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An Analysis of the equity of Utah's public school funding system

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AN ANALYSIS OF THE EQUITY OF UTAH'S
PUBLIC SCHOOL FUNDING SYSTEM

by

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Bachelor of Science
Brigham Young University
1998

Master of Science
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A dissertation submitted in fulfillment
of the requirements for the

**Executive Doctor of Education in Educational Leadership
Department of Educational Leadership
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ABSTRACT

An Analysis of the Equity of Utah's Public School Funding System

by

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There has not been an equity study of the public school funding allocation system, in the state of Utah, since 1990. The purpose of the study was to conduct an analysis of the equity of the Utah state funding allocation system for K-12 education including a trend analysis for the decade 2000-2009. The conceptual framework for the analysis applies four broad concepts of equity framed by Kern Alexander; (1) communitative equity, (2) distributive equity, (3) restitutive equity, and (4) positivism. The analysis of the Utah State funding system used Berne and Stiefel's methodology and included commonly used statistical measures of equity. The findings of the study revealed that Utah did not meet the commonly used standards for horizontal equity or fiscal neutrality. While vertical equity was addressed in the current funding formula the allocation level was not sufficient to meet research-based suggested levels of funding for the differentiated needs of disadvantaged students.

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CHAPTER 1

INTRODUCTION AND BACKGROUND

Human capital theory suggests that individuals and society derive economic benefits from investments in people (Sweetland, 1996). The argument has been made that not only an economic return results to the private individual who advances his or her education level, but also a potential social rate of return results when public expenditure produces a more educated population (Shultz, 1961). As education has become more directly tied to increasing human capital, the funding of education has become more controversial.

With the increasing amount of student achievement data that is now available, we are now much more capable of looking at the differences in the success of students across class, gender, race and ethnicity (Odden, 2000). The growing population of disadvantaged students, and the relationship of education to opportunity both socially and economically, brings an even greater focus on the importance of financing education (Brimley & Garfield, 2008). As we have been able to identify individuals and groups that are not increasing their human capital through education, the idea of creating a fair and equitable education system for all becomes an area of concern for policy makers (Vesely & Crampton, 2004).

Judging the fairness in the equity of funding formulas for allocating funds to public education systems implies a preexisting set of ethical standards as to what constitutes fairness (Baker, Green, Richards, 2008). The criterion of fairness has been continually applied in the American education system. "There exists a dominant belief in our society

that a child's future chances in life should not be constrained by parental wealth and influence" (Berne & Stiefel, 1984, p. 270).

Not only is there an implication of what constitutes fairness, but there is also an implication that equity should be the standard to which the state adheres in the allocation of public funds for the support of public schools (Oden & Picus, 2004). This standard has been established and upheld in various eras of litigation by establishing the equal protection clause in an educational context; however, the practical application of fairness and equity tends to become skewed when filtered through the political and legislative processes over the decades (Oden & Picus, 2004).

In *Brown v. Board of Education* (1954), the Court ruled that intentional racial discrimination of public schools violated the equal protection clause. The *Brown* decision established that the courts would be open to equal protection clause challenges in educational contexts (Enrich, 1995). However, in *San Antonio School District v. Rodriguez* (1973), the court held that the district wealth-based inequalities in the Texas school finance system did not violate the equal protections requirements of the federal constitution. The Supreme Court held that neither the poverty of the plaintiffs nor the importance of education would justify strict scrutiny of the Fourteenth Amendment to its review of the Texas education finance system (Rebell, 2005). This decision effectively terminated Supreme Court finance litigation under the equal protection clause of the Fourteenth Amendment. After the Supreme Court put an end to first-wave litigation, plaintiffs began bringing equity challenges based on state equal protection and education clauses (Rebell, 2005). The first major state court decision after *Rodriguez* was *Serrano v. Priest* (1971). The *Serrano* case was in process when the *San Antonio* case was

finished. This case introduced the principle of fiscal neutrality as a judicially manageable standard (Rebell, 2005). This principle of fiscal neutrality established the notion that the level of resources available to students in each school district should not be a function of wealth, other than the wealth of the state as a whole (Berne & Stiefel, 1984). In cases such as, *Robinson v. Cahill* (1973), *Helena Elementary School District no. 1 v. State* (1989), *Edgewood Independent School District v. Kirby* (1989) and *Roosevelt Elementary School District No. 66 v. Bishop* (1994), it was found under the terms “general”, “uniform,” or “efficient” that public school systems were operating under disparities in school facilities and finances, and therefore were in violation of the state education clause. These cases further established that equity in funding education was a state responsibility rather than a federal responsibility.

Equity in funding education among the states refers to the fair and just distribution of resources among public school students (Sample, 1990). Berne and Stiefel (1984) proposed three principles to determine whether a particular funding system is equitable: horizontal equity, vertical equity, and fiscal neutrality. *Horizontal equity* refers to the equal treatment of equals, which is the traditional understanding that resource allocations are based on similar treatment of students/districts in similar circumstances. Vertical equity recognizes that equal treatment is not always fair and just for pupils experiencing extraordinary conditions such as poverty, physical, psychological, and mental disabilities. *Vertical equity* allows for an appropriate unequal treatment of pupils in unequal circumstances, or the differentiated funding of pupils based on need. *Fiscal Neutrality* incorporates the belief that a relationship should not exist between the objects (i.e. per pupil expenditures) in an educational system and certain characteristics, such as district

wealth (Berne & Stiefel, 1998). The intent of determining fiscal neutrality is directed toward minimizing undesirable systemic relationships (Berne & Stiefel, 1999). In other words, the education of a child should not be dependent upon the wealth of the district in which the child resides.

Berne and Stiefel (1984) developed a methodology to refine the process of determining equity. Their intent was to address the many values of what should, and should not, be part of an educational funding system. Judicial interest in educational equity continues to be high and the Berne and Stiefel methodology for reviewing equity in state allocation systems is still the accepted standard (Garfield & Brimley, 2008).

Statement of the Problem

Challenging issues in the state of Utah require a review of the state funding formula to determine whether or not the system meets the standards of fairness and equity. These issues include limited financial resources, an increase in minority and low income students, a diminishing rural population, an increased economic gap, achievement gap, and increases in charter schools. In 1990, the Utah School Finance Task Force commissioned John Augenblick to conduct a study to determine the overall equity of the funding formula of the state of Utah. Since this study, significant change has occurred in the state's economy, demographics, social structure, and school finance statutes. The courts today are not only determining fairness based on horizontal equity and fiscal neutrality, but are also taking into account the differentiated needs of certain groups of students. Since these changes, there have not been any studies to determine the overall equity of the Utah school finance formula.

Purpose of the Study

The purpose of this study was to conduct an analysis of the equity of the Utah state funding allocation system for K-12 education including a trend analysis for the decade 2000-2009. Generally accepted statistical procedures were used to determine the extent of equity of the current funding allocation system in its distribution of funds to the 40 school districts of the state of Utah. There are currently 41 districts in the state of Utah, the Canyons district was added during the 2009-10 school year. Since for the majority of the years of this study there were only 40 districts, the Canyons district was not included.

Research Questions

The research questions for this study were:

1. To what extent does the existing state funding allocation system meet the standards for horizontal equity for each of the years of the study?
2. To what extent does the existing funding allocation system meet the standards for fiscal neutrality for each of the years of the study?
3. To what extent does the existing state funding allocation system take into account the differentiated costs required to meet vertical equity needs for the year 2009?
4. What changes have been made in the distribution of revenues over the past decade relative to each of the standards of equity?

Conceptual Framework

A conceptual framework for this study was based on the four broad concepts of equity framed by Kern Alexander (2008). These general concepts of equity include: (1)

commutative equity, (2) distributive equity, (3) restitutive equity, and (4) positivism (Alexander, 2008). Alexander discusses these broad concepts within a continuum of fairness, communitative equity being the lowest level of equity and positivism the highest level of equity.

Commutative equity: Commutative equity means the unit of equity is the community (Alexander, 2008). Having taxation at the local level produces commutative equity. Assets are maintained at the local level, and there is no redistribution of assets. This tradition of local control has much value, in that the local community decides what it desires in education and decisions are made at the local level. Commutative equity permits local choice even if it creates unequal educational opportunity. This fosters inequality among local units as long as revenue for schools is dependent on local community wealth or income. Commutative equity creates exclusiveness, disparity, and division in the education system—all of which have elements of inequity (Alexander, 2008).

Distributive Equity: Distributive equity requires the state to address mathematical equality of fiscal resources (Alexander, 2008). The concept of distributive equity applies many of the same principles as horizontal equity. The best result which a government can effect is that all of the players in the game will have an equal chance to succeed; that legislation will not be responsible for determining who will be successful (Alexander, 2008).

Distributive equity assumes the state has the obligation to provide education. In order to establish distributive equity the state treats all school districts as fiscally neutral (Alexander, 2008). Although distributive equity is a higher standard than communitative

equity, sometimes the grossest discrimination can lie in treating things that are different similarly (Jennes v. Fortson, 1976).

Restitutive Equity: Equity in school finance is not accomplished if unjustified shares of resources that are derived from state action are not rectified. When financing public schools, most states have, through organization of school districts, tax measures, or categorical funding, created unjust educational enrichment for some students in preference to others. This creates a system where some receive unjust benefit, while others unjust deprivation (Alexander, 2008).

Restitution requires the state to make up for these fiscal inequities created by schools or school districts. Any differences in cost in delivering comparable educational services must be accounted for. Restitutive equity applies many principles similar to fiscal neutrality as it applies to tax payers. It is critical for the state to equalize the fiscal effort among school districts in an effort to establish restitutive equity.

Positivism: The highest form of equity is positivism. Positivism accepts a legal and moral obligation to establish fairness in funding (Alexander, 2008). Any initial disadvantage, regardless of reason—physical or mental condition, cultural incapacity, social or economic deprivation—may be justified in greater resources allocated by the state. A legal positivism to the effect that an unequal distribution is made by the state is just if it is provided to the disadvantaged (Hayek, 1976). Positivism creates a moral obligation to assist those who are disadvantaged, even though their inferior position is not the fault of government (Fuller, 1995).

Positivism demands that programs designed to help high needs children be provided even if the fiscal cost is high. Positivism applies the principles of vertical equity

for students. This would include programs for children with disabilities, language learners, and children of poverty. This would include students from low income homes or minority students (Alexander, 2008).

On the surface, spending an equal amount of dollars on each student seems to be equitable. A deeper look finds that students with special needs require greater expenditures to assure no ceiling for opportunity or the ability to contribute. Benson (1974) emphasized this point:

Obviously, providing equal dollar inputs for unequal students produces unequal results. Equal spending does not make education the “great equalizer of the conditions of men” as Horace Mann suggested...If education is to facilitate the movement of the poor and disadvantaged into the mainstream of American social and economic life, if it is to afford everyone equal probability of success (however one defines it), then equal facilities, teaching skills, and curriculums are not the answers. Additional resources must be made available to students who enter and pass through the educational system with handicaps such as language barriers for which they are not responsible (Benson, 1974, p.8).

This study examined the level of equity which existed among the pupils of the 40 school districts in state Utah as it applied to these four concepts of equity: communitative equity, distributive equity, restitutive equity, and positivism.

Methodology

The most frequently cited authorities on the topic of measurements of equity in school finance are Robert Berne and Leanna Stiefel. The Berne and Stiefel (1984) framework requires the researcher to answer four fundamental questions.

1. What is the makeup of the groups for which school finance systems should be equitable?
2. What services, resources, or more generally, objects should be distributed fairly among members of the groups?

3. What principles should be used to determine whether a particular distribution is equitable?
4. What quantitative measure should be used to assess the degree of equity?

For the purposes of this study, the question for whom should the school finance system be equitable was answered with children. This study focused on the pupil as the unit of analysis. The object to be distributed fairly was the total net current expenditures per pupil for each school district. Data was gathered from current and previous expenditure reports from the Utah Department of Education and the National Center of Educational Statistics. The principles of equity in this study were *horizontal equity*, *vertical equity* and *fiscal neutrality*. The quantitative measures used to assess the degree of equity were generally accepted statistical measures from the extant literature. Vertical equity was measured by using a simulation of research based per pupil weights in a reanalysis of the horizontal and fiscal neutrality measures. They are briefly described here and followed by a more detailed description in Chapter 3.

Horizontal equity measures focus on the degree of dispersion of one variable, such as per-pupil expenditure in a funding distribution system. Seven univariate statistical measures of horizontal equity measures included in this study were the range, restricted range, federal range ratio, coefficient of variance, McLoone index, Verstegen index, and gini coefficient. These seven measures are described in detail in chapter 3.

Fiscal Neutrality is the relationship or correlation between per-pupil unit revenues, or expenditures, and per-pupil district wealth (Bern & Stiefel, 1984). There are three correlation measures used in determining fiscal neutrality; correlation coefficients,

measures of elasticity, and coefficients of determination. These measures are described at greater length in chapter 3.

Vertical equity specifies that differently situated entities should be treated differently. Three categories of characteristics have been identified in the research literature for identifying groups that should be funded differently: characteristics of children, characteristics of school districts, and characteristics of programs (Berne & Stiefel, 1984; Odden & Picus, 2000).

One variation to recognize funds necessary for children of differentiated needs to receive an equitable education is the per pupil weight. For the purpose of this study, per pupil weights obtained through a synthesis of the research literature on cost differentials (Verstegen, 2008) were applied to the 40 school districts in the state of Utah to determine vertical equity. These measures are described at greater length in Chapter 3.

Population and Data Sources

The subjects of this study included all pupils within the 40 school districts of the state of Utah. Utah Department of Education data that was used in the study include; weighted pupil enrollment, property tax and non-property tax revenues, total net current expenditures, and per-pupil expenditures for each school district. These data are compiled annually by the Utah State Department of Education. Data from 2000 through 2009 were used in this study.

Definition of Terms

Common good requires that all persons, regardless of where they live, bind themselves to observe the same duties, responsibilities, and restraints, and enjoy the same benefits. (Verstegen & Ward, 1991).

Average Daily Membership (ADM) is aggregate number of days for which students are in membership divided by the number of days in the reporting period (Augenblick, 1990).

Equity in funding education among the states refers to the fair and just distribution of resources among public school students (Sample, 1990).

Horizontal Equity is the principle of equity that students who are alike should receive equal shares (Berne & Stiefel, 1984).

Fiscal Neutrality is the equity principle that incorporates the belief that a relationship should not exist between the objects in an education system and certain characteristics (Berne & Stiefel, 1984).

Per Pupil Weight is an extra weight relative to a normed expenditure of how much additional services cost (Odden & Picus, 2008).

Total Net Current Expenditures refers to several types of expenditures by school districts and other public elementary/secondary education agencies. Researchers generally use total net current expenditures instead of total expenditures when comparing education spending between states or across time because total net current expenditures exclude expenditures for capital outlay, which tend to have dramatic increases and decreases from year to year (National Center for Educational Statistics Web Site, July 28, 2003). For the purpose of this study debt services and transportation were also excluded.

Unit of Analysis refers to the focus group or object of school finance analysis. The unit of analysis may include the state, the individual school districts within a state, or the pupils in the state education system. Each state's finance system is comprised of a distribution of pupils. The data on per-pupil dollar inputs are generally available at a district level (Berne & Stiefel, 1984).

Vertical Equity is the principle of equity that recognizes that students are different and that unequals should receive appropriately unequal treatment (Berne & Stiefel, 1984).

Weighted pupil unit is the amount of money allotted by the state for each student in the district (Augenblick, 1990).

Assumptions

In this study it was assumed that the data collected through the Utah State Office of Education was correct and valid. It was also assumed the unit of analysis, the weighted pupil unit, was an appropriate unit of analysis for this study. A final assumption was that the net current and current expenditures of the State of Utah were valid for determining the equity of the system.

Limitations

For the purpose of the horizontal equity and fiscal neutrality analyses of this study, the methodology developed by Berne & Stiefel (1984) was used. There have been models developed and used in other equity studies that were not employed in this study. For the purpose of the vertical equity analysis of this study, a synthesis of the weights employed by Verstegen (2008) was used. There have been other methodologies developed for addressing vertical equity that were not employed in this study.

For the purpose of this study, current special education, language learner, and low income funding was left in the calculations. With these calculations left in, some legitimate variation may be captured in both the horizontal equity and fiscal neutrality analyses.

Delimitations

The analysis addressed the inter-district distribution of moneys from the state to

the school districts, but did not address the intra-district allocation of funds. Delimitation factors for this study included application to the 40 public school districts in the State of Utah. The revenue and budget data obtained was confined to the past decade, spanning the years 2000 to 2009.

Significance of Study

The development of the Utah Minimum School Program, a modified foundation program, represented the last modification to the public school funding system that began in 1921. The funding system has evolved from a basic foundation program in 1921, to a system with several equalization components implemented at different times over the past 87 years. The last major review of reform of Utah's school finance program occurred in 1989, which resulted in several budgetary and formula changes.

The significance of this study is that the Utah public education funding allocation system has not been reviewed in detail since the modifications of 1989. The state has undergone many changes and seen a growth and diversification in population since that date. Changes include an increase in minority and low income students, a diminishing rural population, an increased economic gap, and increases in charter schools. The results of this study will assist policy makers in reviewing and refining the current public education funding allocation system for the state of Utah to better meet the educational needs of all of the children that reside within its state borders and attend its public school system.

Summary

Chapter 1 provided a general discussion of school finance, problems related to the funding of schools, with an emphasis on fairness in equity. It also provided the purpose

of the study, methodology, and a general framework to be used in analyzing equity for the state of Utah. Definitions of terms, along with assumptions, limitations and delimitations were included. The chapter concluded with the significance of the equity study.

Chapter 2 contains a review of literature and research that applies directly to this study. It includes an analysis of the economics of education as well as a discussion of the concepts of fairness and equity. An analysis of the historical influences on equity and the history of school finance litigation also are included. The chapter concludes with a review of Utah's history of school finance, including the history of the development of the state funding formula.

Chapter 3 contains a discussion of the conceptual framework and methodology for the equity study. The purpose of the study, research questions, population and data sources are reviewed. The research procedures are outlined, including an in depth description of the measures of analysis to be used in determining the degree of horizontal equity, fiscal neutrality, and vertical equity for the state of Utah.

Chapter 4 contains an analysis of the statistical measures for horizontal equity, fiscal neutrality, and vertical equity. A ten year trend analysis for each of the measures was discussed, including changes to the statistical measures over the ten years of this study.

Chapter 5 presents the summary, conclusions, and recommendations of this study. A response to each of the four research questions is presented, as well as an interpretation of the findings in the context of Alexander's equity framework. Conclusions are drawn

based on the findings of the study and interactions of the findings with the related research. Finally, policy recommendations based on the outcomes of the study are presented.

CHAPTER 2

REVEIW OF LITERATURE

Economics of Education

The economics of education first came into focus as a legitimate source of economic enquiry in T. W. Schultz's presidential address to the American Economic Association in 1960 in which he observed that human capital formation is an important aspect of economic development and that the economic advancement of a country depends to a great extent on its storehouse of human resources. (Shultz, 1961). This observation by Shultz emphasized the role of education in developing that human capital.

Human capital theory suggests that individuals and society derive economic benefits from investments in people (Sweetland,1996). Education is such an investment in human capital. The development of human capital by our public education system is critical to ensure a strong economy, provide a high standard of living, and establish a social and political democracy. (Picus, 1995).

Public schools are dependent on the private economy for financial support. Resources are needed to provide for the needs of students. These needs include teachers, administrators, facilities, equipment, supplies, etc. Increases in education bring increases in productivity and gains in social, political, and economic life (Psacharopoulos, 2006). Consequences of not educating properly include an increase in unemployment, increase in prison incarceration, a high dependence on public relief, and other drains on a society (Garfield & Brimley, 2008).

Education benefits cannot be measured on the basis of financial returns alone. Education benefits student's children, their neighbors and society as a whole, by

transferring knowledge, creating social values, and creating skills in employees (Alexander, 2008). Benson (1961) stated, “Throughout the world, both philosophers and men of affairs appear to have reached consensus on this point; education is a major force for human betterment. Quality of education is intimately related to its financing. How much resources are made available, and how effectively these resources are used stand as crucial questions in determining the degree to which education meets the aspirations that people have for it (p. 23).”

With the importance of education in mind, the following review of literature will examine the history of education finance and the role of local, state, and the federal government. Following this history the concept of equity in school finance will be examined, along with a model for measuring equity. There will then be a discussion of the role of litigation in shaping thought and practice in school finance. Finally, there will be an examination of the history of school finance in the state of Utah, as well as a description of the current funding model used in the state.

History of Education Finance

While it was established that the ultimate responsibility for education rests with the state in that the U.S. Constitution is silent on education, local control of schools has been a hallmark of the system of public education throughout the history of this nation (Theobald & Malen, 2000). The following is a brief history of local, state, and federal roles in public education:

Local Role

Since the first Europeans settled the United States, establishing and operating a system of public schools has been recognized as a function of government rather than

private enterprise. Early colonists saw the importance of schooling in maintaining a democratic government and developing individuals to serve that government (Garfield & Brimley, 2008). The 1787 Northwest Ordinance declared: “Schools and the means of education shall forever be encouraged.”

Over time state school systems developed from local units. State responsibility was accepted in theory, yet there was little leadership coming from states, leaving the school district as the basic administrative unit for the operation of public schools. Each district has a governing board and a superintendent who acts as the chief administrative officer. The number of school districts in the United States has decreased over time through consolidation shown in the chart below.

Table 2.1: Total number of school districts 1930-2009

Year	# of School Districts
1930	127,649
1940	117,108
1950	83,178
1960	40,520
1970	17,995
2005	14,383
2009	15,746

Source: Digest of Education Statistics, U.S. Department of Education, National Center for Education Statistics, Office of Educational Research and Improvement (NCES 2000333, June 2005).

Some states have held on to a large number of school districts (Texas has 1,040 school districts), while Hawaii is a single school district state.

Local boards of education have found their authority diminishing over time. One reason is the increase in state and federal accountability requirements. The No Child Left Behind Act includes options for the state to take over schools that fail to meet adequate

yearly progress (Thurston, 2006). Twenty four states have ways for poor functioning school districts to be taken over by the state. Some mayors of dependent school districts, such as Boston, Chicago, Philadelphia, Washington D.C., and New York, have exerted increased control over the local school district. (Rubin & Helfand, 2006).

State responsibility for education is guaranteed by the Tenth Amendment of the United States Constitution, as well as in states' constitutions. Local control of schools has been the norm in the United States, but this power comes to local districts by delegation from the state and can be withdrawn. Districts must operate within the limits established by its state's constitution (Furman & Elmore, 1990).

Increase in State Responsibility

State support for the public schools has a long history. At first, local districts financed education with little or no state assistance. The sixteenth section land grants, provided in the Ordinance of 1787 creating land grants for public education in all states newly admitted to the Union, began setting a precedent of providing funding for public schools from the state. (Garfield and Brimley, 2008). By the year 1890, 23.8% of funding for public schools came through land grants (Benson & O'Halloran, 2008). Although education was a state responsibility, most states in the nineteenth century exercised that responsibility by authorizing local school taxes for public schools.

According to the National Education Finance Project (1971), in the early twentieth century, people began to theorize the role of state support should increase. Ellwood Cubberly, in 1905, began a time of experimentation in creating state plans that might lead to equality of educational opportunity. Cubberley's studies of state allocations

discredited flat grants and percentage grants as a means in equalizing educational opportunity (Garfield & Brimley, 2008).

In the 1920's, George B. Strayer and Robert M. Haig built on the original work of Cubberly and developed a fiscal equalization funding model referred to as the Strayer-Haig model. Strayer and Haig advocated for a foundation, or minimum program. Strayer and Haig emphasized the equalization of the tax burden to support schools as well as the equalization of educational opportunity (Wood & Thompson, 2007). Shortly after this Harlan Updegraff developed a funding model called district power equalizing that created a way to reward district's for their tax effort. State support is the difference between what the district is able to raise per student based on its taxable wealth and the state guarantee per student (Garfield & Brimley, 2008).

The intent of these early formulated funding models was to finance schools equitably for students and taxpayers. As these theories gained in credibility, total revenue for public elementary and secondary schools began to change drastically. Below is a table outlining the percentage share of each level of government and illustrating the increased role states began to assume over time.

Table 2.2: Percentage share of funding for education by level of government

Year	Local	State	Federal
1920	83.2	16.5	.3
1940	68	30.3	1.7
1960	56.5	39.1	4.4
1980	43.4	46.8	9.8
2005	43.4	47.6	9.0
2009	36.1	52	11.9

Source: Charles S. Benson and Kevin O'Halloran, *The Economic History of School Finance in the United States*, NEA rankings of the states, 2008-09.

The work of these early education finance philosophers has led to different funding methods utilized in the country. State aid formulas can be classified into five categories: flat grants, foundation programs, district power equalizing programs, full state funding, and combination/tiered systems (Verstegen & Jordan, 2009).

Flat Grants

The flat grant is the oldest type of state aid for education (Oden & Picus, 2004). Flat grants were originally created to ensure that even the poorest localities could offer some type of education program. A flat grant is calculated by dividing the funds that are available by a unit of measure. The unit of measure is selected by the state, but usually is the pupil. There is no adjustment made in a flat grant for tax effort or ability to pay and money flows to local districts in an equal amount per unit. This equal distribution of funds therefore is unlikely to have a major impact on improving the fiscal equity of a finance system. Due to their negative effect on equity and their expensive nature, flat grants are rarely used as the major funding formula. Only one state, North Carolina currently uses a flat grant (Oden & Picus, 2004).

Foundation Programs

The concept of equalization of education funding for schools grew out of the work of Cubberley and was followed by Updegraff, Strayer, and Haig. The work of these scholars created the beginnings of a foundation program (NEFP, 1971). In 1924, Paul Mort extended the minimum foundation program by developing a measure of financial district need. The need was based on a weighted pupil method.

A foundation program combines state and local resources to provide funding for every student. One of the purposes in developing a foundation program was to create

equality of educational opportunity. The state determines the amount funding needed to provide a student with an education. One of the reasons flat grants failed was due to the increased cost to the state. The foundation program resolved this dilemma by financing the foundation expenditure per pupil with a combination of state and local revenues. Foundation programs are based on the school district's ability to pay, with the state making up the difference to a state guaranteed level of per pupil funding. The state provides financial assistance as needed proportionate to the district's ability to generate funding. Another advantage to a foundation program over a flat grant, is the foundation program allows states to substantially upgrade the education systems in the lowest-spending school districts to a level to meet a minimal standard (Oden & Picus, 2004).

There are some shortcomings to foundation programs. These shortcomings revolve around the concept of the local district being able to raise additional funds beyond the foundation amount through local property taxes. This allows for wealthy districts with high property values to bring in additional resource not available to districts with limited property value per pupil (Oden & Picus, 2004).

District Power Equalization Programs

As stated earlier, the concept of district power equalizing programs began with Harlan Updegraff's funding allocation model. District Power Equalization Programs support taxpayer equity, rather than pupil equity. Guaranteed tax base, guaranteed tax yield, and percentage equalization programs are three types of equalization formulae (Verstegen & Jordan, 2009). District Power Equalization plans have a goal to match resources inversely to local capacity. States with equalization programs have school districts determine the amount of revenue through taxation they consider necessary for a

quality education. The state then ensures that each district has the same ability to generate that revenue (Tachon, 2008). Although district power equalization programs tend to equalize things for tax payers, they are incompatible with horizontal equity principle for students because it does not require equal spending per child (Oden & Picus, 2004).

Full State Funding

In this funding formula the state pays for education rather than it being shared between the state and local districts. Hawaii is the only state using statewide funding. The Hawaii State Board of Education is responsible for the development of advisory budgets, which are submitted to the governor's office for review. The state legislature reviews the budgets and appropriates funds, which the school board distributes to the schools (Garfield & Brimley, 2008).

Combination/Tiered Programs

The combination approach merges the best features of the foundation and district power equalization programs. These funding models allow for a base guarantee per pupil, as well as the ability to equalize funding among the districts. Several states provide combination approaches to financing education. Georgia uses a combination of foundation and guaranteed tax yield. In Kentucky, a base foundation level with optional two tiers of supplementation is employed under a district power equalization program.

A combination program requires local matching funds and provides for fiscal capacity equalization. The fault is that the program allows for different spending levels and thus is not in keeping with the principles of horizontal equity.

These five categories represent basic structures of state funding programs. The following is a table of state funding based on a survey of the 50 state funding allocation systems (Verstegen & Jordan, 2009).

Table 2.3: State funding allocation systems

State	Flat Grant	Foundation	DPE	Full Funding	Combination/Tiered
Alabama		X			
Alaska		X			
Arizona		X			
Arkansas		X			
California		X			
Colorado		X			
Connecticut		X			
Delaware		X			
Florida		X			
Georgia					X
Hawaii				X	
Idaho		X			
Illinois					X
Indiana		X			
Iowa		X			
Kansas		X			
Kentucky					X
Louisiana		X			
Maine		X			
Maryland		X			
Massachusetts		X			
Michigan		X			
Minnesota		X			
Mississippi		X			
Missouri		X			
Montana					X
Nebraska		X			
Nevada		X			
New Hampshire		X			
New Jersey		X			
New Mexico		X			
New York		X			
North Carolina	X				
North Dakota		X			

Ohio		X			
Oklahoma		X			
Oregon		X			
Pennsylvania		X			
Rhode Island			X		
South Carolina		X			
South Dakota		X			
Tennessee		X			
Texas					X
Utah		X			
Vermont			X		
Virginia		X			
Washington		X			
West Virginia		X			
Wisconsin			X		
Wyoming		X			
Total	1	40	3	1	5

Source: Verstegen, D.A, Jordan T.S., *A Fifty State Survey of School Finance Policies and Programs: An Overview*, Journal of Education Finance 34 no3 213-30 Winter 2009.

Federal Role

The founders of this country viewed education as a public good with social benefits aimed at protecting our social and political democracy (Carcieri, 1997).

Education is also viewed as a means to achieve social mobility; that is, as the means in our society to create opportunity. Since all benefit from increased education, education is not only seen as a public good, but as a common good (Hostetler, 2003).

Public schools in the United States operate in a national economic system that not only permits substantial economic disparities among individuals and families but by its nature tends to increase division between the rich and the poor (Alexander & Salmon, 2007).

Income separation has risen in both quantity and distance from the mean. The United States is not the land of opportunity that it was once believed to be. In the United

States, social mobility is far more perceived than real. (Krueger, 2003) In income inequality the United States ranks 28th of 30 developing countries. In child poverty it ranks 29th out of 30 nations (Alexander & Salmon, 2007).

An analysis of taxation in the United States shows citizens of the United States do not bear heavy tax burdens when compared to their peers in other developed countries, and the taxes that are paid bear more heavily on the poor than on the rich. Tax effort by the Organization of Economic and Cooperation and Development ranked the United States 27th of 30 nations (Alexander & Salmon, 2007).

States differ greatly in per capita personal income or wealth, and correspondingly in educational expenditures per pupil. In 1930, the range in school expenditures was from \$32 per pupil in Georgia to \$138 per pupil in New York a difference of 4.3 times (Burke & Mort, 1943). According to the 1986 Bureau of Census, funding disparities remained high in the 1980's. In 1985, per pupil funding ranged from \$2,182 in Utah to \$5,226 in New York, a difference of 2.4 times (Benson & O'Halloran, 2008). Those same disparities exist today, according to NEA rankings of states (2009), the range in per pupil expenditure varied from \$17,368 in Washington D.C., compared to \$5,912 in Utah, Utah's expenditures being just 58% of the national average of \$10,190.

The difference in funding at the state level, as well as comparing our current funding mechanisms to those in other developed countries, has led some to believe federal action should be taken to equalize funding and therefore educational opportunity across states (Garfield & Brimley, 2008). The Constitution, Article I, Section 8 gives Congress the leverage and authority to provide the educational support to equalize

funding. *“The Congress shall have power to lay and collect taxes...to pay the debts and provide for the common defense and general welfare of the United States.”*

Historically there have been several efforts by the federal government to increase the role of the federal government in education. Federal education activities began in 1785 with the land grants in the Northwest Ordinances that were given for the purpose of establishing schools. In 1870, Representative George Hoar introduced a bill intended to provide for a national system of education operated by the states with federal standards (Benson & O’Halloran, 2008)

. In 1946 Senator Taft stated:

“I feel that the federal government does have a responsibility to see that every child in the United States has at least minimum education in order that each child may have the opportunity which lies at the very base of the whole system of our Republic).” (p. 31 Benson & O’Halloran, 2008)

In 1948 a federal equalization bill passed the Senate, but failed in the House. Although this bill failed, over time the federal government has become involved in an effort to provide for the general welfare of pupils in the education system. Examples of federal programs that have been created include school lunch programs (1946), Title I grants (1965), Head Start pre-school (1965), Title IX (1972), special education (1975), education for homeless children and youth (1987), and reading first grants (2001),. Each of these programs is targeted at attempting to level the playing field for a perceived marginalized group of students in our schooling system (Garfield & Brimley, 2008).

At the turn of the twenty first century, the federal government perceived a national need that students from certain socioeconomic and racial populations were

suffering from a significant achievement gap. In response, the No Child Left Behind Act (2001) was initiated demanding testing for all students in grades 3 through 8 in reading and math. It also evaluated schools on having highly qualified teachers. The requirements for testing and oversight for highly qualified teachers were significant shifts from the historical role of the federal government in education. The requirements of NCLB, some maintain, have brought considerable federal control to education (Tachon, 2008)

The federal government has certain advantages to assist in the operation of the expensive endeavor of providing a high quality education for all students. The largest advantage is the ability as a tax collector (Garfield & Brimley, 2008). With inherent inequalities existing for some students if funding is left to the local or state unit, the role of the federal government may be expected to increase in a more global economy.

Concepts of Equity and School Finance

Equity in funding education among the states refers to the fair and just distribution of resources among public school students (Sample, 1990). When examining equity it is important to acknowledge fairness, equality, and justice. These terms all contribute to a community's perception of what constitutes equity in education.

What is equitable depends on the orientation of the dispenser and receiver of equity (Alexander, 2008). This brings about an examination of fairness. When examining equity in school finance we could examine fairness for pupils or fairness for tax payers. The moral test of equity, if implemented, would remove the obstacles of self-interest on the part of the pupil or the tax payer and focus on the "common good" of society. The idea that the "common good" is best served by an equitably financed public school system has been and remains a fundamental principal in examining fairness.

Common good requires that all persons, regardless of where they live, bind themselves to observe the same duties, responsibilities, and restraints, and enjoy the same benefits. (Verstegen & Ward, 1991).

At the heart of the matter of educational equity is the issue of equal educational opportunity for all (Natale, 1990). Equity is different than equality, yet the goal of equality is a standard against which equity can be judged (Alexander, 2008). Equal education opportunity is the standard for which equity should be judged. Spending the same number of dollars for each student shows a level of equality; but does not guarantee equity. Some students require more resources for their educational needs and for equal education opportunity to exist requires us to take into account social inequalities and disparities created by power and politics (Alexander, 2008). Niebuhr observed (1957), that equality is the pinnacle of the ideal of justice. Social justice refers to the impartial treatment of individuals on an equal level, or treating unequal individuals in an unequal manner. In relation to school finance, social justice is more likely to be identified as distributive justice. Who gets what, where, when and how (Verstegen & Ward, 1991). Social justice requires some unequal treatment of students in order to provide equal education opportunity.

Kern Alexander (2008), identified four concepts which demonstrate differing levels of equity as it pertains to the standards of fairness, equality, and justice: (1) commutative equity, (2) distributive equity, (3) restitutive equity, and (4) positivism: communicative equity being the lowest level of equity and positivism the highest form of equity. These concepts of equity were discussed in the conceptual framework section of chapter 1.

Commutative equity: Commutative equity means the unit of equity is the community (Alexander, 2008). Having taxation at the local level produces commutative equity. Assets are maintained at the local level, and there is no redistribution of assets. The tradition of local control has much value, in that the local community decides what it desires in education and decisions are made at the local level. Commutative equity permits local choice even if it creates unequal educational opportunity. This fosters inequality among local units as long as revenue for schools is dependent on local community wealth or income. Commutative equity creates exclusiveness, disparity, and division in the education system—all of which have elements of inequity (Alexander, 2008).

Distributive Equity: Requires the state to address mathematical equality of fiscal resources (Barry, 1989). The best result which government can effect is that all players in the game will have equal chances to succeed, or that legislation will not be responsible for determining who will be successful (Alexander, 2008).

Distributive equity assumes the state has the obligation to provide education. In order to establish distributive equity the state treats all school districts and pupils within that district the same. Each district receives the same amount of money per pupil. The standard for distributive equity to exist is full fiscal equalization of resources (Kern, 2008). Although distributive equity is a higher standard than communitative equity, sometimes the grossest discrimination can lie in treating things that are different exactly alike (Jennes v. Fortson, 1976).

Restitutive Equity: Equity in school finance is not accomplished if unjustified shares of resources that are derived from state action are not rectified. When financing

public schools, most states have, through organization of school districts, tax measures, or categorical funding created unjust educational enrichment for some students in preference to others. This creates a system where some receive unjust benefit, while others unjust deprivation (Alexander, 2008).

Restitution requires the state to make up for these fiscal inequities created by schools or school districts. Any differences in cost in delivering comparable educational services must be accounted for. It is critical for the state to equalize the fiscal effort among school districts in an effort to establish restitutive equity.

Positivism: The highest form of equity is positivism. Positivism accepts a legal and moral obligation to establish fairness in funding (Alexander, 2008). Any initial disadvantage, regardless of reason—physical or mental condition, cultural incapacity, social or economic deprivation—may be justified in greater resources allocated by the state. A legal positivism to the effect that an unequal distribution is made by the state is just if it is provided to the disadvantaged (Hayek, 1976). Positivism creates a moral obligation to assist those who are disadvantaged, even though their inferior position is not the fault of government (Fuller, 1995).

Positivism demands that programs designed to help high needs children be provided even if the fiscal cost is high. This would include programs for handicapped children, language learners, and students with learning disabilities. This would include students from low income homes or minority students (Alexander, 2008).

On the surface spending an equal amount of dollars on each student seems to be equitable. A deeper look finds students with special needs that require greater

expenditures to assure no ceiling for opportunity or the ability to contribute. Horace Mann suggested:

“If education is to facilitate the movement of the poor and disadvantaged into the mainstream of American social and economic life, if it is to afford everyone equal probability of success (however one defines it), then equal facilities, teaching skills, and curriculums are not the answers. Additional resources must be made available to students who enter and pass through the educational system with handicaps such as language barriers for which they are not responsible (McCluskey, 1958).”

Model for Measuring Equity

The most noted authors of school finance equity study are Robert Berne and Leanna Stiefel (1984). Their work has guided the study of equity for the past 45 years. They have identified three overriding principles in the study of school finance equity: horizontal equity, fiscal neutrality, and vertical equity. The conceptual framework created by Berne and Stiefel provides a structure to analyze equity on several levels.

In consideration of the value judgments and established rules and procedures necessary in funding systems, Berne & Stiefel’s framework centers around four key questions:

1. *Who?* What is the makeup of the groups for which school finance systems should be equitable?
2. *What?* What services, resources, or objects should we distribute fairly among members of the groups?
3. *How?* What principles should we use to determine whether a particular distribution is equitable?
4. *How much?* What quantitative measures should we use to assess the degree of equity? (Berne & Stiefel, 1984)

Equity for Whom

There are four groups affected by equity within school finance. They are as follows: the children who receive the educational benefits, the taxpayers who provide the resources to pay for education, the school districts who determine educational plans, and the teachers and other employees who provide the education (Berne & Stiefel, 1984).

Most of the literature written on school finance equity has been dominated by the concerns for either the students receiving the education, or the taxpayer who ultimately provides the resources for education. Taxpayer equity considers the adult population who pay the taxes. Pupils have been the center of attention when considering for whom education should be equitable (Berne & Stiefel, 1999). Sample (1990) stated, students make up the group most directly benefiting from an education. By educating our children, we are ensuring more equitable opportunities for them as adults. Additionally, students are less able to speak for themselves regarding their future needs, which obligates society to provide, equitable treatment for them in their educational offerings (Sample, 1990).

Objects of Interest

The object of interest is also important in understanding and measuring equity. That is, what should be available for the answer to the question “for whom”. Three groups of objects are considered: 1) inputs, 2) outputs, and 3) educational outcomes (Berne & Stiefel, 1984).

If we are attempting to determine if the finance system is equitable for students we might use the inputs of money spent, teacher quality, pupil to teacher ratio, or physical resources. Determining the best object of measurement is difficult in the realm

of education. The most commonly used group of objects is inputs and the most commonly used measure of inputs is per-pupil revenue, or expenditure (Sample, 1991). Per-pupil revenue, or expenditure, is readily accessible and less likely to be affected by outside variables (Cronk, 1983). If we are determining if the finance system is equitable for taxpayers, we switch the inputs. For example, inputs for taxpayer equity would include tax rates, effort, and burden.

Outputs for determining student equity might include educational achievement or educational attainment. Sample (1990), is quick to point out that equity in school output does not necessarily mean equal school achievement. He argues that outputs are influenced by many factors for which schools do not have direct influence. Although this argument has been considered for many years, recent court litigation based on adequacy has determined there should be a minimal level of output created for every pupil. If we were considering the equity to the taxpayer, the outputs would include the direct benefits of the education to the common good of society.

There are many different resources involved in the educational processes. The task of combining which resources to consider is difficult. It may take decades to realize which outcomes resulted from a particular combination of resource inputs. As such, policy makers often rely on the premise that educational achievement and attainment (outputs) are good predictors of future earnings and career satisfaction. Therefore, policy makers tend to focus their efforts on outputs rather than outcomes in creating policy (Baker, Green, & Richards 2008).

The measurement of outputs include such areas as students' achievement test scores, demonstrated competency in specified areas, and percentage of students obtaining

high school diplomas. Equity in school output does not necessarily mean equal achievement by all students (Sample, 1991). Some interpretations seek equity in student gains of achievement and relate equity to equal gains per dollar of resource for each student (Berne & Stiefel, 1984). These outputs, however, are affected by many environmental factors outside the realm of education and are therefore difficult to assign a specific dollar value.

How? Equal Opportunity

A series of frameworks for addressing how to measure and understand school equity issues began to emerge in the late 1960's in the middle of the Civil Rights movement and the Coleman Report (Baker, Green, Richards, 2008). Two views of equal opportunity came about during this time. The first view, was the principal of geographic uniformity which meant that the quality of a child's education, or money spent on that child's education, should not vary simply on the basis of where the child lived (Horowitz, 1966). The second view, was the theory of fiscal neutrality. Fiscal neutrality dictated that the quality of education, or money spent on a child's education should not be associated with financial capacity of the school district where the child lives. (Coons, Clune, & Sugarman, 1969). Berne & Stiefel (1984) later theorized that equal opportunity means that there should be no differences in money spent based on property wealth per pupil, household income, and fiscal capacity. A neutral system, or a system that provides equal opportunity, is one where all constituents have access to exactly the same set of objects and is not tied to community wealth.

How Much? Horizontal and Vertical Equity

In considering the question of how much should be provided to each student,

there are two overriding concepts that must be understood; horizontal equity and vertical equity. Horizontal equity is referred to as the equal treatment of equals in terms of educational inputs. Vertical equity is the unequal treatment of unequals in terms of educational inputs (Berne and Stieffel, 1984).

Horizontal equity assumes that there is a set of uniform educational needs for students that have comparable circumstances (Berne & Stieffel, 1999). Baker, Green, & Richards (2008) when addressing horizontal equity state, “We presume the general population of students in a state to have a uniform set of educational needs, then it should be appropriate to provide those students with the same level of fiscal inputs to their education, or the fiscal inputs required to purchase the same level of educational resources if resource prices vary.” The concept of horizontal equity can be applied when considering a group of regular education students, gifted and talented students, language learners, or special education students. In each group cases the group of students which are equal should be given the same financial resources regardless of the school district.

Vertical equity assumes that there are certain factors relating to certain characteristics of students that require additional inputs to create desired outputs, in other words not all students are equal (Berne & Stieffel, 1999). Baker, (2005) stated: “Students have vastly different needs for educational and support service in order to participate and benefit in our educational program. Meeting these needs often requires additional resources. A component of the equity framework therefore must accept that some unequal students should have access to unequal levels of resources.”

Julie Underwood (1995) argues that vertical equity is a form of educational adequacy. The theory of vertical equity has led to recent adequacy litigation. According

to Imber (1990), failure to meet vertical equity standards is a form of passive discrimination by failing to treat individuals with measurably different educational needs differently. Providing the same services to two children with different needs is simply insufficient for at least one of the two children in question.

History of Equity and School Finance Litigation

According to the National Access Network (2009), of the 50 states all but five states have experienced some form of legal dispute regarding the funding of schools and the state financing systems. Twenty Seven (27) State Supreme Courts have held school finance systems unconstitutional. Most cases concerning state funding systems have addressed one or more of the following problems:

- Inequality of the fiscal capacity of school districts that results in unequal spending and unequal educational opportunity due to heavy reliance on the individual school district tax base
- Inequalities in educational spending and opportunities
- Inadequate educational opportunities

Litigation challenging the constitutionality of state school aid formulas under specific state constitutional provisions represents an evolutionary step in judicial expansion of constitutional protections, specifically addressing the fourteenth amendment of the U.S. Constitution (Garfield & Brimley, 2008). The fourteenth amendment states:

All persons born or naturalized in the United States, and subject to the jurisdiction thereof, are citizens of the United States and of the State wherein they reside. No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person

of life, liberty, or property, without due process of law, nor deny to any person within its jurisdiction the equal protection of the laws (U.S. Const. amend. XIV. And Reutter, 1994. p988).

The precedent for litigation related to school finance was first established in the U.S. Supreme Court's landmark civil rights ruling, *Brown v. Board of Education (1954)*. Not only did this case establish civil rights issues it also addresses the fact that "it is doubtful that any child may reasonably be expected to succeed in life if he is denied the opportunity for an education." The court held in *Brown v. Board of Education* that separate educational facilities were inherently unequal. Chief Justice Warren stated in his interpretation of the fourteenth amendment as it pertains to this case, "...in the field of public education, the doctrine of separate but equal has no place. Separate educational facilities are inherently unequal..."

After the Brown case, educational reformers saw the need to devise political and legal methods for ensuring the provision of adequate resources to the large number of poor and minority students in the United States (Rebell, 2005). Over time this litigation has brought considerable reform to school finance.

Three waves of school finance reform brought on by litigation have been identified in the literature: *Wave I* was during the early 1970s, involving claims centered around school funding systems that violated the U.S. Constitution's Equal Protection clause of the Fourteenth Amendment. *Wave II* took place between 1973 and 1989 involving claims that school funding systems violated the Education and Equal Protection Clauses of a State's Constitution. *Wave III* began in 1989 and continues to the present.

Wave III deals primarily with claims that public education funding should switch from equity standards to adequacy standards (Duncombe, 2002).

Wave I

Litigation in the first wave tested whether public school funding systems violated the equal protection clause of the Fourteenth Amendment to the U.S Constitution. Until the early 1970s courts did not see that they had a role in school finance cases. They determined school funding issues were the responsibility of the legislature (Sawyer v. Gilmore, 1912).

By 1968, several lawsuits had been filed seeking to have state school finance programs deemed unconstitutional. The reason for these suits was that a state that gives fewer dollars for a child in a poorer school district is denying equal protection rights to that child. In *McGinnis v. Shapiro* (1969), the plaintiffs claimed the Illinois school finance system created great differences in expenditures per student from one district to the next. In this court case it was concluded that “unequal educational expenditures per student do not amount to an invidious discrimination.” It was concluded that there were no “discoverable and manageable standards by which a court can determine when the Constitution is satisfied and when it is violated.” This outcome resulted in the courts declining to establish judicial standards for determining how the legislature should allocate their funds. This case created precedent and had a significant impact on legal thought (Alexander & Alexander, 2008).

Another landmark case in 1971 altered the general view of the courts as it related to state school financing issues. The California Supreme Court, in *Serrano v. Priest* (1971), handed down a decision that strongly documented the establishment of a new

equal protection application to school finance. It was determined regarding the California school finance system, that although the basic state aid program tended to equalize among school districts, the total funding system, created great disparities in school revenues. The courts found that the system as a whole generated school revenue proportional to the wealth of the individual district. Since property taxes were the major source of revenue for schools, the measure of wealth used was the assessed value of property in the district. The court held that wealth-based inequalities violated the equal protection provisions of both the federal and state constitutions. This ruling made California the first state to strike down its education funding formula.

The legal basis for the *Serrano* decision has been called the “fiscal neutrality” standard (Rebell, 2005). That is, educational opportunities for a child should not depend on the taxable wealth of the school district in which the child resides. The basis for funding should be a function of the taxable wealth of the state as a whole.

Another significant court case following *Serrano* was *San Antonio School District v. Rodriguez*. This case was similar to that of *Serrano*. It was claimed that plaintiffs had been denied equal protection of the law by the Texas system of financing public schools. The case was brought in behalf of school children from poor families, who live in districts with low property value. The court determined, as was the case in *Serrano*, that not all educational expenditures needed be equal, but educational expenditures should be wealth neutral.

Federal school finance equity court cases ended when the United States Supreme Court limited educational financing claims based on the Equal Protection Clause by reversing the decision in *San Antonio School District v. Rodriguez* (1973). The court

held that the district wealth-based inequalities in the Texas school finance system did not violate the equal protection requirements of the federal constitution. Although not denying the importance of education, the Court determined that no educational process can assure an equal quality of education. The Court emphasized the absence of any specific reference to education in the U.S. Constitution and rejected the argument that education is essential to the effective exercise of First Amendment freedoms (Rebell, 2005).

The rejection of *Rodriguez* ended Wave I litigation and the argument that education was a fundamental right at the federal level. Where the responsibility for education is defined is in state constitutions. Every state constitution contains an education clause that defines the state's responsibility for establishing a system of education (Wood & Thompson, 2007).

Wave II

As a result of the *San Antonio v. Rodriguez* decision, all school finance litigation shifted to the state courts. Finance litigation after *Rodriguez* asserted that inequality in educational funding violated state constitutions. Litigation concerning equity claims continued to consider claims based on the due process and educational clauses of the state constitutions. The majority of state Supreme Court decisions holding school finance systems unconstitutional have relied primarily on the education provisions of state constitutions. The constitutional language relating to education differs from state to state, but generally contains some common words that describe the type of educational systems the state must provide, such as; "thorough," "efficient," "uniform," and "general," as well as other modifiers in a variety of combinations. School finance equity claims were

unsuccessful in many cases, because courts refused to find that state education clauses required equality of funding (Alexander and Alexander, 2008).

After the Supreme Court's ruling in *Rodriguez*, the California Supreme Court reviewed its decision in the *Serrano V. Priest* (1971) case. The ruling was upheld based on the state constitution. The California Supreme Court, held that even if education is not a fundamental right under the federal constitution it is under the California equal protection clause (Rebell, 2005). This case left us a judicially manageable standard for determining equity.

A case similar to that of *Rodriguez* came before the New Jersey Supreme Court in *Robinson v. Cahill* (1973). This case challenged fiscal and educational inequalities resulting from disparities in the ability to collect taxes among school districts. The New Jersey Supreme Court did not base its decision on state equal protection requirements, but instead ruled the funding of its public schools violated the "thorough and efficient" education clause of the state constitution. New Jersey's funding system relied on local property taxes, and as a result created unequal educational opportunity. It was concluded that the New Jersey Legislature and Department of Education had never determined a required level of education. The court then instructed the Legislature and the Department of Education to determine the required level of education to be "thorough." Once that level was determined it was the responsibility of the legislature to fund education at that level.

In 1989 the Montana Supreme Court ruled in *Helena Elementary School District no. 1 v. State*. This suit claimed the State of Montana was depriving students of equal educational opportunity under the state educational clause. It was argued that the

Montana Constitution states that, "Equality of educational opportunity is guaranteed to each person in the state." The Montana Supreme Court ruled that the state's education finance system was unconstitutional, and that the state provided inadequate fund for the equality of educational opportunity guaranteed by the state constitution.

Although some claims in Wave II were successful, other claims were not, because the courts refused to find that state education clauses required equality of funding and that local control of education was paramount. In *Thompson v. Engelking*, (1975). Plaintiffs challenged the Idaho funding system based on the state equal protection clause. It was stated that, "traditionally, not only in Idaho but throughout most of the states of the Union, the legislature has left the establishment, control and management of the school to the parents and taxpayers in the community which it serves. The local residents organized the school district pursuant to enabling legislation, imposed taxes upon themselves, built their own school house, elected their own trustees and through them managed their own schools." The Idaho funding system was found to be constitutional and the importance of local control was stated.

In 1976 in *Olsen v. State*, it was argued that the state education clause mandated equality of funding by requiring the state "to provide by law for the establishment of a uniform and general system of Common Schools." The Oregon Supreme Court acknowledged disparities in funding among school districts and the causal link to reduced educational opportunity for students in lower wealth, lower spending districts. The court concluded that the school finance system was not "desirable" but, nonetheless, was not violating the equal protection or education clause of the Oregon Constitution. The court found that the constitution sets a minimal standard, whereby the state is in compliance "if

the state requires and provides for a minimum of educational opportunities . . . and permits the districts to exercise local control over what they desire, and can furnish, over the minimum. The court ruled against the plaintiffs, stating that the constitutional requirement would be met “if the state requires and provides for a minimum of educational opportunities in the district and permits the districts to exercise local control over what they desire, and can furnish, over the minimum.”

Although Wave I and Wave II litigation attempted to create fiscal equality through fiscal neutrality, there were still gross disparities in educational opportunity for certain groups. As Peter Enrich stated (2005): “Equalizing tax capacity does not by itself equalize education. The educationally relevant disparities not only reflect tax base inequalities, but local political and administrative choices as well, not to mention the impact of preexisting differences in the students and their milieus (p. 147).” This thought rings true in Wave II litigation as great disparities were still seen in education funding, and many court decisions were being handed down based on local political climate.

Wave III

Litigation in the third wave involves claims that public education funding should switch from an equity standard to an adequacy standards. This wave of litigation stemmed from the standards-based reform movement during the 1980s. Standards based reform created a system for the courts to determine the quality of education students were receiving. It was found that most state systems and school districts that served predominantly poor and minority students were below expectations (Rebell, 2005). This brought on a wave of litigation based on adequacy standards.

In 1989, *Rose v. Council for Better Education, Inc.* 790 S.W.2d 186, became the first case which declared a state's entire funding system to be unconstitutional. The Kentucky Supreme Court held that the state's educational system violated the Kentucky constitution's education clause by failing to provide its student with an adequate education (Oden & Picus, 2004). The court ordered the General Assembly to provide funding "sufficient to provide each child in Kentucky an adequate education" The court presented seven learning goals to be met for each and every child listed below.

1. Sufficient oral and written communication skills to enable students to function in a complex and rapidly changing civilization;
2. Sufficient knowledge of economic, social, and political systems to enable the student to make informed choices;
3. Sufficient understanding of governmental processes to enable the student to understand the issues that affect his or her community, state, and nation;
4. Sufficient self-knowledge and knowledge of his or her mental and physical wellness;
5. Sufficient grounding in the arts to enable each student to appreciate his or her cultural and historical heritage;
6. Sufficient training or preparation for advanced training in either academic or vocational fields so as to enable each child to choose and pursue life work intelligently; and
7. Sufficient levels of academic or vocational skills to enable public school students to compete favorably with their counterparts in surrounding states, in academics or in the job market.

This case resulted in the Kentucky legislature enacting comprehensive education reform and tied those reforms to court ordered funding reforms. This resulted in a dramatic increase in school funding, as well as sweeping reforms in education.

The Rose case built off of the concept of vertical equity and began to establish the concept of adequacy in school finance. The concept of adequacy focused more on outcome standards for students. According to Rose, “an efficient system of education must have as its goal to provide each and every child with certain capacities” Failure to provide this system is in violation of the state education clause (*Rose v. Council*, 1989) .

Another characteristic of adequacy stemming from *Rose* centers around the correlation between poor academic performance and educational spending. The Kentucky Supreme Court cited a great difference in the curricula offered by rich and poor school districts. Poor school districts also had less school funding and higher teacher/student ratios than more affluent districts (Oden & Picus, 2004).

In *Abbott v. Burke* (1990), the court held that the state had failed to provide students from poor, special needs, and urban school districts with an adequate education. The court ordered the legislature to provide special needs districts with the inputs necessary to achieve an adequate education. The court found that the academic standards set by the state were constitutional. However, the court found that special needs districts did not have the funds necessary to help pupils reach those standards. This was an important case, in that it recognized the concept of vertical equity: that certain types of students may need increased resources in order to achieve adequate outcomes (Tachon, 2008).

A 2003 decision in the *Campaign for Fiscal Equity v. The State of New York* also had a major impact on adequacy. In this case evidence was to be gathered on the meaning of the state constitutional right to “the opportunity for a sound basic education.” The court rejected the defendants argument that reading, writing, and math skills at an 8th to 9th grade level meet the requirements for a sound basic education. Instead, the court held that sound basic education requires the “foundational skills that students need to become productive citizens capable of civic engagement and sustaining competitive employment.”

Not only did the court define what a sound basic education was, but the court ordered the governor and the legislature “to reform the State’s funding formula to ensure necessary resources, and to implant a fair accountability system to ensure that students actually receive that opportunity.” This ruling demonstrated a shift in cases focused on per pupil expenditure or fiscal neutrality to a pattern based on principals of adequacy. It also set precedent of the courts ordering the legislature to determine the cost of an adequate education and provide that funding for each school.

Adequacy was further defined in *Campbell County School District v. State* (1995). In this case, the Wyoming Supreme Court not only defined adequacy in terms of outcomes but also identified a number of educational inputs necessary to achieve those outcomes. These inputs centered around class size, available technology, curriculum, increased funding for at-risk students, setting of standards, and timely assessment (Rebell, 2005).

The No Child Left Behind Act (NCLB) of 2001 has required accountability measures for all public schools. These measures are usually based on students

demonstrating mastery of concepts on end of level tests. In *Montoy v. State* (2005), the Kansas Supreme Court held the state had failed to provide schools with high proportions of minority and disadvantaged students with an adequate education, in violation of the state constitution. It was concluded that education was inadequate due to the low test scores of minority and disadvantaged students when accountability measures were disaggregated.

Although there seems to be limitations to the effect of adequacy litigation on state funding systems, it appears to be the current focus of educational finance litigation. The related concept of vertical equity is growing in importance in each of these cases. Different students must be funded at different levels in order for them to get an adequate education.

Equity and adequacy litigation is and has been active in the courts. Only five states have not had a high court decision regarding their state education funding system. In table 2.4 is a list of the results of each states litigation outcome as of August 2010.

Utah History of School Finance

Prior to statehood in 1896, education was a local issue with church buildings of the Church of Jesus Christ of Latter Day Saints often serving the dual role of both church and school (Galvin & Robins, 2000). School lands first began to generate revenue in 1893. By the year 1857 the state of Utah had established 76 school districts (Nelson, 1990). School finance revenues came from three primary sources: charity, donations, and tuition. By 1874 the number of school districts had increased to 224. By the time Utah established statehood there was not enough property wealth to fund a minimum education program (Nelson, 1990).

Statehood in 1896 brought a drive for school consolidation and with it the move toward Utah's first real public school system. By 1915, the Utah legislature mandated a consolidation from 224 to 40 school districts (Galvin & Robins, 2000). This same Table

2.4: Summary of state litigation outcomes as of August 2010.

States with plaintiff victory (20)	States with defendant victory (20)	States with no high court decisions (6)
Arkansas	Colorado	Delaware
California	Georgia	Hawaii
New Jersey	Maryland	Iowa
Washington	Michigan	Mississippi
West Virginia	Oregon	Nevada
Wyoming	Pennsylvania	Utah
Alaska	Oklahoma	
Arizona	Alabama	
Connecticut	Florida	
Idaho	Illinois	
Kansas	Indiana	
Kentucky	Louisiana	
Massachusetts	Maine	
Missouri	Minnesota	
Montana	North Dakota	
New Mexico	Nebraska	
North Carolina	Rhode Island	
New Hampshire	South Dakota	
New York	Virginia	
Ohio	Wisconsin	

Source: Retrieved on August 20,2010 from www.schoolfunding.info/states/state_by_state.php3.

number of school districts existed in the state until 2009, when Jordan School District split in half creating the Canyons District. Utah currently has 41 school districts.

In 1917 the state began to develop the first true foundation program that combined both state and local revenues and set a base per pupil spending plan (Nelson,

1990). Utah's foundation program was adopted in 1921. The foundation program established state participation based a state property tax and local participation based on a local property tax. In 1931, a district power equalization component was added to the funding formula based on weighted pupil counts and cost differentials (Galvin& Robins, 2000). The need for annual increases in funding was recognized but difficult during the great depression. The state assumed a major role in financing public education during this time (Nelson, 1990).

In 1948 Utah created a new foundation program based on income taxes as the primary source for funding public education, creating a Uniform School Fund (Galvin & Robins, 2000). This allowed for consolidation of funds, guaranteed equalization of tax support, uniform tax rates, and the use of weighted distribution units (Nelson, 1990). That same year was the first year that the state received federal impact aid also (Galvin & Robins, 2000).

During the 1950s and 1960s limited change took place in the funding formula. During those two decades federal influence greatly increased. The passage of the Elementary and Secondary Education Act in 1965, combined with court decisions in *Brown v. the Board of Education of Topeka* in 1954 and *Serrano v. Priest* in 1971 prompted the Utah legislature to undertake a major revision of the school finance program (Nelson, 1990).

A major school finance reform effort took place in Utah in 1973. This reform resulted in improved statewide tax equalization, and a major shift to a weighted pupil unit (WPU). These reforms were an effort to establish increased vertical equity for both tax payer and pupil (Galvin & Robins, 2000). The reform added several categorical programs

including instructional media centers, extended day programs, teacher leadership, and compensatory education were added to the formula (Nelson, 1990).

The late 1970s and early 1980s brought a large increase in student enrollment coupled with an economic recession. In 1981 there was not enough revenue to complete the regular school term. The 1980s brought a political and fiscal conservatism to the state of Utah (Nelson, 1990). In the ensuing years, there were some budgetary and formula changes recommended and implemented including the establishment in 1993 of a Capital Outlay Foundation Program (Galvin & Robins, 2000). The Capital Outlay Foundation program allows for school districts levying less than the maximum of the combined capital outlay levy to receive proportional funding under the Capital Outlay Foundation program based on the percentage of the highest combined capital outlay levy tax rate levied by the district

The 1990s brought to the forefront an education paradox in the state when concerning education finance. A November 1999 study conducted by the Utah Foundation research group conducted a study with finding highlighting two statistics: (1) Utah spent a greater percentage of its state budget on public education than most states ranking 3rd in the United States, and ranked second in the nation in spending as a percentage of personal income. (2) Utah spent less per pupil than any other state, and its average class size exceeded that of than any other states, ranking 51st including Washington D.C.

During the early 1990s even though its' per pupil funding was low, Utah ranked high in effort. It remained four to five percentage points above the national average up through 1996. From 1997 on, however, the level of effort in Utah began to fall as the

national average began to climb. This resulted in Utah moving from ranking 5th in effort in 1995 to 42nd in 2000 (Bureau of Economic Analysis). Currently, Utah is ranked last in the nation in per pupil funding and 22nd in effort (Utah Foundation Research Brief, 2009).

Utah's unique demographics create challenges when it comes to financing public education. Utah has the highest birthrate in the country at 21.2 live births per 1,000 population, 50 percent higher than the national average of 14.0 live births per 1,000. Utah also has the youngest population in the country with the median age of 27.1, compared to the national median age of 36.7. Utah has 483 school-age children for every 1000 adults in the labor force, compared with the national average of 402. This means that Utah's labor force must support a student population 20% larger than the national average (Utah Education Brief, 2009).

Despite low levels of funding, Utah's students have historically achieved above average results on national tests. This also can be explained demographically. Until recently, was largely a homogeneous state. As the state diversified, meeting the needs of all students increased in complexity. A current look at national test scores shows that when state level test score data are disaggregated, Utah Hispanic students perform lower than the national average for Hispanic students. (Utah Foundation Brief, 2009) As the diversity of students in Utah continues to increase, there will be an increased scrutiny on the equity of Utah's disaggregated educational outcomes and the state's funding allocation system's ability to address the differentiated needs of its student population.

Basic Support Program

The constitution of Utah states *“the legislature shall provide for the establishment and maintenance of a uniform system of public schools, which shall be open to all*

children of the State, and free from sectarian control (retrieved:

www.schools.utah.gov/law).” Utah is one of five states that have not had a court challenge to its state funding formula.

In an effort to provide for a uniform system of public schools, the state has a two tier funding formula; a foundation program based on weighted pupil units (WPU) plus a guaranteed yield program that allows for both voted local leeway and local school board leeway. The voted leeway program is authorized to cover a portion of the costs within the general fund of the state-supported minimum school program in a district. The board leeway is to cover a portion of the costs within the school district general fund of the state-supported minimum school program. Each school district participates in the basic school program at the local level by levying a tax rate, called the basic tax rate. For the 2008-09 school year, the tax rate was .001515.

The money generated from state income tax creates a fund for the state’s foundation grant. The foundation grant is to ensure that all Utah students in the state receives a minimum school program. Each district receives this allotted grant amount which is known as the weighted pupil unit or WPU based on student enrollment. These dollars are intended to provide the basic services necessary for schooling, such as, teachers, materials, supplies, etc. Pupil count is based on average daily membership (ADM).

The value of the weighted pupil unit (WPU) in fiscal year 2009 was \$2,577. Of the 41 districts, 2 to 4 each year raise a greater local share than is required for the minimum program. The surplus is recaptured and becomes a part of the state *Uniform School Fund*.

The voted local leeway allows districts to raise addition levy of up to .002 tax rate for any general fund use. The state guarantees up to .0016 of that tax rate yield. Those districts that yield above the guarantee formula keep the funds—there is no recapture. District boards of education may also levy up to .004 tax rate for board leeway. This money is restricted for class size reduction. The sum of the voted leeway and the board leeway must not exceed .002 tax rate.

The minimum school program (MSP) is the primary funding source for school districts in Utah. This is Utah’s basic foundation support program. The MSP represents approximately 69.5 percent of total district expenditures. The balance includes 8.7 percent federal funds, and the 21.8 percent local and other state distributions. The minimum school funds are distributed according to formulas provided by State law.

Funding for Utah’s basic support program is identified in Utah’s Minimum School Program. This program is composed of four sets of services: 1) K-12 Instruction; 2) Necessarily existent Small Schools; 3) Professional Staff; and 4) Administrative Costs. These four sets of services combine to support the general operational functions of the state schooling system.

As part of the minimum school program, there are two categorical areas where additional funds are given to help support a “uniform” education. These categories are district based components and pupil based components. Below is a summary of the categories comprising these two components (Verstegen & Jordan, 2009)

District Based Components

Necessarily Existent Small Schools

To assist small schools located in remote areas of the state and are expensive to operate, there are additional funds given to necessarily existent small schools. In the overall formula for the state this can give a sum total addition of 7,649 additional WPU's to be shared statewide by small schools. Schools are considered to be small schools when average daily membership is below 160 in elementary schools. If average daily membership drops below 300 for two year secondary schools, below 450 for three year secondary schools, or below 550 for four-year secondary schools, they are considered small schools. (R277-445 of State Code) Schools receive an additional funding weight of 0.55 per average daily membership in necessarily existent small schools.

Declining Enrollment or Growth

The basic school program is funded based on prior year average daily membership (as of the end of the school year reported on July 15) plus growth (as of the October 1 count). If there is decline in enrollment, there is no negative growth charged to the school district. This allows one year for districts to reduce personnel or other resources.

Capital Outlay and Debts Services

The Utah School Bond Guarantee act established the full faith and credit of the State of Utah behind every obligation bond issued by Utah school districts. The state also provides to school districts for the Capital Outlay Foundation Program and the Capital Outlay Enrollment Growth Program with one-time funds.

Transportation

State aid for to-and-from school transportation is calculated and distributed to school districts based on an allowance for mileage, time, equipment and administration. The state funds nearly 70% of the total pupil transportation costs. School districts may levy up to .0003 tax rate to fund the costs of new buses, field trips, athletic events and hazardous bus routes.

Student Based Components

Student based components used to establish a “uniform” education include the area of special accelerated learning programs,, at-risk services, quality teaching block grants, local discretionary block grants, and special education services. Many of these programs are based on one time money allotted by the state minimum school program.

Accelerated Learning Program

Advanced Placement is to allow students to take college level courses while in high school and thereby to obtain college credit by passing end of year. An allotted amount of money is given to each school based on exams passed the previous year.

Concurrent Enrollment is designated to allow students to earn high school and college credit at the same time. Each high school receives a proportional share of district concurrent enrollment money allocated to the district based on the hours of concurrent enrollment course work successfully completed by students on the high school campus as compared to the state total of completed concurrent enrollment hours.

Gifted and Talented is to implement programs beneficial to students who function academically above their normal grade level. This money is proportional to sum of current year WPU's.

At-risk Programs

Homeless and disadvantaged minority money is provided proportional to prior year number of homeless students and one half of the prior year number of ethnic minority students who are eligible for free or reduced school lunch.

Mesa program is to encourage ethnic minority and female students to pursue training and employment in math, engineering, or science by allowing them an enriched curriculum in high school. This funding is done 100% through the grant writing process.

Regular programs for at risk students are intended to close the achievement gap between demographic subgroups. This money is calculated to the mean of the share of current year grades 1-12 WPU's plus small school WPU's and the share of students eligible for free or reduced price school meals, with a guaranteed minimum of \$18,600.

Youth in custody is provide money for students in state custody. Districts apply for the money and applications are reviewed by the Utah coordinating council for youth in custody. The council then makes recommendations to the USOE, identifying each acceptable application.

Highly impacted schools Determined every three years by the school's position within a ranked list of all schools which apply for funding. Schools are ranked according to their number of highly impacted students. Highly impacted students include those receiving free or reduced meals, ethnic minority students, English language learners, mobile students, and students from single parent homes. The 54 most highly impacted schools receive funds of \$30,000 base plus remaining proportional to formula students.

Intervention for student success block grant is intended to improve the academic performance of students who do not meet performance standards as determined by

UPASS test results. Formula for money allotted is 77% according to the same formula used in the local discretionary block grant, and 23% according to the number of English language learners.

Local Discretionary Block Grant

During the 2001 General Session the Legislature consolidated twenty five categorical programs within the Minimum School Program. The Local Discretionary Block Grant Program was created from this consolidation, providing revenue to allow the local school districts to meet locally determined needs. Four previous categorical programs include the Un-restricted Local Program, Education Technology Initiative, Character Education, and School Nurses. Upon consolidation into the Local Discretionary Block Grant, individual program identities and allocation formulas associated with the categorical programs were eliminated.

Consolidation removed former distribution methods and a new distribution formula is based on Regular Basic Program WPUs. The Local Discretionary Block Grant distribution formula requires that 8 percent of the total appropriation be distributed equally among all school districts.

Quality Teaching Block Grant

This is intended to implement comprehensive long term professional development plans in both schools and school districts. This money is proportional to prior year regular basic program WPU's (70%) and prior year licensed teacher FTE (30%). This money cannot be used to hire additional staff, to maintain current staffing levels, or to cover administrative costs.

Special Education Services

Special education add on money is designated to provide educational services for students with disabilities as required by federal law. Weighted growth is calculated by multiplying special education ADM from two years prior by the percentage difference between special education ADM two years prior and special education ADM for the year prior to that. Growth is multiplied by a factor of 1.53. This weight is intended to account for the additional cost of educating a special education student.

Extra special education services are provided for students who need extended year services, are self contained, or have extensive needs costing the district more than \$15,000.

Other Sources of Funds

State aid is provided by income, which is earmarked for the schools established by the legislature. Other sources of funds include school land income, corporation franchise tax, mineral production, and other resources. Revenue from the general fund can be transferred in which state sales tax can become a source of revenue.

Summary

Education has long been seen as critical to the overall success of our nation and its overall building of human capital. Education is also critical to building the human capital of each individual. It is widely regarded that citizens and participants in the society of the United States require a minimum level of education to promote the democracy and economy in which they reside. The intent of the Constitution of the United States was to leave the provision of education to the states, yet each state funds education in a unique way. Through the years the concept of equity in education funding

has been of great concern and debate. Researchers have addressed the concern for an equitable distribution of education resources since the early 1920's. Early litigation focused on equitable distribution based on the United States Constitution. As courts have determined the responsibility of education to be held by states, education funding litigation has largely challenged state constitutions. Litigation has also seen a shift from a focus on fiscal neutrality to measures associated more with vertical equity or adequacy. The State Supreme Court decisions have been almost evenly split for and against claims of inequity.

Studies of school finance equity have commonly followed a framework established by Berne & Stiefel (1984). This framework outlines research statistical measures that address the finance concepts of horizontal equity, fiscal neutrality, and vertical equity. This framework is applicable to the study of equity in Utah. Utah has many unique demographic challenges when it comes to financing public education. These unique challenges have contributed to Utah having less money designated per pupil than any other state in the nation. The constitution of Utah states “*the legislature shall provide for the establishment and maintenance of a uniform system of public schools, which shall be open to all children of the State, and free from sectarian control.*” The history of school finance in Utah covers many eras and adjustments to its funding of public schools. Many of these adjustments have been aimed at creating equitable distribution of resources to the pupils of the state. Currently, in an effort to provide for a uniform system of public schools, Utah's minimum school program has a two tier funding formula; a

foundation program based on weighted pupil units (WPU) plus a guaranteed yield program. This plan is one of only five state funding systems that have not seen litigation challenging the equitable distribution of resources.

CHAPTER 3

METHODOLOGY

Introduction

Utah's system for financing education presents unique challenges. In 2009, Utah had less funding per pupil than any other state at \$6,095 per pupil (NEA Rankings, 2010). There are several factors which create such low funds per pupil. Utah has the highest birthrate in the country, which is 50% higher than the country as a whole. Utah has the youngest population in the country with a median age of 27.1. Utah also has 483 school age children for every 1000 adults in the labor force, compared with the national average of 402, which means Utah's labor force must support a student population that is 20% larger than the national average (NEA Rankings, 2009).

At the same time Utah's students have historically achieved above average results on national tests (NCES, 2008). Once again this can be attributed to demographics. Utah is a fairly homogeneous state. However, when test scores are disaggregated, Utah Hispanic students perform lower than the U.S. average for Hispanic students. Also, Utah's Asian and American Indian students score lower than the average of their U.S. counterparts (NCES, 2009).

The unique funding challenges and the below average assessment scores for ethnic minorities in the state put a spotlight on fairly distributing funds to pupils in the state of Utah. Over time, states have taken multiple approaches in an effort to fairly distribute funds to school districts. These approaches have included equalizing grants, reward for effort, and several adaptations of foundation programs. Debate continues as to which of these approaches is the most equitable and fair for all students (Brimley &

Garfield, 2008). The concept of equity in distributing education funds has evolved over the past half century, which has allowed an established methodological for the analysis of how equitable the distributions of resources are (Oden & Picus, 2004). That framework was developed by Robert Berne and Leanna Stiefel (1984). The methodological framework they developed as outlined in Chapter 1 was utilized in this study.

Purpose of the Study

The purpose of the study was to conduct an analysis of the equity of the Utah state funding allocation system for K-12 education including a trend analysis for the decade 2000-2009. Generally accepted statistical procedures were used to determine the extent of equity of the current funding allocation system in its distribution of funds to the 40 school districts of the state of Utah.

Research Questions

The research questions for this study which addressed generally accepted research procedures for determining equity were:

1. To what extent does the existing state funding allocation system meet the standard for horizontal equity for each of the years of the study?
2. To what extent does the existing funding allocation system meet the standards for fiscal neutrality for each of the years of the study?
3. To what extent does the existing state funding allocation system take into account the differentiated costs required to meet vertical equity needs for the year 2009?
4. What changes have been made in the distribution of revenues over the past decade relative to each of the standards of equity?

Methodology

This was a rationalistic study using a correlational design (Creswell, 2008) employing both univariate and bivariate statistics, as well as simulation analyses. This study explored the equitable distribution of resources for the 40 school districts in the state of Utah.

Population and Data Sources

The subjects of this study included the pupils within the 40 school districts of the state of Utah. The data, reported by the Utah Department of Education, that was used in the study included; weighted pupil enrollment, property tax and non-property tax revenues, total net current expenditures, and per-pupil expenditures of each school district. These data are compiled annually by the Utah State Department of Education. In an effort to adjust for the size differences among the 40 school districts in Utah, students were the unit of analysis.

Research Procedures

Measures of equity were organized around Berne and Stiefel's three principles of equity; horizontal equity, fiscal neutrality, and vertical equity based on their methodological framework (Berne and Stiefel, 1984). These principles were discussed in detail in chapter one and the following goes into further detail of the measurements to be used with each principle.

Horizontal Equity

For the purpose of this study the primary focus in determining horizontal equity was the distribution of resources by pupil within the state. The univariate dispersal measures used for measuring horizontal equity were: Range, Restricted Range, Federal

Range Ratio, Coefficient of Variation, McLoone index, Verstegen Index, Gini Coefficient, and the calculation of an angle of inequity. Each dispersion measure characterizes the differences in available resources across students or districts in a state and can be calculated using either districts or pupil units of analysis (Berne & Stiefel, 1984). For the purpose of this study, the pupil was the unit of analysis. Finance data included state and local revenues and per pupil expenditure. Transportation funding was excluded from the analysis.

The following is a detailed description of each measure. Notations for the statistical formulas are defined as follows:

P_i = number of pupils in a given district, i

N = number of districts

X_i = average equity object per pupil in a district i

$\overline{X_p}$ = pupil weighted mean equity object per pupil for all pupils in the state

M_p = median equity object per pupil for all pupils in the state

$X_i (P_{95})$ = equity object per pupil at 95th percentile

$X_i (P_5)$ = equity object per pupil at 5th percentile

W = per pupil wealth

\overline{W} = mean per pupil wealth

1. Range = (*High-Low*) Range statistics compare differences between high and low per pupil expenditure. The larger the range the larger the existing inequity. This measure of horizontal equity is limited in its scope, as it only takes into account the highest and lowest per pupil expenditure (Berne & Stiefel, 1984).

$$\text{Range} = X_i(\text{Max}) - X_i(\text{Min})$$

2. Restricted Range=(*High-Low*) The absolute difference between the per pupil expenditure at the fifth percentile and the per pupil expenditure at the ninety fifth percentile as the pupils/districts are arranged in ascending order. This removes the distorted affects of extremely high and extremely low spending districts (Berne and Stiefel,1984) .

$$\text{Restricted Range} = X_i(P_{95}) - X_i(P_5)$$

3. Federal Range Ratio=(*95th percentile-5th percentile*)/ *5th percentile* The Federal Range Ratio is a ratio where the top and bottom 5% of the distribution have been removed. The outcome statistic ranges from 0 to any positive number, with the federal standard being .20. The federal range ratio is a measure used by the U.S. government that sets a standard for states to be able to discount impact aide. Thus, in order to meet the federal standard, pupils at the 95th percentile of per-pupil expenditures must not receive a per-pupil expenditure greater than 120% of those pupils at the 5th percent. (Berne & Stiefel, 1984)).

$$\text{Federal Range Ratio} = \frac{X_i(P_{95}) - X_i(P_5)}{X_i(P_5)}$$

4. Coefficient of Variation= *Standard Deviation/Mean* The Coefficient of Variation is a ratio, allowing for comparisons. The coefficient of variation is based on the standard deviation of per pupil expenditure divided by the mean per pupil expenditure. The value of the coefficient of variation ranges from zero to 1.0. The lower the coefficient the more equitable the state. A score of .1 or less is the recognized research standard for equity. Thus, to meet the standard the variation of per pupil expenditures should not exceed 10% of the mean per pupil

expenditure (Berne & Stiefel, 1984).

$$\text{Variation} = \frac{(\bar{X} - X)^2}{N} = \text{VAR}$$

$$\text{Coefficient of Variation} = \sqrt{\text{VAR}} / \bar{X}_p$$

5. McCloone Index= The McCloone Index is unique to school finance and differs from other school finance measures in that it focuses on the distribution of resources only in the lower half of the districts. The McCloone index is calculated by determining the median pupil with respect to per pupil expenditure. It is a ratio of the sum of the per-pupil expenditures for pupils below the median to the amount that would exist if each pupil below the median were at the median per-pupil expenditure. This will create a ratio from zero to 1.0. The closer the score is to 1.0 the greater the equity with a .95 or higher considered the standard. To meet this standard the average of the sum of per pupil expenditures for pupils in the lower half of the distribution must be 95% of the median of all district per pupil expenditures. The McCloone index indicates how a state allocates the distribution of resources to the poorer or lower half of the distribution of pupils (Berne and Stiefel, 1984).

$$\text{McLoone Index} = \left(\sum_{i=1}^J P_i X_i \right) / \left(M_p \sum_{i=1}^J P_i \right)$$

6. Verstegen Index= The Verstegen index is a ratio of the sum of the per-pupil expenditures for pupils above the median to the amount that would exist if each pupil above the median were at the median per-pupil expenditure. This index is a statistical measure used for determining how pupils in the upper half of the

distribution are funded relative to the median per pupil funding in the state. The closer the calculation is to 1.0, the greater the equity of the top half of the distribution. An acceptable standard for the Verstegen Index would be 1.05 if one uses the same rationale as that used for the McLoone standard. Since this is a relatively new equity measure in the research literature, no research standard has been established (Bennett, 2004). For the purpose of this study the standard used in the Bennett study (2004) of 1.05 will be used. Thus, to meet the standard the average of the sum of per pupil expenditures for pupils in the upper half of the distribution cannot exceed 105% of the median of all per pupil expenditures.

$$\text{Verstegen Index} = \left(\sum_{i=k}^N P_i X_i \right) / \left(M_p \sum_{i=k}^J P_i \right)$$

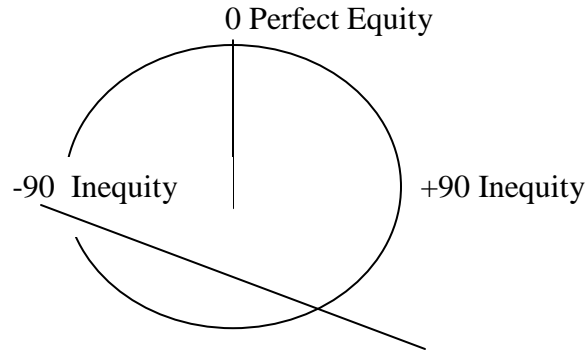
7. Angle of Inequity— The angle of inequity is determined by utilizing the McLoone Index and the Verstegen Index. The findings of these two measures are compared through a graphical representation. The purpose of this calculation is to illustrate the Degrees of Disparity between the lower half of the distribution and the upper half of the distribution. The formula is as follows:

$$\left[90 * \left(1 - \frac{\sum_{i=1}^J X_i P_i}{M_p * \sum_{i=1}^J P_i} \right) \right] + \left[90 * \left(\frac{\sum_{i=k}^N X_i P_i}{M_p * \sum_{i=k}^N P_i} - 1 \right) \right]$$

Zero degrees results in perfect equity and 90 degrees is complete inequity. Any measure less than 0 degrees results in an inequitable distribution to the lower half of the distribution. Any measure above 0 degrees indicates an inequity skewed to the upper half of the distribution. Figure 1.0 below is the angle of inequity plot

(Bennett, 2004).

Figure 1.0: Angle of Inequity Plot



8. Gini Coefficient= A Gini Coefficient is the measure used most often for the study of income inequality (Oden & Picus, 2000). The Gini Coefficient presumes a condition of perfect equity where each 1% of the individuals receive 1% of the funding. The Gini Coefficient scores range from zero to 1.0. A score of zero indicates maximum equity. In other words, the first 1 percent of the individuals should have 1 % of the funding, the first 2 percent should have 2 percent of the funding and so on. The standard for equity using the Gini Coefficient is .05. In other words at any point on the distribution there should not be a difference of more than 5% between percent of the individuals and the percent of the funding being received (Berne and Stiefel, 2004).

$$\text{Gini Coefficient} = \left(\sum_{i=1}^N \sum_{j=1}^N P_i P_j (X_i - X_j) \right) / \left(2 \left(\sum_{i=1}^N P_i \right)^2 \overline{X_p} \right)$$

Fiscal Neutrality

Fiscal neutrality for pupils in a state focuses on an individual state's ability to maintain a level of neutrality relative to a district's local wealth when distributing resources throughout the state. Fiscal Neutrality is the relationship between per-pupil unit

revenues, or expenditures, and per-pupil district wealth (Bern & Stiefel, 1984). Notations for the statistical formulas for fiscal neutrality are as follows:

P_i = number of pupils in a given district, i

N = number of districts

X_i = average equity object per pupil in a district i

\bar{X} = mean per pupil expenditure for all pupils in the state

W = per pupil wealth

\bar{W} = mean per pupil wealth

σ_x = standard deviation of the per pupil expenditure

σ_w = standard deviation of the per pupil wealth

1. Pearson Correlation Coefficient: The Pearson Correlation Coefficient

measures the degree to which a linear relationship exists between two variables; coefficients range from -1.0 to $+1.0$. In this case the variables are per pupil expenditures (PPE) and per pupil local wealth (PPW). If a state is fiscally neutral then there should be little or no positive correlation between PPE and PPW.

$$\frac{\sum_{i=1}^N P_i (X_i - \bar{X})(W_i - \bar{W})}{\sqrt{\sum_{i=1}^N P_i (X_i - \bar{X})^2} \sqrt{\sum_{i=1}^N P_i (W_i - \bar{W})^2}}$$

2. Elasticity measures the magnitude of the relationship in terms of the size of change in the dependent variable (per pupil expenditures) associated with one unit of change in the independent variable (per pupil local wealth). Elasticity of “0” indicates equity, and inequity increases as the elasticity increases (Berne &

Stiefel, 1984). For example, an elasticity statistic of 1.0 between per-pupil expenditure and per pupil local revenue indicates that spending increases, in percentage terms, at the same rate as local wealth.

In other words if per pupil local revenues go up 1.0 percent the per pupil expenditure should also go up 1.0 percent.

$$\text{Elasticity} = (b) \text{ (SIM CORR)} \left(\frac{\sigma_X}{\sigma_W} \right) \left(\frac{\overline{W}}{\overline{X}} \right)$$

(b) = The slope from the simple regression with per-pupil dollar inputs as the dependent variable and per-pupil local wealth as the independent variable.

$$\text{Slope} = \frac{\sum_{i=1}^N P_i (X_i - \bar{X})(W_i - \bar{W})}{\sum_{i=1}^N P_i (W_i - \bar{W})^2}$$

3. Coefficient of Determination (r^2) is the proportion of the variance, explained in this study, by the independent variable (per pupil local assessed property value as a means of wealth). In other words in an equitable system variation in PPE should not be able to be explained by the wealth of the district.

$$\text{Coefficient of Determination} = (\text{SIMCORR})^2$$

Vertical Equity

For the purpose of this study, vertical equity was ascertained by the effect of using weights from the extant literature to determine the difference between the current weights and the recommended weights from the research literature for the academic year 2008-09. One premise of vertical equity specifies that differently situated children should be

treated differently (Berne & Stiefel, 1984; Odden & Picus, 2008; Verstegen, 2008). The determination is usually done by identifying groups of students who differ in their needs for quality or use of inputs to achieve defined levels of outputs (Berne & Stiefel, 1999). Inputs are adjusted for the costs of educating various groups of children to indicate the amount of additional resources needed to bring some students to given levels of outputs (Berne & Stiefel, 1999). Three groups of students have been identified in the existing literature as requiring additional inputs to achieve comparable outputs of regular education students (Verstegen, 2008). These groups were used to determine vertical equity: (1) special education students, (2) low income students, and (3) English Language Learners. Vertical equity was incorporated into the analysis by weighting students according to research-based excess cost differentials associated with their special needs and then weighting all measures by weighted students (Verstegen & Driscoll, 2009). To utilize weighted distribution measures, pupils in traditionally underachieving groups received a weight greater than one as compared to pupils that were not in a special group. (Verstegen & Driscoll, 2009). Once the simulation formula was completed, a comparison was made of the differential impact of the weighted formula with the original formula. The following weights taken from the extant literature were used.

Special Education

Research on the excess cost of educating children with special education needs conducted by Verstegen and Driscoll (2009), indicated an additional 90% or .9 (total weight of 1.9) is required above the funding to educate the typical regular education pupil. A weight of 1.9 was created by examining the findings of the Special Education Expenditure Project (Chambers and Parish, 2004).

For the purpose of this study, the number of special education students was identified through state reports for each of the 40 school districts. Each of these students was given a weight of .9 above the funding required to educate the typical regular education student with no special needs in Utah in the study's simulations.

Low Income

The most commonly accepted method of determining the incidence of children with greater educational needs as a result of low income is participation in the National School Lunch Program (Alexander and Wall, 2006). Deborah Verstegen (2008) conducted a synthesis of the research on weighting measures as it pertains to low income students. Alexander and Wall's (2006) findings were used in her analysis. Alexander and Wall analyzed experts' weights such as those of Reschovsky and Imazeki (1997), Rothstein and Allgood (2001), Augenblick and Meyers (2002), and Duncombe et al. (2003). Verstegen found excess costs for low-income students varied from an additional 25% to 250% depending on the state or study conducted. From her analysis, Verstegen extrapolated a modest estimate weight of 50% or .5 (total weight of 1.5) for low income students.

For the purpose of this study, low income students were identified using statistics from the National School Lunch Program to determine the number of low income students in each of the 40 school districts in the state of Utah. Each of these students was given an additional weight of .5 above the funding required to educate the typical regular education pupil not in poverty in the study's simulation.

English Language Learners

In 2008, Verstegen conducted a synthesis of the research as it applies to weights for English Language Learners. Verstegen employed a modest estimated weight for English language learners of 50% or .5 (total weight of 1.5). The same weight was applied in this study.

For the purpose of this study, the number of English language learners was identified through state reports for each of the 40 school districts. ELL status is determined by proficiency on two state assessments: the Utah Academic Language Proficiency Assessment (UALPA) and the end of grade level Criterion Reference Test (CRT) for Language Arts. Each qualifying ELL student was given a total weight of .5 above the funding required to educate the typical regular education pupil in the study's simulations.

Ten Year Trend Analysis

Utilizing data reported by the Utah Department of Education, a ten year trend analysis of the equity of the Utah state funding allocation system for K-12 education for the decade 2000-2009 was employed. Data used in this study included weighted pupil enrollment, property tax and non-property tax revenues, total net current expenditures, and per-pupil expenditures for each school district. The trend analysis used a ten year scatter plot for each of the equity measures utilized to conduct both horizontal equity and fiscal neutrality analyses. These analyses were used to determine the changes, if any, over time in the funding system's distribution of moneys to the 40 school districts of the state of Utah.

Summary

The Berne and Stiefel (1984) methodological framework was used as a guide for the equity analysis of the Utah public school funding allocation system. Horizontal equity, fiscal neutrality and vertical equity were addressed. Common univariate and bivariate statistical measures were used. Weighted measures extrapolated from the literature were used in the simulations for the vertical equity analysis.

CHAPTER 4

DATA ANALYSIS AND INTERPRETATION

Introduction

The purpose of this study was to analyze the State of Utah's funding allocation system for K-12 public education. This study used established statistical procedures to determine the extent of equity of the current system in its distribution of funds to the 40 Utah school districts (Berne & Stiefel, 1984, Odden & Picus, 2000). The equity concepts used in this study were horizontal equity, fiscal neutrality, and vertical equity.

The *first section* of this chapter discusses the measures of horizontal equity for the years 2000-2009 total net current expenditures as reported by the Utah Department of Education. For the analysis on horizontal equity, the specific data taken from the Utah Department of Education report included the average daily membership for pupil enrollment and per pupil net current expenditure (per pupil expenditure reported exclusive of transportation, capital, small school, and debt services expenditures). The intents of this analysis were: (1) to compare the 10 years of data to determine if the trend in Utah has been toward a more or less equitable funding allocation system during the past decade for horizontal equity, and (2) analyze the data from 2009 to determine to what extent the current funding formula meets the standard of equity as determined by the statistical measures used for horizontal equity.

The *second section* discusses the measures of fiscal neutrality for the years 2000-2009 total net current expenditures as reported by the Utah Department of Education. For the analysis on fiscal neutrality, specific data taken from the Utah Department of Education report included average daily membership for pupil enrollment, net current

expenditure, and per pupil valuation of property for the 40 school districts. The intents of this analysis were: (1) to compare the 10 years of data to determine if the trend in Utah has been toward a more or less equitable funding allocation system during the past decade as it pertains to fiscal neutrality, and (2) analyze the data from 2009 to determine to what extent the current funding formula meets the standard of equity as determined by the statistical measures utilized for measuring fiscal neutrality.

The *third section* discusses the measures of vertical equity for the year 2009. Data utilized from the Utah Department of Education included average daily membership for pupil enrollment and per pupil net current expenditure. Data also included average daily membership for low income, English language learners, and special education students. Weights from the extant literature were used to run a simulation for comparison with the actual Utah formula for academic year 2009. Inputs were adjusted for the costs of education for low income, English language learners, and special education students to determine the additional resources needed to bring these students to a given level of funding recommended by the research literature. Pupils in the low income group were given an additional 50% or .5 weight, English language learners were given an additional 50% or .5 weight, and special education students were given an additional 90 % or .9 weight as compared to pupils that were not in these groups.

Horizontal Equity Analysis

To measure horizontal equity, the statistical dispersion measures discussed in Chapter 3 were applied using the pupil as the unit of analysis. Both a ten year trend analysis and an analysis of the current horizontal equity for the year 2009 will be

discussed under each statistical measure. A summary table is provided at the conclusion of this section.

Range

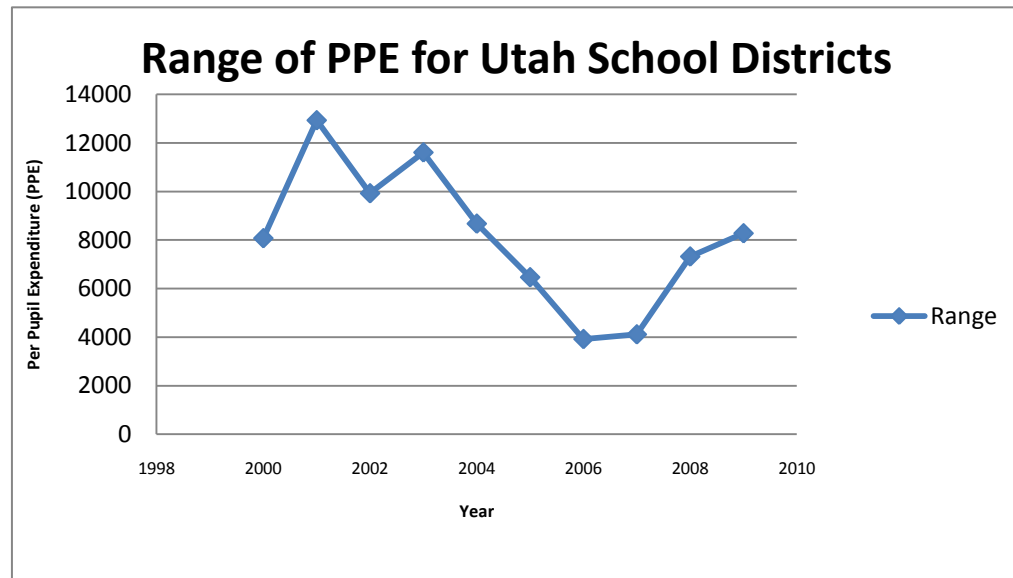
The first equity calculation, the *Range*, measured the differences between the highest and the lowest per-pupil expenditure (PPE) in Utah's 40 school districts. The districts were ranked in ascending order according to the PPE. The ranges for each of the years are in the table below:

Table 4.1: Utah Funding Ranges

Year	Max	Min	Range
2000	11911	3836	8074
2001	15287	3594	12934
2002	13522	3587	9925
2003	15808	4198	11609
2004	12880	4205	8674
2005	11040	4573	6466
2006	8316	4396	3919
2007	8742	4630	4112
2008	12572	5341	7320
2009	13820	5543	8277

The range in the distribution of resources for the three years were; \$8074 for 2000, \$6,466 for 2005, and \$8,277 for 2009. From the year 2000 to 2005, the range of the distribution of resources to the pupils of Utah showed a decrease of 19%. Since 2005 there has been an increase in the range of resources to the pupils of Utah of 21%. The 2009 range indicated a difference of \$8,277 between the highest and lowest net current expenditures per pupil.

Graph 4.1: Utah Funding Ranges



Restricted Range

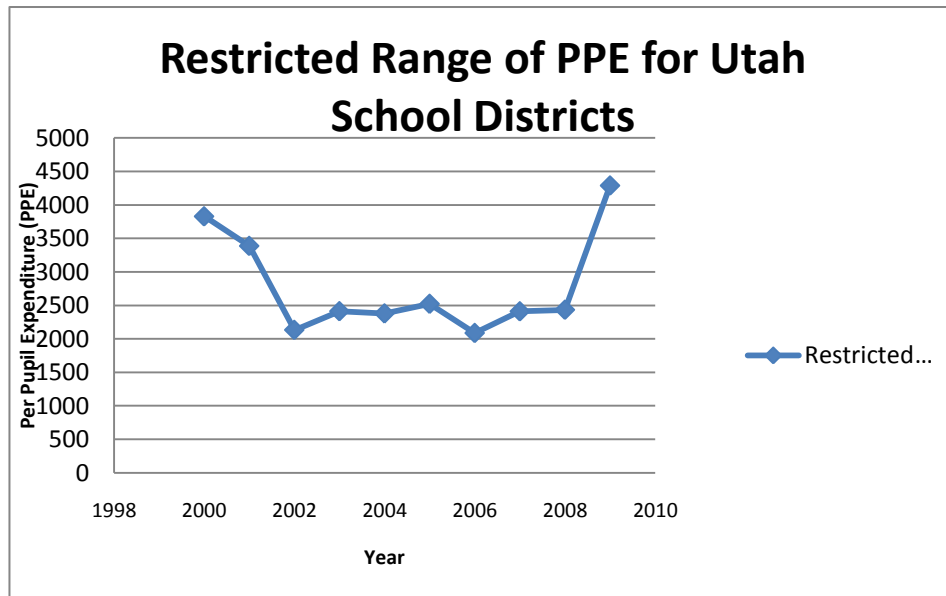
The *Restricted Range* measures the dollar difference between the PPE at the 5th percentile and the PPE at the 95th percentile when district average PPE's are ranked in ascending order.

The *Restricted Range* in the distribution of resources to the pupils for the three years were; \$3,830 for 2000, \$2,522 for 2005, and \$4,291 for 2009. From the year 2000 to 2005, the restricted range of the distribution of resources to the pupils of Utah showed a decrease of 34%. Since 2005 there has been an increase in the range of resources to the pupils of Utah of 70%. The 2009 *restricted range* indicated a difference of \$4,291 in the net current expenditure per pupil at the 5th percentile and the net current expenditure per pupil at the 95th percentile. The restricted ranges were as follows:

Table 4.2: Utah Funding Restricted Ranges

Year	Max	Min	Restricted Range
2000	7717	3887	3830
2001	6355	4223	3388
2002	6732	3344	2132
2003	6611	4199	2412
2004	6583	4205	2378
2005	7095	4573	2522
2006	6638	4552	2086
2007	7041	4630	2410
2008	7784	5341	2433
2009	9834	5543	4291

Graph 4.2: Utah Funding Restricted Ranges



Federal Range Ratio

The *Federal Range Ratio* was determined by dividing the restricted range by the PPE at the 5th percentile. The outcome statistic ranges from 0 to any positive number.

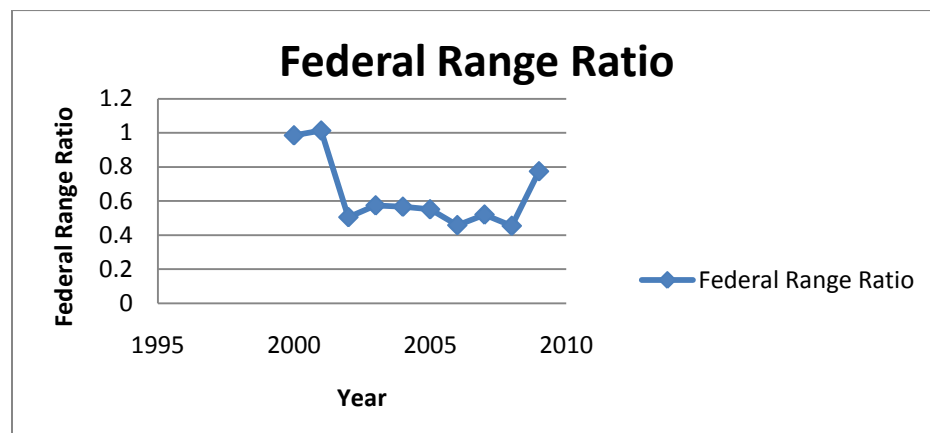
The *Federal Range Ratio Standard* for equity is .20. In order to meet the standard, pupils

at the 95th percentile of PPE must not receive a PPE greater than 120% of those pupils of the 5th percentile. The *Federal Range Ratios* were:

Table 4.3: Utah Funding Federal Range Ratios

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Federal Range Ratio	.985	1.013	.505	.574	.566	.551	.458	.52	.454	.774

Graph 4.3: Utah Funding Federal Range Ratios



Total net current expenditures have never met the *Federal Range Ratio* standard in Utah over the past decade. The *Federal Range Ratios* for the three years were; .985 for 2000, .551 for 2005, and .774 for 2009. The *Federal Range Ratio* decreased by 43% between 2000 and 2005, and saw a 22% increase between 2005 and 2009. The year 2009 had a Federal Range Ratio of .774. In other words, the students at the 95th percentile PPE received 177% of those pupils at the 5th percentile, which does not meet the federal standard for equity.

Coefficient of Variation

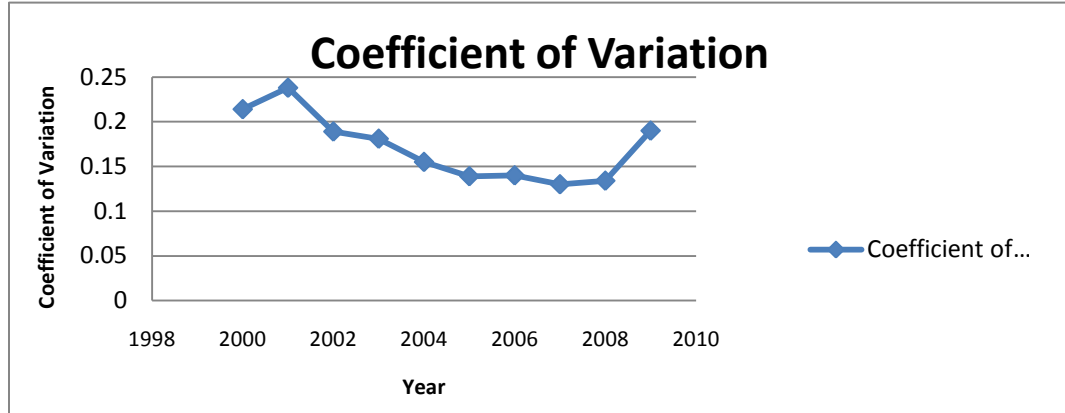
The *Coefficient of Variation* was determined by taking the standard deviation of PPE expenditure divided by the mean PPE. The value of the *Coefficient of Variation* ranges from zero to 1.0. The lower the coefficient the more equitable the state is. A score of .1 or less is the research standard for equity. Thus, to meet the standard, the variation of PPE, should not exceed 10% of the mean PPE. The *Coefficient of Variations* were:

Table 4.4: Utah Funding Coefficient of Variations

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Coefficient of Variation	.214	.238	.189	.181	.155	.139	.14	.13	.134	.19

Total net current expenditures have never met the *Coefficient of Variation* equity standard in Utah over the past decade. The *Coefficient of Variation* for the three years were; .214 for 2000, .139 for 2005, and .19 for 2009. The Coefficient of Variation decreased by 7% between 2000 and 2005, and increased by 5% between 2005 and 2009. In 2009 the Coefficient of Variation was .19. In other words, the variation of PPE was 19% of the mean PPE.

Graph 4.4: Utah Funding Coefficient of Variations



McCloone Index

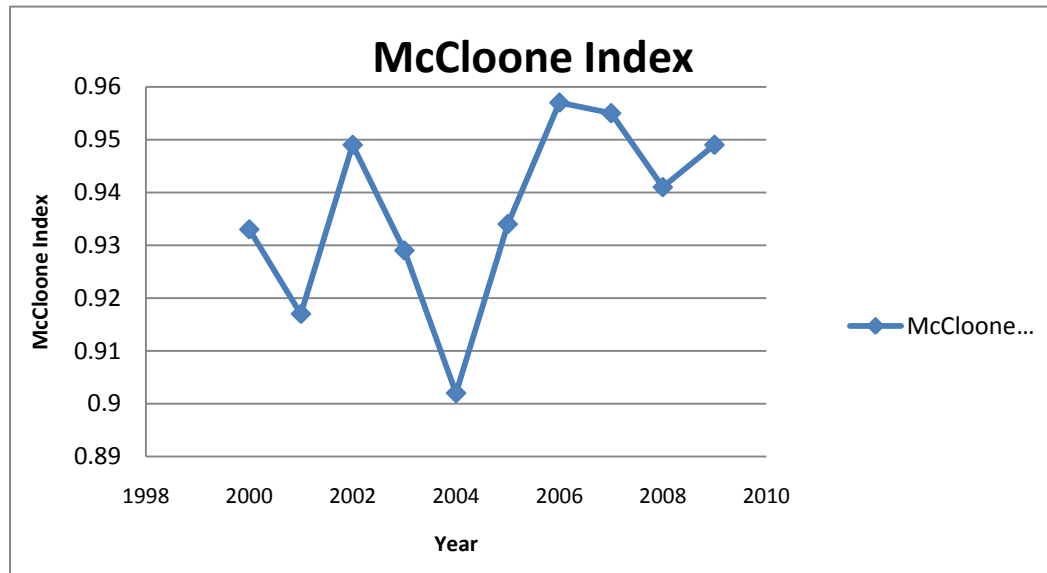
The *McCloone Index* was calculated by finding the median pupil with respect to PPE, then creating a ratio of the sum of the PPE for pupils below the median to the amount that would exist if each pupil below the median were funded at the median PPE. The ratio created ranges from zero to 1.0. The closer the score is to 1.0 the greater the equity. The equity standard for the *McCloone Index* is .95. To meet this standard the average of the sum of PPE for pupils in the lower half of the distribution must be 95% of the median of all districts PPE. The *McCloone Indices* were:

Table 4.5:

Utah Funding McCloone Indices:

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
McCloone Index	.933	.917	.949	.929	.902	.934	.957	.955	.941	.949

Graph 4.5: Utah Funding McCloone Indices:



Considering the total net current expenditure data, Utah's funding had been fairly equitable for the pupils who are below the median. The standard for the *McCloone Index* was only met in 4 of the ten years, and the average of the sum of PPE for the lower half of the distribution was always above 90% of the median of all districts' PPE. The *McCloone Indices* for the three years were; .933 for 2000, .934 for 2005, and .949 for 2009. The standard for the *McCloone Index* was not quite met for 2000 or 2005, but 2009 was one of the four years the standard for the *McCloone Index* was met. In 2009 the average of the sum of PPE for pupils in the lower half of the distribution was 95% of the median of all districts PPE. In other words, the *McCloone Index* demonstrated that Utah treated the lower half of the PPE distribution districts equitably.

Verstegen Index

The *Verstegen Index* is calculated by finding the median pupil with respect to PPE, then creating a ratio of the sum of the PPE for pupils above the median to the

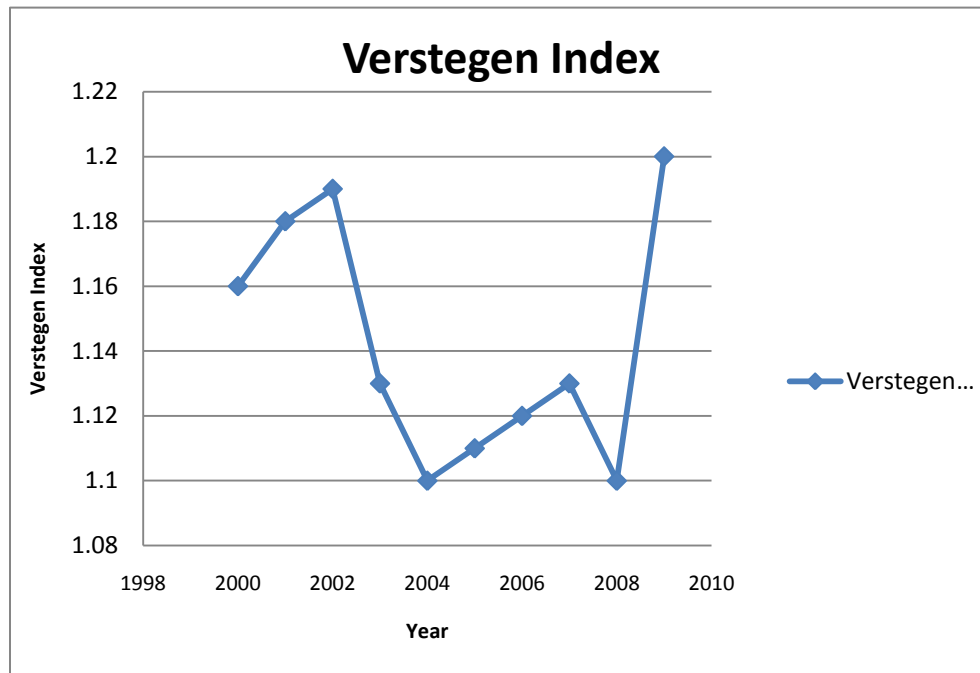
amount that would exist if each pupil above the median were funded at the median PPE. The closer the score is to 1.0 the greater the equity. The *Verstegen Index* is a relatively new equity measure. The 1.05 standard was used in a previous equity study. It is the analog to the *McCloone Index* (Bennett, 2001). For the purpose of this study, the equity standard for the *Verstegen Index* was 1.05. To meet this standard the average of the sum of PPE for pupils in the upper half of the distribution must be 105% of the median of all district PPE. The *Verstegen Indices* were:

Table 4.6: Utah Funding Verstegen Indices

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Verstegen Index	1.16	1.18	1.19	1.13	1.10	1.11	1.12	1.13	1.10	1.20

Total net current expenditures have never met the 1.05 level in Utah over the past decade. The *Verstegen Indices* for the three years were; 1.16 for 2000, 1.11 for 2005, and 1.20 for 2009. In 2009 the *Verstegen Index* showed the least equitable ratio over the past decade at 1.20. In other words, the average of the sum of PPE for pupils in the upper half of the distribution was 120% of the median of all district PPE. Thus, Utah tends to provide additional resources to those districts that were wealthier.

Graph 4.6: Utah Funding Verstegen Indices



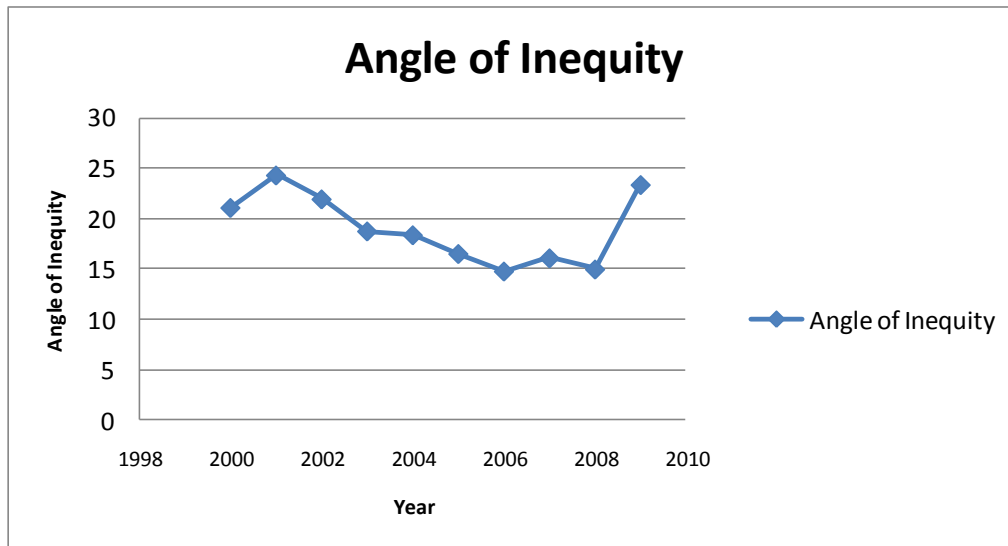
Angle of Inequity

The concept of determining an Angle of Inequity was developed by Verstegen (1996). The angle of inequity uses both the *McLoone Index* and the *Verstegen Index* to determine the dispersal of districts' PPE around the median. The findings of the two measures are compared through a graphical representation to see the disparity between the lower half of the distribution and the upper half of the distribution. Zero degrees is perfect equity and 90 degrees is complete inequity. The *Angles of Inequity* were:

Table 4.7: Utah Funding Angles of Inequity

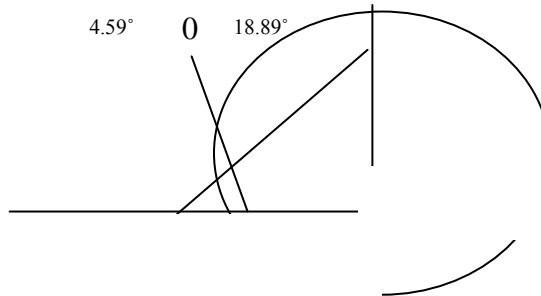
Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Verstegen Index	15.11	16.87	17.39	12.43	9.58	10.62	11.01	12.11	9.75	18.83
McCloone Index	6.00	7.46	4.57	6.35	8.81	5.91	3.78	3.99	5.25	4.55
Angle of Inequity	21.11	24.33	21.96	18.78	18.40	16.54	14.80	16.11	15.00	23.38

Graph 4.7: Utah Funding Angles of Inequity



The total net current expenditure *Angle of Inequity* for 1991 was 21.11 degrees. The Angle of Inequity narrowed in the 2005 data to 16.54 degrees, but widened in the 2009 data to 23.38 degrees. In other words, the allowable angle of inequity for the purpose of this study (9.00 degrees) was not met. The graph below represents the disparity between the McCloone and Verstegen indices for 2009. It is clear from the angle of inequity that Utah was allocating a disproportionate amount of PPE to the wealthier districts in the state.

Graph 4.8: 2009 Angle of Inequity



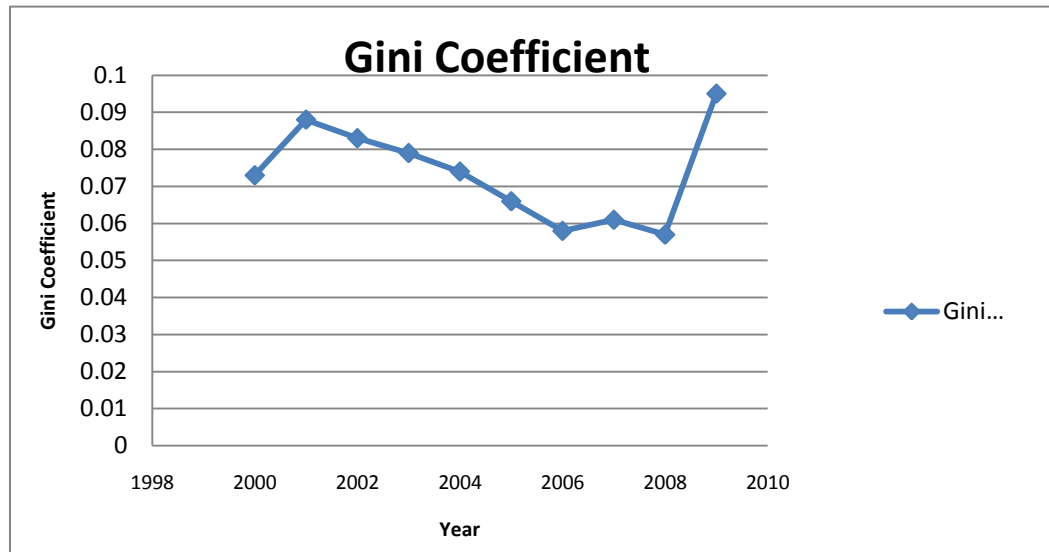
Gini Coefficient

The *Gini Coefficient* was calculated by creating a matrix which allowed for a comparison of each districts average daily membership to the net current expenditure received. The *Gini Coefficient* presumes a condition of perfect equity where each 1% of the individuals receive 1% of the funding. The *Gini Coefficient* scores range from zero to 1.0. A score of zero indicates maximum equity. The standard for equity using the *Gini Coefficient* is .05. In other words, at any point on the distribution there should not be a difference of more than 5% between the percent of the individuals and the percent of the funding being received by those individuals. The *Gini Coefficient* calculations were:

Table 4.8: Utah Funding Gini Coefficients

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Gini Coefficient	.073	.088	.083	.079	.074	.066	.058	.061	.057	.095

Graph 4.9: Utah Funding Gini Coefficients



Considering the total net current expenditure data, Utah's funding has not been equitable when comparing percentage of students to percentage of dollars spent. The standard for equity has never been met over the past decade. The calculations for each of the ten years were close to the standard. The calculations for the three years were; .073 for 2000, .066 for 2005 and .095 for 2009. Utah's *Gini Coefficient* decreased by 0.9% between 2000 and 2005, and then increased by 2.9% between 2005 and 2009. In 2009 Utah was least equitable for the *Gini* with a difference of 9.5% between the percent of the individuals and the percent of the funding being received. In other words, Utah did not meet this equity standard.

Summary

Results demonstrate, Utah's system for funding education has consistently not met the generally accepted standards, espoused by Odden, in the extant literature, for horizontal equity. The Federal Range Ratio, Coefficient of Variation, Verstegen Index,

and Gini Coefficient were determined to be outside of the common standards of equity. The Angle of Inequity showed a disparity indicating that pupils in the upper half of the distribution were receiving a disproportionate amount of state resources. The Range has been on the rise since 2006, and the 2009 Restricted Range is at a 10 year high. The one area where the standard of equity was met was the McCloone Index. This would indicate that Utah's funding formula treats students in the lower half of the distribution equitable relative to the per pupil expenditure at the median.

Fiscal Neutrality Analysis

To determine if there is a relationship between the per-pupil expenditures in a funding system and certain wealth-related characteristics, school finance analysts commonly utilize correlation measures. The most commonly used measures to determine if there is a relationship between district wealth and per pupil expenditures are the *Pearson Correlation Coefficient* measures (discussed in Chapter 3).

For the analysis on fiscal neutrality, data included the average daily membership for pupil enrollment, per pupil net current expenditure (per pupil expenditure reported exclusive of transportation, capital, small school, and debt services expenditures), and assessed property value per pupil. The intent of these analyses were: (1) to compare the 10 years of data to determine if the trend in Utah has been toward a more or less equitable funding allocation system during the past decade for fiscal neutrality, and (2) to analyze the data from 2009 to determine to what extent the current funding formula meets the standard of equity for measuring fiscal neutrality. The two analyses are reported together under each statistical measure. A summary table is provided at the conclusion of this section.

Pearson Correlation Coefficient

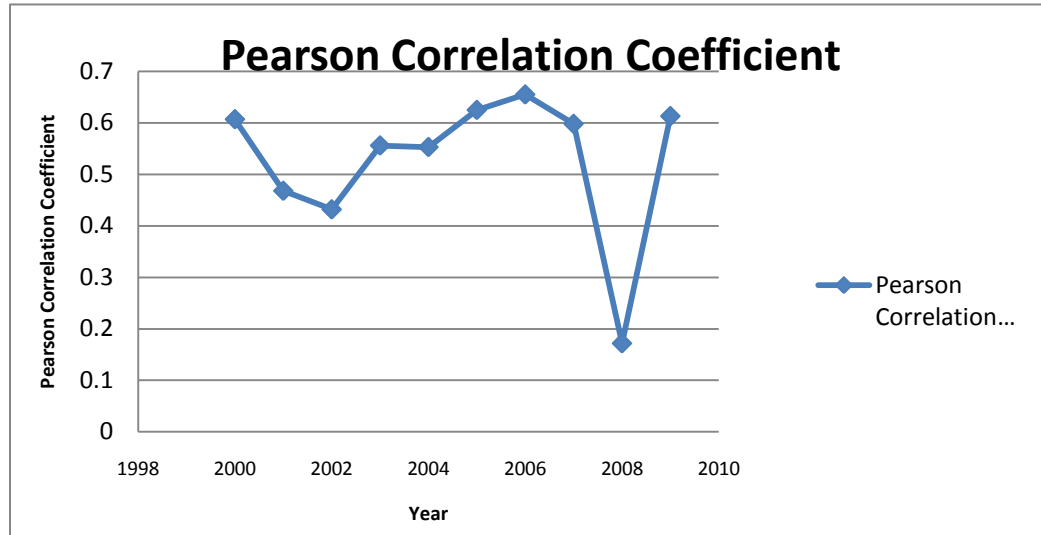
The *Pearson Correlation Coefficient* measures the degree to which a linear relationship exists between two variables. The correlation coefficient ranges from -1.0 to +1.0. A coefficient of "0" indicates perfect equity, or no relationship exists between PPE and PPW. A correlation of 1.0 indicates the most inequitable relationship. A negative correlation indicates an inverse relationship between the PPW and PPE, or the wealthier the school district the less money it receives from the state. When it comes to school finance policy a negative correlation would be a positive finding, since an equalization formula attempts to establish an inverse relationship between PPE and PPW. The *Pearson Correlation Coefficients*, which utilized data of the total net current expenditures per pupil and assessed property value per pupil were:

Table 4.9: Utah Funding Pearson Correlation Coefficients

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Pearson Correlation Coefficient	.607	.468	.432	.556	.553	.625	.655	.598	.172	.613

Utah's funding formula created a positive correlation in each of the years for the past decade. This showed a strong correlation between per pupil wealth and the amount of money spent per pupil. The higher the per pupil wealth the more money provided per pupil. The Pearson Correlation Coefficients for the three years were; .607 for 2000, .625 for 2005, and .613 for 2009. 2009 saw a correlation of .613. In other words, there was a strong correlation between PPW and PPE, or the wealthier the school district the more money it received from the state.

Graph 4.10: Utah Funding Pearson Correlation Coefficients



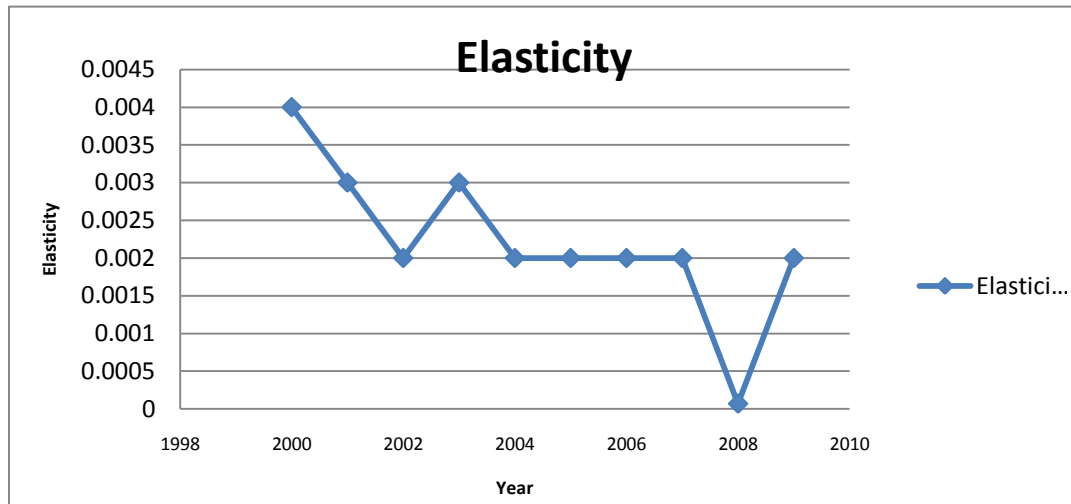
Elasticity

Elasticity measures the magnitude of the relationship in terms of the size of change in the dependent variable (PPE) associated with one unit of change in the independent variable (PPW). It denotes what percent increase/decrease in expenditures exists for a 1% increase in wealth. For example, an elasticity statistic of 1.0 between PPE and PPW indicates that spending increases, in percentage terms, at the same rate as property wealth. The elasticity measures, which utilized data of the total net current expenditures per pupil and assessed property value per pupil were:

Table 4.10: Utah Funding Elasticity

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Elasticity	.004	.003	.002	.003	.002	.002	.002	.002	.00007	.002

Graph 4.11: Utah Funding Elasticity



Utah's funding formula created a small magnitude of difference between the percentage increase in per pupil wealth and percentage increase in the net current expenditure per pupil. *Elasticity* measures were low, with the statistics for the three years being; .004 for 2000, .002 for 2005, and .002 for 2009. In other words, the magnitude of change in PPE associated with one unit change in PPW (.002) was small, but positive.

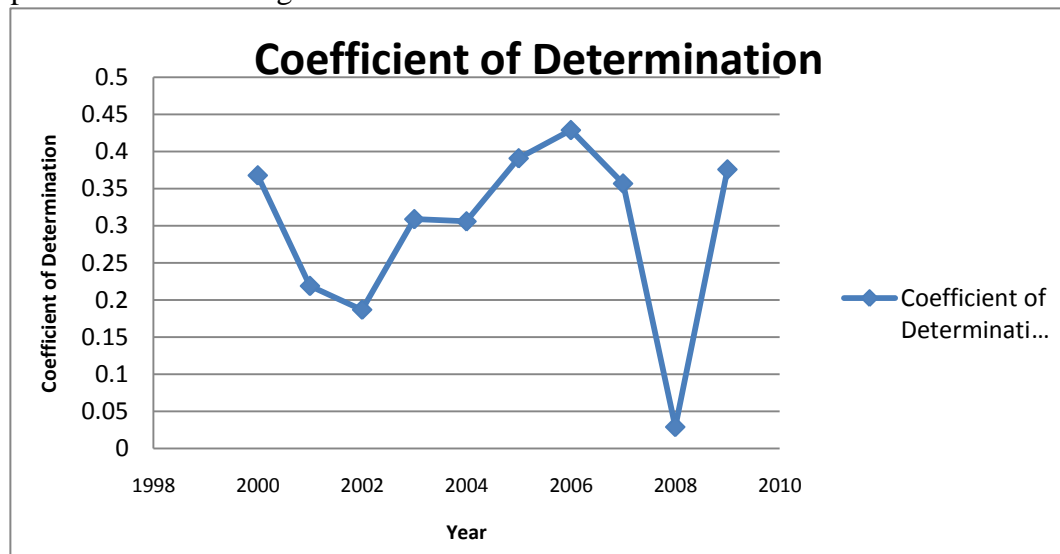
Coefficient of Determination

The *Coefficient of Determination* is the proportion of the variance in PPE that can be explained by wealth. In an equitable system variation in PPE should not be able to be explained by the wealth of a district. This is calculated by squaring the Pearson Correlation Coefficient. The Coefficients of Determination were:

Table 4.11: Utah Funding Coefficients of Determination

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Coefficient of Determination	.368	.219	.187	.309	.306	.391	.429	.357	.029	.376

Graph 4.12: Utah Funding Coefficients of Determination



The Coefficient of Determination statistics showed that the variance in per pupil expenditures can be explained by wealth. *Coefficient of Determination* calculations for the three years were; .368 for 2000, .391 for 2005, and .376 for 2009. There was a .023 increase in variance between 2000 and 2005, and .15 decrease between 2005 and 2009. In 2009 the Coefficient of Determination was .376. In other words, 38% of the variance in PPE could be explained by wealth.

Summary

The state of Utah's education funding formula does not meet the generally accepted standard espoused by Odden in the extant literature for fiscal neutrality.

Correlation measures saw a positive correlation, however the magnitude of the difference was small. The Coefficient of Determination indicated that 38% of the variance in per pupil expenditures could be explained by local per pupil wealth. This means in the state of Utah some pupils, in the context of Alexander's equity framework, were receiving unjust financial benefit and others were subject to unjust deprivation.

Vertical Equity

A premise of vertical equity specifies that differently situated children should be treated differently (Berne & Stiefel, 1984; Odden & Picus, 2008; Verstegen, 2008). The determination is usually done by identifying groups of students who differ in their needs for quality or use of inputs to achieve defined levels of outputs (Berne & Stiefel, 1999).

For the purpose of this study vertical equity was ascertained by using weights from the extant literature for comparison with the actual Utah formula for the academic year 2009. Inputs were adjusted for the costs of educating various groups of children to indicate the amount of additional resources needed to bring some students to given levels of outputs (Berne & Stiefel, 1999). Three groups of students were identified in the existing literature as requiring additional inputs to achieve comparable outputs of regular education students (Verstegen, 2008). The groups used to determine vertical equity were: (1) special education students, (2) low income students, and (3) English Language Learners. Vertical equity was incorporated into the analysis by weighting students according to research-based excess cost differentials associated with their special needs and then weighting all measures by weighted students (Verstegen & Driscoll, 2009). To use weighted distribution measures, pupils in traditionally underachieving groups received a weight greater than one as compared to pupils that were not in a special group.

The weights used in this study were as follows: (1) Special Education Students were given an additional 90% (or an add on weight of .9) funding compared to the traditional non impacted student, (2) English language learners were given an additional 50% (or an add on weight of .5) funding compared to a non impacted student, and (3) low income students were given an additional 50% (or an add on weight of .5) funding compared to a traditional student.

Vertical Equity Analysis

For each group, funding designated for that group in the current Utah funding formula was substituted with the funding designated by the research based weights. A total amount of additional funds needed for each designated group was calculated by district. When estimated weights were calculated into the funding formula for the three groups, an additional \$512,119,147 would need to be added to the Utah funding formula in order to meet the research based standard for vertical equity. Below is a summary table indicating the total amount of additional dollars for each of the groups of this study if the Utah funding formula were to meet the research based standard for vertical equity.

Complete table can be found in appendix 1.

Table 4.12:

	Special Ed.	Language Learners	Low Income	Total Add On
Total	181,481,198	63,204,564	267,433,384	512,119,147

Special Education

For the Special Education vertical equity analysis, funds designated for Special Education students in the current Utah funding formula were calculated, and an additional weight of

.9 or 90% of the funding designated for non special education students was added.

Considering the number of Special Education pupils in the state of Utah that would be given an extra 90% funding, an additional \$181,481,198 would need to be added to the Utah funding formula in order to meet the research based standard for vertical equity as it applies to Special Education pupils. Below is a summary table indicating the total amount of additional dollars needed for Special Education students if the Utah funding formula were to meet the research based standard for vertical equity. Complete table can be found in appendix 2.

Table 4.13

Special Education Add On

	# of Special Education Students	Additional Value at .9 weight	Additional Add-On Special Education
Total	63718	57346.2	181,481,198

English Language Learners

For the English Language Learners vertical equity analysis, funds designated for English Language Learner students in the current Utah funding formula were calculated, and an additional weight of .5 or 50% of the funds designated for non English Language Learner students were added. Considering the number of English Language Learner pupils in the state of Utah that would be given an extra 50% funding, an additional \$63,204,564 would need to added to the Utah funding formula in order to meet the research based standard for vertical equity as it applies to English Language Learners. Below is a summary table indicating the total amount of additional dollars needed for

Language Learner students if the Utah funding formula were to meet the research based standard for vertical equity. Complete table can be found in appendix 3.

Table 4.14

Language Learner Add On

	# of Language Learners	Additional Value at .5 Weight	Additional Add On Language Learners
Total	19,145	9,572.500	63,204,564

Low Income Students

For the Low Income Students vertical equity analysis, funds designated for Low Income students in the current Utah funding formula were calculated, and an additional weight of .5 or 50% of the funds designated for non Low Income pupils were added. Considering the number of Low Income pupils in the state of Utah that would be given an extra 50% funding, an additional \$267,433,384 would need to be added to the Utah funding formula in order to meet the research based standard for vertical equity as it applies to Low Income pupils. . Below is a summary table indicating the total amount of additional dollars needed for Low Income students if the Utah funding formula were to meet the research based standard for vertical equity. Complete table can be found in appendix 4.

The decrease in the level of equity between the original formula for 2009 and the research-based formula, is an indicator that there is not enough revenue in the current funding formula to support the differentiated needs of students according to the research literature.

Table 4.15:

Low Income Add On

	# of Low Income Students	Additional Value at .5 Weight	Additional Add-On
Total	81,007	40503.5	267,433,384

Summary

The results of the vertical equity analysis of Utah's funding allocation system showed a lack of resources for typically disadvantaged students. If Utah were to fund Special Education at the research based weight of .9, or an additional 90%, the state of Utah would need \$181,481,198 in additional funds to equitably fund Special Education students. English Language Learners, if funded at the research based weight of .5, or an additional 50%, would require an additional \$63,204,564 to meet the standard for vertical equity. If low income students were funded at the research based weight of .5, or an additional 50%, and additional \$267,433,384 would be necessary to meet the standard for vertical equity. If the three disadvantage groups incorporated in this study were to be funded at the recommended weights, an additional \$512,119,147 would be needed to equitably support these students.

Final Summary

The analysis reported the statistical results of commonly used equity measures applied to Utah's distribution of funds to the 40 school districts from 2000 through 2009. Results demonstrated. The Federal Range Ratio, Coefficient of Variation, Verstegen Index, and Gini Coefficient were determined to be outside the common standards of equity. The Angle of Inequity showed a wide disparity indicating that pupils in the upper

half of the distribution were receiving a disproportionate amount of state resources. The Range has been on the rise since 2006, and the 2009 Restricted Range is at a 10 year high. The one area where the standard of equity was met was the McCloone Index. This would indicate that Utah's funding formula treated students in the lower half of the distribution equitably.

The state of Utah's education funding formula did not meet the standards for fiscal neutrality. The Coefficient of Determination indicated that 38% of the variance in per pupil expenditures could be explained by local per pupil wealth.

The results of the vertical equity analysis of Utah's funding allocation system showed a lack of resources for typically disadvantaged students. If the three disadvantage groups in this study were to be funded at the recommended weights, an additional \$512,119,147 would be needed to equitably support these students.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND POLICY RECOMMENDATIONS

Introduction

The purpose of this study was to conduct an analysis of the equity of the Utah state funding allocation system for K-12 education including a trend analysis for the decade 2000-2009. Generally accepted statistical procedures were used to determine the extent of equity of the current funding allocation system in its distribution of funds to the 40 school districts of the state of Utah. While there are currently 41 districts in the state of Utah, the Canyons district was added during the 2009-10 school year. For the majority of the years of this study there were only 40 districts, Canyons school district was not included in the study.

The overriding question of this study was to determine whether or not equity of funding public schools had been maintained over the past decade. The principles of equity used were *horizontal equity*, *fiscal neutrality* and *vertical equity*. Generally accepted dispersion measures from the extant literature were used to determine the degree of horizontal equity. Generally accepted relationship measures were used to determine fiscal neutrality. Data used from the Utah Department of Education included average daily membership for pupil enrollment and per pupil net current expenditure. Data also included average daily membership for low income, English language learners, and special education students.

Weights from the extant literature were used to run a simulation for comparison with the actual Utah formula for academic year 2009. Inputs were adjusted for the costs of education for low income, English language learners, and special education students to

determine the additional resources needed to bring these students to a given level of funding recommended by the research literature. Pupils in the low income group were given an additional 50% or .5 weight, English language learners were given an additional 50% or .5 weight, and special education students were given an additional 90 % or .9 weight as compared to pupils that were not in these groups. Weights from the extant literature were used to make a comparison with the actual Utah formula. A comparison was made of the differential impact of the weighted formula to the original formula.

The conceptual framework used to analyze the findings of this study was based on four broad concepts of equity framed by Kern Alexander (2008) As discussed in Chapter 1, these general concepts of equity include: : (1) commutative equity, (2) distributive equity, (3) restitutive equity, and (4) positivism (Alexander, 2008). Alexander discussed these broad concepts within a continuum of fairness, communitative equity being the lowest level of equity and positivism the highest level of equity.

Response to Research Questions and Conclusions

Research Question #1: To what extent does the existing state funding allocation system meet the standard for horizontal equity?

Analysis of the eight measures of horizontal equity utilized in this study indicates that the existing funding allocation system does not meet the standard for horizontal equity, except, as indicated by the McCloone index, for students in the lower half of the distribution. All other horizontal equity calculations did not meet the standard for equity, and the funding allocation system was more inequitable in 2009 than it had been in the past decade. The data for total net current expenditures were becoming more equitable up

through the year 2006. Since 2007, the funding system became increasingly inequitable extending through the year 2009.

Range disparities were at a high in the year 2001 and steadily decreased through 2006. Since 2007 there has been a sharp increase in range disparity. Disparity for 2009 was at its highest. The restricted range of total expenditures showed that in 2009 there was a greater disparity than at any time in the previous decade. Further evidence of disparity was evidenced by the Federal Range Ratio. Utah did not meet the standard (.20) for the past decade .The Range Ratio for 2009 (.77) indicated the least equitable year.

The McCloone Index showed the greatest equity of all the statistical measures. The funding allocation system for Utah met the standard (.95) for four of the ten years with an index of .95 in 2009. The standard for the Verstegen Index (1.05) was never met in the past decade with a final index of 1.20 in 2009, indicating that pupils in the upper half of the distribution received more than their fair share of funds when compared to pupils in the lower half of the distribution.

The Angles of Inequity illustrated the slightly skewed horizontal distribution of funds. The Angle of Inequity had a high in 2001 (24.35) and showed marked improvement through the year 2006 (14.80). In 2009 the angle of inequity (23.38) was similar to that of 2001. The final year of the study signaled decreasing equity for those students in the lower half of the distribution as compared to those students in the upper half of the distribution.

The Gini Coefficient showed a similar trend in equity measures over the past decade. 2009 (.095) was the least equitable year, showing a greater disparity of the percent of individuals to the percent of dollars funded.

In viewing these findings in the context of Alexander's equity concepts, *distributive equity* applies many of the same principles of horizontal equity. The best result which a government can affect is that all of the players in the game have an equal chance to succeed; that legislation will not be responsible for determining who will be successful (Alexander, 2008). Distributive equity assumes the state has an obligation to provide education. In order to establish distributive equity, the state must make up for mathematical differences in funding (Alexander, 2008).

A key to distributive equity is that there is a presumed right to a just allocation of things of value. In this case the presumed right is to an education for all the pupils of the state of Utah, the just allocation would be the funding for that education.

The constitution of Utah states “*the legislature shall provide for the establishment and maintenance of a uniform system of public schools, which shall be open to all children of the State.*” The money generated from state income tax creates a fund for the state's foundation grant. The foundation grant is to ensure that all Utah students in the state receive this allotted grant amount. While Utah has an equalized minimum foundation program, it does not allocate funding in such a way as to make it horizontally equitable, in that the funding formula for the state of Utah has created a disproportionate distribution of resources for those students above the median PPE. In other words, pupils at the top 5% of the distribution were receiving 177% of the funding as those students at the bottom 5%, or nearly double the resources. Thus, it falls short of Alexander's principle of distributive equity.

Research Question #2: Does the existing state funding allocation system meet the standard for fiscal neutrality?

Fiscal neutrality is used by school finance analysts to determine the relationship between per pupil expenditures and wealth related characteristics. If a state is fiscally neutral then there is no relationship between per pupil expenditures and the per pupil wealth of the district in which the child resides. The *Correlation Coefficient* and *Coefficient of Determination* outcomes determined from the total net current expenditure showed a strong positive correlation between per pupil expenditure and the wealth of a district for each of the ten years of the study (2009 correlation .61; percent of the variance explained by wealth 38%). In other words, the two statistics showed that the Utah funding formula was not fiscally neutral.

The magnitude of change in expenditures for each 1% increase in wealth, however, was small for each of the ten years of the study. Much like the Correlation Coefficient and Coefficient of Determination, 2008 showed the least amount of change in expenditure for each 1% increase in wealth. The elasticity measure for 2009 was .002.

When we look at the range of local district wealth in Utah, the state ranges from an assessed property valuation of \$211,000 per pupil in Cache school district to over \$2.2 million dollars of assessed property value per pupil in Park City school district. Although there were efforts in the funding plan to recapture money from districts with more wealth and redistribute to districts with less wealth, this study indicated that the amount of money recaptured was not creating a fiscally neutral system.

In viewing these findings in the context of Alexander's equity concepts, commutative equity views the unit of equity as the community (Alexander, 2008).

Allowing taxation at the local level is an example of commutative equity. Assets are maintained at the local level, and there is no redistribution of assets. This tradition of local control has much value, in that the local community decides what it desires in education and decisions are made at the local level. Commutative equity empowers local choice even as it may create unequal educational opportunity. Local control also allows for decisions to be made closest to those directly affected by those decisions. Although there are desirable aspects of commutative equity, it fosters inequality among local units as long as revenue for schools is dependent on local community wealth. Commutative equity can create exclusiveness, disparity, and division in the education system—all of which have elements of inequity (Alexander, 2008).

When examining the statistical measures for Utah's fiscal neutrality, there was evidence to support that commutative equity was a state value. In other words, the state was willing to tolerate some level of funding being related to district wealth to preserve a level of local control.

Utah districts having local leeway, i.e. the ability to levy a tax increase, is an example of Alexander's (2008) concept of commutative equity. Utah's voted local leeway allows districts to raise an addition levy of up to .002 tax rate for any general fund use. The state guarantees up to .0016 of that tax rate yield. Those districts that yield above the guarantee formula keep the funds—there is no recapture. District boards of education may also levy up to .004 tax rate for board leeway. This money is restricted for class size reduction. The sum of the voted leeway and the board leeway must not exceed .002 tax rate. Due to the wide range of property values within the 40 school districts of the state of

Utah, this inherently creates disparity in the funding system, as some revenue is dependent upon local wealth.

In viewing findings in the context of Alexander's restitutive equity concept, equity in school finance is not accomplished if unjustified shares of resources that are derived from state action are not rectified. When financing public schools, most states have, through organization of school districts, tax measures, or categorical funding, created unjust educational enrichment for some students in preference to others. This creates a system where some receive unjust benefit, while others unjust deprivation (Alexander, 2008).

Restitution requires the state to make up for fiscal inequities created by schools or school districts. Any differences in cost in delivering comparable educational services must be accounted for. *Restitutive equity* applies many principles similar to fiscal neutrality as it applies to tax payers. It is critical for the state to equalize the fiscal effort among school districts in an effort to establish restitutive equity.

Restitutive equity requires that the state is the basic unit of funding, taking into account the cost of delivering education, economies of scale and taxation overburden. An example of restitutive equity which is addressed by the Utah funding formula is the cost of delivering education in rural school districts due to sparcity. In the state funding formula there were additional categorical aide dollars given to offset issues of economies of scale for small school enrollment. This was funding in addition to local revenue and the state foundation grant.

Although there are examples of restitutive equity in the Utah formula, an examination of fiscal neutrality measures would indicate a lack of restitutive equity, in that 38% of the variance in PPE can be explained by per pupil wealth.

Research Question #3: To what extent does the existing state funding allocation system take into account the differentiated costs required to meet vertical equity needs for each of the years of the study?

The results of the vertical equity analysis of Utah's funding allocation system showed a lack of sufficient resources for typically disadvantaged students. If Utah were to fund Special Education at the research based weight of .9, or an additional 90%, the state would need \$181,481,198 in additional funds to meet the differential needs of Special Education students. English Language Learners, if funded at the research based weight of .5, or an additional 50%, would require an additional \$63,204,564 to meet the differential needs of English Language Learners. If low income students were funded at the research based weight of .5, or an additional 50%, an additional \$267,433,384 would be necessary to meet the needs of low income students. Thus, if the three disadvantaged groups were to be funded at the level recommended in the research literature, a total of \$512,119,147 in additional funds would be needed to support these students.

If the state of Utah wished to create an equitable system in its highest form, making strides in narrowing the gap in funding for the differentiated needs of students is necessary. *Positivism*, the highest form of equity espoused by Alexander (2008), accepts a moral obligation to establish fairness in funding. Any initial disadvantage, regardless of reason--physical or mental condition, cultural incapacity, social or economic deprivation--may be justified in having greater resources allocated by the state. Positivism creates a

moral obligation to assist those who are disadvantaged, even though their inferior position is not the fault of government (Fuller, 1995). Positivism applies the principles of vertical equity for students. This would include programs for children with disabilities, language learners, and children of poverty.

As stated in chapter one, human capital theory suggests that individuals and society derive economic benefits from investments in people (Sweetland, 1996). The argument has been made that not only an economic return results to the private individual who advances his or her education level, but also a potential social rate of return results when public expenditure produces a more educated population (Shultz, 1961). As education has become more directly tied to increasing human capital, the need for positivism is amplified.

With the increasing amount of student achievement data that is now available, we are now much more capable of looking at the differences in the success of students across class, race, and learning disability (Odden, 2000). The growing population of disadvantaged students in Utah, and the relationship of education to opportunity both socially and economically, shows an even greater need and focus on the importance of financing education in a way that promotes positivism (Brimley & Garfield, 2008). As we have been able to identify individuals and groups that are not increasing their human capital through education, the idea of creating a fair and equitable education system for all becomes an area of concern for policy makers (Vesely & Crampton, 2004).

There are some funding mechanisms in place in the Utah formula that provide additional resources to Special Education, English Language Learners, and low income students. Although these additional resources do not meet the research based weighting

suggested in this study, there is an advantage to having the funding mechanisms already in the formula. Critical to moving toward a more vertically equitable system will be increasing the weights in the formula for disadvantaged students.

The difficulty the Utah Legislature has in creating a more vertically equitable funding formula is the minimal amount of funding it provides for all students. Utah historically has been the lowest per pupil funded state in the nation. To draw limited resources away from other students in an effort to create a vertically equitable system does not seem to be an option, even if intent existed.

If Utah is going to create a system that is vertically equitable there needs to be additional dollars added to the equation. This could require an increase in taxes. At this time Utah is not overburdened by tax effort, ranking in the middle of the fifty states. There will be challenges to increasing revenues. Utah is a fiscally conservative state and the desire to raise taxes is not politically popular.

Research Question #4: What changes have been made in the distribution of revenues over the past decade relative to horizontal equity and fiscal neutrality?

The results of the equity analyses demonstrated that Utah's funding allocation system has been inconsistent with regard to the horizontal equity of the distribution of resources. There were consistent decreases in the range, restricted range and federal range ratio between the years 2000 and 2006. The years 2007 and 2008 brought slight increases in these statistical measures, followed by a sharp increase in 2009. 2009 marked the greatest difference in these three measures of horizontal equity in the past decade. The standard for the federal range ratio was never met, but was close to being met in both 2007 and 2008.

While the McLoone Indices met the standard for equity in 2002, 2006, 2007 and 2009, the Verstegen Indices and Angles of Inequity were not met for any of the years. All three statistics showed a similar pattern of movement toward horizontal equity between 2001 and 2007 followed by a sharp movement away from equity in 2009. The gini coefficient showed a similar pattern.

One area that gives hope to a more horizontally equitable system is that there have been times when the funding allocation in the state of Utah was trending toward being more equitable. Reasons for this trend could be due to economic conditions and increased revenues within the state of Utah. For the years in which the greatest level of horizontal equity was achieved, the state of Utah was experiencing great economic growth. 2009, when most horizontal equity measures indicated the least equity, was the beginning of the economic downturn. This would indicate that sufficient resources are critical to creating a greater level of horizontal equity within the funding formula.

The results of the equity analyses demonstrated that Utah's funding allocation system was inconsistent with regard to fiscal neutrality measures as well. The Pearson Correlation Coefficient, as well as the Coefficient of Determination, never met the standard for equity.

There was a correlation between per pupil wealth and the per pupil funds received. Those students from districts with greater per pupil wealth were receiving a greater proportion of the funding. Although this correlation had been positive, the year 2008 showed the greatest level of fiscal neutrality on all three measures. The year 2009, saw a sharp decrease in the level of fiscal neutrality. Overall, the decade showed variable

equity with a trend toward decreasing equity with the most recent year of the study the least equitable.

Policy Recommendations

The statistical outcomes of data analyses for the equity of Utah's education funding formula supports several recommendations for Utah policy and practice in funding the public schools.

1. Up until the 1970's Utah was always on the forefront of education finance policy staying with research based best practices. Much of the same base funding model that was implemented in the 1970's is still at the base of the funding formula. However, since that time, Utah has undergone significant demographic and economic changes. During this same period, litigation about the equity and adequacy of state funding systems has been initiated in 45 states. Nation wide significant changes have been made in state funding systems, with an emphasis being given to the equity and adequacy of funding systems and the differentiated needs of students. For these reasons it is recommended that the Utah Legislature **provide for a comprehensive review of the funding formula** that would include an analysis of the following.
 - a. **Funding more fully the differentiated needs** of English language learners, special education students, and low income students in the state's funding system.
 - b. **Increasing the basic per pupil guaranteed** through the Utah education funding formula as it relates to state and national data in the context of Utah's fiscal capacity and effort.

- c. Considering **options for insuring funding allocation are wealth neutral** such as improving the process for distributing money from school districts with wealth to those school districts with less wealth.
2. It is recommended that the direction of the Utah legislature, **a formal evaluation of the current funding allocation system** for K-12 public education should be conducted. Utah is one of five states that have not had litigation brought against its education funding formula. State and federal accountability requirements and previous litigation should be considered in this report.
3. It is recommended **that every five years, an independent analysis of the equity of the Utah education funding formula** be conducted and reported to the Utah legislature. This report would provide the legislature with an impartial and objective analysis Utah's funding for public education. The purpose would be to keep the funding system updated and meeting the changing demographic and economic needs of the state.
4. It is recommended that the legislature require that **any requests for funding of education include an impact statement regarding the effect on equity**.
5. Utah has unique challenges in its ability to fund education with similar dollar amounts per pupil as other states. Although Utah's students have generally tested well on standardized tests compared to their peers, it has been noted in this study that there is a gap when achievement data is disaggregated. It is recommended that **an analysis of the current funding formula take into account: 1) ways to redistribute revenues to help support typically**

disadvantaged students, and 2) how additional funding could be procured to support at-risk students.

Appendix 1
Total Add On by District

	Special Ed.	Language Learners	Low Income	Total Add On
ALPINE	12,457,823	7,627,246	39,300,274	59,385,344
BEAVER	418,822	187,649	2,095,419	2,701,890
BOX ELDER	2,761,858	1,252,159	11,772,098	15,786,116
CACHE	4,455,027	2,367,966	13,641,075	20,464,067
CARBON	762,941	176,275	6,426,694	7,365,910
DAGGETT	142,030	0	193,487	335,517
DAVIS	18,167,575	8,512,430	54,001,778	80,681,782
DUCHESNE	1,334,029	199,140	4,435,384	5,968,553
EMERY	1,426,040	207,479	3,874,197	5,507,716
GARFIELD	642,331	125,420	1,920,226	2,687,977
GRAND	532,695	344,763	2,596,729	3,474,188
GRANITE	17,070,825	41,979,954	90,174,388	149,225,167
IRON	2,251,135	840,196	11,474,755	14,566,085
JORDAN	58,819,874	19,254,079	85,866,505	163,940,459
JUAB	287,074	0	2,076,017	2,363,091
KANE	527,098	41,568	1,912,121	2,480,787
MILLARD	1,989,173	881,846	5,212,275	8,083,294
MORGAN	301,343	38,724	974,050	1,314,117
NEBO	8,914,756	3,245,019	23,500,080	35,659,855
NO. SANPETE	889,195	483,814	4,040,869	5,413,878
NO. SUMMIT	367,169	171,831	823,355	1,362,354
PARK CITY	2,130,350	1,898,265	3,691,865	7,720,480
PIUTE	291,241	64,757	828,887	1,184,885
RICH	257,691	30,545	923,976	1,212,212
SAN JUAN	2,124,448	3,318,519	10,146,705	15,589,672
SEVIER	1,258,313	328,378	5,957,301	7,543,992
SO. SANPETE	1,586,632	837,371	5,382,580	7,806,583
SO. SUMMIT	606,110	275,790	998,429	1,880,329
TINTIC	165,249	0	714,344	879,592
TOOELE	3,376,532	1,976,044	13,503,906	18,856,482
UINTAH	1,364,338	237,210	6,575,809	8,177,357
WASATCH	2,118,391	1,818,569	5,070,050	9,007,009
WASHINGTON	7,226,553	6,390,715	29,547,586	43,164,853
WAYNE	205,940	17,546	912,393	1,135,880
WEBER	3,120,788	2,327,834	25,857,905	31,306,526
SALT LAKE	9,075,242	24,897,417	57,616,733	91,589,392
OGDEN	3,528,275	8,621,364	31,693,483	43,843,123
PROVO	4,738,506	6,883,044	20,965,141	32,586,692
LOGAN	2,141,732	2,186,552	9,686,040	14,014,324
MURRAY	1,646,051	1,195,470	6,202,911	9,044,432
Total	181,481,198	63,204,564	267,433,384	512,119,147

Appendix 2 Special Education Add-On

	# of Special Education Students	Additional Value	Per Pupil Expenditures	Additional Add-On Special Education
ALPINE	6578	5920.2	5,256.612	12,457,823
BEAVER	214	192.6	5,644.861	418,822
BOX ELDER	1288	1159.2	5,739.367	2,761,858
CACHE	1811	1629.9	5,809.377	4,455,027
CARBON	560	504	6,797.538	762,941
DAGGETT	15	13.5	15,472.080	142,030
DAVIS	7330	6597	5,825.939	18,167,575
DUCHESNE	677	609.3	5,781.574	1,334,029
EMERY	370	333	7,432.848	1,426,040
GARFIELD	126	113.4	9,685.829	642,331
GRAND	193	173.7	7,048.356	532,695
GRANITE	7718	6946.2	5,950.057	17,070,825
IRON	1150	1035	5,587.398	2,251,135
JORDAN	10103	9092.7	9,327.172	58,819,874
JUAB	243	218.7	5,553.697	287,074
KANE	184	165.6	7,389.509	527,098
MILLARD	495	445.5	7,326.557	1,989,173
MORGAN	160	144	5,738.293	301,343
NEBO	3925	3532.5	5,355.943	8,914,756
NO. SANPETE	318	286.2	6,466.322	889,195
NO. SUMMIT	119	107.1	7,237.075	367,169
PARK CITY	408	367.2	9,246.682	2,130,350
PIUTE	50	45	9,698.260	291,241
RICH	53	47.7	8,839.419	257,691
SAN JUAN	322	289.8	10,825.787	2,124,448
SEVIER	586	527.4	5,665.785	1,258,313
SO. SANPETE	464	417.6	7,074.315	1,586,632
SO. SUMMIT	160	144	6,947.651	606,110
TINTIC	25	22.5	12,839.550	165,249
TOOELE	1726	1553.4	5,333.164	3,376,532
UINTAH	762	685.8	5,678.039	1,364,338
WASATCH	658	592.2	6,336.466	2,118,391
WASHINGTON	2906	2615.4	5,787.783	7,226,553
WAYNE	57	51.3	7,809.150	205,940
WEBER	4072	3664.8	5,176.696	3,120,788
SALT LAKE	3042	2737.8	7,619.146	9,075,242
OGDEN	1577	1419.3	6,405.867	3,528,275
PROVO	1855	1669.5	6,186.652	4,738,506
LOGAN	748	673.2	6,090.033	2,141,732
MURRAY	670	603	6,144.080	1,646,051
Total	63718	57346.2		181,481,198

Appendix 3 Language Learner Add-On

	# of Language Learners	Additional Value	Per Pupil Expenditures	Additional Add On Language Learners
ALPINE	2752	1,376.000	5,256.612	7,627,246
BEAVER	66	33.000	5,644.861	187,649
BOX ELDER	416	208.000	5,739.367	1,252,159
CACHE	773	386.500	5,809.377	2,367,966
CARBON	48	24.000	6,797.538	176,275
DAGGETT	0	0.000	15,472.080	0
DAVIS	2783	1,391.500	5,825.939	8,512,430
DUCHESNE	66	33.000	5,781.574	199,140
EMERY	55	27.500	7,432.848	207,479
GARFIELD	29	14.500	9,685.829	125,420
GRAND	94	47.000	7,048.356	344,763
GRANITE	13355	6,677.500	5,950.057	41,979,954
IRON	283	141.500	5,587.398	840,196
JORDAN	3916	1,958.000	9,327.172	19,254,079
JUAB	0	0.000	5,553.697	0
KANE	12	6.000	7,389.509	41,568
MILLARD	235	117.500	7,326.557	881,846
MORGAN	13	6.500	5,738.293	38,724
NEBO	1141	570.500	5,355.943	3,245,019
NO. SANPETE	142	71.000	6,466.322	483,814
NO. SUMMIT	48	24.000	7,237.075	171,831
PARK CITY	399	199.500	9,246.682	1,898,265
PIUTE	15	7.500	9,698.260	64,757
RICH	8	4.000	8,839.419	30,545
SAN JUAN	625	312.500	10,825.787	3,318,519
SEVIER	113	56.500	5,665.785	328,378
SO. SANPETE	229	114.500	7,074.315	837,371
SO. SUMMIT	79	39.500	6,947.651	275,790
TINTIC	0	0.000	12,839.550	0
TOOELE	704	352.000	5,333.164	1,976,044
UINTAH	79	39.500	5,678.039	237,210
WASATCH	547	273.500	6,336.466	1,818,569
WASHINGTON	2109	1,054.500	5,787.783	6,390,715
WAYNE	5	2.500	7,809.150	17,546
WEBER	823	411.500	5,176.696	2,327,834
SALT LAKE	6156	3,078.000	7,619.146	24,897,417
OGDEN	2529	1,264.500	6,405.867	8,621,364
PROVO	2091	1,045.500	6,186.652	6,883,044
LOGAN	684	342.000	6,090.033	2,186,552
MURRAY	371	185.500	6,144.080	1,195,470
Total	19,145	9,572.500		63,204,564

Appendix 4
Low Income Add-On

	# of Low Income Students	Additional Value	Per Pupil Expenditure	Additional Add-On
ALPINE	14180	7090	5543.056998	39,300,274
BEAVER	737	368.5	5686.34656	2,095,419
BOX ELDER	3911	1955.5	6019.994045	11,772,098
CACHE	4453	2226.5	6126.689749	13,641,075
CARBON	1750	875	7344.792674	6,426,694
DAGGETT	28	14	13820.50751	193,487
DAVIS	17655	8827.5	6117.4486	54,001,778
DUCHESNE	1470	735	6034.536268	4,435,384
EMERY	1027	513.5	7544.687072	3,874,197
GARFIELD	444	222	8649.665725	1,920,226
GRAND	708	354	7335.393523	2,596,729
GRANITE	28687	14343.5	6286.777148	90,174,388
IRON	3865	1932.5	5937.777387	11,474,755
JORDAN	17464	8732	9833.543893	85,866,505
JUAB	701	350.5	5923.015197	2,076,017
KANE	552	276	6927.974916	1,912,121
MILLARD	1389	694.5	7505.075578	5,212,275
MORGAN	327	163.5	5957.494514	974,050
NEBO	8263	4131.5	5688.026201	23,500,080
NO. SANPETE	1186	593	6814.281648	4,040,869
NO. SUMMIT	230	115	7159.608718	823,355
PARK CITY	776	388	9515.115063	3,691,865
PIUTE	192	96	8634.242596	828,887
RICH	242	121	7636.164154	923,976
SAN JUAN	1911	955.5	10619.26189	10,146,705
SEVIER	2050	1025	5812.001023	5,957,301
SO. SANPETE	1472	736	7313.287701	5,382,580
SO. SUMMIT	286	143	6982.022534	998,429
TINTIC	137	68.5	10428.3728	714,344
TOOELE	4811	2405.5	5613.762468	13,503,906
UINTAH	2190	1095	6005.305085	6,575,809
WASATCH	1525	762.5	6649.245686	5,070,050
WASHINGTON	9751	4875.5	6060.421718	29,547,586
WAYNE	260	130	7018.409839	912,393
WEBER	9142	4571	5656.946956	25,857,905
SALT LAKE	14246	7123	8088.829508	57,616,733
OGDEN	9297	4648.5	6818.002227	31,693,483
PROVO	6369	3184.5	6583.495325	20,965,141
LOGAN	3030	1515	6393.425892	9,686,040
MURRAY	1925	962.5	6444.582928	6,202,911

Bibliography

- A.B. Krueger, "Inequality, too much of a good thing," in K. Alexander (Ed.), *Education and economic growth: Investment and distribution of financial resources*, Cambridge, UK: Linton Atlantic: Linton Atlantic
- Abbott.v. Burke, 693 A.2d 417, 427 (N.J. 1990).
- (2009, March) Addressing achievement gaps [Part of education vital signs 2009]. *The American School Board Journal* v3 14.
- Alexander, K. (2008), *Education and Economic Growth: Investment and Distribution of Financial Resources*. Cambridge UK: Linton Atlantic Books.
- Alexander, K. & Alexander, M.D. (2005). *American public school law* (6th ed.). Belmont, CA: Wadsworth.
- Alexander, K. & Salmon, R. (2007, fall). "Warranting failure: The system that breeds children in poverty and starves public schools." *Journal of Education Finance* 33(2), 203-221.
- Asres, A. (2008, October 2). Can the achievement gap be closed? *Diverse Issues in Higher Education* 25(17) p.45.
- Baker, B.C. (2005). The emerging shape of educational adequacy: From theoretical assumptions to empirical evidence. *Journal of Education Finance*, 30(3), 259-287.
- Baker D. B., Green P., & Richards C. E. (2008), *Financing education systems*. Upper Saddle River , NJ: Pearson Education.
- Bennett, R. (2004). An analysis of the equity of Nevada's public school funding system (Doctoral dissertation, University of Nevada Las Vegas, 2004)

- Benson, C. S. (1961), *The Economics of Public Education* (Boston, MA; Houghton Mifflin,
- Benson, C. S., and O' Halloran, K. (2008) The economic history of school finance in the United States in K. Alexander (Ed.), *Education and economic growth: Investment and distribution of financial resources*, Cambridge, UK: Linton Atlantic
- Berliner P., "Our Impoverished View," citing NCES 2005-003 (Washington DC; Department of Education, National Center for Education Statistics, 2004).
- Berne, R. & Stiefel, L. (1984). *The measurement of equity in school finance: Conceptual methodological and empirical dimensions*. Baltimore. Johns Hopkins University.
- Berne, R. and L. Stiefel. 1999. "Concepts of school finance: 1970 to the present." In H.F. Lad., R. Chalk, and J.S. Hansen (Eds.) *Equity and adequacy in education finance: Issues and perspectives*, eds., (pp. 7-33). Washington, DC: National Academy Press.
- Brimley, V. Jr., & Garfield, R. R. (2008). *Financing education in a climate of change*. (9th ed.). Boston, MA. Allyn & Bacon.
- Brimley, V. D., Verstegen, D. A., and Garfield, R. (2012) *Financing Education in a Climate of Change*. Boston, MA: Pearson, Inc.
- Brown v. Board of Education of Topeka, 348 U.S. 886; (1954).
- Burke, A. and Mort, P. (1943). *Defensible spending for public schools* (New York, NY: Columbia University Press.
- Campaign for Fiscal Equity Inc v. The State of New York, 655 N.E.2d 661 (N.Y. 2003).
- Campbell County School District v. State, 907 P.2d 1238. (Wyoming 1995).

- Carcieri, M. D. (1997, January). Democracy and education in the thought of Jefferson and Madison. *Journal of Law and Education*, 26(1) 1-30.
- Coons, J. E., Clune, W. H., & Sugarman, S.D. (1970). *Private wealth and public education*. Cambridge, MA, Harvard University Press.
- Creswell C. W. (2008). *Educational research: Planning, conducting and evaluating quantitative and qualitative research* (3rd Ed.) Thousand Oaks, CA: Sage Publication
- Cronk, Cynthia A., & Johnson, Gary P.(1983, spring), An equity analysis of Pennsylvania's basic instruction subsidy program. *Journal of Education Finance*, 8(4) 502-10.
- Cubberly, Ellwood P. (1920) *The History of Education*. Boston, MA: Houghton Mifflin.
- U.S. Department of Education (2005, June), National Center for Education Statistics (NCES publication 2000333). Washington, DC: U.S.
- Duncombe, W. (2002). Estimating the cost of an educational adequacy: A comparison of approaches. Syracuse University, NY.
- Edgewood Independent School District v.Kirby (1989) 777 S.W.2d 391.
- Fuhrman, S. H., & Elmore, R. F. (1990), Understanding Local Control in the Wake of State Education Reform. *Educational Evaluation and Policy Analysis* 12: 82-96.
- Galvin, P. & Robins, H. (2000). Retrieved from <http://nces.ed.gov/edfin/pdf/StFinanc/Utah.pdf>
- Glass G.V., & Hopkins K.D. (1996). *Statistical Methods in Education and Psychology* (3rd ed.) Englewood Cliffs, NJ: Prentice Hall.

- Helena Elementary School District no. 1 v. State, 769 P.2d 684 (Montana, 1989).
- Hostetler, K. (2003, summer) The common good and public education. *Educational Theory*. 53(3) 347-61.
- Horowitz, H. (1966). Unseparate but unequal: The emerging Fourteenth Amendment issue in public school education. *UCLA Law Review*, 13, 1147-1172.
- Imber, M. (1990) A typology of discrimination in education. *Reading on Equal Education*, 10, 387-397.
- Jenness v. Fortson, 403 U.S. 431, 442, 91 S.Ct. 1970, 1976, 29 L.Ed.2d 554 (1971).
- Lau v. Nichols, 414 U.S. 563, 94 S. Ct. 786 (1974).
- Marley, D. (2008, November 21). Rich and Poor Gap Has Failed to Narrow. *The Times Educational Supplement*. 4815 24-5.
- McCluskey, Gerald N.(1958) "*Public Schools and Moral Education: The Influence of Horace Mann, William Torrey Harris, and John Dewey.*" New York, NY: Columbia University Press.
- McInnis v. Shapiro, 293, F. Supp. 327; 1968 U.S. Dist. LEXIS 11860 at 329.
- Montoy v. State of Kansas, 279 Kan. 817, 845, 112 P.3d 1170 (2005).
- Mort, P. (1924). *The Measurement of Educational Need*. New York, NY: Columbia Teachers College.
- Natale, J. (1990, March), "Just Desserts." *The American School Board Journal*, 177(3).
- National Center for Education Statistics, (2008) Retrieved from <http://nces.ed.gov/nationsreportcard/states/>
- National Education Association (2009), *Estimates and Rankings of School Statistics* (Washington, DC: NEA).
- Neibuhr, R.H. (1957). Richard H. Neihbur Papers, 1919-1962. Retrieved from

<http://www.hds.harvard.edu/library/bms/bms00630.html>

No Child Left Behind Act of 2001, 20 USC 6301(2002).

Odden, A. R., and Picus, L. O. (2004), *School Finance: A Policy Perspective*. New York, NY: McGraw-Hill.

Olsen v. State, 554 P. 2d 139 (Oregon, 1976)

Parrish, T.B., Chambers, J.G., & Guarino, C.M. (1999). *Funding Special Education*. 1998 *Yearbook of the American Education Finance Association*. Thousand Oaks, CA: Sage.

Picus, L. O. (1995, August). What does the money buy? Allocation and use of education resources. *School Business Affairs* 61(8) 13-21.

Plessy v. Ferguson, 163 U.S. 537; 16 S. Ct. 1138; 41 L. Ed. 256; 1896 U.S. LEXIS 3390

Psacharopoulos, G. (2006, fall). The value of investment in education: Theory, evidence and policy. *Journal of Education Finance* 32(2) 113-136.

Rebell, M. (2001). Education adequacy, democracy, and the courts. In T. Ready, C. Edley, & C. Snow (Eds.), *Achieving high educational standards for all* (pp. 218-267). Washington, DC: National Academy Press.

Rebell, M. (2005), *Educational Adequacy, Democracy, and the Courts*, National Research Council.

Robinson v. Cahill, 118 N.J. Super. 233; 287 A.2d 187; 1972 N.J. Super. LEXIS 588 (Law Div. 1972)

Roosevelt Elementary School District No. 66 v. state of Arizona, 74 P.3d 258 (1994),

Rose v. Council for Better Education, 790 S.W. 2d 186, 212 (Ky. 1989).

Sample, P. R. (1990). *Pennsylvania school finance equity: An analysis of the equalized*

- subsidy for basic education.* (Unpublished doctoral dissertation, Pennsylvania State University).
- Sample, P. R.(1990, summer), An equity simulation of Pennsylvania's school finance system. *Journal of Education Finance* 16, 49-69
- San Antonio School District v. Rodriguez, 411 U.S. 1 (1973).
- Sawyer v. Gillmore, 109 Me. 169, 186, 188, 83. A. 673 (1912).
- Serrano v. Priest (Serrano I), 5 Cal. 3d 584, 96 Cal. Rptr. 601, 487 P.2d 1241 (1971)
- Sheldon, G. H.. 1998. *Financing America's Public Schools. Issues Brief.* 6 pp.
- Shultz, T. W. (1961), "Investment in Human Capital," *American Economic Review* 51, 1-17.
- Shultz, T. W. (1970), "The human capital approach to education," in Vern Brimley Jr. et. al. (Eds.), "*Financing education in a climate of change*" 10th edition
- Smith, A. (1904), *The wealth of nations* (5th ed.) E. Cannan, (Ed.) London: Methuen.
- Strayer, G. D. & Haig, R. M. (1923) *The financing of education in the state of New York.* New York, NY: Macmillan.
- Sweetland, S. R. (1996) Human Capital Theory: Foundations of a Field Inquiry. *Review of Educational Research*, 66(3) 341-359.
- Tachon, T. A. (2008) Florida's public education finance program regarding equity and adequacy. Doctoral Dissertation, University of Florida.
- Theobald, N. & Malen (2000). Balancing local control and state responsibility for K-12 education. *The 2000 Yearbook of the American Education Finance Association.* Larchmont, NY: Eye on Education,
- Thompson, D.C. and R.C. Wood. 1998. *Money and schools – A handbook for practitioners.* Larchmont, NY: Eye On Education.

- Underwood, J. K. (1995). School finance adequacy as vertical equity. *University of Michigan Journal of Law Reform*, 28(3), 493-519.
- U.S. Department of Education, National Center for Education Statistics (2005), Funding Sources for State Funding System, (Washington DC:U.S. Government Printing Office,
- Utah Foundation (2008, May) What can \$3,702 buy: How Utah compares in education spending and services. Retrieved from <http://www.utahfoundation.org/img/pdfs/rr686.pdf>
- Utah Foundation (2002, September) Utah at the crossroads: Challenges for K-12 education in the coming ten years. Retrieved from <http://www.utahfoundation.org/img/pdfs/rr653.pdf>
- Utah State Office of Education. (1990). *A Study of the Utah Public School Finance System: Findings and Recommendations of the Utah School Finance Task Force*. (ERIC Document Reproduction Services No: ED325975)
- Verstegen, D. A. & Ward, J. G. (1991). *Spheres of justice in education: The 1990 American education finance association yearbook 11th edition*. American Education Finance Association. Harper Business.
- Verstegen, D. A. (2002, winter). Financing the new adequacy: Towards new models of state education finance systems that support standards based reform. *Journal of Education Finance* 27, 749-782.
- Verstegen D.A. & Driscoll L.G.(2008, spring) Educational opportunity: The Illinois dilemma, *Journal of Education Finance* 33(4) 331-351 Spring 2008.
- Verstegen D.A. & Jordan T.S (2009, winter) A fifty state survey of school finance

policies and programs: An overview, *Journal of Education Finance* 34(3) 213-30.

Vesely R.S. & Crampton F.E. (2004, fall), An assessment of vertical equity in four states: Addressing risk factors in education funding formulas. *Journal of Education Finance* 30(2) 111-122.

Viadero, D. (2009. February) Book probes scoring gaps tied to race. *Education Week* 28(20) 10-11

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