{18}. Formula f_{30} produced

significant variation in the groups which indicated some increase and some decrease of equalization of educational opportunity. Because no conclusion could be drawn, the formula was rejected.

A significantly greater equalization of educational opportunity was found in formulae f_{18}, f_{19}, f_{20}, f_{25}, f_{27} and f_{29}.

Formula f_{18}. Formula f_{18} determined the expenditure per weighted pupil in each school district when the guaranteed support level (u) had to be determined, when the total state contribution was held constant, and where 85% of Federal Forest funds was deducted from the guaranteed support level. Formula f_1 representing the 1965 distribution formula deducted 40% of Federal Forest funds from the guaranteed level.

As a result of formula f_{18} application, it is evident that by requiring a greater reduction (85%) of Federal Forest funds from the guaranteed support level, a significantly greater equalization of educational opportunity results. The converse was evident in formula f_4 of Table II where less equalization of educational opportunity was found when no reduction of Federal Forest funds was taken from the guaranteed support level.

The findings of formulae f_4 and f_{18} coupled with the

findings in formula f_3 and f_{17} suggest that a similar conclusion may be drawn for Public Law 874 funds.

Formula f_{19}. Formula f_{19} determined the expenditure per weighted pupil in each school district when the guaranteed support level (u) had to be determined, when the total state contribution was held constant and when 85% of Public Law 874 funds and 85% of Federal Forest funds are deducted from the guaranteed support level. As a result of formula f_{19} application, a significantly greater increase in equalization of educational opportunity was evident. These results further substantiate the suggestion that Public Law 874 funds, when deducted at approximately 85%, may produce greater equalization of educational opportunity.

Formula f_{20}. Formula f_{20} determined the expenditure per weighted pupil in each school district when the guaranteed support level (u) was doubled to $610.00, when the total state contribution to all school districts had to be determined, and when all special levies were eliminated.

A significantly greater equalization of educational opportunity resulted from the application of formula f_{20}. These results suggest that a guaranteed support level that exceeds the expenditure per weighted pupil in most of the school districts would provide greater equalization of educational opportunity.

Formula f_{21}. Formula f_{21} determined the expenditure per weighted pupil in each school district when the guaranteed support level (u) is held constant and when the special levy is reduced by 50%. Through the 50% reduction of special levies, all groups experienced a significantly greater equalization of educational opportunity.

Formulae f_{27} and f_{29}. Formulae f_{27} and f_{29} were developed to determine the number of mills required in special levy districts under specified conditions. Both formulae produced a significant reduction in the variation of the standard deviation of mills. Both could be used as a method to reduce special levies. However, both would have to be examined relative to their effect on the equalization of educational opportunity. By eliminating or reducing substantially the special levies, the inequities contained therein would be reduced. Therefore, it might be expected that an increase in equalization of educational opportunity would result.

Effect of Local Effort Factor

Formulae f_{32} and f_{33} of Table VI produced a significantly less equalization of educational opportunity when compared with formula f_{31}. However, the concept of equalizing excess mill levies may achieve greater equalization of

educational opportunity if applied in a different manner. Suggestions relative to different manners of application are made in the recommendations at the end of this chapter.

Conclusions

The following conclusions are made which recognize some of the strengths and weaknesses of the 1965 distribution formula and from which recommendations for further study are drawn.

1. Significantly greater equalization of educational opportunity is obtained by use of formulae where handicapped programs, driver education programs, vocational-technical programs, adult education programs and institutional programs are eliminated from the 1965 state distribution formula.
2. Significantly less equalization of educational opportunity is obtained by use of formulae where 1% county real estate transaction tax revenue, Public Law 874 funds and Federal Forest funds are eliminated from the 1965 state distribution formula.
3. No significant difference in equalization of educational opportunity is obtained by use of formulae where in-lieu-of tax revenue, public utility district revenue, non-high school receipts

and transportation funds are eliminated from the 1965 state distribution formula.

4. The 1965 distribution formula does effectively accomplish a goal for which it was designed. Special, more costly educational programs, offered in certain school districts and partially financed by the state, should and do cause significantly less equalization of educational opportunity (greater variation in the standard deviation of educational opportunity). Conversely, the deduction of a portion of local revenue (i.e.: 85% of Federal Forest funds) from the state guaranteed support level causes significantly greater equalization of educational opportunity.
5. Significantly greater equalization of educational opportunity is obtained when 85% of Federal Forest funds is deducted from the guaranteed support level rather than when 40% of these funds is deducted as done in the 1965 state distribution formula.
6. A tendency toward greater equalization of educational opportunity is obtained when 85% of Public Law 874 funds is deducted from the guaranteed support level rather than when 40% of these funds is deducted as done in the 1965 state distribution

formula.

7. Significantly greater equalization of educational opportunity is obtained when the special levies are eliminated and when the guaranteed support level is increased to an amount greater than the actual mean expenditure per weighted pupil as in formula f_{20} where the guaranteed support level was doubled to $610.00.

8. Significantly greater equalization of educational opportunity is obtained when the 1965-66 special levies are reduced by 50% and the state guaranteed support level is maintained at the 1965 level.

9. Significantly reduced equalization of educational opportunity is obtained through the application of those special levy matching formulae (f_{32} and f_{33}) tested.

IV. Recommendations and Implications

The following suggestions for future research are recommended:

1. Contemplated changes in the current state distribution formula should be tested for the effect of those changes on equalization of educational opportunity utilizing a study design of simulated

formulae similar to this study. The most current, actual district data should be used in the formulae simulation.

2. The effect on equalization of educational opportunity should be examined when various, predetermined weighting factors are applied in the measurement of need (N_i). This study used, without variation, the weighting factors employed in the 1965 distribution formula. However, it is evident from this study that weighting factors have considerable influence over the expenditure per weighted pupil in all districts, particularly the very small ones.
3. A follow-up study should be made to test further the relationship Public Law 874 funds and Federal Forest funds have to equalization of educational opportunity and what percentages of these funds produce the minimum variation in expenditure per weighted pupil.
4. A follow-up study should be made to investigate the effect of further manipulation of the factors found significant in this study relative to equalization of educational opportunity. These factors include formulae f_6 (in-lieu-of tax revenue), f_9 (handicapped funds), f_{10} (driver education funds),

f_{11} (vocational-technical funds), f_{12} (adult education funds), f_{14} (institutional funds), f_{17} (Public Law 874 funds), f_{18} (Federal Forest funds), f_{20} (guaranteed support doubled), and f_{25} (special levy reduced by 50%) which should be combined in various predetermined ways. Each factor should be individually treated as a unknown and solved for by establishing a predetermined, equalized level of per weighted pupil expenditure. By so doing, optimum factor applications might be determined.

5. To seek greater qualization of educational opportunity, a follow-up study should be conducted which utilizes the matching formula concept (recognizing local effort in relation to local ability to pay as in formulae f_{32} and f_{33}) as a model. Various factors should be introduced to relate the ratio of local effort to local ability to pay. Some of these factors might include: (a) a specified percent of the numerator (p) considered matchable, (b) the special levy (r_i-r) held at or below a predetermined ceiling, (c) the denominator (m) adjusted to varying percentages of true and fair value, or (d) certain combinations of the preceding three examples.

Authorities in school finance point out that there are other ways to define educational opportunity other than expenditure per pupil. Among these ways is the burden of taxation for educational purposes. The equalizing portion of formulae f_{32} and f_{33} represents the relative burden of taxation (ratio of relative effort to relative ability to pay) carried by taxpayers in a school district. Additional research should be conducted to determine variations in the distribution formula which might better equalize within predetermined limits the expenditure per pupil and the taxation burden. Example variations might include: (a) adjusting the guaranteed level by district or groups of districts, (b) adjusting the weighting factors which define need by districts or groups of districts, (c) adjusting the local ability to pay, and (d) certain combinations of the preceding three examples.

6. Until further research is conducted on the state equalization formula, the following recommendations are made.

   a. Deduct 85% of Public Law 874 and Federal Forest funds.

b. Maintain all other deductible local revenue at the present level.

c. Finance all additive special programs in the amount required to conduct the programs.

d. Increase the guaranteed support level up to or greater than the mean expenditure per weighted pupil.

e. Equalize county assessment ratios when determining local support from the regular fourteen mills. For example, to equalize assessment to 25% in a county which assesses at 20% of true and fair value apply the formula:

$$\frac{.025\ r\ C_i}{.02} = Ca_i$$

where r is the regular 14 mill levy, C_i is the assessed valuation determined by the county assessor, and Ca_i is the adjusted assessed valuation.

Until further research is conducted on the state equalization formula, the preceding recommendations 6a through e would have these implications:

1. The guaranteed support level would be closer to the current average expenditure per pupil;
2. the payments to schools would be more equitably distributed among the population, effecting, in

due time, a more equitable distribution of state wealth than in the 1965-66 school year.

3. The dependency upon special levy financing would be reduced, thereby:
   a. diminishing inequities caused by variations in effort and ability to pay;
   b. lessening the risk and impact of a special levy failure;
   c. providing an opportunity for better and longer range planning for curriculum improvement, instructional staffing and other facets of program development;
   d. diverting the use of staff time and energy from special levy promotion to program improvement; and
   e. providing opportunities for tax options, whereby, at their discretion, "lighthouse" districts, might use special levies for program innovation.
4. Districts requiring special programs, such as handicapped and driver education, could offer them without dependence upon local effort.
5. Assessment practice among counties would be equalized relative to the required mill rate for school revenue.

6. Inequities caused by some districts receiving Public Law 874 and Federal Forest funds would be minimized.

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APPENDIX A

A GLOSSARY OF TERMS AND SYMBOLS

To provide a framework for the study the following terms were defined and symbols assigned. The definitions were developed as a result of a review of the literature pertinent to the problem. Symbols were assigned consistent with symbols generally used in the literature. Where the literature did not reveal a symbol or definition relevant to and required by the study the author assigned symbols and defined terms to clarify the design, execution and interpretation of the study.

I. Definition of Terms

Educational opportunity. Educational opportunity is measured by expenditure per weighted pupil enrolled October 1, 1965 where current expenses, exclusive of transportation, lunchroom, abatements, community services, and that portion of accounts 1300 and 1400 not attributed to per pupil costs are considered.

Equalization. Equalization is used with educational opportunity and means the ability (in terms of materials and/or resources) of local authorities to provide equal educational services commensurate with other school districts in Washington. The services provided by districts

need not be identical but the ability to provide equivalent services or situations should be available.

School distribution formula. School distribution is defined as the means used by a state to allocate grants-in-aid to school districts.

Local effort. Local effort is measured by the difference between the regular 14 mill levy (required mill rate) and the total levy (local burden) for current maintenance and operation. Local effort is also referred to as the excess mill levy or the special levy.

Required mill rate. Required mill rate refers to the 14 mills required to be levied by a local school district in order to qualify for state equalization funds to bring the district revenue up to the guaranteed support level.

Local ability to pay. This term is measured by a given district's assessed valuation per weighted pupil adjusted by a weighting determined by the Washington State Tax Commission (adjusted valuation).

Guaranteed support level. This term refers to the number of dollars per weighted pupil considered by the state to be a minimum expenditure; the state will supplement the revenue derived from the required 14 mill levy and certain

other revenues of local school districts in order to guarantee that each district reaches this level.

Excess mill levy. An excess mill or special levy is defined as a tax levied against the property tax of a school district by an amount that exceeded the regular 14 mill constitutional limit following approval by the electorate.

Tax year. The tax year in Washington State is defined as that period between January 1 and December 31 of any given year.

Indicated county ratio. Indicated county ratio is the ratio of assessed value to true value of property as determined by the Washington State Tax Commission.

General aid. General aid is defined as a grant-in-aid granted to state or local governments without designation of purpose or restriction of expenditure other than in broad areas such as for operation or for construction.

Categorical aid. Categorical aid is defined as a grant-in-aid granted to state or local governments for specific purposes and programs to encourage their development.

Factors. Factors are defined as those elements included in the distribution formula which affect the number

of dollars per pupil allocated to local districts, e.g., enrollment, assessed valuation, guaranteed support level, regular millage rate, Federal Forest Funds, handicapped programs.

Weighted pupils. Weighted pupils are measured by applying factors adopted by the Washington State Board of Education for the 1965-66 school year; e.g, Kindergarten = .5, elementary = 1.0, secondary = 1.3, vocational = .2 per hour, and other values for staff experience, staff preparation, culturally disadvantaged or migrant pupils, small schools, and grandfather and emergency districts.

Expenditure. Expenditure is defined as the total expenditure of funds in a given district less expenditures for transportation, lunchroom, abatements, community services, and that portion of accounts 1300 and 1400 not attributed to per pupil costs.

Need. Need is measured by the number of weighted pupils in the school district as of October 1, 1965. The weighting factors used are those which were employed in the state distribution formula for the school year 1965-66.

Base enrollment. Base enrollment is measured by the number of students in the school district as of October 1,

1965 where kindergarten pupils are counted .5 and all other students 1.0. Base enrollment may also be referred to as full time equivalents (F.T.E.).

Average local effort. Average local effort is measured by dividing the sum of the excess mill levies in the districts included in the study by the number of excess mill levy districts in the study.

Relative effort. Relative effort is measured by the ratio of a given district's excess mill levy (local effort) to the average excess mill levy (average local effort) in the districts studied.

Average local ability to pay. This term is measured by dividing the sum of the adjusted valuations per weighted pupil of all excess mill levy districts in the study by the number of excess mill levy districts in the study.

Relative ability to pay. Relative ability to pay is measured by the ratio of a given district's adjusted valuation per weighted pupil (local ability to pay) to the average adjusted valuation per weighted pupil of all excess mill levy districts in the study (average local ability to pay).

Local burden. Local burden is measured by the local effort plus the required mill rate.

Relative burden of taxation. This term is used to express the ratio of relative effort to relative ability to pay.

II. Definition of Symbols

A	=	Sum of state grants-in-aid for school districts in the study
A_i	=	State grants-in-aid to a given district
u	=	Guaranteed support level measured by dollars per weighted pupil
u'	=	Additional state grants-in-aid per weighted pupil for distribution to local districts by means of certain hypothetical manners
N	=	Sum of weighted pupils in districts under study
N_i	=	Number of weighted pupils in a given district
r	=	Regular school millage rate (.014)
r_i	=	Total millage rate for current maintenance and operation in a given district (local burden)
$r_i - r$	=	Excess mill levy
C_i	=	Assessed value of a given district as determined by the county assessor
Ca_i	=	Adjusted value of a given district as determined by the Washington State Tax

Commission which considers the various county assessment ratios

R_i = Total district revenue available for expenditure

R_i* = Total receipts received by a district from July 1, 1965 to June 30, 1966

R_i' = Receipts from sources such as the 1% county tax, Public Law 874 funds, Federal Forest Funds, Public Utility District Revenue, in-lieu-of tax revenue and non-high receipts, which, in the current distribution formula are reduced from the state guaranteed support level in a given district

R_i'' = Revenue from Public Law 874 funds in a given district

R_i''' = Total district revenue available for expenditure less ending cash balance, June 30, 1966

F_i = Revenue from Federal Forest Funds in a given district

S_i = Receipts for special programs such as handicapped, driver education, vocational-technical, adult education, transportation and institutions in a given district

S_i' = All other revenue sources in a given district such as Federal funds other than revenue from Federal Forest Funds and Public Law 874 funds as indicated in budget accounts 60, 70, 80, 90

E_i = Educational opportunity (expenditure per weighted pupil exclusive of transportation, lunchroom, and capital outlay funds) in a given district

E_i' = Total expenditure of funds in a given district less expenditures for transportation, lunchroom, abatements, community services and that portion of accounts 1300 and 1400 not attributed to per pupil costs

E_i'' = Total expenditure of funds in a given district during the 1965-66 school year

E_i''' = Total expenditure of funds for a ten month period during the 1965-66 school year

B_i = Relative burden of taxation in a given district

Ba_i = Balance of district revenue unexpended and unencumbered as of June 30, 1966

Ba_i^* = Ending cash balance, in a given district, as of June 30, 1965

p = Relative effort (ratio of a given district's excess mill levy to the average excess mill levy in the districts studied)

m = Relative ability to pay (ratio of a given district's adjusted valuation per weighted pupil to the average adjusted valuation per weighted pupil of all excess mill levy districts in the study)

k = Number of districts in the study or in any particular formula application

k' = Number of excess mill districts in the study or in any particular formula application

D_i = All expenditures for transportation, lunch-room, abatements, community services and that portion of accounts 1300 and 1400 not attributed to per pupil costs

D_p = Deferred payment (1/6 or 17%) of state aid distributed to a given district in July and August of 1966-67 school year for services rendered in the 1965-66 school year

Nc = Net cost of school operation in a given district for a twelve month period in 1965-66

Lr = Expenditures in a given district for lunch-room, abatements, community services, and that portion of accounts 1300 and 1400 not

attributed to per pupil costs for a twelve month period

Wo = Warrants outstanding in a given district as of July 1, 1965 for 1964-65 expenditures

Ti = Transportation expense in a given district in 1965-66 for a twelve month period

Ti' = Cost of transportation services for ten months in a given district in 1965-66

Ti'' = Total state transportation allotment for a given district in 1965-66 for a twelve month period

$f_1,...f_{15}$ = Formulae 1 through 15 utilized to answer question one in study

$f_{16},...f_{30}$ = Formulae 16 through 30 utilized to answer question two in study

$f_{31},...f_{33}$ = Formulae 31 through 33 utilized to answer question three in study

APPENDIX B

ANALYSIS OF EXPENDITURES IN ELEMENTARY GRADES KINDERGARTEN THROUGH 6
(For the Year Ending June 30, 1966)

DISTRICT (1)	GRAND TOTAL CURRENT EXPENDITURES (2)	NET COST OF SCHOOL OPERATIONS (3)	AVERAGE FULL TIME ENROLLMENT (4)	AVERAGE NET COST PER PUPIL (5)	TRANSPORTATION SERVICES (6)	AVERAGE NET COST PER PUPIL W/O TRANSPORTATION (7)
Seattle	21,046,947.18	19,796,584.29	45,494.66	435.14	98,803.65	432.97

ANALYSIS OF EXPENDITURES IN SECONDARY GRADES 7 THROUGH 12
(For the Year Ending June 30, 1966)

DISTRICT (1)	GRAND TOTAL CURRENT EXPENDITURES (2)	NET COST OF SCHOOL OPERATIONS (3)	AVERAGE FULL TIME ENROLLMENT (4)	AVERAGE NET COST PER PUPIL (5)	TRANSPORTATION SERVICES (6)	AVERAGE NET COST PER PUPIL W/O TRANSPORTATION (7)
Seattle	23,190,326.49	21,559,890.25	42,395.47	508.54	16,361.92	508.16

ANALYSIS OF EXPENDITURES IN ALL GRADES KINDERGARTEN THROUGH 12
(For the Year Ending June 30, 1966)

DISTRICT (1)	GRAND TOTAL CURRENT EXPENDITURES (2)	NET COST OF SCHOOL OPERATIONS (3)	AVERAGE FULL TIME ENROLLMENT (4)	AVERAGE NET COST PER PUPIL (5)	TRANSPORTATION SERVICES (6)	AVERAGE NET COST PER PUPIL W/O TRANSPORTATION (7)
Seattle	44,237,273.67	41,356,474.54	87,890.13	470.55	115,165.57	469.24

ANALYSIS OF EXPENDITURES IN HANDICAPPED PROGRAM
(For the Year Ending June 30, 1966)

DISTRICT (1)	GRAND TOTAL CURRENT EXPENDITURES (2)	NET COST OF SCHOOL OPERATIONS (3)	AVERAGE FULL TIME ENROLLMENT (4)	AVERAGE NET COST PER PUPIL (5)	TRANSPORTATION SERVICES (6)	AVERAGE NET COST PER PUPIL W/O TRANSPORTATION (7)
Seattle	2,134,904.17	2,107,979.39	---	---	222,704.30	---

ANALYSIS OF EXPENDITURES IN DRIVER TRAINING PROGRAM
(For the Year Ending June 30, 1966)

DISTRICT (1)	GRAND TOTAL CURRENT EXPENDITURES (2)	NET COST OF SCHOOL OPERATIONS (3)	AVERAGE FULL TIME ENROLLMENT (4)	AVERAGE NET COST PER PUPIL (5)	TRANSPORTATION SERVICES (6)	AVERAGE NET COST PER PUPIL W/O TRANSPORTATION (7)
Seattle	199,218.75	198,779.00	---	---	---	---

ANALYSIS OF EXPENDITURES IN STATE INSTITUTIONS
(For the Year Ending June 30, 1966)

DISTRICT (1)	GRAND TOTAL CURRENT EXPENDITURES (2)	NET COST OF SCHOOL OPERATIONS (3)	AVERAGE FULL TIME ENROLLMENT (4)	AVERAGE NET COST PER PUPIL (5)	TRANSPORTATION SERVICES (6)	AVERAGE NET COST PER PUPIL W/O TRANSPORTATION (7)
Seattle	175,475.23	175,435.42	---	---	---	---

ANALYSIS OF EXPENDITURES IN ADULT VOCATIONAL PROGRAM
(For the Year Ending June 30, 1966)

DISTRICT (1)	GRAND TOTAL CURRENT EXPENDITURES (2)	NET COST OF SCHOOL OPERATIONS (3)	AVERAGE FULL TIME ENROLLMENT (4)	AVERAGE NET COST PER PUPIL (5)	TRANSPORTATION SERVICES (6)	AVERAGE NET COST PER PUPIL W/O TRANSPORTATION (7)
Seattle	3,391,494.05	3,145,039.61	---	---	---	---

ANALYSIS OF EXPENDITURES IN ADULT GENERAL PROGRAM
(For the Year Ending June 30, 1966)

DISTRICT (1)	GRAND TOTAL CURRENT EXPENDITURES (2)	NET COST OF SCHOOL OPERATIONS (3)	AVERAGE FULL TIME ENROLLMENT (4)	AVERAGE NET COST PER PUPIL (5)	TRANSPORTATION SERVICES (6)	AVERAGE NET COST PER PUPIL W/O TRANSPORTATION (7)
Seattle	25,784.82	25,664.89	---	---	---	---

ANALYSIS OF EXPENDITURES IN VOCATIONAL TECHNICAL SCHOOLS
(For the Year Ending June 30, 1966)

DISTRICT (1)	GRAND TOTAL CURRENT EXPENDITURES (2)	NET COST OF SCHOOL OPERATIONS (3)	AVERAGE FULL TIME ENROLLMENT (4)	AVERAGE NET COST PER PUPIL (5)	TRANSPORTATION SERVICES (6)	AVERAGE NET COST PER PUPIL W/O TRANSPORTATION (7)
Seattle	None	---	---	---	---	---

ANALYSIS OF EXPENDITURES IN SPECIAL SCHOOLS
(For the Year Ending June 30, 1966)

DISTRICT (1)	GRAND TOTAL CURRENT EXPENDITURES (2)	NET COST OF SCHOOL OPERATIONS (3)	AVERAGE FULL TIME ENROLLMENT (4)	AVERAGE NET COST PER PUPIL (5)	TRANSPORTATION SERVICES (6)	AVERAGE NET COST PER PUPIL W/O TRANSPORTATION (7)
Seattle	None	---	---	---	---	---

ANALYSIS OF EXPENDITURES IN ALL FEDERAL PROGRAMS
(For the Year Ending June 30, 1966)

DISTRICT (1)	GRAND TOTAL CURRENT EXPENDITURES (2)	NET COST OF SCHOOL OPERATIONS (3)	AVERAGE FULL TIME ENROLLMENT (4)	AVERAGE NET COST PER PUPIL (5)	TRANSPORTATION SERVICES (6)	AVERAGE NET COST PER PUPIL W/O TRANSPORTATION (7)
Seattle	1,297,225.19	---	---	---	---	---

ANALYSIS OF EXPENDITURES IN ALL PROGRAMS
(For the Year Ending June 30, 1966)

DISTRICT (1)	GRAND TOTAL CURRENT EXPENDITURES (2)	NET COST OF SCHOOL OPERATIONS (3)	AVERAGE FULL TIME ENROLLMENT (4)	AVERAGE NET COST PER PUPIL (5)	TRANSPORTATION SERVICES (6)	AVERAGE NET COST PER PUPIL W/O TRANSPORTATION (7)
Seattle	None	---	---	---	---	---

TRANSPORTATION SUMMARY
(For the Year Ending June 30, 1966)

DISTRICT (1)	PUPILS (2)	TEACHERS (3)	OTHERS (4)	REIMBURSABLE CURRENT EXPENSE FOR TRANSPORTATION (5)	DEPRECIATION OF DISTRICT-OWNED CONVEYANCES (6)	DEDUCTION FOR CONVEYANCES SOLD (7)	NET AMOUNT USED TO COMPUTE ALLOTMENT (8)	ALLOTMENT 90% OF TOTAL (9)
Seattle	---	---	---	320,773.16	---	---	320,773.16	288,695.84

SUMMARY OF WEIGHTED ENROLLMENTS USED IN DETERMINING TOTAL GUARANTEE OF STATE FUNDS
(For the Year Ending June 30, 1966)

DISTRICT (1)	TOTAL BASE ENROLLMENT x 1 (2)	SECONDARY GRADES 7-12 x .3 (3)	APPROVED VOCATIONAL CLASSES x .2 (4)	BASE ENROLLMENT x STAFF WEIGHTING FACTOR (5)	ADDITIONAL WEIGHTING FOR SMALL SCHOOL ENROLLMENTS ELEMENTARY (6)	ADDITIONAL WEIGHTING FOR SMALL SCHOOL ENROLLMENTS SECONDARY (7)	DISADVANTAGED OR MIGRANT PUPILS x .1 (8)	TOTAL WEIGHTED ENROLLMENT (9)	TOTAL GUARANTEE @ $305 (10)
Seattle	89,420.850	12,718.641	642.582	11,982.394	---	---	800.000	115,564.467	35,247,162.44

COMPUTATION OF DEDUCTIBLE REVENUE: LOCAL TAX RECEIPTS
(For the Year Ending June 30, 1966)

DISTRICT (1)	ASSESSED VALUATION PREVIOUS YEAR (2)	ASSESSED VALUATION CURRENT YEAR (3)	MILLS (4)	REVENUE FROM 35% OF 85% OF MILLAGE x PREVIOUS YEAR VALUATION (5)	REVENUE FROM 65% OF 85% OF MILLAGE x CURRENT YEAR VALUATION (6)	85% OF NON-HIGH RECEIPTS (7)	85% OF IN-LIEU-OF TAX RECEIPTS (8)	REAL ESTATE EXCISE TAX RECEIPTS (9)
Seattle	972,694,033	994,851,247	---	4,051,270.65	7,695,174.39	---	81,623.52	2,632,300.60

COMPUTATION OF DEDUCTIBLE REVENUE: OTHER LOCAL RECEIPTS, FEDERAL, ETC.
(For the Year Ending June 30, 1966)

DISTRICT (1)	PUBLIC LAW 874 RECEIPTS 31% OF PREVIOUS YEAR (2)	PUBLIC LAW 874 RECEIPTS 40% OF CURRENT YEAR (3)	40% OF FEDERAL FOREST FEES (4)	40% OF P.U.D. FEES (5)	TOTAL DEDUCTIBLE REVENUE (6)
Seattle	50,200.16	194,075.20	17,701.79	---	14,722,346.31

ALLOTMENT OF STATE FUNDS
(For the Year Ending June 30, 1966)

DISTRICT (1)	ALLOTMENT DUE FROM STATE FUNDS GUARANTEE LESS DEDUCTIBLE REVENUE (2)	ALLOTMENT AS PROVIDED BY GRANDFATHER CLAUSE (3)	ACTUAL AMOUNT DUE FROM STATE FUNDS LARGER OR COLUMN 2 OR 3 (4)	ADJUSTMENT RESULTING FROM REIMBUPSEMENT ON BASIS OF ESTIMATED FACTORS			
				ADJUSTMENT FROM PREVIOUS YEAR (5)	TOTAL DUE FOR CURRENT YEAR SUM OF 4 & 5 (6)	TOTAL PAID CURRENT YEAR (7)	ADJUSTMENT--- TO BE APPLIED FOLLOWING YEAR (8)
Seattle	20,524,816.13	---	20,524,816.13	291,898.99-	20,232,917.14	20,337,291.11	104,373.97-

EXPENDITURE INFORMATION FOR 1965-1966 BY SCHOOL DISTRICTS

DISTRICT	TOTAL RECEIPTS AND BALANCES A	WARRANTS OUTSTANDING AT BEGINNING OF YEAR B	TRUE BEGINNING CASH BALANCE FOR 1965-1966 F	DRIVER EDUCATION REIMBURSEMENT H
Seattle	61,010,025.18	4,879,219.10	6,102,427.46	139,954.41

GENERAL FUND EXCESS LEVIES - SPECIAL LEVY DISTRICTS ONLY

DISTRICT	COUNTY RATIO 1965 ASSESSMENT A	1965 VALUATION B	1965 MILLS C	1966 VALUATION D	1966 MILLS E
Seattle	20.8	968,224,608	8.40	990,131,878	9.80

STATE REIMBURSEMENTS

DISTRICT	HANDICAPPED PROGRAM A	ADULT EDUCATION B	INSTITUTIONS C	VOCATIONAL-TECHNICAL SCHOOLS D
Seattle	1,685,694.00	150,875.00	230,220.00	2,379,000.00

APPENDIX C

TABLE A

MEAN, STANDARD DEVIATION, CORRELATION, AND T-TEST RESULTS OF EDUCATIONAL OPPORTUNITY, FORMULAE f_1-f_{15}, TABLE II, FOR ALL SCHOOL DISTRICTS IN GROUPS A THROUGH H

Measure	Grp	Number in Group	f_1	f_2	f_3	f_4	f_5	f_6	f_7	f_8	f_9	f_{10}	f_{11}	f_{12}	f_{13}	f_{14}	f_{15}
U	A	278	305.00	288.85	300.48	303.85	304.51	304.81	304.50	281.52	316.80	306.19	312.24	306.03	319.40	307.09	342.27
M	A	278	417.71	415.95	417.77	420.26	418.60	417.62	418.33	419.54	421.12	417.97	424.07	418.31	404.61	417.02	413.52
σ	A	278	106.08	106.51	108.05	108.08	106.08	106.08	106.58	111.25	104.64	106.08	105.14	105.98	115.51	104.18	109.65
r	A	278	———	.999	.997	.982	.999	.999	.999	.975	.998	.999	.999	.999	.947	.979	.927
t	A	278	———	1.40	3.68**	1.66	.01	.01	1.77	3.53**	3.69**	.06	3.75**	1.33	4.41**	1.46	1.46
U	B	12	305.00	287.05	301.58	304.68	304.83	304.49	304.71	282.35	319.19	306.12	319.42	306.13	311.69	306.52	344.07
M	B	12	449.52	448.29	450.54	449.62	449.56	449.46	449.77	449.64	450.44	449.29	453.67	449.47	447.75	449.61	452.61
σ	B	12	44.70	45.57	50.39	44.35	44.52	44.76	44.45	50.34	40.82	44.44	35.03	44.01	44.36	42.60	27.80
r	B	12	———	.996	.991	.999	.999	.999	.999	.992	.995	.999	.971	.999	.995	.999	.945
t	B	12	———	.72	2.80*	3.24**	2.05	.22	.82	2.94*	2.81*	2.77*	3.27**	1.72	.25	3.40**	4.77**
U	C	20	305.00	289.77	298.65	304.27	304.29	304.77	304.55	281.27	316.87	306.02	308.82	306.18	318.47	305.00	336.36
M	C	20	415.70	415.64	415.46	415.80	415.80	415.71	415.77	415.68	415.95	415.48	415.72	415.73	415.93	415.70	416.02
σ	C	20	33.82	35.04	36.45	33.30	33.43	33.89	33.50	36.06	30.47	33.97	33.22	33.49	32.15	33.82	28.41
r	C	20	———	.996	.976	.998	.999	.999	.999	.980	.991	.999	.980	.999	.976	1.00	.925
t	C	20	———	1.62	1.45	1.19	.961	.353	1.37	1.380	3.39**	1.30	.38	.96	.99	0.00	1.96
U	D	43	305.00	289.82	299.10	303.94	304.51	304.98	304.43	281.78	314.35	306.28	305.00	305.75	325.33	306.12	337.83
M	D	43	387.15	387.03	387.55	387.23	387.14	387.15	387.16	387.49	387.14	386.86	387.15	387.05	387.01	386.78	386.24
σ	D	43	50.20	50.78	56.94	50.20	50.07	50.20	50.34	57.33	49.86	50.18	50.20	50.44	50.47	48.52	48.64
r	D	43	———	.997	.980	.999	.999	.999	.999	.979	.998	.999	1.000	.999	.988	.983	.967
t	D	43	———	.93	4.09**	.01	.43	.43	.50	4.17**	.665	.23	0.00	.57	.22	1.19	.80
U	E	40	305.00	290.82	300.87	302.65	303.38	304.96	303.99	281.67	312.48	306.02	305.00	305.37	329.59	315.90	349.36
M	E	40	396.78	396.77	396.72	397.00	396.81	396.79	396.87	397.06	396.93	396.52	396.78	396.76	396.64	395.59	395.32
σ	E	40	56.08	57.09	60.35	57.92	55.94	56.09	55.93	62.60	55.69	55.93	56.08	56.04	55.65	31.66	31.43
r	E	40	———	.999	.989	.995	.997	.999	.999	.985	.998	.999	1.000	.999	.981	.563	.497
t	E	40	———	2.16*	2.99**	1.96	.21	.21	.36	3.89**	.61	.91	0.00	.66	.24	4.50**	4.35**
U	F	88	305.00	290.70	300.59	298.52	303.36	304.52	302.71	275.80	312.68	305.94	305.00	305.30	336.31	307.62	347.85
M	F	88	415.59	415.85	415.58	415.96	415.87	415.63	415.56	416.47	415.69	415.50	415.59	415.64	415.28	416.01	415.75
σ	F	88	88.43	88.91	89.59	99.49	88.92	88.39	90.39	103.98	86.79	88.51	88.43	88.29	89.29	86.31	85.68
r	F	88	———	.999	.997	.976	.997	.999	.997	.964	.998	.999	1.000	.999	.989	.973	.957
t	F	88	———	.93	1.71	5.04**	.67	.72	2.48*	5.68**	2.79**	.69	0.00	2.27*	.62	.97	1.01
U	G	23	305.00	291.37	301.61	300.40	303.39	304.71	303.49	279.97	313.08	305.00	305.00	305.00	336.29	305.00	344.37
M	G	23	396.09	396.28	395.55	395.74	396.63	396.06	395.61	395.41	395.69	396.09	396.09	396.09	396.27	396.09	398.87
σ	G	23	60.28	60.95	63.33	59.83	61.09	60.07	60.85	64.88	61.53	60.28	60.28	60.28	64.14	60.28	65.19
r	G	23	———	.997	.996	.992	.996	.999	.997	.976	.995	1.000	1.000	1.000	.934	1.000	.934
t	G	23	———	.62	2.44*	.27	.70	.78	.55	1.56	.96	0.00	0.00	0.00	.80	0.00	1.01
U	H	52	305.00	320.57	330.03	320.74	332.85	334.33	305.00	301.19	341.95	334.33	334.33	334.33	396.30	334.33	403.92
M	H	52	465.63	491.90	492.03	482.76	492.47	492.40	465.63	481.93	493.31	492.40	492.40	492.40	503.43	492.40	503.90
σ	H	52	189.90	184.30	185.24	183.10	183.96	183.80	189.90	185.39	187.17	183.80	183.80	183.80	187.14	183.80	184.97
r	H	52	———	.997	.997	.979	.999	.999	1.00	.976	.998	.999	.999	.999	.947	.999	.947
t	H	52	———	2.99**	2.38*	1.26	4.29**	4.46**	0.00	.77	4.30**	4.46**	4.46**	4.46**	.32	4.46**	.58

* Significant at .05 level
** Significant at .01 level

U State guaranteed support level
M Mean expenditure per weighted pupil

σ Standard deviation
r Coefficient of correlation

t T-test

TABLE B

MEAN, STANDARD DEVIATION, CORRELATION, AND T-TEST RESULTS OF EDUCATIONAL OPPORTUNITY FORMULAE f_1-f_{15}, TABLE II FOR ALL NON-HIGH SCHOOL DISTRICTS IN GROUPS A, F, G, AND H

Measure	Grp	Number in Group	f_1	f_2	f_3	f_4	f_5	f_6	f_7	f_8	f_9	f_{10}	f_{11}	f_{12}	f_{13}	f_{14}	f_{15}
U	A	83	305.00	294.54	305.68	303.23	308.40	309.17	308.92	283.51	319.25	309.39	309.29	309.32	343.80	309.29	353.90
M	A	83	431.54	434.82	435.27	434.15	436.22	435.62	435.39	433.20	437.47	435.68	435.63	435.65	431.64	435.63	433.00
σ	A	83	148.29	147.95	149.06	147.25	147.68	147.67	147.73	148.69	146.66	147.72	147.71	147.71	162.39	147.71	160.02
r	A	83	———	.999	.998	.978	.999	.999	.999	.974	.998	.999	.999	.999	.933	.999	.933
t	A	83	———	.48	.82	.30	1.47	4.19**	3.55**	.11	1.67	4.20**	4.43**	4.44**	2.27*	4.43**	1.91
U	F	14	305.00	290.13	301.79	297.08	304.56	304.90	304.08	277.55	314.57	305.26	305.00	305.07	337.85	305.00	347.74
M	F	14	399.42	400.07	399.34	403.09	399.54	399.52	399.17	403.62	399.07	399.42	399.42	399.44	397.84	399.42	397.50
σ	F	14	47.72	47.59	48.66	78.32	47.76	47.54	47.54	78.49	47.35	47.86	47.72	47.74	47.25	47.72	46.53
r	F	14	———	.998	.994	.949	.999	.999	.999	.947	.994	.999	1.000	.999	.959	1.000	.963
t	F	14	———	.14	.60	5.67**	.21	.91	.29	5.57**	.26	.79	0.00	.31	.12	0.00	.33
U	G	16	305.00	290.35	304.06	302.81	302.72	304.54	305.00	284.48	315.30	305.00	305.00	305.00	337.58	305.00	347.88
M	G	16	384.92	385.01	385.05	385.21	385.51	384.83	384.92	385.93	385.00	384.92	384.92	384.92	385.39	384.92	385.46
σ	G	16	50.46	50.04	51.07	48.34	52.34	50.19	50.46	50.37	50.53	50.46	50.46	50.46	53.28	50.46	52.99
r	G	16	———	.998	.999	.992	.993	.999	1.000	9.78	.992	1.000	1.000	1.000	.911	1.000	.910
t	G	16	———	.51	1.03	1.30	1.16	.71	0.00	.03	.04	0.00	0.00	0.00	.49	0.00	.44
U	H	51	305.00	318.83	328.13	318.62	331.00	332.51	305.00	299.10	340.21	332.51	332.51	332.51	395.63	332.51	403.33
M	H	51	456.77	482.54	482.35	472.55	482.90	482.89	456.77	471.67	483.98	482.89	482.89	482.89	495.46	482.89	495.92
σ	H	51	180.78	177.85	178.47	175.28	177.26	177.15	180.78	177.63	175.66	177.15	177.15	177.15	181.49	177.15	179.01
r	H	51	———	.998	.998	.977	.999	.999	1.00	.973	.998	.999	.999	.999	.942	.999	.943
t	H	51	———	1.86	1.31	1.02	3.37**	3.63**	0.00	.54	3.31**	3.63**	3.63**	3.63**	.08	3.63**	.21

* Significant at .05 level
** Significant at .01 level

U State guaranteed support level
M Mean expenditure per weighted pupil

σ Standard deviation
r Coefficient of correlation

t T-test

TABLE C

MEAN, STANDARD DEVIATION, CORRELATION, AND T-TEST RESULTS OF EDUCATIONAL OPPORTUNITY FORMULAE f_1-f_{15}, TABLE II
FOR ALL COMPLETE PROGRAM DISTRICTS IN GROUPS A THROUGH H

Measure	Grp	Number in Group	f_1	f_2	f_3	f_4	f_5	f_6	f_7	f_8	f_9	f_{10}	f_{11}	f_{12}	f_{13}	f_{14}	f_{15}
U	A	195	305.00	288.73	300.37	303.87	304.43	304.72	304.41	281.48	316.75	306.13	312.30	305.96	318.88	307.05	342.02
M	A	195	411.82	410.16	412.32	414.12	412.63	411.64	412.77	414.51	415.13	411.67	418.02	412.20	401.48	409.96	409.32
σ	A	195	81.03	81.73	83.68	85.47	81.22	81.06	82.04	90.19	79.43	81.06	79.98	80.92	81.72	77.36	75.24
r	A	195	———	.999	.994	.989	.998	.999	.998	.978	.998	.999	.998	.999	.987	.948	.928
t	A	195	———	2.20*	4.12**	5.11**	.51	.958	2.56*	7.09**	4.41**	.31	3.08**	1.10	.719	2.02*	2.78**
U	C	20	305.00	289.77	298.65	304.27	304.29	304.77	304.52	281.27	316.87	306.02	308.82	306.18	318.47	305.00	336.36
M	C	20	415.70	415.64	415.46	415.80	415.80	415.71	415.77	415.68	415.95	415.48	415.72	415.73	415.93	415.70	416.02
σ	C	20	33.82	35.04	36.45	33.30	33.43	33.89	33.50	36.06	30.47	33.97	33.22	33.49	32.15	33.82	28.41
r	C	20	———	.996	.976	.998	.999	.999	.999	.980	.991	.999	.980	.999	.976	1.000	.925
t	C	20	———	1.62	1.45	1.19	.96	.35	1.37	1.38	3.39**	1.30	.38	.96	.992	0.00	1.96
U	D	42	305.00	289.84	299.14	303.93	304.51	304.98	304.42	281.83	314.29	306.31	305.00	305.76	325.26	306.15	337.78
M	D	42	387.04	386.91	387.43	387.11	387.02	387.03	387.05	387.38	387.03	386.74	387.04	386.92	386.90	386.66	386.12
σ	D	42	50.79	51.38	57.61	50.79	50.66	50.79	50.93	58.00	50.45	50.77*	50.79	51.02	51.07	49.09	49.22
r	D	42	———	.997	.980	.999	.999	.999	.999	.979	.998	.999	1.000	.999	.988	.953	.968
t	D	42	———	.92	4.03**	.01	.43	.42	.50	4.12**	.65	.29	0.00	.56	.22	1.18	.79
U	E	39	305.00	290.80	300.77	302.66	303.34	304.96	300.96	281.49	312.42	306.04	305.00	305.38	329.70	316.15	349.70
M	E	39	397.20	397.19	397.14	397.43	397.23	397.22	397.29	397.50	397.37	396.93	397.20	397.19	397.04	395.96	395.68
σ	E	39	56.73	57.75	61.03	58.60	56.58	56.74	56.57	63.28	56.31	56.59	56.73	56.69	56.33	32.05	31.83
r	E	39	———	.999	.989	.995	.997	.999	.999	.985	.998	.999	1.000	.999	.981	.563	.497
t	E	39	———	2.12*	2.94**	1.94	.23	.20	.38	3.82**	.65	.86	0.00	.63	.22	4.43**	4.28**
U	F	74	305.00	290.77	300.44	298.69	303.22	304.92	302.54	275.58	312.45	306.02	305.00	305.33	336.12	307.94	347.86
M	F	74	418.65	418.80	418.73	418.29	419.04	418.62	418.75	419.01	418.97	418.49	418.65	418.69	418.68	418.98	419.19
σ	F	74	93.86	94.45	95.02	102.86	94.36	93.84	96.00	107.91	91.96	93.97	93.86	93.71	94.75	91.57	90.81
r	F	74	———	.999	.998	.984	.997	.999	.997	.969	.998	.999	1.000	.999	.991	.971	.957
t	F	74	———	1.00	1.53	4.36**	.57	.44	2.31*	4.84**	3.01**	.81	0.00	2.05*	.60	.88	.96
U	G	7	305.00	293.09	297.46	296.32	304.52	305.00	300.95	272.34	309.31	305.00	305.00	305.00	334.11	305.00	338.42
M	G	7	421.63	421.45	421.02	421.24	421.64	421.63	420.95	419.76	421.44	421.63	421.63	421.63	421.93	421.63	421.74
σ	G	7	71.97	75.44	77.19	71.85	71.98	71.97	72.31	81.00	73.15	71.97	71.97	71.97	76.92	71.97	78.04
r	G	7	———	.996	.993	.993	.999	1.000	.993	.976	.999	1.000	1.000	1.000	.948	1.000	.948
t	G	7	———	1.20	1.34	.03	.01	0.00	.09	1.21	.94	0.00	0.00	0.00	.46	0.00	.57

* Significant at .05 level
** Significant at .01 level
U State guaranteed support level
M Mean expenditure per weighted pupil
σ Standard deviation
r Coefficient of correlation
t T-test

NOTE: Group B is the same as in TABLE A and Group H has only 1 school district in it so no tests were run on it.

TABLE D

MEAN, STANDARD DEVIATION, CORRELATION, AND T-TEST RESULTS OF EDUCATIONAL OPPORTUNITY FORMULAE f_{16}-f_{30}, TABLE V
FOR ALL SCHOOL DISTRICTS IN GROUPS A THROUGH H

Measure	Grp	Number in Group	$f_1(r_i \cdot r)$	$f_1(E_i)$	f_{16}	f_{17}	f_{18}	f_{19}	f_{20}	f_{21}	f_{22}	f_{23}	f_{24}	f_{25}	f_{26}	f_{27}	f_{28}	f_{29}	f_{30}
U	A	278	305.00	305.00	305.00	306.23	305.25	306.48	610.00	457.50	305.00	457.50	319.59	305.00	389.02	389.02	305.00	305.00	389.50
M	A	278	9.75	417.71	501.44	412.03	411.85	406.17	692.82	570.21	430.29	0.00	489.12	405.13	583.96	.72	474.67	3.90	401.94
σ	A	278	6.77	106.08	165.05	105.25	98.43	97.50	90.30	106.08	119.08	0.00	171.59	97.02	175.83	.67	148.83	2.67	82.15
r	A	278	———	———	.819	.994	.979	.973	.747	1.000	.985	0.000	.862	.978	.757	.687	.860	.953	.928
t	A	278	———	———	13.2**	1.21	6.05**	6.07**	4.05**	0.00	11.2**	0.00	16.4**	7.05**	13.4**	74.3**	11.2**	38.1**	11.5**
U	B	12	305.00	305.00	305.00	305.84	305.04	305.88	610.00	457.50	305.00	457.50	319.48	305.00	400.16	400.16	305.00	305.00	389.50
M	B	12	16.02	449.52	550.22	444.00	449.06	443.53	647.99	602.02	479.51	0.00	552.55	419.54	572.36	0.00	494.53	5.32	423.52
σ	B	12	6.80	44.63	69.20	39.15	45.08	39.56	154.29	44.70	53.02	0.00	69.03	39.86	46.02	0.00	84.64	2.82	43.36
r	B	12	———	———	.876	.976	.999	.976	.046	1.000	.972	0.000	.877	.950	.989	0.000	.706	.986	.881
t	B	12	———	———	2.95*	1.95	3.30**	1.78	5.01**	0.00	2.31*	0.00	2.95	1.16	.63	0.00	3.05*	16.7**	.20
U	C	20	305.00	305.00	305.00	306.46	305.09	306.55	610.00	457.50	305.00	457.50	316.77	305.00	372.33	372.33	305.00	305.00	389.50
M	C	20	12.03	415.70	473.51	408.18	414.77	407.25	689.11	568.20	431.49	0.00	475.45	399.90	502.10	2.74	434.77	5.16	399.12
σ	C	20	9.07	33.82	65.08	33.40	34.52	33.94	26.55	33.82	44.19	0.00	65.79	26.98	37.12	1.37	37.12	3.54	42.69
r	C	20	———	———	.899	.957	.998	.960	.592	1.000	.970	0.000	.898	.918	.988	.525	.988	.960	.968
t	C	20	———	———	6.81**	.18	1.46	.06	1.29	.00	4.74**	0.00	6.91**	2.44*	2.52*	13.8**	2.52*	14.1**	3.98**
U	D	43	305.00	305.00	305.00	306.45	305.13	306.58	610.00	457.50	305.00	457.50	319.58	305.00	376.74	376.74	305.00	305.00	389.50
M	D	43	10.55	387.15	435.64	379.30	385.87	378.02	669.45	539.65	398.50	0.00	439.95	375.80	479.14	.74	407.40	3.72	374.24
σ	D	43	6.32	50.21	83.21	45.43	50.32	45.42	46.84	50.21	57.88	0.00	82.26	46.21	55.41	.39	55.41	2.21	34.47
r	D	43	———	———	.821	.951	.999	.953	.813	1.000	.972	0.000	.830	.955	.965	.688	.965	.959	.813
t	D	43	———	———	5.92**	2.08*	.30	2.12*	.76	0.00	3.88**	0.00	5.90**	1.80	2.43*	49.6**	2.43	19.6**	4.24**
U	E	40	305.00	305.00	305.00	306.04	305.29	306.33	610.00	457.50	305.00	457.50	319.73	305.00	381.18	381.18	305.00	305.00	389.50
M	E	40	8.70	396.78	435.42	391.69	393.88	388.79	684.72	549.28	405.31	0.00	440.58	388.25	496.35	0.00	420.17	2.88	388.62
σ	E	40	4.89	56.08	74.41	52.82	54.75	51.33	53.43	56.08	61.10	0.00	73.05	53.41	60.90	0.00	60.90	1.88	56.25
r	E	40	———	———	.900	.977	.993	.971	.903	1.000	.982	0.000	.902	.977	.904	0.000	.904	.985	.938
t	E	40	———	———	4.05**	1.71	1.23	2.29*	.70	.00	2.81**	0.00	3.81**	1.40	1.19	0.00	1.19	25.2**	.05
U	F	88	305.00	305.00	305.00	306.21	305.81	307.02	610.00	457.50	305.00	457.50	325.29	305.00	402.09	402.09	305.00	305.00	389.50
M	F	88	8.18	415.59	467.91	410.00	407.90	402.30	700.36	568.09	425.71	0.00	474.02	405.48	545.26	0.00	446.75	3.52	418.93
σ	F	88	5.52	88.43	123.56	87.61	82.34	81.40	79.03	88.43	95.69	0.00	116.71	82.76	105.11	0.00	100.36	1.97	113.32
r	F	88	———	———	.939	.996	.955	.952	.954	1.000	.992	0.000	.946	.990	.923	0.000	.940	.949	.970
t	F	88	———	———	9.17**	.942	2.24*	2.51*	3.48**	0.00	5.91**	0.00	8.03**	4.29**	4.18**	0.00	3.45**	21.7**	9.51**
U	G	23	305.00	305.00	305.00	306.05	305.58	306.63	610.00	457.50	305.00	457.50	318.05	305.00	379.36	379.36	305.00	305.00	389.50
M	G	23	9.19	396.09	446.83	392.31	391.32	387.53	676.39	548.59	408.44	0.00	457.59	383.74	533.83	0.00	459.47	3.74	372.04
σ	G	23	7.30	60.28	92.93	57.26	61.94	59.49	56.44	60.28	69.37	0.00	91.10	55.59	69.91	0.00	69.91	3.52	68.74
r	G	23	———	———	.846	.992	.990	.972	.815	1.000	.972	0.000	.830	.956	.808	0.000	.808	863	.971
t	G	23	———	———	3.84**	1.81	.90	.26	.52	0.00	2.74*	0.00	3.49**	1.26	1.16	0.00	1.16	4.45**	2.54*
U	H	52	305.00	305.00	305.00	335.54	336.03	366.57	610.00	457.50	305.00	457.50	377.08	305.00	539.90	539.90	305.00	305.00	389.50
M	H	52	5.85	465.63	687.03	461.00	453.20	448.57	724.66	618.13	481.37	0.00	652.63	449.90	971.62	0.00	636.96	0.00	442.01
σ	H	52	3.18	189.90	392.39	190.06	173.90	174.14	140.12	189.90	215.42	0.00	326.04	171.95	351.05	0.00	276.37	0.00	115.48
r	H	52	———	———	.824	.998	.983	.980	.749	1.000	.984	0.000	.857	.976	.803	0.000	.879	0.000	.834
t	H	52	———	———	9.89**	.09	3.39**	3.08**	3.29**	0.00	5.09**	0.00	7.78**	3.19**	7.76**	0.00	5.69**	0.00	6.84**

* Significant at .05 level
** Significant at .01 level

U State guaranteed support level
M Mean expenditure per weighted pupil

σ Standard deviation
r Coefficient of correlation

t - T-test

TABLE E

MEAN, STANDARD DEVIATION, CORRELATION, AND T-TEST RESULTS OF EDUCATIONAL OPPORTUNITY FORMULAE f_{16}-f_{30}, TABLE V FOR ALL NON-HIGH SCHOOL DISTRICTS IN GROUPS A, F, G, AND H

Measure	Grp	Number in Group	$f_1(r_i \cdot r)$	$f_1(E_i)$	f_{16}	f_{17}	f_{18}	f_{19}	f_{20}	f_{21}	f_{22}	f_{23}	f_{24}	f_{25}	f_{26}	f_{27}	f_{28}	f_{29}	f_{30}
U	A	83	305.00	305.00	305.00	310.25	310.04	315.29	610.00	457.50	305.00	457.50	328.64	305.00	403.58	403.58	305.00	305.00	389.50
M	A	83	6.54	431.54	576.70	427.56	420.97	416.99	706.08	584.04	443.00	0.00	543.61	420.08	744.06	0.00	565.82	1.16	405.14
σ	A	83	4.27	148.29	281.78	147.98	133.76	133.48	116.72	148.29	163.39	0.00	242.63	138.57	319.10	0.00	205.35	.92	89.39
r	A	83	———	———	.812	.997	.976	.973	.800	1.000	.985	0.000	.845	.979	.801	0.000	.886	.853	.879
t	A	83	———	———	10.6**	.26	4.26**	4.08**	3.63**	0.00	5.05**	0.00	8.62**	2.99**	12.7**	0.00	6.44**	19.2**	9.98**
U	F	14	305.00	305.00	305.00	305.89	305.99	306.88	610.00	457.50	305.00	457.50	318.02	305.00	379.50	379.50	305.00	305.00	389.50
M	F	14	7.50	399.42	443.28	395.44	386.38	382.40	689.94	551.92	406.66	0.00	445.57	392.18	544.49	0.00	463.21	2.36	383.24
σ	F	14	5.14	47.72	80.52	47.46	32.98	32.42	49.50	47.72	50.29	0.00	64.60	47.45	117.11	0.00	96.61	.14	19.59
r	F	14	———	———	.811	.989	.540	.525	.905	1.000	.978	0.000	.886	.975	.680	0.000	.751	.932	.570
t	F	14	———	———	3.24**	.13	1.56	1.61	.30	0.00	.87	0.00	2.30*	.09	4.83**	0.00	4.01**	70.6**	4.27**
U	G	16	305.00	305.00	305.00	305.36	305.27	305.63	610.00	457.50	305.00	457.50	321.33	305.00	386.97	386.97	305.00	305.00	389.50
M	G	16	6.15	384.92	438.03	383.42	382.13	380.62	665.71	537.42	397.02	0.00	455.04	372.81	549.57	0.00	467.60	.72	374.22
σ	G	16	4.54	50.46	96.27	49.94	53.69	53.14	39.88	50.46	63.92	0.00	95.05	41.41	69.98	0.00	69.98	.55	55.45
r	G	16	———	———	.881	.998	.992	.991	.676	1.000	.973	0.00	.875	.935	.893	0.00	.893	.739	.970
t	G	16	———	———	5.48**	.59	1.85	1.42	1.20	0.00	3.88**	0.00	5.24**	2.10	2.77*	0.00	2.77*	14.9**	1.46
U	H	51	305.00	305.00	305.00	333.74	334.24	362.98	610.00	457.50	305.00	457.50	374.73	305.00	532.71	332.71	305.00	305.00	389.50
M	H	51	5.85	456.77	662.27	452.05	444.10	439.37	724.56	609.27	469.24	0.00	634.96	444.30	955.19	0.00	628.29	0.00	442.01
σ	H	51	3.18	180.78	380.40	180.72	162.86	162.85	141.49	180.78	199.15	0.00	309.81	168.87	349.45	0.00	271.98	0.00	115.48
r	H	51	———	———	.803	.997	.982	.978	.792	1.000	.985	0.000	.842	.979	.811	0.000	.885	0.000	.822
t	H	51	———	———	9.56**	.03	3.84**	3.54**	2.84**	0.00	3.95**	0.00	7.33**	2.36*	8.46**	0.00	6.31**	0.00	5.70**

* Significant at .05 level
** Significant at .01 level

U State guaranteed support level
M Mean expenditure per weighted pupil

σ Standard deviation
r Coefficient of correlation

t T-test

TABLE F

MEAN, STANDARD DEVIATION, CORRELATION, AND T-TEST RESULTS OF EDUCATIONAL OPPORTUNITY FORMULAE f_{16}-f_{30}, TABLE V
FOR ALL COMPLETE PROGRAM DISTRICTS IN GROUPS A THROUGH H

Measure	Grp	Number in Group	$f_1(r_i \cdot x)$	$f_1(E_i)$	f_{16}	f_{17}	f_{18}	f_{19}	f_{20}	f_{21}	f_{22}	f_{23}	f_{24}	f_{25}	f_{26}	f_{27}	f_{28}	f_{29}	f_{30}
U	A	195	305.00	305.00	305.00	306.14	305.15	306.29	610.00	457.50	305.00	457.50	319.39	305.00	388.71	388.71	305.00	305.00	389.50
M	A	195	10.54	411.82	469.41	405.42	407.96	401.56	687.18	564.32	424.88	0.00	469.22	398.76	520.66	.76	435.87	4.13	401.15
σ	A	195	7.03	81.03	108.91	79.53	78.39	76.81	75.62	81.03	93.56	0.00	123.03	71.49	106.70	.67	92.68	2.63	80.26
r	A	195	———	———	.893	.990	.984	.974	.685	1.000	.986	0.000	.928	.976	.950	.647	.968	.973	.967
t	A	195	———	———	9.27**	1.82	2.59*	3.29**	1.32	0.00	12.1**	0.00	16.0**	8.06**	12.5**	65.5**	7.41**	48.0**	.52
U	B	12	305.00	305.00	305.00	305.84	305.04	305.88	610.00	457.50	305.00	457.50	319.48	305.00	400.16	400.16	305.00	305.00	389.50
M	B	12	16.02	449.52	550.22	444.00	449.06	443.53	647.99	602.02	479.51	0.00	552.55	419.54	572.36	0.00	494.53	5.32	423.52
σ	B	12	6.80	44.70	69.20	39.15	45.08	39.56	154.29	44.70	53.02	0.00	69.03	39.86	46.02	0.00	84.64	2.82	43.36
r	B	12	———	———	.876	.977	.999	.976	.047	1.000	.972	0.000	.877	.950	.989	0.000	.706	.986	.881
t	B	12	———	———	2.95*	1.95	3.30**	1.78	5.01**	0.00	2.31*	0.00	2.95*	1.16	.63	0.00	3.05*	16.7**	.20
U	C	20	305.00	305.00	305.00	306.46	305.09	306.55	610.00	457.50	305.00	457.50	316.77	305.00	372.33	372.33	305.00	305.00	389.50
M	C	20	12.03	415.70	473.51	408.18	414.77	407.25	689.11	568.20	431.49	0.00	475.45	399.90	502.10	2.74	434.77	5.16	399.12
σ	C	20	9.07	33.82	65.08	33.40	34.52	33.94	26.55	33.82	44.19	0.00	65.79	26.98	37.12	1.37	37.12	3.55	42.69
r	C	20	———	———	.899	.957	.998	.960	.592	1.000	.970	0.000	.898	.918	.988	.525	.988	.961	.968
t	C	20	———	———	6.81**	.18	1.46	.06	1.29	0.00	4.74**	0.00	6.91**	2.44*	2.52*	13.8**	2.52*	14.1**	3.98**
U	D	42	305.00	305.00	305.00	306.44	305.13	306.57	610.00	457.50	305.00	457.50	319.70	305.00	377.41	377.41	305.00	305.00	389.50
M	D	42	10.44	387.04	434.77	379.24	385.75	377.95	669.76	539.54	398.17	0.00	438.91	375.90	478.85	.69	406.44	3.95	374.37
σ	D	42	6.45	50.79	84.00	45.97	50.91	45.95	47.36	50.79	58.53	0.00	82.88	46.75	55.71	.38	55.71	2.08	35.28
r	D	42	———	———	.822	.951	.999	.953	.815	1.000	.972	0.000	.832	.956	.970	.694	.970	.973	.813
t	D	42	———	———	5.83**	2.05*	.29	2.09*	.77	0.00	3.84**	0.00	5.81**	1.79	2.41*	50.8**	2.41*	76.1**	4.05**
U	E	39	305.00	305.00	305.00	306.06	305.29	306.35	610.00	457.50	305.00	457.50	319.27	305.00	379.89	379.89	305.00	305.00	389.50
M	E	39	8.70	397.20	436.24	391.98	394.31	389.08	684.71	549.70	405.95	0.00	440.45	388.46	492.86	0.00	417.97	2.88	388.62
σ	E	39	4.89	56.73	75.18	53.46	55.38	51.95	54.11	56.73	61.74	0.00	73.95	54.07	60.09	0.00	60.09	1.88	56.25
r	E	39	———	———	.900	.977	.993	.971	.904	1.000	.982	0.000	.902	.977	.940	0.000	.940	.985	.939
t	E	39	———	———	3.97**	1.68	1.21	2.25*	.67	0.00	2.75**	0.00	3.77**	1.37	1.03	0.00	1.03	24.8**	.15
U	F	74	305.00	305.00	305.00	306.25	305.79	307.04	610.00	457.50	305.00	457.50	326.19	305.00	404.88	404.88	305.00	305.00	389.50
M	F	74	8.27	418.65	472.57	412.75	411.97	406.07	702.33	571.15	429.32	0.00	478.92	407.99	544.18	0.00	443.64	3.66	423.85
σ	F	74	5.57	93.86	129.58	93.03	88.05	87.13	83.30	93.86	101.63	0.00	123.69	87.63	103.15	0.00	100.75	2.03	119.84
r	F	74	———	———	.947	.996	.972	.969	.957	1.000	.993	0.00	.948	.991	.987	0.00	.986	.953	.973
t	F	74	———	———	8.67**	.86	2.31*	2.55*	3.51**	0.00	5.70**	0.00	7.48**	4.24**	4.99**	0.00	3.66**	20.4*	9.07**
U	G	7	305.00	305.00	305.00	307.23	306.08	308.31	610.00	457.50	305.00	457.50	312.49	305.00	366.49	366.49	305.00	305.00	389.50
M	G	7	21.31	421.63	466.95	412.62	412.32	403.30	700.81	574.13	434.55	0.00	465.35	408.72	502.37	0.00	440.88	6.76	363.29
σ	G	7	6.67	71.97	81.28	66.93	73.37	69.41	77.28	71.97	74.12	0.00	79.76	73.07	66.10	0.00	66.10	2.51	105.97
r	G	7	———	———	.863	.986	.991	.962	.918	1.000	.978	0.000	.852	.978	.980	0.000	.980	.978	.992
t	G	7	———	———	.54	99	.32	.30	.40	0.00	.32	0.00	.44	.16	.95	0.00	.95	24.3**	7.16**

* Significant at .05 level
** Significant at .01 level

U State guaranteed support level
M Mean expenditure per weighted pupil

σ Standard deviation
r Coefficient of correlation

t T-test

NOTE: Group H has only 1 school district in it so no tests were run on it.

TABLE G

MEAN, STANDARD DEVIATION, CORRELATION, AND T-TEST RESULTS
OF EDUCATIONAL OPPORTUNITY FORMULAE f_{31}-f_{33}, TABLE VI
FOR ALL SCHOOL DISTRICTS IN GROUPS A THROUGH H

Measure	Grp	Number in Group	f_{31}	f_{32}	f_{33}	Measure	Grp	Number in Group	f_{31}	f_{32}	f_{33}
U	A	278	405.00	355.00	375.00	U	E	40	405.00	355.00	375.00
M	A	278	517.71	490.59	501.43	M	E	40	496.78	494.19	495.22
	A	278	106.08	114.25	109.49		E	40	56.08	90.92	71.69
r	A	278	———	.944	.978	r	E	40	———	.678	.829
t	A	278	———	3.72**	2.54*	t	E	40	———	4.21**	2.73**
U	B	12	405.00	355.00	375.00	U	F	88	405.00	355.00	375.00
M	B	12	549.52	555.46	553.08	M	F	88	515.59	515.54	515.56
	B	12	44.70	65.82	54.54		F	88	88.43	136.97	112.28
r	B	12	———	.775	.889	r	F	88	———	.792	.894
t	B	12	———	1.99	1.39	t	F	88	———	6.85**	5.00**
U	C	20	405.00	355.00	375.00	U	G	23	405.00	355.00	375.00
M	C	20	515.70	514.85	515.19	M	G	23	496.09	495.03	495.46
	C	20	33.82	68.73	52.44		G	23	60.28	112.24	85.14
r	C	20	———	.777	.869	r	G	23	———	.657	.803
t	C	20	———	5.19**	3.88**	t	G	23	———	4.03**	2.71*
U	D	43	405.00	355.00	375.00	U	H	52	405.00	355.00	375.00
M	D	43	487.15	484.84	485.77	M	H	52	565.63	554.40	558.89
	D	43	50.20	83.21	66.19		H	52	189.90	212.75	195.87
r	D	43	———	.741	.862	r	H	52	———	.841	.936
t	D	43	———	5.02**	3.54**	t	H	52	———	1.49	.62

* Significant at .05 level
** Significant at .01 level
U State guaranteed support level
M Mean expenditure per weighted pupil
Standard deviation
r Coefficient of correlation
t T-test

TABLE H

MEAN, STANDARD DEVIATION, CORRELATION, AND T-TEST RESULTS OF EDUCATIONAL OPPORTUNITY FORMULAE f_{31}-f_{33} TABLE VI FOR ALL NON-HIGH SCHOOL DISTRICTS IN GROUPS A, F, G, AND H

Measure	Grp	Number in Group	f_{31}	f_{32}	f_{33}
U	A	83	405.00	355.00	375.00
M	A	83	531.54	497.84	511.32
	A	83	148.29	150.55	148.45
r	A	83	———	.967	.988
t	A	83	———	.53	.06
U	F	14	405.00	355.00	375.00
M	F	14	499.42	476.47	485.65
	F	14	47.72	79.18	62.71
r	F	14	———	.723	.852
t	F	14	———	2.65*	1.83
U	G	16	405.00	355.00	375.00
M	G	16	484.92	482.12	483.24
	G	16	50.46	96.30	73.10
r	G	16	———	.685	.818
t	G	16	———	3.56**	2.46*
U	H	51	405.00	355.00	375.00
M	H	51	556.77	545.58	550.05
	H	51	180.78	205.70	187.90
r	H	51	———	.832	.931
t	H	51	———	1.63	.741

* Significant at .05 level
** Significant at .01 level
U State guaranteed support level
M Mean expenditure per weighted pupil
Standard deviation
r Coefficient of correlation
t T-test

TABLE I

MEAN, STANDARD DEVIATION, CORRELATION, AND T-TEST RESULTS OF EDUCATIONAL OPPORTUNITY FORMULAE f_{31}-f_{33}, TABLE VI FOR ALL COMPLETE PROGRAM DISTRICTS IN GROUPS A THROUGH H

Measure	Grp	Number in Group	f_{31}	f_{32}	f_{33}		Measure	Grp	Number in Group	f_{31}	f_{32}	f_{33}
U	A	195	405.00	355.00	375.00		U	E	39	405.00	355.00	375.00
M	A	195	511.82	490.70	499.15		M	E	39	497.20	494.71	495.71
	A	195	81.03	96.01	88.00			E	39	56.73	90.28	71.66
r	A	195	———	.904	.960		r	E	39	———	.686	.835
t	A	195	———	5.54**	4.10**		t	E	39	———	4.02**	2.61*
U	B	12	405.00	355.00	375.00		U	F	74	405.00	355.00	375.00
M	B	12	549.52	555.46	553.08		M	F	74	518.65	523.57	521.60
	B	12	44.70	65.82	54.54			F	74	93.86	145.99	119.53
r	B	12	———	.775	.889		r	F	74	———	.791	.894
t	B	12	———	1.99	1.39		t	F	74	———	6.33**	4.62**
U	C	20	405.00	355.00	375.00		U	G	7	405.00	355.00	375.00
M	C	20	515.70	514.85	515.19		M	G	7	521.63	527.69	525.27
	C	20	33.82	68.73	52.44			G	7	71.97	116.49	90.94
r	C	20	———	.777	.869		r	G	7	———	.635	.805
t	C	20	———	5.19**	3.88**		t	G	7	———	1.45	.89
U	D	42	405.00	355.00	375.00							
M	D	42	487.04	484.50	485.51							
	D	42	50.79	84.75	67.25							
r	D	42	———	.737	.860							
t	D	42	———	5.01**	3.52**							

* Significant at .05 level
** Significant at .01 level
U State guaranteed support level
M Mean expenditure per weighted pupil
Standard deviation
r Coefficient of correlation
t T-test

NOTE: Group H has only 1 school district in it so no tests were run on it.

APPENDIX D

State of Washington
SUPERINTENDENT OF PUBLIC INSTRUCTION
Olympia

May 18, 1965

THE APPROPRIATION--ITS DISTRIBUTION

The Appropriation

The total appropriation for apportionment to school districts during 1965-67, designated for K-12 operation and maintenance, is $445,679,639. Of this, $26,500,000 is reserved for the costs of transportation, and to be distributed by the new formula, there remains $419,179,639.

The Increase

This is an increase of approximately $25-million over a comparable apportionment appropriation for 1963-65. It will be supplemented, of course, by normal increases in property taxes of about $11-million, and presumably by another $7-million during the first half of 1967. This total of $43-million will, theoretically, be available to districts for salary increases and such other improvements as are possible.

The Separation by School Years

To allow for costs of growth and salary increases during 1966-67, the $419,179,639 has been divided into two sections:

1965-66 -- $202,100,000
1966-67 -- $217,079,639

The Guaranteed Support Level

On this basis, and using a pure estimate as to the total number of weighted students which will be computed, it is our judgment that a guaranteed support level of $300 per pupil will result for 1965-66. During 1966-67, this figure will be increased by approximately $25.

Preparing Estimates for State Support

1. School districts will estimate their total weighted attendance, using the attached exhibits for this purpose.

2. Estimated total guaranteed support and the state share can then be computed on Form A-17-1/C.

3. The distribution of funds will begin upon the basis of this estimate, subject to confirmation and adjustment as actual factors are reported during the school year.

4. It is possible, particularly if a larger or smaller than anticipated weighted total develops, that some adjustment in the $300 guaranteed figure will be necessary.

5. In order that the first allocation of state funds be not delayed, the submission of forms A-17-1/A and A-17-1/C not later than July 15 is imperative.

6. Preliminary estimate forms for vocational-technical schools and for approved adult education classes will be provided at an early date.

SUPERINTENDENT OF PUBLIC INSTRUCTION -- OLYMPIA, WASHINGTON

FORM A-17-1/A

REPORT OF ESTIMATED AVERAGE ENROLLMENT (CONVERTED TO FULL-TIME EQUIVALENTS) AND COMPUTED WEIGHTED ENROLLMENT FOR 1965-66 School Year

Approved Programs	Estimated Average Base Enrollment (FTE)
1. Kindergarten (Enrollment X .5).....	
2. Grades 1-6 (excluding handicapped).....	
3. Handicapped (Preschool, Kindergarten X .5, & Grades 1-6)	
4. Grades 7-12 (excluding handicapped).....	
5. Handicapped (Grades 7-12).....	
6. Total Base Enrollment (FTE).....	

COMPUTATION OF ENROLLMENT WEIGHTINGS

A. For Grade 7-12 Levels:

Total Lines 4 and 5 _____ X .3..... _____

B. For Approved Vocational Classes:

$\frac{\text{Total Annual Student Hours Enrolled}}{180}$ _____ X .2..... _____

C. Staff Experience and Professional Preparation: 1/

Average Weighting Factor _____ X Line 6..... _____

D. For Small Elementary Districts: 2/

Weighting Factor _____ X _____ Pupils..... _____

E. For Small High Schools: 3/

Weighting Factor _____ X _____ Pupils..... _____

F. For Disadvantaged or Migrant Pupils:

Number of Identified Pupils _____ X .1..... _____

G. Total Weighted Enrollment..... _____ 4/

1/ See Table A to compute appropriate Weighting Factor

2/ See Table B for Small Elementary District Factors

3/ See Table C for Small High School Factors

4/ Districts operating approved vocational-technical schools, and/or approved classes in adult education, will report the enrollment for those programs on Form A-17-1/B

SUPERINTENDENT OF PUBLIC INSTRUCTION -- OLYMPIA, WASHINGTON

FORM A-17-1/C

COMPUTATION OF ESTIMATED LEVEL OF GUARANTEED SUPPORT
FROM LOCAL AND/OR STATE FUNDS FOR THE 1965-66 SCHOOL YEAR

A. Total number of weighted pupils _____ X $300..... $_____
(See Item G on A-17-1/A)

B. Less estimated revenue from sources other than State funds:

(1) Assessed valuation for 1966 tax collection year

$_____ X 85% of 14 mills or 11.9
for high school districts..... $_____

$_____ X 85% of 8.4 mills or 7.14
for nonhigh districts..... _____

(2) Receipts from the high school district fund $_____ X 85%..... _____

(3) Receipts from in-lieu-of-taxes

$_____ X 85%..... _____

(4) Receipts from county 1% real estate excise tax..... _____

(5) Receipts from P.L. 874

$_____ X 40%..... _____

(6) Receipts from Federal Forest funds

$_____ X 40%..... _____

(7) Receipts from P.U.D. excise tax

$_____ X 40%..... _____

C. Total of Items B (1) through (7)..... $_____

D. Deduction of Item C from Item A to determine the amount, if any, of equalization allotment from State funds..... $_____

E. Computation of transportation allotment:

(1) Approved or actual costs (smaller of the two)..... $_____

(2) Depreciation allowance..... $_____

(3) Total reimbursable transportation costs..... $_____ X 90% $_____

F. Estimated total allotment from State funds..... $_____

TABLE 4
(1965-66)

State of Washington
SUPERINTENDENT OF PUBLIC INSTRUCTION
Olympia

TABLE FOR COMPUTING ENROLLMENT WEIGHTING FROM STAFF EXPERIENCE AND PROFESSIONAL PREPARATION

EXPERIENCE	PROFESSIONAL PREPARATION*			
	Less than B.A. Degree (1)	B.A. Degree and Provisional Certificate a/ (2)	Standard Certificate or Equivalent b/ (3)	M.A. Degree or One Year Subsequent to Standard Certification c/ (4)
0 years	- .020	.000	.020	.040
1 "	- .005	.015	.035	.055
2 "	.010	.030	.050	.070
3 "	.025	.045	.065	.085
4 "	.040	.060	.080	.100
5 "	.055	.075	.095	.115
6 "	.070	.090	.110	.130
7 "	.085	.105	.125	.145
8 "	.100	.120	.140	.160
9 "	.115	.135	.155	.175
10 "	.130	.150	.170	.190

EXAMPLE FOR A HYPOTHETICAL STAFF

Number of Teachers	Professional Preparation	Years of Experience		Total Staff Weighting
1	Less than B.A.	5	(1 X .055)	.055
3	B.A.	8	(3 X .120)	.360
4	Standard Certificate	9	(4 X .155)	.620
8				1.035

Student weighting for staff experience and professional preparation = 1.035 ÷ 8 = .129

(For *, a/, b/, and c/ -- please see page 2)

* Credit for previous experience will be allowed for full-time service in public elementary or secondary schools, and private elementary or secondary schools under state certification in any state.

  Service as a teacher or administrator in elementary or secondary programs conducted by the U. S. government or by any governmental unit will apply.

  Military service will apply when teaching career is interrupted by a military tour of duty.

  Allowance will be made for a full year if a teacher serves 4/5 or more of full time.

a/ A regular teaching certificate based upon a Baccalaureate Degree in any state.

b/ 45 quarter hours (30 semester) study in an accredited college or university subsequent to Column (2).

c/ 90 quarter hours (60 semester) study in an accredited college or university subsequent to Column (2).

TABLE B
(1965-66)

State of Washington
SUPERINTENDENT OF PUBLIC INSTRUCTION
Olympia

ADDED WEIGHTINGS TO BE USED FOR ELEMENTARY DISTRICTS WITH ENROLLMENTS OF LESS THAN 100 PUPILS

Enrollment	Weighting	Enrollment	Weighting
99	.002	58	.161
98	.005	57	.168
97	.007	56	.175
96	.009	55	.182
95	.012	54	.189
94	.014	53	.197
93	.017	52	.205
92	.019	51	.214
91	.022	50	.222
90	.025	49	.231
89	.027	48	.241
88	.030	47	.251
87	.033	46	.261
86	.036	45	.272
85	.039	44	.283
84	.042	43	.295
83	.046	42	.307
82	.049	41	.320
81	.052	40	.333
80	.056	39	.348
79	.059	38	.363
78	.063	37	.378
77	.066	36	.395
76	.070	35	.413
75	.074	34	.431
74	.078	33	.451
73	.082	32	.472
72	.086	31	.495
71	.091	30	.519
70	.095	29	.544
69	.100	28	.571
68	.105	27	.601
67	.109	26	.632
66	.114	25	.667
65	.120	24	.704
64	.125	23	.744
63	.131	22	.788
62	.136	21	.836
61	.142	20	.889
60	.148	19	.947
59	.154	18 and under	1.000

TABLE C
(1965-66)

State of Washington
SUPERINTENDENT OF PUBLIC INSTRUCTION
Olympia

ADDED WEIGHTINGS TO BE USED FOR HIGH SCHOOLS WITH ENROLLMENTS OF LESS THAN 225 PUPILS

Enroll.	Wtg.	Enroll.	Wtg.	Enroll.	Wtg.	Enroll.	Wtg.
224	.001	176	.062	128	.168	80	.403
223	.002	175	.063	127	.171	79	.411
222	.003	174	.065	126	.175	78	.419
221	.004	173	.067	125	.178	77	.427
220	.005	172	.068	124	.181	76	.436
219	.006	171	.070	123	.184	75	.444
218	.007	170	.072	122	.188	74	.453
217	.008	169	.074	121	.191	73	.463
216	.009	168	.075	120	.194	72	.472
215	.010	167	.077	119	.198	71	.482
214	.011	166	.079	118	.202	70	.492
213	.013	165	.081	117	.205	69	.502
212	.014	164	.083	116	.209	68	.513
211	.015	163	.085	115	.213	67	.524
210	.016	162	.086	114	.216	66	.535
209	.017	161	.088	113	.220	65	.547
208	.018	160	.090	112	.224	64	.559
207	.019	159	.092	111	.228	63	.571
206	.020	158	.094	110	.232	62	.584
205	.022	157	.096	109	.236	61	.597
204	.023	156	.098	108	.241	60	.611
203	.024	155	.100	107	.245	59	.625
202	.025	154	.102	106	.249	58	.640
201	.027	153	.105	105	.254	57	.655
200	.028	152	.107	104	.259	56	.671
199	.029	151	.109	103	.263	55	.687
198	.030	150	.111	102	.268	54	.704
197	.032	149	.113	101	.273	53	.721
196	.033	148	.116	100	.278	52	.739
195	.034	147	.118	99	.283	51	.758
194	.036	146	.120	98	.288	50	.778
193	.037	145	.123	97	.293	49	.798
192	.038	144	.125	96	.299	48	.819
191	.040	143	.127	95	.304	47	.842
190	.041	142	.130	94	.310	46	.865
189	.042	141	.132	93	.315	45	.889
188	.044	140	.135	92	.321	44	.914
187	.045	139	.137	91	.327	43	.941
186	.047	138	.140	90	.333	42	.968
185	.048	137	.143	89	.340	41	.997
184	.050	136	.145	88	.346	40 & under	1.000
183	.051	135	.148	87	.352		
182	.053	134	.151	86	.359		
181	.054	133	.154	85	.366		
180	.056	132	.157	84	.373		
179	.057	131	.159	83	.380		
178	.059	130	.162	82	.388		
177	.060	129	.165	81	.395		

APPENDIX E

COUNTY RATIO EQUALIZATION STUDY
(1965 Assessment)*

Counties	Ratio**	Counties	Ratio**
Adams	17.6	Lewis	18.2
Asotin	18.2	Lincoln	16.3
Benton	19.7	Mason	18.9
Chelan	18.9	Okanogan	21.0
Clallam	17.9	Pacific	21.4
Clark	19.0	Pend Oreille	17.5
Columbia	15.4	Pierce	20.8
Cowlitz	17.5	San Juan	13.8
Douglas	19.5	Skagit	16.2
Ferry	24.7	Skamania	16.4
Franklin	20.9	Snohomish	17.8
Garfield	17.7	Spokane	22.8
Grant	20.8	Stevens	21.5
Grays Harbor	16.4	Thurston	17.8
Island	16.1	Wahkiakum	18.1
Jefferson	17.9	Walla Walla	22.3
King	20.8	Whatcom	18.5
Kitsap	19.6	Whitman	15.3
Kittitas	20.2	Yakima	15.9
Klickitat	23.6		

* Indicated county ratio as determined by the Washington State Tax Commission
**Ratios include personal property

VITA

Name: William George Stevenson

Date of Birth: February 22, 1924

Place of Birth: Seattle, Washington

Parentage: Harry V. and Charlotte Stevenson

Undergraduate Schools:

Washington State University
Utah State Agricultural College
San Jose State College

Graduate School: University of Washington

Degrees: Bachelor of Arts, with a major in physical science, San Jose State College, 1949
Master of Education, with a major in school administration, University of Washington
Doctor of Education, with a major in school administration, University of Washington

Professional Experience, Shoreline School District:

Two years teaching in elementary school
Three years elementary school vice principal
Four years elementary school principal
Three years assistant superintendent of schools
Six years superintendent of schools

University of Washington

Abstract

SUPPORT OF PUBLIC EDUCATION IN WASHINGTON STATE RELATIVE TO EQUALIZATION OF EDUCATIONAL OPPORTUNITY

By William George Stevenson

Chairman of Supervisory Committee: Professor Dale Leroy Bolton
College of Education

This study investigated state grants-in-aid to determine:

1. what factors in the 1965 school distribution formula exerted the greatest influence on the variation of educational opportunity among selected school districts in Washington State,
2. whether certain predetermined and specified mixes of existing factors under certain hypothetical manners of distributing state grants-in-aid reduced the variation of educational opportunity in the districts under study, and
3. if the variation of educational opportunity was reduced by the introduction of a factor for local effort in relation to local ability to pay and by the application of that factor in predetermined and specified ways in the distribution formula.

In order to study the effect of the distribution formula on school district expenditures for educational opportunity a total of 278 school districts representing all sizes of districts was used. For purpose of comparison between district sizes the data were compiled in eight base enrollment groups. Only districts which received state grants-in-aid under a "Grandfather" or "Emergency" variation in the distribution formula were not included in the study.

Treatment of the data which were obtained from the State Department of Public Instruction and the Washington State Tax Commission included computation of the descriptive measures of mean, coefficient of correlation, standard deviation, and coefficient of variation. These computations used 1965-1966 data for actual and simulated factors pertinent to equalization of educational opportunity. The statistical techniques of Pearson product-moment correlation coefficient, and a t-test for correlated data were utilized. Hypothetical conditions which distributed state grants in various ways were described by designed formulae. Data were obtained from use of these formulae, and results were compared in order to determine conditions which reduced the variation in educational opportunity below the actual 1965-1966 level.

Conclusions which recognized strengths and weaknesses of the 1965-1966 distribution formula included:

1. Significantly greater equalization of educational opportunity was obtained where handicapped, driver education, vocational-technical, adult education and institutional programs were eliminated from the 1965 distribution formula.
2. Significantly less equalization of educational opportunity was obtained where 1% county real estate transaction tax, Public Law 874, and Federal Forest revenue were eliminated from the 1965 distribution formula.
3. No significant difference in equalization of educational opportunity was obtained where in-lieu-of tax, public utility district, non-high school, and transportation revenue were eliminated from the 1965 distribution formula.
4. The 1965 distribution formula accomplishes one goal for which it was designed, i.e., special programs cause less equalization of educational opportunity while deductions of local revenue from the guaranteed support level cause more equalization of educational opportunity.
5. Significantly greater equalization of educational opportunity was obtained when 85% rather than 40% of the Federal Forest funds was deducted in the

distribution formula.

6. A tendency toward more equalization of educational opportunity was noted when 85% rather than 40% of the Public Law 874 funds was deducted in the distribution formula.

7. Significantly more equalization of educational opportunity was obtained when special levies were eliminated, and when the guaranteed support level was increased beyond the actual mean expenditure per weighted pupil.

8. Significantly more equalization of educational opportunity was obtained when the 1965-1966 special levies were reduced by 50%.

9. Significantly less equalization of educational opportunity was obtained through simulated formulae designed to equalize special levies.

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