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AN ANALYSIS OF ISOLATION AS A RESOURCE ALLOCATION FACTOR IN FINANCING SMALL RURAL SCHOOLS IN OKLAHOMA

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AN ANALYSIS OF ISOLATION AS A RESOURCE ALLOCATION FACTOR IN FINANCING SMALL RURAL SCHOOLS IN OKLAHOMA

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AN ANALYSIS OF ISOLATION AS A RESOURCE ALLOCATION FACTOR

IN FINANCING SMALL RURAL SCHOOLS IN OKLAHOMA

APPROVED BY

DISSERTATION COMMITTEE

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CHAPTER I

INTRODUCTION

The major population movements in this country have in the past been away from rural areas and toward urban areas. This trend was thought to be a natural part of the growth of America. Along with this trend of urbanization came a trend toward bigness in political units as well as industrial concerns.

Rural America gradually faded out of the mainstream of American life and its institutions suffered the same fate. It was believed that a continuation of the urbanization of America would result in a completely urbanized society.

What is properly rural is largely a matter of one's perception evidenced by the fact that there are a number of definitions of "rural" currently used by various agencies and by the Census Bureau. The most liberal definition considers "rural" any area which is outside a standard metropolitan statistical area which is defined as an urban area of 50,000 inhabitants or larger. The most restrictive definition includes farms and open countryside, and places of less than 2,500 residents outside Standard Metropolitan Statistical Areas (SMSAS).

Rural can be defined based on density or sparsity of population or by distinctive characteristics. Rurality can be thought of as a rural-urban continuum. A high degree of rurality exists when a place has significant rural characteristics. These characteristics include small community size, agricultural economy, limited cultural and educational opportunities, and small size of institutions.

The extremes of the rural-urban continuum are relatively easy to define, but the definition that should apply to those populations lying between those extremes is more elusive. This gives rise to an important concept--the concept of "degrees of rurality"--and raises the question that if rurality affects schooling, then can it be assumed that these effects occur in degrees also? The problem of this research is to document the effect of extreme rurality (isolation) on selected educational "inputs."

The literature indicates that ruralness is believed to affect schooling in several ways. These include small school size and related problems of cost, quality, equality of educational opportunity and adequacy of resrouces. Nachtigal wrote that efforts to reform rural education have fallen into three distinct themes of rural school reform.

> 1. The problem with rural education is that it is not urban, that the rural school itself is the problem. These reform efforts have sought to mold rural education in the likeness of urban education.
> 2. The theme of the concept of "necessarily existent" small schools concedes that some small schools will have to remain because of sparsity of population.
> 3. The third theme, based on the assumption that the problems of education are generic, emerged with the advent of federal aid to education. Categorical grants, for example, are granted based on common funding formulae.[1]

During the last decade, the rural-to-urban migration has reversed. That

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[1] U.S., Department of Education, Improving Rural Schools, by Paul M. Nachtigal (Washington, D.C.: Government Printing Office, 1980), pp. 3-4.

trend shows signs of continuing into the current decade. This has spawned a new concern for rural America and its institutions.

Two factors concerning rural America deserve consideration. First, using the more liberal definitions of rural reveals that approximately one-third of our population lives in rural areas with some 14 million children enrolled in rural schools.[2] Second, rural America is characterized by tremendous diversity, a fact that makes common solutions to rural school problems difficult if not impossible.

The problem of definition presents itself again when decisions are being made about appropriate school size. Several problems are evident. Many references to "small" schools fail to identify precisely whether the reference is to a school as an organizational unit, or to a school district. There is a lack of agreement in the literature on appropriate size, but frequent references are made concerning appropriate size related to some other criteria.

Stemnock found that minimum size recommendations of junior high schools ranged from 90 to 1500 and minimum size recommendations for senior high schools ranged from 100 to 1600. Other recommendations ranged from 175 students in high school to 1000. District size recommendations would indicate that districts of sizes less than 2500 are considered small.[3]

When relating school size to comprehensiveness and quantitative measures of school services, the recommendations of James B. Conant seemed

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[2]Jonathan P. Sher, Revitalizing Rural Education: A Legislators Handbook (Washington, D.C.: National Rural Center, National Conference of State Legislatures, Legislators Education Action Project, 1978), p. 6.

[3]Suzanne K. Stemnock, Summary of Research on Size of Schools and School District (Arlington, Va.: Educational Research Service, Inc., 1974), pp. 11-49.

to set a bench mark that is in agreement with other data. Conant recommended no less than 100 in the graduating class.

When school size is related to qualitative measures the data available do not yield conclusive evidence. The Washington State Temporary Levy Study Commission concluded that "there is no simple relationship between size and quality," though it is generally agreed that very small schools cannot compete favorably with larger schools. "Size is only important in very small schools."[4] When human relationships, such as student/teacher, school/community, staff, student activities are considered, the small school is more likely to be favored.

A major problem with small size has recently surfaced as a result of lawsuits in Texas, California, and New Jersey. Although the Supreme Court did not support the concept that education is a fundamental and constitutionally protected right, a number of states have acted to modify their state aid systems to further the goal of equalizing educational opportunity. A primary means of accomplishing this difficult task is through equalizing school finance through state aid mechanisms. One mechanism has been the effort to equalize school district wealth by equalizing property values and assessment methods. A second goal has been equalizing district expenditures by weighting formulae that seek to identify special needs and estimate cost of delivery. A third method has been to provide resources and services through intermediate units such as Regional Education Service Centers.

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[4]Washington, State Temporary Special Levy Study Commission, Summary Report and Research Reports, Vol. I (Olympia, Wash.: Temporary Special Levy Study Commission, 1971), p. 7.

Equity may be defined in various ways. It may mean a guaranteed minimum expenditure, equal dollars for each child, different levels of resources based on educational need, or it may involve equalizing tax-paying ability of school districts. However equity is defined, the facts are that rural schools pose problems in addition to those problems already present in achieving this goal.

Background Information

A reform policy that is consistent with the theme that maintains that the rural school itself is the problem is consolidation. Reformers have considered consolidation to be a reform of unlimited potential in solving educational problems. Although some states have made a conscious effort to consolidate schools, the consolidation process in other states has been more influenced by demographic factors than by conscious design. The number of school districts has been reduced from 128,000 in 1930 to approximately 17,000 today.[5] Oklahoma has reduced the number of school districts in the State from 4,450 in 1946 to 618 districts at the current time.[6]

The reduction in the number of districts has been unquestionably a positive force in eliminating some inequities between districts. Tremendous inequity still exists, however, as indicated by the number of

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[5]U.S., Department of Health, Education, and Welfare, Economy, Efficiency, and Equality: The Myths of Rural School and District Consolidation, by Jonathan P. Sher and Rachael B. Thompkins (Washington, D.C.: Government Printing Office, 1976), p. 1.

[6]Oklahoma, State Department of Education, 1979-80 Annual Report (Oklahoma City, Okla.: State Department of Education, 1980), p. 159.

court cases questioning the legality of state aid systems that allow expenditure per child to vary with the property wealth of a district.

In order to look at the problem of equity on a national scale, the U.S. Office of Education initiated the National Educational Finance Project (NEFP) in June, 1968. Among the stated purposes of this project were:

> 1. To identify the dimensions of educational need in the nation.
> 2. To identify target populations with special needs.
> 3. To measure cost differentials among different educational programs.
> 4. To evaluate present state and federal programs for the financing of education.[7]

One accomplishment of the project was the development of a typology for classifying state and local school funds according to level of equalization. The typology was a continuum varying from level zero, which provided no equalization, to level four, which provided the highest level. Level four of equalization occurred when a state recognized unit cost variations and before making the apportionment, deducted a required local share in proportion to the tax-paying ability of the local districts. Oklahoma did not fare well in NEFP comparisons when the NEFP developed a method of measuring the extent of equalization of each state's school finance program in 1968-69. Oklahoma ranked 45th.[8]

The Oklahoma system of allocation consisted primarily of two methods for distribution of state support. These methods included foundation aid, within which flat grants are almost a separate parcel, and

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[7] Roe L. Johns and Kern Alexander, Alternative Programs for Financing Education, Vol. V (Gainesville, Fla.: National Educational Finance Project, 1971), p. vii.

[8] Ibid., p. 250.

incentive aid. These types of distribution systems were evaluated by the afore-mentioned typology.

The Strayer-Haig foundation formula was classified as either level three or level four. If the formula considered cost variations, it was classified as level four. In Oklahoma a portion of the local wealth of the district was subtracted from the minimum program requirement to determine the amount of foundation program but unit cost variations were not considered.

The flat grant system distributed state support to school districts on a per pupil unit or unit basis. Two types of flat grants were investigated for this study. One flat grant proposal allocated state funds without taking into consideration the variations in unit cost or local weatlh. Such was the practice in Oklahoma. The other system considered unit cost variations and ignored local wealth. The first of these systems was classified as level one in the typology; the second was considered level two.

Percentage equalizing or state-aid ratio formulae were classified by the typology as either level three or level four depending upon whether or not cost variations were considered. Essentially, the incentive-aid formula compared the fiscal wealth of the individual district to the state average. Depending on the efforts assumed locally through the millage election, the level of participation could be determined. A "hold-harmless" clause guaranteed wealthy districts as much per capita money under this formula as was received under previous formulae.

An additional indication of the concern over equity in school finance is the assistance provided to the states by the federal government for the development of equalization plans. The Oklahoma study was concluded in 1979. The study was concerned with seeking ways in which the state system of school finance could be altered or changed for "the purpose of achieving greater equality of educational opportunity for all children in the school districts in the State of Oklahoma."[9] A number of problems with the Oklahoma system of state finance were recognized. Inequities of property assessments between and within counties, expenditure-per-pupil disparities, mandated flat grants, property not subject to taxation, economic distortions caused by taxes, inadequate distribution of taxes on public utilities, and failure of the state to appropriate funds to pay for mandated courses of study.

During the course of the study, a lawsuit was filed charging failure to adjust and equalize valuation of real and personal property. The result was action on the part of the Board of Equalization. A plan of compliance was submitted to the Supreme Court. The result was that the court declared the ad valorem system of taxation unconstitutional and ordered the Board to set an assessment rate that would allow a deviation of 3 percentage points. The legislature now directs that for the purpose of state aid assessment ratios may not exceed the range of 9% to 15%. A legislative statement of intent declares that school districts in counties not in compliance will be penalized financially. A time schedule provides for reaching the desired level of 12%.

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[9]Oklahoma, State Department of Education, Report of the Oklahoma School Finance Equity Committee, State Plan Description for Section 842 of P.L. 93-380, as amended by P.L. 94-482; Assistance to States for State Equalization Plans (Oklahoma City, Okla.: State Department of Education, 1979), p. 1.

The committee considered several alternatives to the present state-aid system; the most important probably was the consideration of the current state aid formula with modifications. Recommendations included the retention of the programmatic approach to funding areas of special need, placing ad valorem tax collections within the responsibility of the Oklahoma Tax Commission, and repealing financial trust statutes.

The state-aid formula that was in force in 1981, with minor changes, had been in force since 1971. Although efforts toward equal assessment ratios, minimum support programs, and incentive aid were positive, it was generally recognized that the programmatic approach to meeting the special needs of individual school districts was inequitable, as was the appropriation of large sums of money into flat grants, teacher salary increases and line item appropriations.

There are 618 school districts in Oklahoma, including 467 which are independent, with 258 of these serving fewer than 500 students in grades K-12. (An independent school includes grades K-12 and is accredited by the State Department of Education.) It is apparent that many sections of the state are sparsely settled and are dependent upon an agricultural economy or rural-based extractive small industries such as lumbering or quarrying which, like agriculture, are constrained by the season, weather, and markets beyond local control. Thus, the local agricultural economy and/or small extractive industry may affect significantly the external financial aid required by individual small rural school systems so that quality education may be provided.

A local agricultural economy based on one or two cash crops will be less economically stable than a more diversified cropping system which perhaps combines farm production with ranching or lumbering or quarrying. These local situations, not uncommon in Oklahoma, point to the possibility that there may be categories of small rural school systems which require special financial aid solutions. Because of unique economic characteristics, as reflected in varying unit costs, such school systems may be served more equitably by financial aid formulae related to levels of student enrollment and economy of scale.

Diseconomy of scale may be most pronounced at enrollments of less than 500. One means of addressing the problem is based on the pupil weighting system, a concept developed by Paul Mort a number of years ago which has gained acceptance when varying unit costs are involved.[10] The NEFP, with Florida as the prototype state, applied pupil weights of 0.10 through 0.30 for isolated schools above non-isolated schools. The criteria for isolation were that elementary schools must be 10 miles or more by road from another school, junior high schools 15 miles or more, and senior high schools 20 miles or more.[11] A recognized difficulty with the weighted pupil cost index is the determination of appropriate weights for the various categories.

Small district size and sparsity of population are not synonymous. There is general agreement that extremely small and inefficient systems should not be rewarded or perpetuated when corrections for sparsity are being made. Establishment of a "formula of necessity"--based on some criterion such as enrollment, geographical considerations, sparsity of

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[10]Paul A. Mort, The Measurement of Educational Need (New York: Teachers College, Columbia University, 1924), pp. 6-7.

[11]Johns and Alexander, Financing Education, p. 250.

population, distance, topographical conditions, or a combination of these factors--is necessary. Provision for sparsity is consistent with the theme of reform that some small schools are "necessarily existent." In 1981 in 25 states some adjustment for small and/or isolated schools was made and 13 states used a weighting system to make that adjustment.

The Problem

The present research has sought to analyze the relationship between isolation and resource allocation. Resource allocation included these variables: district wealth, state and federal aid, general fund expenditures, certified personnel salaries, teacher degrees and experience, and program scope as measured by unit offerings.

The Purpose

The purpose of this study has been to provide data that will establish the position of isolated schools relative to their non-isolated counterparts based on selected criteria. Guidelines for decision-making, when future state-aid funding formulae concern small and/or isolated school districts, may be derived from these data.

Procedure

In order to accomplish the purpose of this study it has been necessary first to define school district isolation and to identify those school districts that met the criteria. Hypotheses relating to income, expenditure, and quality variables were formulated in order to make comparisons between isolated and non-isolated schools.

The major hypotheses are:

$H_0 1$: There is no statistically significant difference in income from local, state and/or federal sources between isolated and non-isolated schools.

$H_0 2$: There is no statistically significant difference in the per capita costs in general fund categories between isolated and non-isolated schools.[12]

$H_0 3$: There is no statistically significant difference with regard to the variables believed to be related to school quality between isolated and non-isolated schools.[13]

Testing the significance of these hypotheses, and a series of sub-hypotheses derived from each one, established the position of isolated schools relative to their non-isolated counterparts. The question of how extreme rurality or isolation affects schooling in Oklahoma was also tested.

Operational Definitions

The usage in this study of a number of terms and educational concepts has been according to the following operational definitions:

1. Weighted cost index. Cost index that assumes varying costs for programs.

2. Flat grants. Line item appropriations outside the state-aid formula.

3. Incentive aid. Related local effort to the amount of state-aid received.

4. Foundation aid. State aid that is granted after local wealth is substracted (determined by multiplying Average Daily Attendance by a pre-determined sum of money).

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[12]These categories are (1) Administrative Services, (2) Instructional Services, (3) Attendance Services, (4) Health Services, (5) Transportation, (6) Operation of the Plant, (7) Maintenance of the Plant, (8) Fixed Charges, (9) Food Services, (10) Student Activities, (11) Community Service, and (12) Capital Outlay.

[13]These variables are (1) Teacher Degree and Experience, (2) Total Salary Expenditures, (3) Total Per Capita Expenditures, and (4) Total Unit Offerings.

5. Per capita revenue. Amount representative for each pupil.

6. Cost of delivery. Cost of providing education opportunity, and may vary from program to program or from school to school.

7. Sparsity correction. An adjustment in state-aid formulae to allow for extra cost associated with sparsity of population.

8. Formula of necessity. A formula that identifies existing conditions that require special consideration.

9. ADA or A.D.A. Average Daily Attendance, an arithmetic average of student attendance during the school year.

10. Isolation. As used here, based in part on a definition of the term by the Oklahoma State Department of Education for the purposes of accreditation and in part on a comparison to the definition as used by the State of Florida. Since the sparsity factor was arbitrary in this study, "isolation" in Oklahoma as defined here may not be comparable to such sparsely settled states as New Mexico, Colorado, or Alaska. The term isolation here refers to a school district that is independent, serves grades K-12 with a total population of fewer than 500 students, is located a minimum of 16 miles by road from a non-isolated school, and is located in a county that has a population density of fewer than 15 people per square mile. It is possible that pockets of isolation exist in more heavily populated counties but the sample drawn for this study is assumed to be representative.

11. Unit offerings. The amount of credit given for the completion of a two-semester course.

12. Necessarily existent. The concept that defines some schools as necessarily existing because of some unusual circumstances such as geographic isolation.

13. Degrees of rurality. The concept of a rural-urban continuum with isolated small agricultural communities at one end and metropolitan areas at the other.

14. Cost. For the purposes of school finance, and this research, an educational cost is a monetary outlay that is not controlled by education decision-making.

15. Expenditure. For the purposes of school finance, and this research, an educational expenditure is a monetary outlay that is controlled by education decision-making.

16. ADM or A.D.M. Average Daily Membership, an arithmetic average of enrollment during the school year.

17. Schools. For the purposes of this research, the term "schools" refers to "independent school districts;" "schools" and "school districts" are used interchangeably in this paper. Schools are categorized as belonging to 1 of 4 classes: A-1 schools, small isolated schools with enrollments of 0-259; A-2 schools, small non-isolated schools with enrollments of 0-249; B-1 schools, large isolated schools with enrollments of 250-500; B-2 schools, large non-isolated schools with enrollments of 250-500.

In addition to the above operational definitions, 3 concepts are consistent with the focus of this research: (1) the concept of "necessarily existent" schools, (2) the concept of "degrees of rurality," and (3) the concept of "equity of outputs" (requiring a consideration of varying "costs of delivery"). The relationship between these concepts as they were applied in this study to rural schools in general and to Oklahoma schools in particular will be made clear through the review of the educational literature on rural and/or small schools which follows.

CHAPTER II

REVIEW OF THE LITERATURE

The Problem of Defining Rural

The focus of this study is on isolation of school districts. By definition these districts are rural, small, and serve a relatively large sparsely settled area. They are affected by all these variables, in addition to the numerous problems faced by all schools.

In reviewing the literature on rural schools, one finds that rural is a relative term and subject to interpretation. Tamblyn points out that approximately 25% of our population lives in towns of 2,500 or less (a common rural definition), and 35% lives in non-metropolitan areas of 50,000 or less (also a common definition).[1]

There are 5 basic population-based definitions of rural, according to Sher:

(1) rural non-metropolitan--all farms, open countryside, and places of less than 2,500 residents outside standard metropolitan statistical areas (This definition is the most restrictive and is the definition used in this research.);

(2) expanded rural non-metropolitan--all farms, open countryside, and places of less than 10,000 residents outside standard metropolitan statistical areas;

(3) census rural--all farms, open countryside, and places of less than 2,500 residents both within and outside standard metropolitan statistical areas;

[1]Lewis R. Tamblyn, ed., Inequality: A Portrait of Rural America (Washington, D.C.: Rural Education Association, 1973), p. 9.

(4) expanded census rural--all farms, open countryside, and places of less than 50,000 residents outside standard metropolitan statistical areas;

(5) combination rural--census rural definition, plus all non-metropolitan places between 2,500 and 10,000 residents outside standard metropolitan statistical areas.[2]

Sher points out that although it is intellectually and emotionally satisfying to do so, it is both easier and more accurate to define rural America in terms of what it is not rather than in terms of what it is.[3] The U.S. Bureau of the Census, for example, carefully defines urban and then classifies all else as rural, while statisticians and researchers continue to break the data into the 2 categories of metropolitan and non-metropolitan. Tamblyn has developed a density-based definition of rural which is useful:

> The accepted minimum measurement of an urban environment is a population density of 1,000 or more per square mile. The measure of suburbanization is a population density of 500 per square mile. Approximately one-third of the states, 17 to be exact, do not contain a single county with a population of 500 people per square mile. Twenty-three states have population densities of less than 500 persons per square mile (Oklahoma has 42.0), and 17 states have densities of less than 100 per square mile.[4]

According to census data, urban population averages 2,760 people per square mile (including 67,808 per square mile in Manhattan) while rural population density averages 15 people per square mile.[5] The school districts identified as isolated in this research contain fewer than 15 persons per square mile.

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[2] Johathan P. Sher, Education in Rural America: A Reassessment of Conventional Wisdom (Boulder, Col.: Westview Press, 1977), p. 377.

[3] Ibid., p. 2.

[4] Tamblyn, Inequality: A Portrait, p. 4.

[5] U.S. Dept. of Commerce, Bureau of the Census, Statistical Abstract (Washington, D.C.: Government Printing Office, 1976), Table 16.

Rural may also be defined in terms of "character". Cushman delineates the character of the open country rural scene:

> First, there is a relatively low density of population. People just live farther apart than in cities, and the communities are small. Second, most of the people in rural communities are primarily dependent for their livelihood upon the immediately surrounding resources and the uses made of them. These resources may be rich soil, lakes, minerals, or trees but the inhabitants secure their living from them rather directly. When a population aggregate grows so large that the majority of the people make their living by the processing of raw materials brought in from distant places into manufactured goods . . ., people take on the social and economic characteristics usually associated with cities and the community is no longer rural.[6]

Rural means different things to people depending upon their perceptions. To people living in a small community, "rural people" are those who live in the surrounding countryside. To those people who live in the county seat, the small towns are considered "rural" while residents of the state capitol consider the county seats to be "rural". Similarly, all the above groups may be thought of as "rural" by the standards of people living in the large metropolitan centers. As Sher points out, ruralness--like beauty--lies in the eyes of the beholder.[7]

Beyond this attitudinal difference lies another interesting fact concerning ruralness. That fact concerns the enormous diversity found in rural America. Contrary to popular thought rural America is distinguished by its tremendous diverstiy. Rural communities are very different in

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[6] Alvin Rhodes, Changing School Needs in Rural America, paper presented at the National Conference on School Finance sponsored by the National Education Association (St. Louis, Mo., April, 1962), p. 4. quoting M. L. Cushman.

[7] Jonathan P. Sher, Revitalizing Rural Education: A Legislators Handbook (Legislators Education Action Project, National Conference of State Legislatures, Legislators Education Project, 1978), p. 10.

terms of their economy, their political identity, their geography. A popular image of America is that of an agglomeration of farmers and farm workers; yet, as of 1975, over 80% of America's rural population neither lived nor worked on a farm.[8]

Rurality can be thought of as a rural-urban continuum possessing 2 other continuua: (1) the number of connotations possessed, and (2) the amount of each possessed. Charles states:

> A high degree or rurality exists when the population is found extensively in centers of 2,500 or less where the inhabitants make their living from such activities as farming, cattle raising, dairying, mining, forestry, fishing, oil production, railroading, tourism, or on government installations; where the cultural and educational opportunities are limited and where schools have small enrollments (averaging no more than 75 students per grade in high school); are limited primarily to academic offerings, and have little chance for expansion or consolidation because of geographic reasons or a financial inability.[9]

The extremes of the rural-urban continuum are relatively easy to define, but the definition that should apply to those populations lying between these extremes is a bit more elusive. The concept of degrees of rurality is consistent with the focus of this research. By comparing those schools in isolated communities that are considered extremely rural, the effect of extreme rurality (isolation) on selected educational variables can be documented.

The use of statistical information to support one's conclusions is common and proper but certainly subject to interpretation. When one reviews the literature on rural communities and rural schools it is

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[8] Sher, Revitalizing Rural Education, p. 10.

[9] Edgar B. Charles, The Effect of Rurality on the Education of Rural Youth (Las Cruces, N.M.: New Mexico State University, 1968), p. 1.

common to see supportive data used without reference to the definition of rural from which those data come. Depending upon the definition used, America's 1970 rural population ranged from 37.5 million to 65.1 million. This represented in 1970 from 18.5% to 32% of the total U.S. population.[10]

Indicative of this problem are the several significantly different definitions of rural used by federal agencies. The U.S. Department of Agriculture, Farmers Home Administration, makes loans based on 3 entirely distinct definitions of rural. Similarly, some federal agencies collect data based on a definition of rural as the open countryside and nearly all places with fewer than 2,500, while another definition includes all places outside Standard Metropolitan Statistical Areas. The Rural Development Act of 1972 gave several definitions of rural beginning at places of 5,500 or less and increasing gradually up to 50,000.[11]

Regardless of how one defines rural, one fact is unmistakable: the Seventies mark the "great population turnaround in America."[12] Demographer Calvin Beale reports that "the dominant trend of rural-to-urban migration which spanned many decades has reversed."[13]

A major factor underlying the turnaround is migration away from

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[10] U.S. Dept. of Commerce, Bureau of the Census, Statistical Abstract (Washington, D.C.: Government Printing Office, July, 1976), Sec. 1.

[11] Gail Parks and Jonathan P. Sher, Imaginary Gardens? Real Problems: An Analysis of Federal Information Sources on Rural Education (Las Cruces, N.M.: New Mexico State University, 1979), p. 11.

[12] Harry K. Schwarzweller, Migration and the Changing Rural Scene, Annual Meeting of the Rural Sociological Society, Presidential Address (San Francisco, September, 1978).

[13] Calvin Beale, "A Further Look at Non-Metropolitan Population Growth Since 1970," American Journal of Agricultural Economics Vol. 58 (December, 1976), pp. 953-58

the largest cities. Since 1970 net migration into rural and small towns has exceeded 2 million people, mainly those migrating from metropolitan areas.[14] Recent data confirming the turnaround indicate that from 1970 to 1977, populations of non-metropolitan areas grew by 9.3% compared with 5.3% for metropolitan areas.[15]

Oklahoma data also indicate a turnaround. In 1970, Oklahoma was 55.2% metropolitan. That figure had increased to 55.7% by 1978. Metropolitan growth from 1960 to 1970 was 19.7% compared to a decrease of 0.1% for non-metropolitan. From 1970 to 1978 the metropolitan increase was 13.5% compared with 11.2% for the non-metropolitan areas.[16]

These population figures indicate that while metropolitan growth is still evident the rate of growth is larger for the non-metropolitan areas. Population data indicate that 10 of the 14 counties that contain the isolated schools which are the subjects of this research gained population as a result of net migration during the period from 1970 to 1978.[17]

Current studies of migration usually focus on 2 periods--1950 to 1970, and 1970 to the present. The decades between 1940 and 1970

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[14]Peggy J. Ross and Bernal L. Green, Impacts of the Rural Turnaround on Rural Education (Las Cruces, N.M.: New Mexico State University, 1979), p. 1.

[15]Ibid., p. 4

[16]U.S. Dept. of Commerce, Bureau of the Census, Statistical Abstract of the United States National Data Book and Guide to Sources (Washington, D.C.: Government Printing Office, 1980), Table 26, p. 20.

[17]Oklahoma University, Statistical Abstract of Oklahoma, 1980 (Norman, Oklahoma: Center for Economic and Management Research, College of Business Administration, 1980).

exemplify the height of a dominant trend in the country dating back to the 1800's--the urbanization of America. Urban population over the years increased more rapidly than rural population. During the decades following 1940, the net migration of people leaving farms, rural hamlets, and other non-metropolitan areas numbered in the millions with substantial numbers moving into cities.[18] The primary motivation for the rural exodus was economic gain, but demographers indicate both economic and non-economic factors are accounting for the new migration stream.[19]

A commonly held perspective of rural America is that because of improved transportation and instant communication it has become just a more sparsely populated version of urban America. Sociologists Friedman and Miller wrote in 1965, "From a sociological and indeed economic standpoint, what is properly urban and properly rural can no longer be distinguished. The United States is becoming a thoroughly urbanized society, perhaps the first such society in history."[20]

It is not surprising that this new migration trend has inspired a great deal of interest along with numerous predictions concerning the anticipated impact on our institutions and society. Ross and Green report 4 impacts of rapid population growth upon rural schools and education:

> (1) An initial impact is likely to be a strain on existing facilities to support increased enrollment, resulting in overcrowding and its associated problems. Overcrowding can become a persistent

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[18]Ross and Green, Impacts of the Rural Turnaround, p. 2.

[19]James D. Williams and Andrew J. Sofranko, "Motivations for the Immigration Component of Population Turnaround in Non-Metropolitan Areas" (revised paper presented at the annual meeting of the Population Association of America, Atlanta, April, 1978).

[20]John Friedman and John Miller, "The Urban Field," Journal of American Institute of Planners (November, 1965), pp. 312-20.

problem for communities unable to initiate satisfactory solutions.

(2) Another primary impact of rapid growth is on school finances. School districts in areas with a rapidly growing economy can realize substantial financial benefits through increased local monies available for education. However, the risk is present that opposition from urban newcomers with values, ideas, and expectation about education different from the prevailing ones in the community can have a negative impact upon public support for education.

(3) Rapid growth also may have short range negative administative impacts. Rapid turnover in students results in paperwork overload.

(4) A secondary negative impact may be a rise in social problems, including school discipline, drug and alcohol use, and family related problems such as child abuse. This impact is most likely in "boom town" communities.[21]

Nachtigal, in a study of 14 rural school improvement efforts sponsored by the national Institute of Education, finds that the communities studied fall naturally into the following 3 categories:

(1) Rural poor communities characterized by traditional values, low income, closed political structure, and low priority for schools.

(2) Traditional middle American communities characterized by traditional values, middle income, more open political structure, and high priority for schools.

(3) Communities in transition characterized by a wide range of values, wide range of income, political locus of control shifting from "oldtimers" to "newcomers", and a wide range of priorities for schools resulting in the school's being a battleground.[22]

There is general agreement that the reverse migration trend will continue. Demographer Calvin Beale makes the following statement about that possibility, "With some diffidence, I suggest that the reverse migration trend will continue into the next decade."[23] Assuming a continuation of this trend, there would seem to be a number of implications for the small rural school. A re-examination of the strengths and weaknesses of these schools would seem to be in order if the trend means school

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[21]Ross and Green, Impacts of the Rural Turnaround, pp. 39-40.

[22]U.S., Dept. of Education, Improving Rural Schools, by Paul M. Nachtigal (Washington, D.C.: Government Printing Office, 1980), p. 24.

[23]Parks and Sher, Imaginary Gardens?, p. 12.

survival in extremely rural areas and school growth in less rural communities closer to metropolitan areas.

Definition of Size

The literature reflects considerable difference of opinion regarding school size. As for ideal school size, data are scarce and most of the opinions expressed in the literature cannot be substantiated with hard data. It is common to find references to "small schools" without precise definition of "small", and another common problem arises when school districts and schools as organizational units are not identified precisely.

The recommended minimum enrollment for a number of years was in the range of 210 to 300 pupils as a minimum enrollment for three-year high schools, and from 175 to 250 pupils as a minimum enrollment for six-year high schools.[24] Only in later years have minimum enrollment recommendations shown substantial increase beyond these figures. Recent recommendations are for a minimum enrollment of 150 pupils, ranging up to 300 pupils for four-year high schools, with a single exceptionally large recommendation for a minimum enrollment of 1000 pupils.[25]

Small school projects, housed in and aided by their respective departments of education, have been organized in Oregon and Texas. Each project has minimum size guidelines for the projects sponsored. The

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[24] Joe L. Jackson, School Size and Program Quality in Southern High Schools (Nashville, Tenn.: George Peabody College for Teachers, 1966), p. 8.

[25] Ibid., p. 9.

Texas Small School Project identifies its member schools as those schools which have total enrollments of 500 or less.[26] The Oregon Small School Project includes 86 small high schools with enrollments of 200 or less.[27]

Fourteen states which were visited during the early stages of the Rocky Mountain Area Project had a total of 5,500 small schools identified as having fewer than 200 in the upper 4 grades. These states reported 3,600 schools as being considered to be necessarily existent.[28]

The recommendations concerning school size considered to be the most influential have been those made in 1959 by James B. Conant, as a result of his nationwide studies. The recommendations Conant makes for improving high schools and junior high schools include different aspects of curriculum, staff, facilities, and other features. To provide for these different aspects at reasonable cost was obviously not possible in small schools, and Conant's recommendations are that no high school have fewer than 100 in the graduating class.[29]

During the period 1956-63, a number of school studies focused on school size. From 18 of these studies, recommendations are that enrollments should be less than 2,000 in high school. It is further

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[26] Texas, Texas Education Agency, Policies for the Texas Small Schools Project (Austin, Texas: Division of Administrative Services, 1962), p. 1.

[27] Oregon, Oregon State Board of Education, History of the Oregon Small School Program (Salem, Oregon: Oregon State Board of Education, 1969), p. 3.

[28] Noble J. Gividen, High School Education for Rural Youth (Washington, D.C.: National Committee for Children and Youth, 1963), p. 3.

[29] James B. Conant, The American High School Today, Carnegie Series in Education (New York: McGraw-Hill, 1959), p. 40.

recommended that enrollment be no smaller than is required to have at least 100 in the graduating class.[30] A summary of research on the size of schools and school districts reveals that minimum size recommendations for junior high schools range from 90 to 1,500 pupils with optimum size from 520 to 1,200 and maximum size from 900 to 1,400. Size recommendations for senior high schools range from 100 to 1,600 as a minimum with 290 to 2,000 as optimum, and 1,000 to 3,000 as maximum.[31]

Edington reports that the North Central Association Committee on Small Schools (NCACSS) defines small schools as those with fewer than 300 students in grades 9 through 12.[32] Beckner and O'Neal use a figure of 750 to designate a small secondary school.[33] Edington states, "There is some consensus, however, that a school which is not large enough to provide a program for a majority of its students constitutes a small school."[34] Edington's theme is one he considers more central to the issue than simply numbers--recognition of the existence of the small school, identification of its strengths and weaknesses, and working towards its improvement.

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[30] U.S., Department of Health, Education, and Wealfare, Enrollment Size and Educational Effectiveness of the High School, by Grace S. Wright (Washington, D.C.: Government Printing Office, 1965), p. 3.

[31] Suzanne K. Stemnock, Summary of Research on Size of Schools and School District (Arlington, Va.: Educational Research Service, Inc., 1974), pp. 11-49.

[32] Everett D. Edington, Strengthening the Small Rural School (Las Cruces: New Mexico State University, 1976), p. 4.

[33] Weldon Beckner and Linda O'Neal, "A New View of Smaller Schools," Bulletin of the National Association of Secondary School Principals, Vol. 64, No. 438, (October, 1980), pp. 1-7.

[34] Edington, Strengthening the Small Rural School, p. 4.

There are several factors that deserve consideration. First, there is considerable variation of opinion on minimal size. Second, size recommendations have increased recently. Third, after years of consolidation, a large number of small schools still exist.

Sher and Thompkins state, "The most successfully implemented educational policy of the past 50 years has been the consolidation of rural schools and school districts," and they note that from 1930 to 1972 the number of school districts declined from 128,000 to 16,960. Further, they state, "This policy of rural school and district consolidation was implemented so successfully primarily because of a consensus on the part of educational professionals that it represented a reform of unlimited potential."[35] Tamblyn states:

> School district consolidation and reorganization are among the most significant accomplishments throughout most of rural America, and this trend can be expected to continue until we reach a total of not more than 5,000 local school districts supported by 250 to 500 intermediate school districts.[36]

Conant reports that there were approximately 4,000 high schools with graduating classes of at least 100, and 17,000 smaller high schools. He contends that 9,000 high schools would be ideal and 5,000 would be sufficient.[37] However extensively positive the consolidation effort has been, schools in rural areas have a long way to go. Tamblyn reports that in 1956, 92% of the school districts in the U.S. had enrollments

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[35] U.S., Department of Health, Education, and Welfare, Economy, Efficiency, and Equality: The Myths of Rural School and District Consolidation, by Johathan P. Sher and Rachael B. Thompkins (Washington, D.C.: Government Printing Office, 1976), p. 1.

[36] Tamblyn, Inequality: A Portrait, p. 22.

[37] Conant, American High School Today, p. 81.

of fewer than 1,200 students, and in 1971, 80% of the districts still had enrollments of less than 2,500.[38] Beckner and O'Neal use a figure of 750 to designate a small secondary school (assuming a total school population of fewer than 2,500 students) and report that 75% of the total number of districts in the U.S. and 29% of all public school students fall into this group.[39] Carmichael reports that of the approximately 16,000 school districts extant, there are 11,000 in rural areas which serve one-third of the nation's public school children.[40] Texas, for example, has 685 districts with less than 1000 Average Daily Attendance (ADA). In 1981, Dearman and Plisko report:

> Enrollment size of public elementary and secondary schools varied considerably, ranging from fewer than 50 students to 2,000 students or more. The modal enrollment category--250 to 499--represented one-fourth of all students and one-third of all schools.[41]

Consolidation has had an impact in Oklahoma. The number of school districts has declined from 4,450 in 1946 to 619 in 1980. Of that number 2,282 consolidations are reported as mandatory and 1,450 as elective. The report indicates that 258 of the 457 independent school districts in Oklahoma enroll 500 students or less.[42]

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[38] Tamblyn, Inequality: A Portrait, p. 22.

[39] Beckner and O'Neal, "Smaller Schools", p. 5.

[40] Dale Carmichael, "The Challenge of Rural Education," (Baylor Educator, Spring, 1980), p. 22.

[41] U.S., Department of Education, The Condition of Education, by Nancy B. Dearman and Valena White Plisko (Washington, D.C.: Government Printing Office, 1979), p. 15.

[42] Oklahoma, State Department of Education, 1979-80 Annual Report (Oklahoma City, Oklahoma: State Department of Education, 1980), p. 159.

The purpose of this review of the literature on size of schools and school districts is to establish that the schools included in this research are unquestionably small. There would seem to be little doubt that this is the case.

The Relationship of Size to Quality of Program

One of the major concerns of many writers who address the issue of small schools is the question of quality education. This concern is heightened by recent public concern over equity in school finance and the considerable variations in financial support that exist between school districts both statewide and nationally. The lack of sufficient numbers of students in the small school creates an additional problem in the effort to offer a quality educational program.

Considerable agreement exists on those factors that affect educational quality and numerous opinions can be found concerning their absence or presence in the small school, but data to support conclusions concerning educational quality on a broad scale are lacking. As Parkes and Sher report:

> The current small federal data base on rural education contrasts sharply with the magnitude of its subject . . . When pressed for answers to questions concerning rural student performance, rural school district facilities on the quality of the programs and teaching staff in rural schools, researchers cannot reply with more than the barest of facts.[43]

The relationship of size of school to quality of education can be difficult to ascertain:

> Determination of ideal size is difficult for the following reasons: (1) the variety of roles seen for high schools by

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[43] Parks and Sher, Imaginary Gardens?, p. 16.

various groups of citizens; (2) the complexity and number of variables relating to any measure of educational quality; (3) the complex nature of mankind, often producing findings that are unpredictable and unexplainable; (4) disagreement concerning the role of government in the overall education of citizens; and (5) a general lack of clear understanding of how to evaluate schools in terms of predetermined objectives.[44]

A number of studies clearly indicate this difficulty through inconclusive and questionable results. Conant relates quality of education directly to size of the high school, in his study of the American high school, and makes numerous references to small high schools. He feels that to adequately serve all its students, a high school should have an enrollment of at least 100 in its graduating class, and he contends:

> The normal pattern of distribution of academic talent is such that a class of one hundred will have between fifteen and twenty academically talented students--those who can and should study effectively and rewardingly advanced courses in mathematics, science, and foreign language as well as general education courses in english and social studies. A slightly smaller number of less bright students will, if they work hard, be able to study a somewhat less intensive program. In a class of one hundred these two groups will barely provide sufficient enrollment to justify the schools offering advanced academic courses.[45]

To assist him in his evaluation, Conant designed a checklist which was organized under 4 general headings: (1) adequacy of general education; (2) adequacy of non-academic elective program; (3) special arrangements for the academically talented students; and (4) other factors. These quantitative measures of adequacy are based on quantity of resources.

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[44] U.S., Department of Health, Education, and Welfare, Ideal High School Size: A Mirage in the Desert, by William Clements (Washington, D.C.: Government Printing Office, 1970), p. 2.

[45] Conant, American High School, p. 78.

Sher identifies key resources as including high per pupil expenditures, advanced curriculum offerings, faculty salaries, experience and credentials, new equipment and facilities, and the number of books in the school library.[46]

In Conant's opinion the small schools offer only a limited degree of comprehensiveness, and cannot adequately serve any group of its students--he concludes that this limited degree of comprehensiveness was brought about by a lack of the quantitative measures referred to previously:

> . . . small schools are restricted by financial considerations; a small school cannot by its very nature offer a comprehensive curriculum; they seldom allow the non-academically talented student to follow vocational goals and to develop general interests; courses often are not offered in advanced mathematics, physics, or chemistry, or foreign languages, or are offered in only every other year; with a small enrollment, ability grouping is difficult; personal services such as guidance also tend to be non-existent or to become the additional responsibility of the administrators or teachers who lack professional training in these fields.[47]

Additionally, the small school makes uneconomical use of the time and efforts of its teachers, administrators, and specialists--the shortage of whom is a serious national problem.[48] In his conclusions, Conant states:

> Undoubtedly there are certain parts of the United States where geographic considerations make small high schools necessary. Population is so sparsely distributed that enough pupils just cannot be effectively transported to a central point. Geography may sometimes be legitimate justification for a small high school, but all too often is merely an excuse. Human nature--not geography--offers the real explanation.[49]

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[46] Sher and Thompkins, Economy, Efficiency, and Equality, p. 23.

[47] Conant, American High School, pp. 77-79.

[48] Ibid., p. 77. [49] Ibid., pp. 83-84.

> . . . I should like to record at this point my conviction that in many states the number one problem is the elimination of the small high school by district reorganization.[50]

The timing of publication soon after launch of the Russian Sputnik, and Conant's reputation as the elder statesman of educational policy, combined to give his conclusions the weight of tremendous authority. Typical of the study's reception are these remarks by John Gardner (then President of the Carnegie Corporation of New York, and shortly thereafter appointed Secretary of Health, Education, and Welfare):

> It would be difficult to overestimate the importance of Conant's report at this time. Hundreds of thousands of Americans all over the country are concerned about their schools, wondering what to do about them, seeking answers, hoping for guidance. Mr. Conant has provided that guidance. It is for this reason that some of us believe that Mr. Conant after a lifetime of distinguished contributions to the nation, has in this study made his greatest contribution of all.
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> . . . the Louisville Courier-Journal reports, ". . . the Conant report is a bombshell. Its import is likely to determine for a generation the direction in which public secondary education develops.[51]

Although Conant is a widely respected authority, he is not without critics on the subject of school size and quality. Clements states:

> A quick survey of a number of American high schools was made by a brilliant scholar but one who has little direct experience with American high schools (Conant was a college administrator and teacher). The standards for a "good" school were arbitrarily chosen, with little empirical evidence to support them. The appraisals of schools were cursory rather than thorough. Important predictive variables such as pupil-teacher ratio were ignored.[52]

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[50] Conant, American High School, p. 38.

[51] Ibid, Foreword by John Gardner.

[52] Clements, Ideal High School Size, pp. 5-6.

Sher and Thompkins charge that before doing his study, Conant stated he was convinced that a high school must have a graduating class of at least 100 to function adequately as a comprehensive school. For that reason Conant generally selected, for his sample of 103 schools, those which had graduating classes of considerably more than 100. Of the 22 schools reported on in depth, only 3 had 100 or fewer in the graduating class. An evaluation instrument of 15 items was used to determine degree of comprehensiveness. The 3 small schools--School "H" with 95 seniors, School "O" with 75 seniors, and School "P" with 100 seniors--had scores of 11, 8, and 8 respectively. The mean score of the group was 8.9. Schools "O" and "P" are described as rural consolidated schools that "satisfactorily fulfill" the objectives of a comprehensive school.[53]

The point of the criticism seems to be that even a brilliant scholar like Conant can have difficulty defining and adequately measuring "quality" in education. Nachtigal, writing of rural education in the United States, states:

> Rural education has traditionally been looked upon as the poor country cousin of the public school system. By accepted standards, it has been poorly staffed and less well-financed; it has offered fewer educational opportunities; and it has turned out students less well-equipped to cope with an industrialized urban society.[54]

Jackson, in his concurrence with the criticism of the small school, states:

> There is a great deal of evidence to suggest that one of the most serious deterrents to the attainment of equality of education

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[53]Sher and Thompkins, Economy, Efficiency, and Equality, p. 21.

[54]Nachtigal, Improving Rural Schools, p. 1.

opportunity for all youth stems from the inability of small schools to provide a satisfactory educational program.[55]

Some of the variables which comprise a satisfactory educational program have been the subject of research. Wright summarizes 18 studies that isolate these variables: curriculum offerings, extra class activities, staff qualifications, achievement of pupils, and relationships of teachers, pupils, and the community. Although it is not possible to give a definitive answer to questions of how large a school should be, the studies reveal some findings that can be generalized.[56]

When _curriculum offerings_ and _staff qualifications_ are analyzed the larger school is favored. The studies differ on _achievement of pupils_. Three studies reveal little or no significant difference in _pupil achievement_ relative to school size. Three others reveal that minimum size of approximately 500 was superior to that of smaller schools. In the areas of _extra class activities_ and _relationship factors_ the small schools are favored.[57]

Wright concludes that when the findings or recommendations are compared with Conant's recommendations, one statement seems to be justified. The optimum size of a high school for all-around educational effectiveness appears to be something less than the 2000 suggested by some authors but optimum size would appear to be equal to or above the minimum of 100 in the graduating class recommended by Conant.[58]

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[55] Jackson, _School Size and Program Quality_, p. 1.

[56] Wright, _Enrollment Size and Educational Effectiveness_, p. 3.

[57] _Ibid_. [58] _Ibid_.

The Coleman Report, published in 1966 by the U.S. Office of Education, focuses on equality of educational opportunity in a survey of 3000 schools, 650,000 students, more than 60,000 teachers, and several thousand administrators. An interpretation of the results reveals some interesting conclusions. Coleman states that differences in schools account for only a fraction of differences in pupil achievement when socioeconomic factors are controlled. It appears that variations in the facilities and curricula of the schools account for relatively little variation by standard tests.[59] A pupil attitude factor appears to have a stronger relationship to achievement than do all the "school" factors together. The pupil attitude factor is the extent to which an individual feels that he has some control over his own destiny.[60] Data suggest that variations in school equality are not related highly to variations in achievements of pupils.[61] Possibly the most interesting conclusion is that it appears that pupil's achievement is strongly related to the educational background and aspirations of the other students in the school.[62] Simply stated, the strongest predictive factors for a student's achievement are those factors associated with the student population. Factors other than clientele have a lesser value.

The Washington State Temporary Special Levy Study Commission concludes that there is no simple relationship between school size and quality. Though it is generally agreed that very small schools cannot compete favorably with larger schools, size is only important in very

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[59] U.S., Office of Education, Equality of Educational Opportunity (Washington, D.C.: Government Printing Office, 1966), p. 22.

[60] Ibid., p. 23. [61] Ibid., p. 22. [62] Ibid.

small schools.[63] The Commission's conclusions are based on a consideration of opportunity and actualization factors. Actualization factors are defined as people-oriented factors that enable the student to take full advantage of opportunities provided. Opportunity factors are courses, programs, equipment, facilities, and so on provided by the school. "If indices representing opportunity and actualization were available the worth of the school would be related to the product of the two factors."[64] These findings would seem to support the conclusions of the Coleman Report.

Suggestions that there exists an ideal school size are questioned by Clements. Summarizing research regarding school size, he finds the following:

> (1) When using breadth of offerings as a criterion, large schools have the advantage.
>
> (2) When cost of instruction is considered, medium-sized schools have the advantage.
>
> (3) When the co-curriculum is considered, small schools are favored.[65]

Clements contends that when allowing for student ability, it is difficult to determine quality from student performance in college. That determination is frequently made. He lists a number of factors that may be considered to favor the small schools--such as more favorable student-teacher ratios, higher quality of counseling in the more personal

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[63]Washington, State Temporary Special Levy Study Commission, Temporary Special Levy Study Commission Summary Report and Research Reports, Vol. I (1961), p. 7.

[64]*Ibid.*

[65]Clements, Ideal High School Size, p. 9.

working conditions. He cites recent studies that indicate a movement of experienced teachers to smaller schools--away from trouble-ridden large systems.[66]

In a study of educational quality in Nevada, Sadler and Ching hypothesize several factors as affecting quality: (a) district wealth, (b) teacher training, (c) rural-urban characteristics, (d) instruction cost per student, and (3) student-teacher ratio. Using American College Test (ACT) scores as a measure of quality, Sadler and Ching report the following major findings:

> . . . (1) a significant positive relationship between wealth of a district and quality of education achieved by that district; (2) rural school district achievement of a significantly higher level of educational quality than either urban or remote districts; (3) a positive relationship between educational quality and teacher training; (4) educational quality related to amount expended per student on instruction; (5) decline of educational quality once a certain student-teacher ratio has been exceeded (approximately 24:1).[67]

More recent reports are less favorable to the small school. Edington states that lack of resources often forces rural schools to have to make a decision about whether to educate the youth for the local community or for the outside world.[68]

Dale Carmichael, Director of the Texas Small School Project, comments that as a result of their characteristics, rural schools tend

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[66] Ronald A. Sadler and C. T. K. Ching, "Determinants of Education Quality in Nevada", Nevada Agricultural Experiment Station Bulletin B-22 (February, 1974), p. 18.

[67] U.S., Department of Health, Education, and Welfare, Rural Education--Key Policy Issues by Everett D. Edington (Washington, D.C.: Government Printing Office, December, 1979), p. 18.

[68] Dale Carmichael, "The Challenge of Rural Education," Baylor Educator (Spring, 1980), p. 22.

to offer a more limited curriculum than urban schools, have fewer libraries and programs for special populations, and employ fewer support personnel.[69] According to Beckner and O'Neal, a number of problem areas are typically more pronounced in very small schools: curriculum deficiencies, student achievement, staff morale, and cultural opportunities. These problem areas tend to disappear as school size approached 700 students.[70]

A number of studies concentrate on the alleged strengths and weaknesses of various sized schools. Although the data are inconclusive in many cases, they do lend support to conclusions that very small schools suffer in several areas. Many of the weaknesses attributable to small schools tend to disappear as school size increases, up to a point, and then diminish as schools become very large.

Strengths and Weaknesses of Rural Small Schools

This research focuses on several educational variables: expenditures in general fund categories, education and experience of certified staff, and scope of the educational program. The schools that are the subjects of this study compare favorably in size and income. Another educational variable is that of isolation, and an effort has been made to control for this variable.

A survey of the literature indicates that a number of writers focus on the alleged strengths and weaknesses of the small school,

[69] Carmichael, Challenge of Rural Education, p. 22

[70] Beckner and O'Neal, "Smaller Schools", p. 5.

and many indicate that the strengths are less evident, and the weaknesses more pronounced in extremely rural small schools.[71] The Committee on Small Schools, North Central Association of Colleges and Secondary Schools (NCACSS), points out 3 significant factors evident in the literature about small schools: (1) evaluation of small schools in comparison with large schools; (b) interlocking strengths and weaknesses related to failure to capitalize on opportunities; and (c) many duplications in various lists of strengths and weaknesses. Further the Committee on Small Schools states:

> . . . the alleged strengths of small schools may be classified in terms of three areas: organizational concerns, sociocultural considerations, and classroom management practices. The weaknesses may be grouped under five broad areas: finances and facilities, student characteristics and capabilities, curriculum deficiences, professional staff (including teaching, administrative, and counseling), and sociocultural aspects.[72]

Organizational strengths of the small school may be found in the less formal atmosphere surrounding the system. Less bureaucratic "red tape" is a strength found in the small organizational structure of the rural school, according to the NCACSS Committee on Small Schools[73], Charles[74], and others. Nachtigal writes that a minimum amount of bureaucratic structure in the small school allows a higher percentage of financial and personal resources to be devoted to the instructional

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[71] Wright, Enrollment Size and Educational Effectiveness, pp. 1-3.

[72] North Central Association of Colleges and Secondary Schools, "The Small School: Returning to the Human Dimension, A Report on the Small School Project of the Committee on Small Schools, Occasional Paper No. 2 (Chicago, Illinois: Commission of Education, North Central Association, 1974), p. 13.

[73] Ibid.

[74] Edgar B. Charles, The Preparation of Teachers for Small Rural Schools (Las Cruces, New Mexico: New Mexico State University, 1969), p. 87.

process and a smaller percentage to systems maintenance.[75] Edington identifies the potential for a close-knit educational organization as a strength of the small school[76], and Beckner and O'Neal report close relationships between faculty and administrators and less "red tape" as strengths.[77]

Sociocultural factors found in the small community and the small school are generally considered strengths of small schools. The potential for close student-teacher, teacher-administrator, and school-community relationships is reported by Ford[78], Loustaunau[79], Edington[80], Muse and Stonehocker[81], and Beckner and O'Neal[82]. Wright's review of 18 studies on enrollment size and educational effectiveness of the high school indicated wide variability among findings of the 5 researchers who considered relationships, i.e. school-community, staff, and teacher-pupil.[83]

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[75]Nachtigal, Improving Rural Schools, p. 1.

[76]Edington, Strengthening the Small Rural School, p. 11.

[77]Beckner and O'Neal, "Smaller Schools", p. 5.

[78]Paul Ford, et. al, Remote High Schools: The Realities (Portland: Northwest Regional Education Laboratory, April, 1967), p. 7.

[79]Martha Loustaunau, Small Rural Schools Can Have Adequate Curriculums (University Park: New Mexico State University, February, 1975), p. 40.

[80]Edington, Strengthening the Small Rural School, p. 11.

[81]Ivan D. Muse and Loya Stonehocker, "A Study of Small Rural High Schools of Less Than 200 Students: Perceptions of Teachers and Administrators" (paper presented at the annual meeting of the American Educational Research Association, San Francisco, April 8-12, 1979).

[82]Beckner and O'Neal, "Smaller Schools", p. 5.

[83]Wright, Enrollment Size and Educational Effectiveness, et passim.

Studies concerned with teacher-pupil relationships favor the small school (one suggested size is 273-490), while studies considering staff relations or school-community relations recommend enrollments of 1200 to 1600.[84]

Many factors reported in the literature can be considered as in the area of classroom management. A factor often referred to is the lower teacher-pupil ratio in the small school, which offers the potential for quality instruction. Sadler and Ching report that educational quality declines once a certain student-teacher ratio of 27:1 is exceeded.[85] The Massachusetts State Board of Education[86], Clements[87], Templeton[88], and Beckner and O'Neal[89], all refer to lower teacher-pupil ratios as a strength present in small schools.

Randhawa and Michaylok, in their study of the learning environments of both rural and urban classrooms, compare 47 classrooms in rural areas with 50 classrooms in urban areas. The "Learning Environment Inventory" was administered to half the students and the "Primary Mental Abilities Test" to the other half. Results indicate that measurable differences existed. Rural classrooms have different learning climates with significantly more cohesive structures prevalent, but they are also

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[84]Muse and Stonehocker, "Study of Small Rural High Schools".

[85]Sadler and Ching, "Determinants of Educational Quality", p. 11.

[86]Massachusetts, State Board of Education, Data Comparisons of Regional and Small High Schools (Woburn, Mass.: State Board of Education, January, 1968), p. 2.

[87]Clements, Ideal High School Size, p. 9.

[88]Ian Templeton, "School Size", Educational Management Review Series Number 13 (December, 1972), p. 6.

[89]Beckner and O'Neal, "Smaller Schools", p. 5.

characterized by cliques, disorganization, competitiveness, and limited student satisfaction. Urban classrooms are characterized by superior material resources and challenging, satisfying learning environments. No conclusions are offered as to whether differences are attributable to ruralness or to small school size.[90]

> . . . much of what is unique about rural schools defies quantitative analysis: the slower pace, less pressure environment, less formal atmosphere, the interaction among parents, students, staff, and so on. Weaknesses attributable to the small school are more compatible with quantitative analysis.[91]

Conant criticizes the small school for its inability to meet what he considers a major criterion--offering a more comprehensive program. "The instructional program is neither sufficiently broad nor sufficiently challenging and a small school cannot by its very nature offer a comprehensive curriculum."[92]

Wright reviews studies of school size and educational effectiveness, and reports that Brown finds a significant positive correlation (ranging from 0.53 in mathematics to 0.82 in industrial arts and vocational shop courses) between the size of a high school and the number of course offerings in all curricular areas studied. On the other hand, Woods finds no consistent relationship between size of high school and availability of curricular offerings from his study of schools ranging from 800 to 1199 in attendance. Still later studies reviewed tend to lend support to Brown's findings. Garcia finds a direct relationship

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[90] Bikkan S. Randhawa and Julian O. Michaylok, "Learning Environments in Rural and Urban Classrooms (paper presented at the Education Resources Center, Saskatoon, April, 1974).

[91] Sher, Revitalizing Rural Education, p. 21.

[92] Conant, American High School Today, p. 77.

between school size and variety of curricular offerings; Gray finds a positive relationship between school size and number of educational opportunities available. Wright goes on to present Mayo's findings that based on curricular offerings, an enrollment of under 1000 is undesirable.[93]

In summarizing these studies, Wright finds that of the 7 studies in which curriculum offerings are considered:

> Variety is increased with enrollment up to a point. This may be 2,000 or something else. Beyond that there is usually a multiplication of courses rather than an increase in variety. An enrollment of at least 1,000 in a 4-year high school appears to be essential to provide the minimum variety in course offerings considered essential.[94]

The Massachusetts State Board of Education compares data from regional high schools, small high schools, and non-regional high schools with grades 9-12. Small high schools--defined as those with fewer than 100 in the graduating class--offer fewer different classes than the others. Major variations occur in science, foreign language, art, industrial arts, and business.[95]

Clements, in a summary of research concerning ideal high school size, states that when using breadth of offerings as a criterion, large

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[93] William Earl Brown, High School Size: Its Relationship to Selected Educational and Cost Factors (Los Angeles: University of Southern California, 1956); Thomas E. Woods, Relationship of High School Size to Curricular Offering (Stanford: Stanford University, 1957); Genero Bruno Garcia, Junior High School Size (Los Angeles: University of Southern California, 1961); Stuart Calvin Gray, A Study of the Relationship Between Size and A Number of Qualitative and Quantitative Factors in Four Sizes of Secondary Schools In Iowa (Iowa City: State University of Iowa, 1961); and S. S. Mayo, "What Size High School?", The American School Board Journal Vol. 144, pp. 32-33 (January, 1962); all quoted in Wright, Enrollment Size and Educational Effectiveness, pp. 9-16.

[94] Ibid., p. 3.

[95] Massachusetts, State Board of Education, Data Comparisons, p. 2.

schools have the advantage.[96] According to Edington, falling further and further behind in curricular offerings is a major weakness of the small rural school, and he states that small schools would be well advised to expand curriculum by providing more depth via individual instruction rather than more breadth via additional curricular offerings.[97]

A number of studies consider limited curriculum as a major problem of small schools. Loustaunau reports that sharing services, using audiovisual aids, employing better guidance services, providing better in-service for teachers, and better utilization of community resources may help to resolve this problem.[98]

In Big School--Small School, Barker and Gump report that on student participation in extra-curricular or co-curricular activities, the small school has the advantage. They state:

> Our findings posit a negative relationship between school size and individual student participation. . . The data of this research and our own educational values tell us that a school should be sufficiently small that all its students are needed for its enterprises. A school should be small enough so that students are not redundant.[99]

Two measures of teacher quality are cited frequently as weaknesses of small schools. Teachers in small schools frequently are less well-educated and have less experience than teachers in large systems.

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[96] Clements, Ideal High School Size, p. 9

[97] Edington, Strengthening the Small Rural School, p. 36.

[98] Loustaunau, Small Rural Schools . . . Adequate Curriculum, pp. 9-23.

[99] Robert G. Barker and Paul V. Gump, Big School--Small School: Studies of the Effects of High School Size on the Behavior and Expectations of Students (Lawrence: University of Kansas, Midwestern Psychological Field Station, Cooperative Research Project No. 594, 1962), p. 201.

Additionally, teacher turnover occurs at a higher rate than in large schools. The Texas Education Agency examines teacher degrees and experience in the member schools of the Texas Small School Project, and finds a smaller percentage of teachers with baccalaureate degrees and with no degrees in the Project schools, in comparison to non-Project schools. A turnover rate of 24.4% in Project schools is considered high. Another finding is that while a nucleus of teachers remain year after year, the remainder serve for a short time, usually one or two years.[100]

The Oregon State Board of Education finds a disproportionate share of below-standard teachers, including fewer permanent teachers, a higher incidence of young inexperienced teachers, and the lowest incidence of advanced degrees in small schools.[101] The Washington State Temporary Levy Commission, quoting studies from Arkansas, Ohio, and Iowa, reports that the relative number of teachers with advanced degrees increases with school size. When Ohio schools of 200 or less are compared to high schools of 500 to 700, one finds that teachers in the smaller schools receive lower salaries, have less experience, and are less likely to hold advanced degrees. The Iowa study compares qualifications of teachers to school size and finds that the largest school had the more experienced staff with more academic preparation.[102]

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[100] Texas, Texas Education Agency, Degrees, Tenure, Experience, and Turnover of Professional Staff Members in the Texas Small Schools Project (Austin: Division of Administration Services, December, 1971), p. 6.

[101] Oregon, State Board of Education, Small School Program, p. 5.

[102] Washington, Washington State Temporary Special Levy Study Commission, Summary Report and Research Reports, Vol. I (Olympia, Washington: Temporary Special Levy Study Commission, 1971), p. 351.

Wright finds that the factor of staff qualifications favors the large school. Schools which enroll fewer than 400 students usually do not attract the best qualified teachers. In the larger schools there are more experienced teachers, more teachers with graduate training, larger percentages of teachers teaching in their major fields, and less teacher turnover.[103]

Edington reports it is quite common for a rural teacher to teach outside his or her area of training and to teach 5 or 6 preparations. The cream of the crop (of teachers) gravitates to urban or suburban schools, and administrators consider the small school a steppingstone to something better.[104]

There are specific problems facing rural schools that other types of small schools do not encounter. Rural schools must contend with the problem of _isolation_. Rural schools tend to be isolated from the educational, governmental, and economic support systems found in metropolitan areas, and they do not have the benefits and assistance of universities, mental health centers, teacher centers, and cultural institutions. Isolation, then, can be considered an additional factor affecting staff qualifications in rural schools.

Nachtigal writes that by accepted standards the small rural school has been poorly staffed, less well financed, and offered fewer educational opportunities, turning out students less well-equipped to cope with an industrialized urban society. Historically, efforts to resolve these deficiencies tend to fall into 3 rather distinct categories

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[103] Wright, _Enrollment Size and Educational Effectiveness_, p. 3.

[104] Edington, _Strengthening the Small Rural School_, p. 15.

or themes of school reform, themes based on different assumptions about the nature of the problem.[105]

The first theme holds that the problem with rural education is that it is not urban. "The rural school itself is the problem."[106] Reform efforts based on this assumption aim at molding the rural school into the likeness of urban education. Efforts have long been underway to systematize the rural school. The thinking is that even the smallest one-room school can be given a graded structure with the stuff of learning broken down into discrete subject matter courses.[107]

The second theme of rural school reform is the concept of the "necessarily existent" small school. This theme recognizes that some small schools will have to remain because of the terrain and sparsity of population in some areas. This theme is legitimized to some extent by grants from the Ford Foundation to finance such projects as the Rocky Mountain Area Project for small schools in Colorado, and the Western States Small School Project. Nachtigal contends that this "small is beautiful" philosophy now appears to be gaining some credibility.[108]

The third theme of rural school reform occurred as a result of and in conjunction with the advent of massive federal intervention in education beginning in the 1960's. This theme is based on the assumption that the problems of education are generic and that common program strategies and funding formulae are deemed applicable everywhere.[109]

The consolidation thinking of the first theme, along with the generic assumptions of the third theme, are consistent with the "one best

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[105] Nachtigal, Improving Rural Schools, p. 3. [106] Ibid.

[107] Ibid. [108] Ibid. [109] Ibid., p. 4.

system" theories of David Tyack, expressed in his book by the same title.[110] Elements of these themes are evident in the literature and research on small schools and related issues.

Rural School Finance

Thompkins writes, "The major school finance problem in rural America remains the uneven geographic distribution of wealth measured both by property and income."[111] A second large problem is the relative sparsity of population, which leads to high expenditures for services like transportation and higher per pupil expenditures for some educational problems. Both of these problems involve the concept of equity. Equity has been the goal of school finance theorists through the years and has been defined in various ways. Recent court cases in Texas, California, and New Jersey have served to define equity more precisely as it applies to educational opportunity today.

Historically a guaranteed minimum level of educational expenditure for each child constituted equity. Flat grants and foundation plans exemplify efforts toward this goal. A second definition of equity--equity of inputs--requires exactly equal dollars to be spent on each child. A programmatic approach to education finance fits this definition. Supplying different levels of resources based on educational need suggests a goal of equalizing outputs. This definition of equity--equalizing

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[110] David Tyack, The One Best System (Cambridge, Mass.: Harvard University Press, 1974), p. 23.

[111] Rachael B. Thompkins, "Coping with Sparsity: A Review of Rural School Finance", in Education in Rural America: A Reassessment of Conventional Wisdom edited by Jonathan P. Sher (Boulder: Westview Press, 1977), p. 129.

educational achievement for all children regardless of ability--is a lofty yet difficult goal, since differences among children are great. Weighted pupil categories in state aid formulae are efforts toward this goal. A fourth definition of equity is equalization of tax-paying ability. Efforts toward equalizing tax-paying ability are referred to variously as fiscal neutrality, power equalizing, or guaranteed yield.

Coons, Clune, and Sugarman build the legal arguments to challenge the constitutionality of the state finance system that allows expenditures per child to vary with property wealth in a district rather than being based on the wealth of the state as a whole.[112] While the Supreme Court in San Antonio versus Rodriquez found that the financing system did not violate the equal protection provisions of the Fourteenth Amendment, the justices did recognize the need for property tax reform. Despite the decision turning back the constitutional basis for reform, 22 states have acted to alter their system of financing schools in the years between 1970 and 1978.[113] These systems have aimed at equalizing outputs and making the child's education dependent more on the wealth of the state.

The large number of rural school districts and their unique characteristics tend to complicate the already complicated issue. Rural communities are characterized by tremendous diversity. However, there are common problems.

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[112] John E. Coons, William H. Clune III, and Stephan D. Sugarman, Private Wealth and Public Education (Cambridge, Mass.: The Belknap Press of Harvard University, 1970), p. 6.

[113] Thompkins, "Coping With Sparsity", p. 129.

One problem faced by rural schools is lack of property wealth. "Measured by property wealth, the poorest school districts in any state are rural districts," Thompkins states.[114] In a study of 13 states in all regions of the country, rural areas have been found to have the lowest per pupil expenditures proportionate to their state and local revenue effort. Berke concludes that the disadvantage in rural school finance probably stems from the absolute shortage of taxable property in many areas. Many state aid systems have only modest equalizing power; many rural districts are too poor to take advantage of the full effects of equalizing aid systems. Their tax efforts do not enable receipt of the full level of foundation aid most state aid systems provide.[115]

Most states face 2 problems in attempts to achieve equity; one is reliance on property tax as a primary source of local revenue and the other is how the tax is administered. Elected tax assessors often are poorly trained, unqualified, and faced with a difficult task. Thomas reports that there are 2 basic reasons for poor tax administration. One is the magnitude of the assessment process and the other is the diversity within rural communities:

> . . . the elusive nature of the magnitude which the assessor is trying to measure, namely, the market value of the property. This magnitude is essentially hypothetical or fictional. The assessor is asked to estimate what price the property would bring if, hypothetically, the property were offered for sale. The more unusual the property, the greater the difficulties of measurement.[116]

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[114] Thompkins, "Coping With Sparsity", p. 141.

[115] Joel S. Berke, Answers to Inequity (Berkeley: McCuthan Publishing Corp., 1974), p. 95.

[116] J. Alan Thomas, Financing Rural Education (Austin: National Educational Laboratory Publishers, 1974), p. 34.

As costs of education have risen so has the need for higher property valuation. The optimum size of school districts required to achieve optimum property valuation has grown larger. In Vermont, which currently has 278 districts, it was recently proposed to break the state into 8 school districts to achieve a property valuation of $15,000 per pupil.[117]

Property tax presents special problems for agricultural areas. Sher states property taxes pose a particular hardship for rural citizens who tend to be "property rich" but "income poor."[118] Metzger points out that while the overall effective rates on farm real estate are well below the rates on non-agricultural real property in nearly all states, it is also true farmers pay substantial property taxes relative to farm income and farm net product. He concludes, ". . . disparity between the tax-income and tax-wealth relationship is, of course, a reflection of the markedly lower rate of return in recent years on investment in farm property relative to non-farm investment.[119]

Due posits four major criteria by which tax structures can be evaluated as equitable: (a) equals should be treated equally; (b) distribution of the overall tax burden should be based on ability to pay measured by income, wealth, and consumption; (c) persons in the lowest income groups should be excluded on the grounds they have no tax-paying capacity; and (d) overall distribution of the tax structure should be progressive or at least proportional to income. Additionally, taxes

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[118]Sher, Revitalizing Rural Education, p. 21.

[119]Dick Metzger, Economics of the Property Tax, Studies of Government Finance (Washington, D.C.: The Brookings Institute, 1966), p. 28.

should be collectible to a high degree of effectiveness with minimal real costs to the taxpayers and reasonable cost to the government for collection.[120] The public generally regards the property tax as the most inequitable tax levied, and in rural areas with low income and disparity between income and property value this opinion is even more evident.

Equalization is hampered by uneven distribution of income across school districts. Level of income is a measure of ability to pay taxes. A study for the Education Review Committee of the General Assembly of Ohio demonstrates the relationship between median family income and school finance: ". . . median family income has such a powerful effect on operating millage and expenditures per pupil that if all districts had similar incomes, the operating millage and expenditures per pupil could be expected to be similar also."[121] Thomas states, "The median family income of a state or a district is probably a better index of tax-paying ability than its property valuation."[122] These and other factors complicate school finance formulae designed to guarantee equal dollars for each mill levied.

A difficult problem associated with equity is the inherent high costs of rural education. Most if not all writers agree that diseconomy of scale occurs in small schools. Sher states, "The most important and unique feature of rural school finance lies in the higher costs

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[120] John F. Due, "Alternative Tax Structures in Education," in Economic Factors Affecting the Financing of Education edited by Roe L. Johns and Kern Alexander (Gainesville, Fla.: National Educational Finance Project, 1970), Chapter 10.

[121] Thompkins, "Coping With Sparsity", p. 137.

[122] Sher, Revitalizing Rural Education, p. 32.

associated with sparsity of population."[123] Tamblyn reports that 2 cost overburdens are usually associated with rural areas and areas of sparse population: (a) additional costs due to distances students must be transported, and (b) additional costs associated with small administrative units.[124] These are referred to as "equal cost overburdens" because it costs more to give equal services in small schools. The picture is somewhat distorted because many small schools have not purchased equal services.

Small schools tend to have higher per pupil costs. The Oregon State Board of Education concludes that per student costs in small schools often may be twice that of larger schools[125], a conclusion supported by Mack and Lederman[126], and Clements[127]. Thomas states that administrative costs per pupil in school districts of up to 600 pupils are approximately twice those of districts with more than 2,500 pupils; high costs are sometimes hidden in low teacher salaries and in diminished educational opportunity which result from inadequate curriculum.[128]

Sparsity also ensures that rural districts will have relatively high per pupil costs for energy, equipment and materials, and the construction and maintenance of school facilities. Having fewer students

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[124] Lewis R. Tamblyn, Rural Education in the U.S. (Washington, D.C.: Rural Education Association, 1971), p. 15.

[125] Oregon, State Board of Education, Small School Program, p. 5.

[126] David P. Mack and Alfred T. Lederman, School District Reorganization: Can Small Schools Compete? A Position Paper (Olean, New York: Western New York School Development Council, 1969), pp. 13-21.

[127] Clements, Ideal High School Size, p. 7.

[128] Thomas, Financing Rural Education, p. 3.

over which to spread these costs inevitable means that per pupil costs will be higher in rural schools. The high cost of sparsity is offset to some degree by "doing without". Sher states that rural schools have made numerous concessions to frugality over the years.[129]

Capital costs pose particular problems for rural schools. First, rural schools must make additional efforts to afford an average debt service. Second, bond ratings are frequently lower for rural districts. Third, rural districts with newly built facilities carry very large debt service in relation to wealth. Pierce reports on several states as follows. In Iowa, the rural districts needed to make several times the effort required of the richest districts. The Arizona Supreme Court concluded that funds for capital improvements in school districts were even more closely tied to district wealth than were funds for operating expense. Oregon planners estimated that by using the state's higher credit rating, Oregon schools could save $3.5 million annually on interest costs.[130]

Transportation is usually considered a high cost item in rural schools as there are usually a higher percentage of students who must be transported, over longer distances. Buses usually are not loaded to capacity and using small buses results in high operational costs. For example, Alaska has both the lowest population density and the highest per pupil transportation expenditures of any state.[131]

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[129] Sher, Revitalizing Rural Education, p. 32.

[130] Lawrence C. Pierce, State School Finance Alternatives (Eugene, Ore.: Center for Educational Policy and Management, University of Oregon, May, 1975), pp. 87-89.

[131] Thompkins, "Coping With Sparsity", p. 143.

Researchers in recent years have begun to apply an economic concept to education. This concept, economy of scale, is defined as when larger investments result in lower costs per unit of product. When measuring costs it is agreed generally that costs tend to be high at both ends of the size continuum and lower in the middle. Evidence now seems to show hidden costs associated with large schools. Sabulao and Hickrod examine two basic research theories, that (a) expenditures per student decrease as the size of the district increases, and (b) that (a) is true only up to a certain enrollment level. At that point, the complexity of the school causes increased expenditures per pupil, and they find that (b) is more nearly correct. Optimum district size in terms of operating expense is 750 students in elementary grades (K-8), 500 in secondary grades (9-12), and 5,000 in a unit district (K-12). Further, they find that unit districts experience economies of scale through a much greater segment of the size continuum than the elementary or secondary district.[132]

These findings give support to those who speculate that economy of scale extends to smaller units than formerly has been believed. A cost factor frequently offered as an example is transportation. Transportation costs have risen dramatically in recent years and small school proponents may now make a defensible argument that increasing district size will cause transportation costs to become prohibitive. A recent Oklahoma study indicates the importance of considering transportation costs. Using these data, White and Tweeten estimate optimum district size to be 800 students when measuring only educational costs adjusted to a standard quality of

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[132]Caesar M. Sabulao and G. Alan Hickrod, "Optimum Size of School Districts Relative to Selected Costs," (paper presented at the American Educational Research Association Annual Meeting (New York, Feb. 4-7, 1971).

program (30 academic and 8 vocational units). However, when transportation costs are included the optimum district size drops to 675 students.[133] Calculating optimum size in areas of varying student density ratios, White and Tweeten find a positive relationship exists between density and size. A district with a density of 0.6 transported students per square mile has an optimum size of 300, while a district with 3.0 students per square mile reaches optimum size at 1,075 students.[134] The important factor here is that optimum district size in sparsely populated areas is smaller. As transportation costs rise isolated schools become more economically advantageous. The optimum district size is defined as that which has minimum long-run average costs.[135]

Sparsity, then, presents some very difficult and perplexing problems. Isolated schools cannot expand enrollment to cut per pupil costs and evidence indicates that expending the district transportation area is of questionable value in lowering costs.

The National Education Finance Project, a five-volume study of state and local finance in 48 states, shows some interesting factors relating to income and expenditures of school districts. Analysis of expenditures indicates substantial variations. States with few districts exhibit as much disparity as those with many districts. States with a small number of districts appear to have as much variation in per student valuation as states with a large number of districts. Little evidence has

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[133] Fred White and Luther Tweeten, "Optimal School District Size Emphasizing Rural Areas," <u>American Journal of Agricultural Economics</u> (February, 1973), p. 51.

[134] *Ibid.*, p. 53. [135] *Ibid.*

been gathered that would indicate that stability or equity have been achieved in tax structures. Additionally, large districts have a lower assessed valuation per pupil than small districts, and large districts have a higher tax rate. Those districts that have a large tax base relative to number of pupils will spend more than districts with a low tax base. What appears on the surface to be a relationship between cost and size may in fact be a relationship between cost and assessed valuation.[136] If districts are both rich and small, it is not at all appropriate to argue that their higher costs are because of smallness alone.

The Education Finance Center of the Education Commission of the States distinguishes between education costs (difference in prices that school districts must pay for a specific level and quality of education and services), and education expenditures (monies spent by different school districts regardless of the level and quality of services bought with those expenditures).[137] Simply put, schools have little control over "costs" (which are determined by factors outside the control of school decision makers) while the amount of education expenditures (the services purchased) is a matter of choice for school decision makers, within given budget constraints.

In spite of the huge reduction in the number of districts, sizable inequities remain between districts in terms of wealth, tax rate, and expenditure, regardless of size, type of district, or pattern of state aid. A large number of changes have been made in school finance systems since 1970; one outcome of these reforms (enacted in 18 states through 1975) has

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[136] Clifford Hooker and Van D. Mueller, The Relationship of School District Reorganization to State Aid Distribution Systems, Special Study 11 (Gainesville, Fla.: National Educational Finance Project, Part II (1970), pp. 126-34.

been to increase the proportion of aid to schools from state sources. Regardless of the method of distribution, more state money tends to equalize school districts.[138] The equalization is limited in most states by the necessity to maintain or to "hold harmless" property-rich districts at existing levels of support. A second outcome of reform has been property tax relief and equalization. Absolute decreases in local property tax rates have been possible in states where dramatic increases in the proportion of state aid have been passed, for example, in Colorado, Kansas, Minnesota, North Dakota, and Wisconsin. New school finance plans have recognized the special needs of some children and some districts (such as the higher costs for special services for handicapped children because of the low incidence of such students in rural schools), and have addressed these needs by categorical grants or by weighting.

Thompkins states the general policy framework for state school finance should be governed by goals of adequacy, stability, equity, and flexibility.[139] Ruralness per se has not been an explicit factor shaping the distribution of state aid to education but there is an emerging preference for sparsity adjustments in the distribution of state aid. In 25 of the 50 states density of population and/or scale are now perceived as special needs, and some effort has been made to correct for the inherent differences in rural school costs.[140]

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[138] John J. Callahan and William H. Wilkin (editors), School Finance Reform: A Legislators Handbook (Washington, D.C.: National Conference of State Legislators, 1976), Chapter 1.

[139] Thompkins, "Coping With Sparsity", p. 148.

[140] Sher, Revitalizing Rural Education, pp. 33-34.

Wright summarizes special funding provisions for small or isolated schools, demonstrating that 28 states have assistance mechanisms for small and/or isolated rural schools. Assistance falls into 3 categories: (a) added weightings to the basic support formula (13 states); (b) minimum support levels (5 states); and (c) size adjustments and special payments (6 states).[141] Eligibility factors include student enrollment, instructional units and/or number of teachers, population density/sparsity, isolation, and effort. In many cases several of the elements are interrelated.

A summary of size categories reveals considerable variation among states. Four states have a district level enrollment factor: Arkansas, 350 students; Texas, 1000 students; California, 2500 students; and New Mexico, 4000 students. Two states have multiple enrollment categories for schools: Arizona, 0-100 and 101-500; Kansas, under 200, 200-399, 400-1599, and 1500 and over. States with a single enrollment number include: New Mexico, 200 ADM or less; Colorado, 175 enrollment or less; and Oregon, 100 ADM or less.

Several states consider population density/sparsity. Kansas has a cost-density formula that is applied to transportation. Nebraska's eligibility includes a population of less than 4 persons per square mile. Pennsylvania has a requirement of less than 50 people per square mile, and a modified sparsity factor of 50-100 people per square mile. Texas has a category of districts or less than 300 square miles and more than 300 square miles, tied to an enrollment of 1000 or less. Oklahoma bases

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[141]Lyle O. Wright, Special Funding for Small and/or Isolated Rural Schools (Washington, D.C.: National Institute of Education, January, 1981), pp. 4-7.

its transportation assistance on a factor obtained by dividing the "average daily haul for the next preceding year" by the "area served by the same period".

A number of states consider distance a requirement for eligibility. Colorado requires that an education center be 20 miles from another center. Oregon and Idaho require an elementary school to be 10 miles, and a secondary school to be 15 miles, from a non-isolated school. Minnesota requires 50 miles, Georgia 40 miles, and Maine leaves the decision on distance up to the Commissioner of Education.

Several states utilize other criteria. Georgia includes schools that require a 1-1/2 hour bus ride to reach a school less than 40 miles distant or physically blocked by geographic or climatic conditions for 20 days per year. Idaho permits a classification due to geographical or topographical conditions. Maine considers unique transportation problems. North Carolina considers geographic conditions. Pennsylvania considers distance and road conditions, and Utah classifies schools as "necessarily existent small rural schools" to qualify.[142]

Callahan and Wilkin state that one major outcome of the reforms enacted in 18 states between 1970-75 has been to increase the proportion of aid to schools from state sources. The average state share in these states before reform was 39%, compared to 51% after the reforms.[143] Sher suggests that linking sparsity payments to a "remote but necessary school

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[142] Wright, Special Funding, pp. 4-7.

[143] Callahan and Wilkin, School Finance, p. 8.

[144] Sher Revitalizing Rural Education, p. 55.

classification system would ensure that only schools which deserve state payments would get them as states increase their level of support.[144]

Theoretical Framework of This Research

The basis of concern for this study is grounded in the theories of early pioneers in the field of school finance, all of whom expressed the need for equal educational opportunity for all children in the state. In Cubberly's basic school finance theory, all children theoretically are equally important and are entitled to have the same advantages; practically this can never be true, and the duty of the state is to secure as high a minimum as possible, not to reduce all to this minimum.[145] A related theory is the "power equalizing plan" of Coons, Clune, and Sugarman, based on the idea of the quality of education depending not upon the wealth of the district but upon the local tax effort.[146] Strayer and Haig propose that a state ensure equal educational facilities to every child, but would not preclude a particular community offering a rich and costly educational program at its own expense. The tax burden of education should be uniform throughout the state relative to tax-paying ability, with the state equalizing the financial support of a guaranteed minimum educational program throughout the state.[147]

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[144] Sher, Revitalizing Rural Education, p. 55.

[145] Ellwood Cubberly, School Funds and Their Apportionment (New York: Teachers College, Columbia University, 1905), p. 17.

[146] Coons, Clune, and Sugarman, Private Wealth, Chapter 6.

[147] George D. Strayer and Robert Murray Haig, The Financing of Education in the State of New York, Report of the Education Finance Commission, Vol. I (New York: McMillan Co., 1923), p. 173.

From a constitutional perspective, if education is a state function and if local school districts fail to fulfill that function efficiently or equitably, then full state funding would seem to be the answer to school finance problems. A model of state support whereby all local school districts would be abolished and the state itself would become both the unit for taxation for schools and for administration proposes the income tax as the most equitable tax for school support.[148]

Mort develops the technology for implementing such support theories as those of Strayer and Haig. In developing standard measures of "need" based on the "weighted pupil" concept, Mort provides for necessary variations in per pupil costs for different educational programs and target populations. The concept also provides consideration of variations in the per pupil wealth of local school districts.[149]

As a part of the National Educational Finance Project (NEFP), state finance programs have been evaluated under 3 criteria: program scope, organization, and finance. Under criteria relating to organization the study concludes, in part, that the state finance plan should financially penalize of at least not financially reward the establishment or continuation of small inefficient enrollment centers except in cases resulting from geographical isolation. Additionally, the plan should recognize differences in per pupil local district costs associated with factors such as sparsity and density of population, pupil transportation,

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[148]Edgar L. Morphet, Roe L. Johns, and Theodore L. Reller, Educational Organization and Administration, Concepts, Practices, and Issues (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1974), p. 514.

[149]Paul A. Mort, The Measurement of Educational Need (New York: Teachers College, Columbia University, 1924), pp. 6-7.

extra costs of isolated schools, and other necessary variations in the costs of delivery, educational services, and facilities.[150]

Two methods--weighted pupil and adjusted instructional unit--have been developed for incorporating cost differentials into the program of state support. Wright's summary of small and/or isolated rural schools reports on 13 states which use weightings added to the basic support formula as a mechanism of support for small or isolated schools along with factors such as size, geographic location, topography, or a combination of these factors.[151]

A more recent concept that provides insight into the school system is the concept of systems theory. In this context the organization is viewed as one element of a number of elements which interact interdependently. The flow of "inputs" and "outputs" becomes the starting point in the description of the organization. In simple terms, the organization takes in resources ("inputs") from the larger system (the environment), "processes" these resources, and returns them in the form of a product or products ("outputs") into the larger system. In the systems context the school system is the "processor" with "inputs" in the form of financial resources, facilities, administration and instructional staff, and raw material (the students), and with "outputs" in the form of human resources (educated students) which have been developed. The problem for the public school system is to maximize the

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[150] Alternative Programs for Financing Education edited by Roe L. Johns and Kern Alexander (Gainesville, Fla.: National Educational Finance Project, 1972), Vol. V, Chapter I.

[151] Wright, Special Funding, p. 11.

flow of educational services from the amount of resources provided. A school, like a business organization, will not survive if it is guilty of expending too great an amount of resources relative to its educational product.[152]

The literature has suggested that ruralness affects schools in several ways. First, the rural school was typically small. Isolation, when it existed, was an additional burden to the small rural school, as in most cases there was little hope of district enrollment growth. Consolidation has been of questionable value in sparsely populated areas because of logistics and transportation costs. The rural school was lacking in comprehensiveness due to limited curriculum offerings. Also, the rural isolated school was cut off from the cultural and social activities of more urban areas, and could not take advantage of support services that might have been available to the less rural school.

The rural school was restricted in services and quality of education since it was more likely to employ teachers with fewer degrees and less experience, and to engage teachers in teaching outside their major fields. The rural school paid lower salaries, which ensured that teacher tenure and experience would remain low.

The rural school was characteristically poor, usually did not have an adequate tax base, and was dependent upon taxes from agricultural property. Agricultural property typically was assessed at a low rate, and in general rural areas did not tax at as high a rate as did urban areas. State and federal aid did not always equalize the financial

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[152] James L. Gibson, John M. Ivanevich, and James H. Donnelly, Jr., Organizations: Behavior, Structure, Processes (Dallas: Texas Business Publications, Inc., 1979), p. 29.

resources available to the small rural school. At the same time, the rural school, like all small schools, had high costs for operations, especially transportation, plant maintenance and operation, administration, instruction, and capital outlay.

The literature indicated that a unique feature of ruralness was a tremendous diversity. The fact of this diversity required the identification of special categories along the rural-urban continuue that indicated unique needs.

The problem of this research was to discover if unique needs exist in Oklahoma's rural isolated school districts. The methodology devised to accomplish this purpose is the subject of the following chapter.

CHAPTER III

METHODOLOGY

This chapter describes the method of sampling, data collection, and analysis used to test the following hypotheses:

$H_0 1^a$: There is no statistically significant difference in income from local sources between small isolated and small non-isolated schools.

$H_0 1^b$: There is no statistically significant difference in income from local sources between large isolated and large non-isolated schools.

$H_0 2^a$: There is no statistically significant difference in income from state sources between small isolated and small non-isolated schools.

$H_0 2^b$: There is no statistically significant difference in income from state sources between large isolated and large non-isolated schools.

$H_0 3^a$: There is no statistically significant difference in income from federal sources between small isolated and small non-isolated schools.

$H_0 3^b$: There is no statistically significant difference in income from federal sources between large isolated and large non-isolated schools.

$H_0 4^a$: There is no statistically significant difference in per capita costs for administrative services between small isolated and small non-isolated schools.

$H_0 4^{\underline{a}}$: There is no statistically significant difference in per capita costs for administrative services between large isolated and large non-isolated schools.

$H_0 4^b$: There is no statistically significant difference in per capita costs for instructional services between small isolated and small non-isolated schools.

$H_04^{\underline{b}}$: There is no statistically significant difference in per capita costs for instructional services between large isolated and large non-isolated schools.

H_04^{c}: There is no statistically significant difference in per capita costs for attendance services between small isolated and small non-isolated schools.

$H_04^{\underline{c}}$: There is no statistically significant difference in per capita costs for attendance services between large isolated and large non-isolated schools.

H_04^{d}: There is no statistically significant difference in per capita costs for health services between small isolated and small non-isolated schools.

$H_04^{\underline{d}}$: There is no statistically significant difference in per capita costs for health services between large isolated and large non-isolated schools.

H_04^{e}: There is no statistically significant difference in per capita costs for pupil transportation between small isolated and small non-isolated schools.

$H_04^{\underline{e}}$: There is no statistically significant difference in per capita costs for pupil transportation between large isolated and large non-isolated schools.

H_04^{f}: There is no statistically significant difference in per capita costs for operation of plant between small isolated and small non-isolated schools.

$H_04^{\underline{f}}$: There is no statistically significant difference in per capita costs for operation of plant between large isolated and large non-isolated schools.

H_04^{g}: There is no statistically significant difference in per capita costs for maintenance of plant between small isolated and small non-isolated schools.

$H_04^{\underline{g}}$: There is no statistically signficiant difference in per capita costs for maintenance of plant between large isolated and large non-isolated schools.

H_04^{h}: There is no statistically significant difference in per capita costs for fixed charges between small isolated and small non-isolated schools.

$H_04^{\underline{h}}$: There is no statistically significant difference in per capita costs for fixed charges between large isolated and large non-isolated schools.

$H_0 4^{i}$: There is no statistically significant difference in per capita costs for food services between small isolated and small non-isolated schools.

$H_0 4^{\underline{i}}$: There is no statistically significant difference in per capita costs for food services between large isolated and large non-isolated schools.

$H_0 4^{j}$: There is no statistically significant difference in per capita costs for student activities between small isolated and small non-isolated schools.

$H_0 4^{\underline{j}}$: There is no statistically significant difference in per capita costs for student activities between large isolated and large non-isolated schools.

$H_0 4^{k}$: There is no statistically significant difference in per capita costs for community service between small isolated and small non-isolated schools.

$H_0 4^{\underline{k}}$: There is no statistically significant difference in per capita costs for community service between large isolated and large non-isolated schools.

$H_0 4^{l}$: There is no statistically significant difference in per capita costs for capital outlay between small isolated and small non-isolated schools.

$H_0 4^{\underline{l}}$: There is no statistically significant difference in per capita costs for capital outlay between large isolated and large non-isolated schools.

$H_0 5^{a}$: There is no statistically significant difference in teacher degree and experience between small isolated and small non-isolated schools.

$H_0 5^{b}$: There is no statistically significant difference in teacher degree and experience between large isolated and large non-isolated schools.

$H_0 6^{a}$: There is no statistically significant difference, with regard to total salary expenditures, in the level of expenditure between small isolated and small non-isolated schools.

$H_0 6^{b}$: There is no statistically significant difference, with regard to total salary expenditures, in the level of expenditure between large isolated and large non-isolated schools.

$H_0 7^{a}$: There is no statistically significant difference, with regard to total per capita expenditures, in the level of expenditure between small isolated and small non-isolated schools.

$H_0 7^b$: There is no statistically significant difference, with regard to total per capita expenditures, in the level of expenditure between large isolated and large non-isolated schools.

$H_0 8^a$: There is no statistically significant difference, with regard to total unit offerings, in the number of units of credit offered between small isolated and small non-isolated schools.

$H_0 8^b$: There is no statistically significant difference, with regard to total unit offerings, in the number of units of credit offered between large isolated and large non-isolated schools.

$H_0 9^a$: There is no statistically significant relationship between certified salary expenditures and the teacher degree and experience index in small isolated schools.

$H_0 9^b$: There is no statistically significant relationship between certified salary expenditures and the teacher degree and experience index in small non-isolated schools.

$H_0 9^c$: There is no statistically significant relationship between certified salary expenditures and the teacher degree and experience index in large isolated schools.

$H_0 9^d$: There is no statistically significant relationship between certified salary expenditures and the teacher degree and experience index in large non-isolated schools.

$H_0 10^a$: There is no statistically significant relationship between per capita expenditures and the number of units of credit offered in small isolated schools.

$H_0 10^b$: There is no statistically significant relationship between per capita expenditures and the number of units of credit offered in small non-isolated schools.

$H_0 10^c$: There is no statistically significant relationship between per capita expenditures and the number of units of credit offered in large isolated schools.

$H_0 10^d$: There is no statistically significant relationship between per capita expenditures and the number of units of credit offered in large non-isolated schools.

Selection of the Sample

The sample for this study was drawn from the 258 schools in Oklahoma that enrolled 500 or fewer students for the school year 1979-80.

Fifty-one schools met the definition of isolation presented here; 207 schools did not, and formed a control group of non-isolated schools. It was noted that isolated schools were above the state average in terms of per capita revenue, and that most of these schools fell within the range of \$2000 to \$5000, a distribution which was found to be skewed slightly to the left of the mean plotted against a normal curve. The range of \$2000 to \$5000 was chosen as a selection criterion in order to produce comparable samples. Application of this criterion to the 51 isolated schools yielded a sample of 43 schools, to which the criterion of size was applied. This stratification produced 2 groups, "small isolated schools" (n=24) and "large isolated schools" (n=19), which were designated "A-1 schools" and "B-1 schools", respectively, for statistical purposes.

A control sample was drawn from the 207 schools designated non-isolated. Application of the per capita revenue criterion yielded a group of 62 schools. These schools were stratified by size into "small non-isolated schools" (n=34) and "large non-isolated schools" (n=28), which were designated "A-2 schools" and "B-2 schools", respectively, for statistical purposes.

Data Collection

Data were collected from the Oklahoma State Department of Education (SDOE), the state agency charged with responsibility for the administration of state aid to, and regulation of the operation of, the state's school districts. The agency is divided into a number of departments, each having responsibility for a particular area of school district operation. These departments are reviewed briefly here as they are applicable to this study.

The Finance Section of the Department is responsible for administering state money to the districts according to a formula adopted by the Oklahoma legislature. Financial information on each school district in the state is published annually in a report by the SDOE.

The Transportation Section collects data on district size, location, sparsity, and special conditions. Additionally, it is responsible for the operation of each school district's bus fleet.

The Accreditation and Teacher Certification Sections relate to the level of the quality of education available across the state. The Accreditation Section is responsible for ensuring that schools meet minimum educational requirements, and contains information about program offerings in the schools. The Teacher Certification Section houses teacher credential records and therefore contains information on teacher degrees and experience. The importance of the data in the Teacher Certification Section for the Teacher Degree and Experience Index is discussed below.

To facilitate administration, the SDOE established a Data Processing Center, where the data described above has been assembled and stored. These data have been grouped according to the categories important to this study: School Income Sources, School Expenditures, Teacher Degree and Experience Index, and Unit Offerings.

School Income Sources

Oklahoma Schools have received income from 3 common sources: (1) local revenues derived largely from property taxes consisting of general fund revenues, revenues for capital outlay, and debt services; (2) state revenues consisting of dedicated revenues and appropriated revenues; and (3) federal categorical aid, the largest awards consisting of vocational aid, school lunch aid, impact aid, aid for handicapped children, aid for the special educational needs of disadvantaged children, and migrant aid.

Analysis of data from these sources provided information about a given school district's operation. Local revenues were found to vary greatly among Oklahoma's 618 school districts, and therefore are a source of a great deal of inequity. Oil and gas explorations and the resulting economic improvement in some areas have perpetuated this inequity.

During the period from 1971 to 1981 the legislature appropriated large sums of money which was awarded to school districts as flat grants for teacher salary increases that were outside the state aid formula, and which thus had a negative impact on equalization. State grants were also awarded in a programmatic approach to areas such as special education. Schools with limited income and small numbers of students had difficulty in financing the district's share of grants while more affluent districts could take full advantage.

As for federal aid, Oklahoma has never met equality guidelines established by the government to allow federal aid to be chargeable against the state foundation program. Federal aid thus can be a source of inequity also.

Analysis of these school income sources established the position of isolated small rural schools relative to each source compared to their non-isolated counterparts. Establishment of isolated small rural schools relative to income sources allowed conclusions to be drawn about the relationship between degrees of rurality and school revenues.

School Expenditures

Data on school expenditures are reported on an annual expenditure report required of each district. The operating or general fund of Oklahoma school districts was divided into 12 functional categories for the purposes of this study: (1) Administrative Services, (2) Instructional Services, (3) Attendance Services, (4) Health Services, (5) Pupil Transportation, (6) Operation of Plant, (7) Maintenance of Plant, (8) Fixed Charges, (9) Food Services, (10) Student Body Activities, (11) Community Services, and (12) Capital Outlay. Hypotheses concerning these expenditures were formulated and tested. Small school budgets are simpler than those of larger schools, although in each case a large percentage of the school budget goes into certified salaries. Analysis of salary expenditures and expenditures in each of the functional categories yielded information about how school decision makers may choose to allocate the financial resources available to them. For this study, the analysis was expected to indicate differences in expenditures between isolated and non-isolated schools, if such differences existed, and also to allow a comparison of isolated school expenditures to the typical rural school as characterized in the current literature.

Teacher Degree and Experience Index

Early in 1981 the Data Processing Center of the SDOE began applying a teacher experience-degree index to a school formula that would be initiated for use during the 1981-82 school year. An index table is utilized and all the teachers in the state are compared to the index table, from which a weighted "average state teacher" is obtained. The same index is applied to the teachers in each district to determine the weighted "average district teacher". The ratio of these two factors, if the district weight is higher, yields a district teacher index, that is then multiplied by 0.7 based on the assumption that approximately 70% of the budget of a school district goes for teacher salaries. The result is multiplied by a previously determined weighted ADM to give the district additional pupil units to compensate the districts that have additional costs because of larger than average concentrations of teachers with more than the state average of degrees and experience. One hypothesis of this research was that teacher degrees and experience would not differ signifi-cnatly between isolated and non-isolated schools. These data presented an opportunity to test this hypothesis utilizing a factor now present in the state aid formula, and presumably a permanent part of future formulae.

Unit Offerings

Oklahoma school regulations require each high school to offer a minimum of 36 units of approved course work exclusive of special education units. Eight of these units may be on a two-year alternation plan, with 28 units to be offered in the current school year. A school district that pays taxes in support of a vocational-technical school or pays the tuition for students to attend such schools must offer a minimum of 32 units with 24 units being offered during the current school year. Eighteen units are required for graduation. Many schools offer more than the required minimum number of units and this is an acceptable and reliable measure of a district's effort to provide a quality education. It is also an area of difficulty for small rural schools which suffer from lack of resources and/or lack of sufficient number of students to offer an expanded curriculum.

Statistical Design and Treatment of Data

The purpose of this research was to determine the effect of degree of rurality or isolation on a number of resource variables. To accomplish this purpose a number of comparisons were made utilizing the factors just described. Isolated and non-isolated schools were stratified by size to eliminate distortions because of size, and a number of resource variables were compared to determine differences or relationships which might exist. Two types of analysis were selected for their capacity for uncovering significant differences that might occur between sample schools in relation to a single variable, and significant relationships between variables within a school.

In order to discover if significant differences in level of income, expenditure, or program scope occurred as a result of school district isolation, data were treated to make them more amenable to statistical testing. All revenue amounts were converted to per capita amounts, with the exception of total certified salary. Teacher degree and experience were converted to an index figure. Program scope was converted to units of instruction.

Two statistical tools were selected for the analysis of the data. These were the Fisher's "F" test of Analysis of Variance (ANOVA), and the Pearson r, or product-moment correlation. Fisher's "F" test (F-test) is a test of the difference between sample means. The assumption of the test is that the samples are distributed approximately normally and are of equal or approximately equal variance, differing only in the value of their means. The F-test ratio will accommodate a certain amount of skewness in the distribution.

As noted previously, there was some skewness in the samples analyzed. The skewness was in the same direction and indicated similarity in variance. According to statisticians Sterling and Pollock, the F-test ratio is not affected appreciably unless there is considerable skew in the distribution.[1] For most normal uses of this analysis, a rough fit of the data to the normal distribution will suffice.

Pearson *r*, or product-moment correlation, is a test of the relationship between variables. This test was used primarily to measure the "goodness of fit" of the regression line to a line being drawn. The assumption underlying the test is that the relationship between variables is a linear one. A perfect fit takes on the value of +1.0 or -1.0. Correlation means that variables *x* and *y* tend to move in the same direction and at comparable rates; in other words, they vary or increase or decrease together. When the linear regression line is a poor fit to the data, *r* will be close to zero, and it may be that the true correlation *is* zero. To answer this question, the null hypothesis that $H_0: p=0$ is tested against the alternative hypothesis that it is not, $H_0: p \neq 0$. A *t*-test of the *r* value yields results that can be evaluated according to significance levels of various values of *t*. The necessity of computing *t*, however, is removed by direct use of a table of critical values of *r* required to reach significance.[2]

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[1]Theodore D. Sterling and Seymour V. Pollock, Introduction to Statistical Data Processing (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1968), pp. 499-500.

[2]Edward W. Minium, Statistical Reasoning in Psychology and Education (2nd edition, Santa Barbara, Calif.: John Wiley & Sons, Inc., 1978), p. 353. See also Table E, "Values of the Correlation Coefficient Required for Different Levels of Significance when $H_0: p=0$", p. 539.

The use of these statistical tools is expected to answer questions relative to this research. The most important questions are:

1. Do isolated schools in Oklahoma fit the common characteristics of rural isolated schools as described in the literature?

2. Do differences occur that are attributable to degrees of ruralness that indicate areas of special need?

3. Do these differences occur in the areas of resources, resource allocation, or in the relationship of resources to certain quality related variables?

CHAPTER IV

DATA PRESENTATION

The problem of this research was to define isolation, to identify schools meeting that definition, to derive hypotheses, and to test those hypotheses in order to analyze the relationship between isolation and selected school resource management variables. Twenty-one hypotheses were tested and the results are reported in this chapter.

$H_0 1^a$: There is no statistically significant difference in income from local sources between small isolated and small non-isolated schools. Table 1 contains data showing the results of testing this hypothesis. The F-ratio obtained, 23.28, exceeded the table value. Therefore $H_0 1^a$ was rejected. Small isolated schools received significantly higher levels of income from local sources.

$H_0 1^b$: There is no statistically significant difference in income from local sources between large isolated and large non-isolated schools. Table 2 contains the data showing the results of testing this hypothesis. The F-ratio obtained, 9.98, exceeded the table value. Therefore, $H_0 1^b$ was rejected. Large isolated schools received significantly higher levels of income from local sources.

$H_0 2^a$: There is no statistically significant difference in income from state sources between small isolated and small non-isolated schools. Table 3 contains data showing the results of testing this

TABLE 1

INCOME FROM LOCAL SOURCES

FOR GROUPS A-1 - A-2

Group A-1 Isolated Schools 0-249 ADA N = 24		Group A-2 Non-isolated Schools 0-249 ADA N = 34			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
1471.62	501.14	865.35	449.24	23.28*	.0000

*Significant. The F Ratio obtained, 23.28, indicated a significant difference between the two groups at the .05 level of confidence.

TABLE 2

INCOME FROM LOCAL SOURCES

FOR GROUPS B-1 - B-2

Group B-1 Isolated Schools 250-500 ADA N = 19		Group B-2 Non-isolated Schools 250-500 ADA N = 28			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
1135.68	294.91	722.10	514.84	9.98*	.0078

*Significant. The F Ratio obtained, 9.98, indicated a significant difference between the two groups at the .05 level of confidence.

TABLE 3

INCOME FROM STATE SOURCES

FOR GROUPS A-1 - A-2

Group A-1 Isolated Schools 0-249 ADA N = 24		Group A-2 Non-isolated Schools 0-249 ADA N = 34			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
1669.33	411.89	1259.97	350.67	16.59*	.0001

*Significant. The F Ratio obtained, 16.59, indicated a significant difference between the two groups at the .05 level of confidence.

hypothesis. The F-ratio obtained, 16.59, exceeded the table value. Therfore, $H_0 2^a$ was rejected. Small isolated schools received significantly higher levels of income from state sources in comparisons to their non-isolated counterparts.

$H_0 2^b$: There is no statistically significant difference in income from state sources between large isolated and large non-isolated schools. Table 4 contains data showing the results of testing this hypothesis. The F-ratio obtained, 11.62, exceeded the table value. Therefore, $H_0 2^b$ was rejected. Large isolated schools received significantly higher levels of income from state sources when compared to their non-isolated counterparts.

$H_0 3^a$: There is no statistically significant difference in income from federal sources between small isolated and small non-isolated schools. Table 5 contains data showing the results of testing this hypothesis. The F-ratio obtained, 9.96, exceeded the table value. Therefore, $H_0 3^a$ was rejected. Small non-isolated schools received significantly higher levels of income from federal sources when compared to their isolated counterparts.

$H_0 3^b$: There is no statistically significant difference in income from federal sources between large isolated and large non-isolated schools. Table 6 contains data showing the results of testing this hypothesis. The F-ratio obtained, 10.22, exceeded tha table value. Therefore, $H_0 3^b$ was rejected. Large non-isolated schools received significantly higher levels of income from federal sources when compared to their isolated counterparts.

TABLE 4

INCOME FROM STATE SOURCES

FOR GROUPS B-1 - B-2

Group B-1 Isolated Schools 250-500 ADA N = 19		Group B-2 Non-isolated Schools 250-500 ADA N = 28			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
1570.68	330.03	1275.17	262.76	11.62*	.0014

Significant. The F Ratio obtained, 11.62, indicated a significant difference between the two groups at the .05 level of confidence.

TABLE 5

INCOME FROM FEDERAL SOURCES

FOR GROUPS A-1 - A-2

Group A-1 Isolated Schools 0-249 ADA N = 24		Group A-2 Non-isolated Schools 0-249 ADA N = 34			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
151.75	198.97	359.29	274.98	9.96*	.0026

*Significant. The F Ratio obtained, 9.96, indicated a significant difference between the two groups at the .05 level of confidence.

TABLE 6

INCOME FROM FEDERAL SOURCES

FOR GROUPS B-1 - B-2

Group B-1 Isolated Schools 250-500 ADA N = 19		Group B-2 Non-isolated Schools 250-500 ADA N = 28			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
132.89	146.19	343.14	259.44	10.22*	.0025

*Significant. The F Ratio obtained, 10.22, indicated a significant difference between the two groups at the .05 level of confidence.

$H_0 4^a$: There is no statistically significant difference in per capita costs for administrative services between small isolated and small non-isolated schools. Table 7 contains data showing the results of testing this hypothesis. The F-ratio obtained, 1.66, did not exceed the table value. Therefore, $H_0 4^a$ was not rejected. There was no significant difference in the amounts spent for administrative services between small isolated and small non-isolated schools.

$H_0 4^{\underline{a}}$: There is no statistically significant difference in per capita costs for administrative services between large isolated and large non-isolated schools. Table 8 contains data showing the results of testing this hypothesis. The F-ratio obtained, 0.16, did not exceed the table value. Therefore, $H_0 4^{\underline{a}}$ was not rejected. There was no significant difference in the per capita costs for administrative services between large isolated and large non-isolated schools.

$H_0 4^b$: There is no statistically significant difference in per capita costs for instructional services between small isolated and small non-isolated schools. Table 9 contains data showing the results of testing this hypothesis. The F-ratio obtained, 4.94, exceeded the table value. Therefore, $H_0 4^b$ was rejected. Small isolated schools spent significantly larger amounts for instructional services than did small non-isolated schools.

$H_0 4^{\underline{b}}$: There is no statistically significant difference in per capita costs for instructional services between large isolated and large non-isolated schools. Table 10 contains data showing the results of testing this hypothesis. The F-ratio obtained, 5.58, exceeded the table value. Therefore, $H_0 4^{\underline{b}}$ was rejected. Large isolated schools spent signi-

TABLE 7

PER CAPITA COSTS FOR ADMINISTRATIVE SERVICES

FOR GROUPS A-1 - A-2

Group A-1 Isolated Schools 0-249 ADA N = 24		Group A-2 Non-isolated Schools 0-249 ADA N = 34			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
230.41	69.21	205.29	75.59	1.66	.2023

The F Ratio obtained, 1.66, did not indicate a significant difference between the two groups at the .05 level of confidence.

TABLE 8

PER CAPITA COSTS FOR ADMINISTRATIVE SERVICES

FOR GROUPS B-1 - B-2

Group B-1 Isolated Schools 250-500 ADA N = 19		Group B-2 Non-isolated Schools 250-500 ADA N = 28			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
139.63	39.45	135.25	35.05	.16	.6912

The F Ratio obtained, .16, did not indicate a significant difference between the two groups at the .05 level of confidence.

TABLE 9

PER CAPITA COSTS FOR INSTRUCTIONAL SERVICES

FOR GROUPS A-1 - A-2

Group A-1 Isolated Schools 0-249 ADA N = 24		Group A-2 Non-isolated Schools 0-249 ADA N = 34			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
1708.50	294.29	1505.47	372.50	4.94*	.0303

*Significant. The F Ratio obtained, 4.94, indicated a significant difference between the two groups at the .05 level of confidence.

TABLE 10

PER CAPITA COSTS FOR INSTRUCTIONAL SERVICES

FOR GROUPS B-1 - B-2

Group B-1 Isolated Schools 250-500 ADA N = 19		Group B-2 Non-isolated Schools 250-500 ADA N = 28			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
1488.37	213.61	1335.21	221.07	5.58*	.0225

*Significant. The F Ratio obtained, 5.58, indicated a significant difference between the two groups at the .05 level of confidence.

ficantly larger amounts for instructional services than large non-isolated schools.

$H_0 4^c$: There is no statistically significant difference in per capita costs for attendance services between small isolated and small non-isolated schools. Table 11 contains data showing the results of testing this hypothesis. The F-ratio obtained, 0.70, did not exceed the table value. Therefore, $H_0 4^c$ was not rejected. There was no significant difference in the per capita costs for attendance services between small isolated and small non-isolated schools.

$H_0 4^{\underline{c}}$: There is no statistically significant difference in per capita costs for attendance services between large isolated and large non-isolated schools. Table 12 contains data showing the results of testing this hypothesis. The F-ratio obtained, 0.82, did not exceed the table value. Therefore, $H_0 4^{\underline{c}}$ was not rejected. There was no significant difference in the per capita costs for attendance services between large isolated and large non-isolated schools.

$H_0 4^d$: There is no statistically significant difference in per capita costs for health services between small isolated and small non-isolated schools. Table 13 contains data showing the results of testing this hypothesis. The F-ratio obtained, 4.05, exceeded the table value. Therefore, $H_0 4^d$ was rejected. There was a significant difference in cost for health services between small isolated and small non-isolated schools.

$H_0 4^{\underline{d}}$: There is no statistically significant difference in per capita costs for health services between large isolated and large non-isolated schools. Table 14 contains data showing the results of testing this hypothesis. The F-ratio obtained, 1.23, did not exceed the table

TABLE 11

PER CAPITA COSTS FOR ATTENDANCE SERVICES

FOR GROUPS A-1 - A-2

Group A-1 Isolated Schools 0-249 ADA N = 24		Group A-2 Non-isolated Schools 0-249 ADA N = 34			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
.00	.00	.03	.17	.70	.4056

The F Ratio obtained, .70, did not indicate a significant difference between the two groups at the .05 level of confidence.

TABLE 12

PER CAPITA COSTS FOR ATTENDANCE SERVICES

FOR GROUPS B-1 - B-2

Group B-1 Isolated Schools 250-500 ADA N = 19		Group B-2 Non-isolated Schools 250-500 ADA N = 28			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
1.10	4.81	.25	.58	.82	.3553

The F Ratio obtained, .82, did not indicate a significant difference between the two groups at the .05 level of confidence.

TABLE 13

PER CAPITA COSTS FOR HEALTH SERVICES

FOR GROUPS A-1 - A-2

Group A-1 Isolated Schools 0-249 ADA N = 24		Group A-2 Non-isolated Schools 0-249 ADA N = 34			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
5.54	12.76	1.02	3.10	4.05*	.0488

*Significant. The F Ratio obtained, 4.05, indicated a significant difference between the two groups at the .05 level of confidence.

TABLE 14

PER CAPITA COSTS FOR HEALTH SERVICES

FOR GROUPS B-1 - B-2

Group B-1 Isolated Schools 250-500 ADA N = 19		Group B-2 Non-isolated Schools 250-500 ADA N = 28			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
.68	1.52	2.53	7.12	1.23	.2722

The F Ratio obtained, 1.23, did not indicate a significant difference between the two groups at the .05 level of confidence.

value. Therefore, $H_0 4^{\underline{d}}$ was not rejected. There was no significnat difference in per capita costs for health services between large isolated and large non-isolated schools.

$H_0 4^{e}$: There is no statistically significant difference in per capita costs for pupil transportation between small isolated and small non-isolated schools. Table 15 contains data showing the results of testing this hypothesis. The F-ratio obtained, 9.81, exceeded the table value. Therefore, $H_0 4^{e}$ was rejected. Per capita costs for pupil transportation were significantly higher in small isolated schools.

$H_0 4^{\underline{e}}$: There is no statistically significant difference in per capita costs for pupil transportation between large isolated and large non-isolated schools. Table 16 contains data showing the results of testing this hypothesis. The F-ratio obtained, 1.02, did not exceed the table value. Therefore, $H_0 4^{\underline{e}}$ was not rejected. There was no significant difference in per capita costs for pupil transportation between large isolated and large non-isolated schools.

$H_0 4^{f}$: There is no statistically significant difference in per capita costs for operation of plant between small isolated and small non-isolated schools. Table 17 contains data showing the results of testing this hypothesis. The F-ratio obtained, 12.11, exceeded the table value. Therefore, $H_0 4^{f}$ was rejected. The per capita costs for operation of plant were significantly higher for small isolated schools.

$H_0 4^{\underline{f}}$: There is no statistically significant difference in per capita costs for operation of plant between large isolated and large non-isolated schools. Table 18 contains data showing the results of testing this hypothesis. The F-ratio obtained, 14.34, exceeded the table value.

TABLE 15

PER CAPITA COSTS FOR PUPIL TRANSPORTATION

FOR GROUPS A-1 - A-2

Group A-1 Isolated Schools 0-249 ADA N = 24		Group A-2 Non-isolated Schools 0-249 ADA N = 34			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
278.54	122.31	195.55	79.55	9.81*	.0028

*Significant. The F Ratio obtained, 9.81, indicated a significant difference between the two groups at the .05 level of confidence.

TABLE 16

PER CAPITA COSTS FOR PUPIL TRANSPORTATION

FOR GROUPS B-1 - B-2

Group B-1 Isolated Schools 250-500 ADA N = 19		Group B-2 Non-isolated Schools 250-500 ADA N = 28			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
195.78	56.26	176.92	66.56	1.02	.3166

The F Ratio obtained, 1.02, did not indicate a significant difference between the two groups at the .05 level of confidence.

TABLE 17

PER CAPITA COSTS FOR OPERATION OF PLANT

FOR GROUPS A-1 - A-2

Group A-1 Isolated Schools 0-249 ADA N = 24		Group A-2 Non-isolated Schools 0-249 ADA N = 34			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
258.54	91.57	183.67	72.10	12.11*	.0010

*Significant. The F Ratio obtained, 12.11, indicated a significant difference between the two groups at the .05 level of confidence.

TABLE 18

PER CAPITA COSTS FOR OPERATION OF PLANT

FOR GROUPS B-1 - B-2

Group B-1 Isolated Schools 250-500 ADA N = 19		Group B-2 Non-isolated Schools 250-500 ADA N = 28			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
232.73	53.36	173.07	52.76	14.34*	.0004

*Significant. The F Ratio obtained, 14.34, indicated a significant difference between the two groups at the .05 level of confidence.

Therefore, $H_0 4^{\underline{f}}$ was rejected. The per capita costs for operation of plant were significantly higher in large isolated schools.

$H_0 4^g$: There is no statistically significant difference in per capita costs for maintenance of plant between small isolated and small non-isolated schools. Table 19 contains data showing the results of testing this hypothesis. The F-ratio obtained, 9.59, exceeded the table value. Therefore, $H_0 4^g$ was rejected. Per capita costs for maintenance of plant were significantly higher in small isolated schools.

$H_0 4^{\underline{g}}$: There is no statistically significant difference in per capita costs for maintenance of plant between large isolated and large non-isolated schools. Table 20 contains data showing the results of testing this hypothesis. The F-ratio obtained, 1.66, did no exceed the table value. Therefore, $H_0 4^{\underline{g}}$ was not rejected. There was no significant difference in per capita costs for maintenance of plant between large isolated and large non-isolated schools.

$H_0 4^h$: There is no statistically significant difference in per capita costs for fixed charges between small isolated and small non-isolated schools. Table 21 contains data showing the results of testing this hypothesis. The F-ratio obtained, 0.09, did not exceed the table value. Therefore, $H_0 4^h$ was not rejected. There was no significant difference in per capita costs for fixed charges between small isolated and small non-isolated schools.

$H_0 4^{\underline{h}}$: There is no statistically significant difference in per capita costs for fixed charges between large isolated and large non-isolated schools. Table 22 contains data showing the results of testing this hypothesis. The F-ratio obtained, 3.66, did not exceed the table value.

TABLE 19

PER CAPITA COSTS FOR MAINTENANCE OF PLANT

FOR GROUPS A-1 - A-2

Group A-1 Isolated Schools 0-249 ADA N = 24		Group A-2 Non-isolated Schools 0-249 ADA N = 34			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
140.70	137.94	62.76	43.13	9.59*	.0031

*Significant. The F Ratio obtained, 9.59, indicated a significant difference between the two groups at the .05 level of confidence.

TABLE 20

PER CAPITA COSTS FOR MAINTENANCE OF PLANT

FOR GROUPS B-1 - B-2

Group B-1 Isolated Schools 250-500 ADA N = 19		Group B-2 Non-isolated Schools 250-500 ADA N = 28			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
104.78	55.26	83.14	57.12	1.66	.2031

The F Ratio obtained, 1.66, did not indicate a significant difference between the two groups at the .05 level of confidence.

TABLE 21

PER CAPITA COSTS FOR FIXED CHARGES

FOR GROUPS A-1 - A-2

Group A-1 Isolated Schools 0-249 ADA N = 24		Group A-2 Non-isolated Schools 0-249 ADA N = 34			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
219.87	90.39	211.58	116.90	.09	.7721

The F Ratio obtained, .09, did not indicate a significant difference between the two groups at the .05 level of confidence.

TABLE 22

PER CAPITA COSTS FOR FIXED CHARGES

FOR GROUPS B-1 - B-2

Group B-1 Isolated Schools 250-500 ADA N = 19		Group B-2 Non-isolated Schools 250-500 ADA N = 28			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
202.94	53.97	171.82	55.15	3.66	.0619

The F Ratio obtained, 3.66, did not indicate a significant difference between the two groups at the .05 level of confidence.

Therefore, $H_0 4^{\underline{h}}$ was not rejected. There was no significant difference in per capita costs for fixed charges between large isolated and large non-isolated schools.

$H_0 4^{i}$: There is no statistically significant difference in per capita costs for food services between small isolated and small non-isolated schools. Table 23 contains data showing the results of testing this hypothesis. The F-ratio obtained, 27.67, exceeded the table value. Therefore, $H_0 4^{i}$ was rejected. The per capita costs for food services were significantly higher in small isolated schools.

$H_0 4^{\underline{i}}$: There is no statistically significant difference in per capita costs for food services between large isolated and large non-isolated schools. Table 24 contains data showing the results of testing this hypothesis. The F-ratio obtained, 2.65, did not exceed the table value. Therefore, $H_0 4^{\underline{i}}$ was not rejected. There was no significant difference in per capita costs for food services between large isolated and large non-isolated schools.

$H_0 4^{j}$: There is no statistically significant difference in per capita costs for student activities between small isolated and small non-isolated schools. Table 25 contains data showing the results of testing this hypothesis. The F-ratio obtained, 7.75, exceeded the table value. Therefore, $H_0 4^{j}$ was rejected. The per capita costs for student activities were significantly higher in small isolated schools.

$H_0 4^{\underline{j}}$: There is no statistically significant difference in per capita costs for student activities between large isolated and large non-isolated schools. Table 26 contains data showing the results of testing this hypothesis. The F-ratio obtained, 2.55, did not exceed the table

TABLE 23

PER CAPITA COSTS FOR FOOD SERVICES

FOR GROUPS A-1 - A-2

Group A-1 Isolated Schools 0-249 ADA N = 24		Group A-2 Non-isolated Schools 0-249 ADA N = 34			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
76.25	36.47	31.76	27.93	27.67*	.0000

*Significant. The F Ratio obtained, 27.67, indicated a significant difference between the two groups at the .05 level of confidence.

TABLE 24

PER CAPITA COSTS FOR FOOD SERVICES

FOR GROUPS B-1 - B-2

Group B-1 Isolated Schools 250-500 ADA N = 19		Group B-2 Non-isolated Schools 250-500 ADA N = 28			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
47.94	28.45	34.03	28.91	2.65	.1103

The F Ratio obtained, 2.65, did not indicate a significant difference between the two groups at the .05 level of confidence.

TABLE 25

PER CAPITA COSTS FOR STUDENT ACTIVITIES

FOR GROUPS A-1 - A-2

Group A-1 Isolated Schools 0-249 ADA N = 24		Group A-2 Non-isolated Schools 0-249 ADA N = 34			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
26.45	34.11	7.91	15.73	7.75*	.0073

*Significant. The F Ratio obtained, 7.75, indicated a significant difference between the two groups at the .05 level of confidence.

TABLE 26

PER CAPITA COSTS FOR STUDENT ACTIVITIES

FOR GROUPS B-1 - B-2

Group B-1 Isolated Schools 250-500 ADA N = 19		Group B-2 Non-isolated Schools 250-500 ADA N = 28			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
29.47	43.52	13.32	25.78	2.55	.1171

The F Ratio obtained, 2.55, did not indicate a significant difference between the two groups at the .05 level of confidence.

value. Therefore, $H_0 4^{\underline{j}}$ was not rejected. There was no significant difference in per capita costs for student activities between large isolated and large non-isolated schools.

$H_0 4^k$: There is no statistically significant difference in per capita costs for community service between small isolated and small non-isolated schools. Table 27 contains data showing the results of testing this hypothesis. The F-ratio obtained, 2.50, did not exceed the table value. Therefore, $H_0 4^k$ was not rejected. There was no significant difference in per capita costs for community service between small isolated and small non-isolated schools.

$H_0 4^{\underline{k}}$: There is no statistically significant difference in per capita costs for community service between large isolated and large non-isolated schools. Table 28 contains data showing the results of testing this hypothesis. The F-ratio obtained, 1.61, did not exceed the table value. Therefore, $H_0 4^{\underline{k}}$ was not rejected. There was no significant difference in per capita costs for community service between large isolated and large non-isolated schools.

$H_0 4^l$: There is no statistically significant difference in per capita costs for capital outlay between small isolated and small non-isolated schools. Table 29 contains data showing the results of testing this hypothesis. The F-ratio obtained, 11.27, exceeded the table value. Therefore, $H_0 4^l$ was rejected. The per capita costs for capital outlay were significantly higher in small isolated schools.

$H_0 4^{\underline{l}}$: There is no statistically significant difference in per capita costs for capital outlay between large isolated and large non-isolated schools. Table 30 contains data showing the results of testing this

TABLE 27

PER CAPITA COSTS FOR COMMUNITY SERVICE

FOR GROUPS A-1 - A-2

Group A-1 Isolated Schools 0-249 ADA N = 24		Group A-2 Non-isolated Schools 0-249 ADA N = 34			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
4.37	11.29	1.14	3.25	2.50	.1195

The F Ratio obtained, 2.50, did not indicate a significant difference between the two groups at the .05 level of confidence.

TABLE 28

PER CAPITA COSTS FOR COMMUNITY SERVICE

FOR GROUPS B-1 - B-2

Group B-1 Isolated Schools 250-500 ADA N = 19		Group B-2 Non-isolated Schools 250-500 ADA N = 28			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
1.47	3.32	3.92	7.94	1.61	.2105

The F Ratio obtained, 1.61, did not indicate a significant difference between the two groups at the .05 level of confidence.

TABLE 29

PER CAPITA COSTS FOR CAPITAL OUTLAY

FOR GROUPS A-1 - A-2

Group A-1 Isolated Schools 0-249 ADA N = 24		Group A-2 Non-isolated Schools 0-249 ADA N = 34			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
149.00	192.06	33.17	51.93	11.27*	.0014

*Significant. The F Ratio obtained, 11.27, indicated a significant difference between the two groups at the .05 level of confidence.

TABLE 30

PER CAPITA COSTS FOR CAPITAL OUTLAY

FOR GROUPS B-1 - B-2

Group B-1 Isolated Schools 250-500 ADA N = 19		Group B-2 Non-isolated Schools 250-500 ADA N = 28			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
314.78	482.50	90.71	90.74	5.79*	.0202

*Significant. The F Ratio obtained, 5.79, indicated a significant difference between the two groups at the .05 level of confidence.

hypothesis. The F-ratio obtained, 5.79, exceeded the table value. Therfore, $H_0 4^{\underline{1}}$ was rejected. The per capita costs for capital outlay were significantly higher in large isolated schools.

$H_0 5^a$: There is no statistically significant difference in teacher degrees and experience between small isolated and small non-isolated schools. Table 31 contains data showing the results of testing this hypothesis. The F-ratio obtained, 1.90, did not exceed the table value. Therefore, $H_0 5^a$ was not rejected. There was no significant difference in teacher degrees and experience between small isolated and small non-isolated schools.

$H_0 5^b$: There is no statistically significant difference in teacher degrees and experience between large isolated and large non-isolated schools. Table 32 contains data showing the results of testing this hypothesis. The F-ratio obtained, 0.20, did not exceed the table value. Therefore, $H_0 5^b$ was not rejected. There was no significant difference in teacher degrees and experience between large isolated and large non-isolated schools.

$H_0 6^a$: There is no statistically significant difference with regard to total salary expenditures in the level of expenditures between small isolated and small non-isolated schools. Table 33 contains data showing the results of testing this hypothesis. The F-ratio obtained, 2.05, did not exceed the table value. Therefore, $H_0 6^a$ was not rejected. There was no significant difference with regard to total salary expenditures between small isolated and small non-isolated schools.

$H_0 6^b$: There is no statistically significant difference with regard to total salary expenditures in the level of expenditures between

TABLE 31

THE TEACHER DEGREE AND EXPERIENCE INDEX

FOR GROUPS A-1 - A-2

Group A-1 Isolated Schools 0-249 ADA N = 24		Group A-2 Non-isolated Schools 0-249 ADA N = 34			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
1.01	.07	.99	.05	1.90	.1653

The F Ratio obtained, 1.90, did not indicate a significant difference beiween the two groups at the .05 level of confidence.

TABLE 32

THE TEACHER DEGREE AND EXPERIENCE INDEX

FOR GROUPS B-1 - B-2

Group B-1 Isolated Schools 250-500 ADA N = 19		Group B-2 Non-isolated Schools 250-500 ADA N = 28			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
1.01	.04	1.00	.05	.20	.6568

The F Ratio obtained, .20, did not indicate a significant difference between the two groups at the .05 level of confidence.

TABLE 33

TOTAL SALARY EXPENDITURES

FOR GROUPS A-1 - A-2

Group A-1 Isolated Schools 0-249 ADA N = 24		Group A-2 Non-isolated Schools 0-249 ADA N = 34			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
378,051.00	135,974.00	644,552.00	902,371.00	2.05	.1577

The F Ratio obtained, 2.05, did not indicate a significant difference between the two groups at the .05 level of confidence.

large isolated and large non-isolated schools. Table 34 contains data showing the results of testing this hypothesis. The F-ratio obtained, 1.52, did not exceed the table value. Therefore, $H_0 6^b$ was not rejected. There was no significant difference with regard to total salary expenditures in the level of expenditures between large isolated and large non-isolated schools.

$H_0 7^a$: There is no statistically significant difference with regard to total per capita expenditures in the level of expenditures between small isolated and small non-isolated schools. Table 35 contains data showing the results of testing this hypothesis. The F-ratio obtained, 18.11, exceeded the table value. Therefore, $H_0 7^a$ was rejected. Total per capita expenditures were significantly higher in small isolated schools.

$H_0 7^b$: There is no statistically significant difference with regard to total per capita expenditures in the level of expenditures between large isolated and large non-isolated schools. Table 36 contains data showing the results of testing this hypothesis. The F-ratio obtained, 21.33, exceeded the table value. Therefore, $H_0 7^b$ was rejected. Total per capita expenditures were significantly higher in large isolated schools.

$H_0 8^a$: There is no statistically significant difference with regard to total unit offerings in the number of units of credit offered between small isolated and small non-isolated schools. Table 37 contains data showing the results of testing this hypothesis. The F-ratio obtained, 6.49, exceeded the table value. Therefore, $H_0 8^a$ was rejected. Small isolated schools offered a significantly greater number of unit offerings in comparison to small non-isolated schools.

TABLE 34

TOTAL SALARY EXPENDITURES

FOR GROUPS B-1 - B-2

Group B-1 Isolated Schools 250-500 ADA N = 19		Group B-2 Non-isolated Schools 250-500 ADA N = 28			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
429,899.10	252,656.10	584,307.35	501,831.00	1.52	.2229

The F Ratio obtained, 1.52, did not indicate a significant difference between the two groups at the .05 level of confidence.

TABLE 35

TOTAL PER CAPITA EXPENDITURES

FOR GROUPS A-1 - A-2

Group A-1 Isolated Schools 0-249 ADA N = 24		Group A-2 Non-isolated Schools 0-249 ADA N = 34			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
3,112.33	610.76	2,448.91	565.62	18.11*	.0001

*Significant. The F Ratio obtained, 18.11, indicated a significant difference between the two groups at the .05 level of confidence.

TABLE 36

TOTAL PER CAPITA EXPENDITURES

FOR GROUPS B-1 - B-2

Group B-1 Isolated Schools 250-500 ADA N = 19		Group B-2 Non-isolated Schools 250-500 ADA N = 28			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
2,771.42	477.37	2,235.46	319.47	21.33*	.0000

*Significant. The F Ratio obtained, 21.33, indicated a significant difference between the two groups at the .05 level of confidence.

TABLE 37

TOTAL UNIT OFFERINGS

FOR GROUPS A-1 - A-2

Group A-1 Isolated Schools 0-249 ADA N = 24		Group A-2 Non-isolated Schools 0-249 ADA N = 34			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
52.79	7.11	42.79	18.22	6.49*	.0136

*Significant. The F Ratio obtained, 6.49, indicated a significant difference between the two groups at the .05 level of confidence.

$H_0 8^b$: There is no statistically significant difference with regard to total unit offerings in the number of units of credit offered between large isolated schools and large non-isolated schools. Table 38 contains data showing the results of testing this hypothesis. The F-ratio obtained, 1.45, did not exceed the table value. Therfore, $H_0 8^b$ was not rejected. There was no significant difference in the number of unit offerings between large isolated and large non-isolated schools.

$H_0 9^a$: There is no statistically significant relationship between certified salary expenditures and the teacher degree and experience index in small isolated schools. Table 39 contains data showing the results of testing this hypothesis. The obtained correlation, 0.35, exceeded the table value, indicating a significant relationship between the two elements. Certified salary expenditures were significantly related to the teacher degree and experience index in small isolated schools.

$H_0 9^b$: There is no statistically significant relationship between certified salary expenditures and the teacher degree and experience index in small non-isolated schools. Table 40 contains data showing the results of testing this hypothesis. The obtained correlation, 0.20, did not exceed the table value. Therefore, $H_0 9^b$ was not rejected. Certified salary expenditures were not related significantly to the teacher degree and experience index in small non-isolated schools.

$H_0 9^c$: There is no statistically significant relationship between certified salary expenditures and the teacher degree and experience index in large isolated schools. Table 41 contains data showing the results of testing this hypothesis. The obtained correlation, 0.29, did not exceed the table value. Therefore, $H_0 9^c$ was not rejected. Certified salary

TABLE 38

TOTAL UNIT OFFERINGS

FOR GROUPS B-1 - B-2

Group B-1 Isolated Schools 250-500 ADA N = 19		Group B-2 Non-isolated Schools 250-500 ADA N = 28			
Mean	S.D.	Mean	S.D.	F Ratio	F Prob
63.78	17.40	58.42	13.04	1.45	.2341

The F Ratio obtained, 1.45, did not indicate a significant difference between the two groups at the .05 level of confidence.

TABLE 39

CERTIFIED SALARY EXPENDITURES AND TEACHER DEGREES AND EXPERIENCE

FOR GROUP A-1

Group A-1 Isolated Schools 0-249 ADA N = 24	
Correlation	Probability
.35*	.047

*Significant. The correlation obtained, .35, exceeded that table value.

TABLE 40

CERTIFIED SALARY EXPENDITURES AND TEACHER DEGREES AND EXPERIENCE

FOR GROUP A-2

Group A-2
Non-isolated Schools
0-249 ADA
N = 34

Correlation	Probability
.20	.13

The correlation obtained, .20, did not exceed the table value.

TABLE 41

CERTIFIED SALARY EXPENDITURES AND TEACHER DEGREES AND EXPERIENCE

FOR GROUP B-1

Group B-1 Isolated Schools 250-500 ADA N = 19	
Correlation	Probability
.29	.11

The correlation obtained, .29, did not exceed the table value.

expenditures and the teacher degree and experience index were not related significantly in large isolated schools.

$H_0 9^d$: There is no statistically significant relationship between certified salary expenditures and the teacher degree and experience index in large non-isolated schools. Table 42 contains data showing the results of testing this hypothesis. The correlation obtained, 0.32, exceeded the table value. Therefore, $H_0 9^d$ was rejected. Certified salary expenditures were related significantly to the teacher degree and experience index in large non-isolated schools.

$H_0 10^a$: There is no statistically significant relationship between per capita expenditures and the number of units of credit offered in small isolated schools. Table 43 contains data showing the results of testing this hypothesis. The correlation obtained, 0.27, did not exceed the table value. Therefore, $H_0 10^a$ was not rejected. There was no significant relationship between per capita expenditures and the number of units of credit offered in small isolated schools.

$H_0 10^b$: There is no statistically significant relationship between per capita expenditures and the number of units of credit offered in small non-isolated schools. Table 44 contains data showing the results of testing this hypothesis. The correlation obtained, 0.28, did not exceed the table value. Therefore, $H_0 10^b$ was not rejected. There was no significant relationship between per capita expenditures and the number of units of credit offered in small non-isolated schools.

$H_0 10^c$: There is no statistically significant relationship between per capita expenditures and the number of units of credit offered in large isolated schools. Table 45 contains data showing the results

TABLE 42

CERTIFIED SALARY EXPENDITURES AND TEACHER DEGREES AND EXPERIENCE

FOR GROUP B-2

Group B-2 Non-isolated Schools 250-500 ADA N = 28	
Correlation	Probability
.32*	.04

*Significant. The correlation obtained, .32, exceeded the table value.

TABLE 43

PER CAPITA EXPENDITURES AND NUMBER OF UNITS OF CREDIT OFFERED

FOR GROUP A-1

Group A-1 Isolated Schools 0-249 ADA N = 24	
Correlation	Probability
.27	.10

The correlation obtained, .27, did not exceed the table value.

TABLE 44

PER CAPITA EXPENDITURES AND NUMBER OF UNITS OF CREDIT OFFERED

FOR GROUP A-2

Group A-2 Non-isolated Schools 0-249 ADA N = 34	
Correlation	Probability
.28	.06

The correlation obtained, .28, did not exceed the table value.

TABLE 45

PER CAPITA EXPENDITURES AND NUMBER OF UNITS OF CREDIT OFFERED

FOR GROUP B-1

Group B-1 Isolated Schools 250-500 ADA N = 19	
Correlation	Probability
.17	.23

The correlation obtained, .17, did not exceed the table value.

of testing this hypothesis. The correlation obtained, 0.17, did not exceed the table value. Therefore, $H_0 10^c$ was not rejected. There was no significant relationship between total per capita expenditures and the number of units of credit offered in large isolated schools.

$H_0 10^d$: There is no statistically significant relationship between per capita expenditures and the number of units of credit offered in large non-isolated schools. Table 46 contains data showing the results of testing this hypothesis. The correlation obtained. 0.18, did no exceed the table value. Therefore, $H_0 10^d$ was not rejected. There was no significant relationship between total per capita expenditures and the number of units of credit offered in large non-isolated schools.

In order to demonstrate the similarity between the sample schools with regard to factors other than isolation, a number of demographic comparisons wer made. Table 47 contains data showing the results of these comparisons for small isolated and small non-isolated schools. The teacher-pupil ratio, a factor known to affect educational quality, was quite similar. The ratio of students to special education programs, though lower in the isolated schools, was also quite similar. County demographic data showed a higher average of family income in the counties that contain the isolated schools. The population density was substantially lower in the counties containing the isolated school districts. County demographics differed substantially more than did school demographics. Table 48 contains data showing the result of the comparisons for large isolated and large non-isolated schools. The pupil-teacher ratio was very similar. Less similarity was shown in the comparison of students to special education programs, although the difference was not great.

TABLE 46

PER CAPITA EXPENDITURES AND NUMBER OF UNITS OF CREDIT OFFERED

FOR GROUP B-2

Group B-2 Non-isolated Schools 250-500 ADA N = 28	
Correlation	Probability
.18	.18

The correlation obtained, .18, did not exceed the table value.

TABLE 47

SELECTED SCHOOL DISTRICT AND COUNTY DEMOGRAPHICS

FOR GROUPS A-1 - A-2

	Group A-1 Isolated Schools 0-249 ADA N = 24	Group A-2 Non-isolated Schools 0-249 ADA N = 34
Pupil Teacher Ratio	8.9 to 1	9.04 to 1
Students to Program (Special Education)	15 to 1	18 to 1
Average Family Income	7783.33	6612.83
Population Density	6.55	26.02

TABLE 48

SELECTED SCHOOL DISTRICT AND COUNTY DEMOGRAPHICS

FOR GROUPS B-1 - B-2

	Group B-1 Isolated Schools 250-500 ADA N = 19	Group B-2 Non-isolated Schools 250-500 ADA N = 28
Pupil Teacher Ratio	11.05 to 1	12.08 to 1
Students to Program (Special Education)	16 to 1	20 to 1
Average Family Income	7877.00	5656.00
Population Density	7.32	25.30

County demographic data showed a considerable difference in family income with higher income in counties that contained isolated school districts. Again, county demographic data showed substantially greater differences than did school district demographic data.

In order to justify sample stratification, the major hypotheses of this research were tested comparing isolated schools by size and non-isolated schools by size. Table 49 contains data showing the results of comparing the two samples of isolated schools. In regard to local sources of revenue, the F-ratio obtained, 6.68, exceeded the table value. Small isolated schools received significantly larger amounts of local revenue than large isolated schools in regard to costs. Each F-ratio exceeded the table value, and therefore, it was determined that small isolated schools had significantly higher costs for administration, instruction, transportation, and food service while large isolated schools had higher costs for capital outlay. Large isolated schools also offered a significantly higher number of course offerings.

Table 50 contains data showing the results of comparing the two samples of non-isolated schools. In regard to costs for administration and instruction, the F-ratios indicated a significant difference in each case. Small non-isolated schools had significantly higher costs for these services. The F-ratios also indicated significant differences for attendance services and capital outlay. In both cases, the large non-isolated schools had significantly higher costs. A significant difference in number of unit offerings was found, with the large non-isolated schools having a greater number of course offerings.

TABLE 49

SIGNIFICANT DIFFERENCES BETWEEN SCHOOL SIZES

COMPARING ISOLATED SCHOOLS

GROUPS A-1 - B-1

Significant Findings	Group A-1 Isolated Schools 0-249 ADA N = 24	Group B-1 Isolated Schools 250-500 ADA N = 19	F Ratio	F Prob
Income From Local Sources	1471.62	1135.68	6.68	.0134
Per Capita Costs for Administrative Services	230.41	139.63	25.90	.0000
Per Capita Costs for Instructional Services	1708.50	1488.36	7.49	.0091
Per Capita Costs for Pupil Transportation	278.54	195.78	7.42	.0094
Per Capita Costs for Food Service	76.25	47.94	7.71	.0082
Per Capita Costs for Capital Outlay	149.00	314.00	5.15	.0210
Total Unit Offerings	52.80	63.80	7.90	.0075

TABLE 50

SIGNIFICANT DIFFERENCES BETWEEN SCHOOL SIZES

COMPARING NON-ISOLATED SCHOOLS

GROUPS A-2 - B-2

Significant Findings	Group A-2 Non-isolated Schools 0-249 ADA N = 34	Group B-2 Non-isolated Schools 250-500 ADA N = 28	F Ratio	F Prob
Per Capita Costs for Administrative Services	205.29	135.25	20.38	.0000
Per Capita Costs for Instructional Services	1505.47	1335.21	4.53	.0375
Per Capita Costs for Attendance Services	0.03	0.25	4.39	.0405
Per Capita Costs for Capital Outlay	33.17	90.70	11.97	.0015
Total Unit Offerings	42.80	58.40	14.48	.0003

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

The findings and conclusions that were drawn from the statistical treatment of the data of this research are presented in this chapter. Additionally, recommendations that are supported by the findings are included.

The problem of this research was to derive hypotheses and test these hypotheses in order to analyze the relationship between isolation, and school resources and resource management variables. The major hypotheses, findings, conclusions and recommendations follow.

Major Hypotheses and Findings

$H_0 1$: There is no statistically significant difference in income from local, state, and/or federal sources between isolated and non-isolated schools.

Findings:

(1) Isolation. as defined, was a significant predictor of high levels of local income in both sample sizes.

(2) Isolation, as defined, was a significant predictor of high levels of state income in both sample sizes.

(3) Isolation, as defined, was inversely related to federal income. Isolation was a significant predictor of low levels of federal income in both sample sizes.

$H_0 2$: There is no statistically significant difference in the per capita costs in general fund categories between isolated and non-isolated schools.

Findings:

(1) Administrative services: Isolation, as defined, was not a significant predictor of per capita cost for administrative services in either sample size.

(2) Instructional services: Isolation, as defined, was a significant predictor of high per capita cost for instruction in both sample sizes.

(3) Attendance services: Isolation, as defined, was not a significant predictor of per capita cost for attendance services in either sample size.

(4) Health services: Small group isolation, as defined, was a significant predictor of high per capita cost for health services. Large group isolation, as defined, was not a significant predictor of per capita cost for health services.

(5) Transportation: Small group isolation, as defined, was a significant predictor of high per capita cost for transportation. Large group isolation, as defined, was not a significant predictor of per capita cost for transportation.

(6) Operation of plant: Isolation, as defined, was a significant predictor of high per capita cost for operation of plant in both sample sizes.

(7) Maintenance of plant: Small group isolation, as defined, was a significant predictor of high per capita cost for maintenance

of plant. Large group isolation, as defined, was not a significant predictor of per capita cost for maintenance of plant.

(8) Fixed charges: Isolation, as defined, was not a significant predictor of per capita cost for fixed charges in either sample size.

(9) Food services: Small group isolation, as defined, was a significant predictor of high per capita cost for food service. Large group isolation, as defined, was not a significant predictor of per capita cost for food service.

(10) Student activities: Small group isolation, as defined, was a significant predictor of high per capita cost for student activities. Large group isolation, as defined, was not a significant predictor of per capita cost for student activities.

(11) Community service: Isolation, as defined, was not a significant predictor of per capita cost for community service in either sample size.

(12) Capital outlay: Isolation, as defined, was a significant predictor of high per capita cost for capital outlay in both sample sizes.

$H_0 3$: There is no statistically significant difference with regard to the variables believed to be related to school quality between isolated and non-isolated schools.

Findings:

(1) The teacher degree and experience index: Isolation, as defined, was not a significant predictor of teacher experience or education in either sample size.

(2) Certified salary: Isolation, as defined, was not a significant predictor of certified salary cost in either sample size.

(3) Per capita expenditures: Isolation, as defined, was a significant predictor of high per capita expenditures in both sample sizes.

(4) Unit offerings: Small group isolation, as defined, was a significant predictor of high levels of unit offerings. Large group isolation, as defined, was not a significant predictor of unit offerings.

Correlations

(1) In regard to the relationship between the teacher degree and experience index and certified salary expenditures: The two variables were significantly related in the small group isolated schools, but were not significantly related in the small group non-isolated schools. The two variables were not significantly related in the large group isolated schools, but were significantly related in the large group non-isolated schools. Small group isolation, as defined, produced a significant relationship between the two variables. Large group isolation, as defined, did not produce a significant relationship between the variables.

(2) In regard to the relationship between per capita expenditures and number unit of credit offered: The two variables were not significantly related in small isolated or in small non-isolated schools. The two variables were not significantly related in large isolated or in large non-isolated schools. Small group isolation,

as defined, did not produce a significant relationship between the two variables. Large group isolation, as defined, did not produce a significant relationship between the two variables.

Demographics

In regard to school district and county demographics: Small group isolation, as defined, produced little difference in school demographics, but considerable difference in county demographics. Large group isolation, as defined, produced little difference in school demographics, but considerable difference in county demographics.

Size Comparisons

In regard to the comparison of small isolated schools to large isolated schools, the following statistically significant differences were found:

(1) Income: Small group isolation, as defined, was a significant predictor of high per capita local income levels when compared to large isolated schools.

(2) Per capita cost: Small group isolation, as defined, was a significant predictor of high cost for administrative services, instructional services, pupil transportation and food service when compared to large isolated schools. Large group isolation, as defined, was a significant predictor of high cost for capital outlay when compared to small isolated schools.

(3) Unit offerings: Large group isolation, as defined, was a significant predictor of higher numbers of unit offerings when compared to small isolated schools.

In regard to the comparison of small non-isolated schools to large non-isolated schools, the following statistically significant differences were found:

(1) Per capita costs: Small group non-isolation, as defined, was a significant predictor of high cost for administrative services and instructional services when compared to large group non-isolated schools. Large group non-isolation, as defined, was a significant predictor of high cost for attendance services and capital outlay when compared to small group non-isolated schools.

(2) Unit offerings: Large group non-isolation, as defined, was a significant predictor of higher numbers of unit offerings when compared to small group non-isolated schools.

Conclusions Concerning the Major Hypotheses

On the basis of this study, the following conclusions are supported.

Income:

(1) In contrast to the general consensus in the literature, Oklahoma's isolated schools are not poor.

(2) There is considerable inequity in state aid to rural Oklahoma schools.

(3) There is an inverse relationship between degree of ruralness and federal revenue. This finding is in agreement with literature that cites rural schools as the recipients of the least amount of federal aid.

(4) Although federal aid has been cited as a possible source of inequity in Oklahoma, this research does not support that conclusion.

(5) Degree of ruralness is a more important factor in predicting income levels than size alone.

(6) Diversity in rural Oklahoma produces categories of need exclusive of size.

Per capita Costs:

(1) Degree of ruralness is a more powerful predictor of per capita cost than size alone.

(2) A relationship between cost and assessed valuation in contrast to a cost-size relationship is evident in small isolated schools.

(3) The cost-size relationship is more evident in large isolated schools in which fewer significant differences in cost categories were found.

(4) Economy of scale is evident in the large group samples.

(5) The finding of significantly higher cost in small isolated schools for categories such as health services, attendance services, food service and instruction, exclusive of salary, in which relatively little or no general fund cost is incurred in the non-isolated schools indicates that these allocations are most likely "expenditures," as defined, instead of "costs."

(6) The need to consider categories of rural schools is supported.

(7) Size differences were related to cost of administration. This finding supports literature references to administration as a high cost category in small schools.

School Quality Variables:

(1) Degree of ruralness is a more powerful predictor of differences in quality variables than size alone.

(2) High per capita total expenditures combined with higher levels of income, especially in small isolated schools, supports the conclusion that a relationship between cost and valuation is evident.

(3) Significantly higher credit offerings in small isolated schools together with significantly higher per capita expenditures indicates a relationship between quality, as measured by these variables, and expenditure. A significant relationship between salary and the teacher degree and experience index supports that conclusion.

(4) The finding that isolated schools do not employ better trained or more experienced teachers fails to support the existence of a relationship between per capita expenditure and quality.

(5) The finding that isolated schools do not pay higher salaries fails to support the existence of a relationship between per capita expenditure and quality.

(6) The finding of no significant difference in units of credit offered between large isolated and large non-isolated schools fails to support the existence of a relationship between per capita expenditure and quality.

Summary

Isolated schools receive more income and spend more money than non-isolated schools. The small isolated schools receive and spend larger amounts than the large isolated schools. The effect of degree of ruralness is evident.

The inequities associated with state aid and state dedicated revenues are evident. The diversity of rural America is evident in the widely differing amounts of local income.

As school size increases, the effect of ruralness diminishes as evidenced by the finding of fewer differences between large isolated and large non-isolated schools. Additionally, more differences were found between isolated schools when comparing size than between non-isolated schools.

The capacity to transfer large expenditures into quality education is questioned. The small isolated schools were able to produce a higher number of credits and a statistically significant relationship between salary and the degree and experience index from a substantially larger income and expenditure. They did not employ better educated or more highly qualified teachers nor did they pay higher salaries.

The larger isolated schools did not fare as well producing no significantly higher levels of quality related variables. The fact that there are fewer differences as size increases is evidence of economy of scale most likely evident in the large non-isolated schools.

Recommendations

(1) With regard to differences in income sources, this research supports efforts to put increasing amounts of money into the state aid formula. Increases in state aid tend to equalize school districts.

(2) Continued use of "hold harmless" provisions in state aid are recommended to diminish the disequalizing effect of variations in taxable wealth in schools districts.

(3) Studies are needed to categorize school districts according to need. Awards based on small size alone are disequalizing.

(4) Studies are needed to find ways to minimize the effect of the loss of federal aid. Federal aid has been shown, within the limitations of this research, to be an important source of income in the non-isolated school districts. Its loss would tend to increase the already significant differences in income now apparent.

With regard to differences in per capita costs, further study is indicated to determine if small isolated school allocations are "costs" or "expenditures" as defined. If it is indicated that there is flexibility in allocations, then that data should be made available to school decision makers. Further study is indicated in the large sample groups. The isolated schools receive more income, differ in expenditure levels in 3 categories (instruction, plant operation, and capital outlay) but do not differ in the quality related variables. Study results would be expected to show either inefficiency, in terms of school quality, in the isolated sample, or a high degree of efficiency, in the non-isolated sample.

With regard to differences in the variables believed to be related to school quality, further study is recommended to determine the relationship between per capita expenditure and school quality. Incentives are recommended to attract and retain better qualified and more experienced teachers in small schools. Further study is recommended to determine if the increased number of unit offerings in the small isolated sample was related to quality. The literature indicates that small schools are well advised to expand their program in depth rather than scope when the opportunity arises.

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