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Measuring Up: A Case Study of School Finance Equity Among Five Middle Schools

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MEASURING UP: A CASE STUDY OF SCHOOL FINANCE EQUITY AMONG FIVE MIDDLE SCHOOLS

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ABSTRACT

The purpose of this study was to examine the relationship between intra-district per-pupil expenditures in five middle schools in within the same school division using an equity audit. Broadly, the distribution of resources was examined. Specifically, how intradistrict per-pupil expenditures influenced horizontal and vertical equity measures was explored. The questions central to this study were: (a) Does variation exist among schools? (b) What is the per-pupil expenditure by school? (c) When examining per-pupil expenditures, what differences exist? (d) To what extent does the district funding system meet the standards for horizontal and vertical equity? The history of educational funding was discussed. Then, equity in education was examined. Finally, equity audits were completed and the data were analyzed.

Data were gathered from Virginia Department of Education School Quality Profiles and other publicly available sources for each of the middle schools using an equity audit format previously used by Owings and Kaplan (2010). Collected data were analyzed within and among five middle schools in the same school district. Additionally, vertical and horizontal equity was examined among the schools.

The central question answers were analyzed to determine if consistent patterns could be identified. Using the data patterns uncovered, recommendations for an equitable distribution of resources were provided. Furthermore, recommendations for further research were made.

Keywords: equity, horizonal equity, intra-district funding, vertical equity

I dedicate this work of labor to the memory of my mom, Pat Bradford. As one of the strongest women I knew, I would not be the person I am today without her influence. I only wish she were here to see me reach this accomplishment. I know that she is proudly looking down on me.

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CHAPTER I

INTRODUCTION

When examining equality and equity, Rick Lavoie's quote "Fair doesn't mean giving every child the same thing, it means giving every child what they need" comes to mind (Rosen & Lavoie, 2004). But a closer examination may bring to the forefront that "giving" students what they need may be part of the problem. "Giving" must be clarified to mean providing students the opportunity to engage in their learning. An educator alone cannot increase students' achievement. Only the students' own cognition can do this. Educators are responsible for creating, supporting, refining, and protecting the experiences and opportunities for all to be engaged in learning. Equity becomes a key point when providing access to a socially just education is the goal.

Horace Mann was quoted as saying education, beyond all other devices of human origin, is the great equalizer of men, the balanced-wheel of the social machinery" (Rhode, Cooke, & Ojha, 2012, p.1). Thomas Jefferson went even further when he said, "An educated citizenry is a vital requisite for our survival as a free people" (Jewett, 1997). Furthermore, a just K-12 public schooling system should meaningfully prepare all students, including the most disadvantaged, for their roles in public service or democratic governance. Those who are educated hold the power and people in power are often the majority and rarely the disenfranchised in power (Zajada, Majhanovich, & Rust, 2006). Deschenes, Cuban, & Tyack (2001) found that rather than students failing school, the focus should be on how schools are failing students. They go further stating students often labeled as slow, delinquent, or unable to learn do not meet the school's standards. Without access to a just K-12 education the disenfranchised continue to be disenfranchised limited in their contribution to or power to make change within society. Creating access to a just

K-12 education for all, requires an examination of equity—both horizontal and vertical. Horizontal equity is defined as funding equals equally, and vertical equity means the treatment of unequals requires appropriate unequal treatment (Owings & Kaplan, 2013). Additionally, school leaders need to be aware of the varying needs of students and how to allocate resources to address them. The focus of this study is to examine equity in order to provide a just and equitable education for all students.

Educational leaders are tasked with increasing student achievement for all students. As the landscape of education continues to change, it is imperative that leaders take steps to adapt to meet the needs of all students. Furthermore, educational budgets are becoming tighter and tighter. As educational leaders are faced with meeting the variety of student needs with less resources, the allocations of resources need to be allocated in such a way to provide access to a fair and just educational experience for all students regardless of their ethnicity, family income, or ability. Of importance are the marginalized students who are disenfranchised in public schools. Marginalized students include students of color, students with disabilities, English Language Learners, and students of poverty. As accountability continues to be a focal point, a focused effort to change how we meet the needs of all students is imperative. In conclusion, resource allocations have been shown to correlate with student achievement (Betts, Rueben, & Danenberg, 2000).

A short look through history shows that power has been traditionally held by wealthy, white men. Additionally, there are data to support the belief that the very systems that are in place maintain "bureaucratic and institutional norms rather than scholarly norms" (Pintrich, Marx, & Boyle, 1993. p.193). The disenfranchised, people of color, the poor, the disabled, and the English language learners, have historically had to fight for equal rights. Equal rights

equalize a person's power and hence their ability to generate change. It is imperative that we ensure a more equitable and fair access to resources, and socially valued commodities (Zajada, Majhanovich, & Rust, 2006). A fair and just educational system is required for all to achieve their maximum ability. At this time, gaps continue to exist between students of color, poverty, and disabilities when compared to their same aged peers who are white, rich, and non-disabled.

Gaps in student achievement of the disenfranchised student have been problematic and continue to be present. Often educational leaders want to blame external factors of which they have no control such as motivation, parenting, income, home environments, and neighborhood environments (Samuels, 2020). While there may be external factors that are outside the control of schools, there continues to be a presence of large and persistent patterns of inequity internal to schools (Skrla, Garcia, & Nolly, 2004). The large and persistent patterns of inequity manifest in assumptions, beliefs, practices, procedures, and policies of schools. Equity audits are one tool to help educational leaders identify and address these inequities. Skrla, McKenzie, & Scheurich, (2009) leading researchers on equity, examine patterns of inequity and use equity audits to identify and correct inequities.

In an examination of equity within the public schools, Skrla, McKenzie, & Scheurich, (2009) found barriers that adversely influence access to education for the underrepresented student are being addressed. For example in Wisconsin, the Department of Public Instruction's website states " That every student has access to the educational resources and rigor they need at the right moment in their education, across race, gender, ethnicity, language, ability, sexual orientation, family background, and/or family income." (Wisconsin Department of Education, 2020). To further support the focus on equity, an examination of Virginia's Department of Education's website under Division of School Quality, Instruction, and Performance equity is

emphasized in the following statement “strategic initiatives to advance equitable student outcomes and comprehensive school quality. Through tailored support to schools, the division implements Virginia’s continuous school quality and improvement interventions. Additionally, the division leads the Department’s efforts aimed at advancing equity, closing achievement gaps, coordinating stakeholder engagement, and managing external communications and outreach strategies.” (Virginia Department of Education, 2020a). While equity continues to be an issue in U. S. public schools, taking action to correct inequities is well underway. As educational leaders work towards closing the achievement gap, a focus on equity is required and strategies to correct inequities implemented. Equity audits are designed to provide insight into, discussion of, and practical responses to systemic patterns of equity in schools and school districts. While the impact is strongest at the school level, change must be systemic and begin at the top.

Most recently, significant legislation has come into play to address equity in schools. In December 2015, Every Student Succeeds Act (ESSA) was passed. As part of ESSA, state educational agencies (SEAs) and local educational agencies (LEAs) must prepare and report annual report cards that include LEA and school-level per-pupil expenditures (ESSA, 2015). Specifically, sections 1111(h)(1)(C)(x) and 1111(h)(2)(C) require an SEA and all of its LEAs, to report “the per-pupil expenditures of Federal, State, and local funds, including actual personnel expenditures and actual non-personnel expenditures of Federal, State, and local funds, disaggregated by source of funds, for each local educational agency and each school in the State for the preceding fiscal year.” The data must be reported beginning with the 2018-2019 school year.

Per-pupil expenditures reporting involves delving into specific details of educational spending rather than an overarching explanation of how educational monies are spent. In order

to funnel down to specific details of educational spending, leaders will need a tool to frame their reporting. Equity audits are one example of a tool to examine equity (Skrla, McKenzie, & Scheurich, 2009). Using equity audits are an objective way to examine equity at the state level, between districts, and within districts. By examining equity, we can identify inequities and address them which can result in closing of achievement gaps. This study is designed to examine the equity of resource allocations with the ultimate goal of closing achievement gaps.

First, the purpose of the study will be laid out followed by the research questions. Next, the line of logic, background and conceptual framework will be explored. Finally, research methods and the significance and overview of the study will be proposed.

Purpose of the Study

The purpose of this study is to examine the relationship between intradistrict per-pupil expenditures in five middle schools in Anonymous school district using equity audits. Broadly, the distribution of resources will be examined. Specifically, how intradistrict per-pupil expenditures are influenced by various demographic statistics and influence horizontal and vertical equity measures will be explored. Using a framework of vertical and horizontal equity, equity across schools will be examined. Employing the simplified reconceptualization of equity auditing that Skrla, Scheurich, Garcia, & Nolly (2004) discuss and Owings & Kaplan (2010) employed, five middle schools in Anonymous school district will be examined for intradistrict equity. The answers to the following questions will be sought.

Research Questions

To understand the relationship between horizontal and vertical equity and per-pupil expenditures, the following research questions will be addressed:

1. Does variation exist among schools?

2. What is the per-pupil expenditure by school?
3. When examining per-pupil expenditures, what differences exist?
4. To what extent does the district funding system meet the standards for horizontal and vertical equity?

Definition of Terms

Central to this study is the principal concept of equity. Equity is defined as giving people what they need while equality is defined as treating everyone the same (Owings & Kaplan, 2013). When examining equity several other terms must be defined—equalization, adequacy, horizontal equity, vertical equity, and equity audits. Equalization is process of balancing poorer community need for greater state support for education than wealthier communities (Owings & Kaplan, 2013). Adequacy is providing sufficient resources to accomplish the job of educating students (Owings & Kaplan, 2013). Odden and Picus (2004) offer a workable definition of adequacy as providing enough funds "to teach the average student to state standards, and then to identify how much each district/school requires to teach students with special needs-the learning disabled, those from poverty with educationally deficient backgrounds, and those without English proficiency-to the same high and rigorous achievement standards" (p. 25). Horizontal equity is defined as funding equals equally, and vertical equity means the treatment of unequals requires appropriate unequal treatment (Owings & Kaplan, 2013). Appropriate treatment varies depending on local priorities. Choices are often based on personal or community values. Equity audits are a tool intended to facilitate ease of use and to promote insight into, discussion of, and a substantive response to systemic patterns of inequity in schools and school districts. Ultimately, ensuring access to just K-12 education for all and closing the gaps that exist between marginalized and unmarginalized student resulting in an increase in student achievement.

Finally, two terms need to be clarified—district and division. While most states use school districts, Virginia uses school divisions. Virginia's school divisions are not separate units of local government and are not a taxing authority. The school divisions are under the jurisdiction of a school board and rely on their associate city, town, or county government for at least a portion of their funding. Throughout this paper both school districts and school division will be used as they are referring to the same concept. Next, the significance of the study will be laid out.

Significance of the Study

"In these days, it is doubtful that any child may reasonably be expected to succeed in life if he is denied the opportunity of an education. Such an opportunity, where the state has undertaken to provide it, is a right which must be made available to all on equal terms."

– Chief Justice Earl Warren, Brown v. Board of Education

Funding for education continues to be a difficult budget issue at the national, state, and local levels (Flanigan, 2020). With funds constantly under scrutiny, educational leaders are required to do more with less (Sparks, 2019, Burnette, 2019). While funds are constantly being cut, the needs of students continue to increase (Burnette, 2019). The neediest students are often the marginalized. Disabilities, race, gender, and socioeconomic status often characterize marginalized students (Skrla, McKenzie, & Scheurich, 2009; Betts, Rueben, & Danenberg, 2000). Further investigation uncovers achievement gaps between nonmarginalized and marginalized groups (Sparks, 2016). One way to address and close those gaps is providing access to quality educational programming for all students. Before gaps can be addressed, it is imperative to identify inequities. One way to identify inequities is through equity audits. Equity

audits examine data points that allow an objective analysis of the data to identify areas of inequity (Skrla, Scheurich, Garcia, & Nolly, 2004; Skrla, McKenzie, & Scheurich, 2009).

This study expands on current data and delves deeper into intradistrict per-pupil expenditures using equity audits to examine per-pupil expenditures, horizontal equity, and vertical equity within a district. Berne & Stiefel (1984, 1994) posit that school level analysis are more valid and reliable when examining resource allocation. Additionally, intradistrict vertical and horizontal equity will be examined using equity audits. Finally, refinement of methods/tools used to identify, and address inequities will be explored with the ultimate goal of closing achievement gaps. This study can also serve as a foundation for local education agencies as they embark on reporting per student expenditures on an intradistrict level which as of the 2018-2019 school year is required for schools to report. The overview of the study will be discussed next.

Overview of the Study

As explained in the introduction, this study examines the relationship between intradistrict per-pupil expenditures across five middle schools in Anonymous school district using equity audits to contribute to the empirical and theoretical literature related to equity in education. This study is significant especially considering calls for closing of achievement gaps of disenfranchised students. This study is divided into five chapters. In Chapter II, discussion on equity begun in this chapter will be expanded. To the degree possible, the literature review is organized according to major themes that developed organically as the topic was researched. In Chapter III, an overview of horizontal and vertical equity will be provided as well as the methodology. Chapter IV will discuss the findings and Chapter V will include the conclusions, discussions, and recommendations. The knowledge gained can be used to identify inequities and

begin the discussion on strategies to equitably allocate resources with the focus on closing the achievement gap that exists between nonmarginalized and marginalized groups.

CHAPTER 2

REVIEW OF THE LITERATURE

The overall purpose of this study is to examine the relationship between intradistrict per-pupil expenditures within five middle schools in Anonymous school district using an equity audit. Broadly, the distribution of resources will be examined. Specifically, I will explore how intradistrict per-pupil expenditures influence horizontal and vertical equity measures. Five middle schools in Anonymous school district will be examined for intradistrict equity using the simplified reconceptualization of equity auditing that Skrla, Scheurich, Garcia, & Nolly (2004) discuss, and Owings & Kaplan (2010) employed.

To understand the relationship between horizontal and vertical equity and per-pupil expenditures, I address the following research questions:

1. Does variation exist among schools?
2. What is the per-pupil expenditure by school?
3. When examining per-pupil expenditures, what differences exist?
4. To what extent does the district funding system meet the standards for horizontal and vertical equity?

Overview and Purpose of Literature Review

The following literature review is used to explore (a) the history of educational funding, (b) the concept of equity in education, and (c) equity audits. Equity is a unifying theme throughout this study and four research questions will attempt to analyze per-pupil expenditures and to examine intradistrict equity both horizontally and vertically.

History of Educational Funding.

Government's attention to education for all can be traced as far back as Thomas Jefferson. Thomas Jefferson was the first to propose a public-school system that would be financed by the governing public body. Litigation regarding access to education can be traced back to *Plessy v. Ferguson* (1896) which made segregation legal and legitimized segregation laws. Segregation resulted in schools being "separate but equal." It was not until over fifty years later that *Brown v. Board of Education* (1954) challenged "separate but equal" schools. The 1954 decision resulted in a shift from African Americans and Whites attending separate schools. Brown's core mission was desegregation--encouraging the integration of schools (McPherson, 2011).

School finance reform has come in three waves. The first wave relied on "the equal protection clause of the U. S. Constitution" (Briffault, 2007 p. 25). The second wave focused on interdistrict inequity--state constitutional provision (Briffault, 2007 p. 25). The third wave came with decisions that shifted litigation from equal protection to adequacy-state constitutional provisions (Briffault, 2007). Below each wave will be unpacked leading up to the current focus which is equity and access to for all students to educational opportunities regardless of their backgrounds, ethnicity, socioeconomic status, or ability.

The first wave began in the late 1960s with a focus on equal protection and challenged the per pupil inequities among school districts. Most school funding cases sought equal per pupil funding based on equal protection clauses in state constitutions. In 1965, President Lyndon B. Johnson signed into law the Elementary and Secondary Education Act (ESEA) expanding federal support in K-12 education. ESEA included the Title I program which purpose was to help cover the costs of educating disadvantaged students (Dayton & Dupre, 2004). This act signified a

commitment to equal access to quality education. In the 1971 *Serrano v Priest* the California Supreme Court ruled education is a fundamental right and that the public-school finance system then in place was unconstitutional because of the disparities in expenditures that it generated State funding disparities violated both State and Federal Equal Protection Clauses. In 1973, *San Antonio Independent School District v. Rodriguez* the U.S. Supreme Court found that the federal government is not constitutionally mandated to fund schools equitably. The second wave of financial reform followed.

The second wave of financial reform began in 1970 and was focused on interdistrict spending inequities grounded in the equal protection provisions of state constitutions. While rooted in the 1971 *Serrano v. Priest* and the 1973 *San Antonio Independent School District v. Rodriguez,* the second wave brought attention to other funding issues. In 1975, the Education for all handicapped children act was signed into law providing children with disabilities a free and appropriate public education and set federal funding commitments to ensure access. In 1976, the *Serrano v. Priest II* case was sent back to the California courts. At that time, California determined that even though education was not a right at the federal level it was a right in California, so it required the distribution of money "equitably" among districts. Other states followed suit and thus began the infusion of state funds to equalize spending distribution Moving from interdistrict inequity to adequacy began the third wave.

The third wave focused on adequacy. In *Abbott v. Burke* (1985), the New Jersey Supreme Court ruled that the state was obligated to provide an "adequate" education for all students thus increasing the amount of money states spend on schools. The poorest urban schools should be funded equal to that of wealthier suburban schools. Specifically, "an adequate education must enable disadvantaged children to compete against children from affluent districts.

state and local educational agencies must fund the poorest urban schools equal to that of wealthier suburban schools" (Briffault, 2007, p. 28). Moving forward, the distinction between adequate and equity has become blurred. Furthermore, federal and state funding of education responsibility continues to volley between federal funds and state funds.

Federal and state funds were used to provide educational opportunities for all. Funds are tied to the economy. When funds get tight, it is harder to fund education. The Great Recession of 2007 led to a decrease in revenues resulting in school personnel, mostly teachers, losing their jobs. In order to stabilize state budgets, President Obama signed two important acts to improve education funding. The first act was the American Recovery and Reinvestment Act (ARRA) in 2009. ARRA set aside $100 billion for schools including money to stabilize school budgets. The second act was Every Student Succeeds Act (ESSA) in 2015. One piece of ESSA requires that districts report school by school spending figures for the first time beginning in the 2018-2019 school year (Education Week, September 24, 2019). Furthermore, per-pupil expenditures by school, program, and grade were required to be reported. Reporting at the school level gives insight to areas of inequity within districts. In this study, equity will be examined among five middle schools in the same district. Public data for 2018-2019 which are available through the Department of Education will be used for this study. Below, a historical review of educational funding in Virginia will be examined.

History of Educational Funding in Virginia.

The historical review of educational funding in Virginia will be discussed in the time periods of 1700s, 1800s, 1900s, and 2000s. As early as 1758, education has been deemed important by our nation's founders. To that point, Rousseau stated that education is fundamental for legitimate government (Cole, 1973). In the Colonial Years, Virginia was slow to support

free public schools, education is currently one of the largest parts of the state budget (Salmon, 2010). Below, funding of education in Virginia will be explained. Regardless of the level of government, funding for education has been an ongoing balancing act. On one hand you have the limited funds, and on the other the priorities of the various stakeholders. With increase tightening on school budgets, using the funds efficiently to address the needs of all students is becoming challenging. Below, the evolution of funding public education in Virginia will be explored. Beginning with the 1700s and go through the current state of educational funding highlighting the changes.

1700s & 1800s.

As early as 1758, education has been deemed important by our nation's founders. In colonial years, the Commonwealth of Virginia was slow to support free public schools, but there were exceptions. Several Governors of Virginia—Thomas Jefferson, James Monroe, George Cabell, and John Tyler—did support free public schools (Salmon, 2010). In 1810, under Governor Tyler's leadership, the General Assembly created the Virginia Literary Fund to provide public education funding for Virginia's poor (Owings & Kaplan, 2019). While the literary fund was only for public schools, the money was often redirected to other projects such as funding for University of Virginia. Virginia Constitution became effective in 1870 and addressed for the first-time public education. The constitution spelled out that the General Assembly was required to provide compulsory universal free system of public education to be funded by the Literary Fund and statewide property tax (Salmon, 2010). During this time, the first Superintendent was hired to oversee public education in Virginia (Owings & Kaplan, 2019). Separate and unequally funded schools came to fruition for Black and White students at this time.

1900s

In 1902, a new Virginia Constitution was ratified and continued to support public funding of education. The only difference from the first constitution was that funding was based on the number of students age 7-20 rather than 5-21. Standards of Quality (SOQ) were established in 1972 ensuring a free educational system of high-quality education was created and maintained. The Standards of Quality set a formula for basic level of services and minimum required local effort and state support for districts to provide.

2000s

Currently, Virginia has a biennial budget system which means that budgets are enacted on even years and amendments occur on odd years. For example, in 2020 a new budget will be enacted and in 2021 amendments can occur. The Standards of Quality program required a calculation for determining a locality's wealth or fiscal capacity—Local Composite Index. Local Composite Index uses the locality's true value of real property (weighted at 50%), adjusted gross income (weighted at 40%), and taxable retail sales (weighted at 10%) to determine the school division's ability to pay educational costs fundamental to the Virginia Standards of Quality (SOQ). The Local Composite Index (LCI) determines the Local Required Effort (LRE). The Local Composite Index translates into an equalizing variance in computing the Local Required Effort which means wealthier districts get less money and poorer districts get more money. For example, Composite Data (2018-2020) has the Local Composite Index for Lee County a poorer area of the state at .1754 (17.54%) which means that Lee county's Local Required Effort is 17.54% of localities SOQ funding and the state will pay 82.46%. Compared to the Local Composite Index for Arlington a wealthier area of the state at .8000 (80%) which means Arlington must provide 80% of localities SOQ funding and the state contributes 20%. The SOQ

funding is a minimum, and local districts often fund above their Local Required Effort. In fact, each school division in Virginia exceeds their SOQ funding level. The 2019 Annual Report on the Conditions and Needs of Public Schools in Virginia reported, in 2018-2019 Virginia localities invested $4.2 billion above the required local effort for SOQ programs Virginia Department of Education, 2020b). Next, Virginia's education budget will be unpacked.

Virginia Direct Aid Budget

Currently, Virginia has a Direct Aid Budget which includes six categories. The six categories are Standards of Quality, Incentive Programs, Categorical Programs, Lottery Proceeds Fund, Supplemental Education Programs, and Federal Funds. Standards of Quality funding will be discussed first. Then, Incentive Programs, Categorical Programs, and Lottery Proceeds Fund will be unpacked. Finally, Supplemental Education Programs, and Federal Funds will be explained. Below, each category will be described as well as the percentage of the total budget provided.

Standards of Quality (SOQ) funds make up the largest portion of the budget at 90%. In 2019, the Virginia Board of Education prescribed new SOQ. Virginia Department of Education's website describes the Standards of Quality as "the foundational instructional programs and support services all schools must provide." (Virginia Department of Education, 2020c). Additionally, it is noted that the new standards promote educational equity. The next category to be unpacked in Incentive Programs.

The Incentive Programs are 2-3% of total state funding. Districts that receive these funds must agree to ensure they will provide what they say and meet all requirements. Incentive programs are not required, but voluntary. Examples include Governor's Schools, additional

special education programs, and compensation supplements. Categorical Programs will be explained below.

Categorical Programs are 1% of total state funding and target specific student populations. Adult education and literacy, Virtual Virginia, required services for students with disabilities (SWD), and school lunch programs state match are examples of categorical programs. Adult education and literacy funding is made up of four areas. The first area is Adult Education and Family Literacy Act (AEFLA) Funded Programs which encompass Adult Basic Education and English as a Second Language. Next, Adult High School Diploma Programs include both Adult Secondary Completion Options and High School Equivalency/GED testing. Then, Integrated English Literacy & Civics Education (IELCE) that is designed to enable adult English language learners gain English proficiency, understand civic rights and responsibilities, and obtain workforce skills. The final area is Workforce Development that provides workforce preparation activities and integrated education and training. The next category is Lottery Proceeds Fund.

Lottery Proceeds Fund began in 1987 and are 7-8% of total state funding. Lottery Proceeds Fund require local match and some funding is equalized based on free or reduced-price lunch eligibilities. Lottery Proceeds Funds supplanted general funds—twenty programs formerly funded out of general funding are now funded out of the Lottery Proceeds Funds. First, four Standards of Quality (SOQ) accounts—textbooks, English Language Learners (ELL), Early Reading Intervention, and Standards of Learning for Algebra Readiness classes are funded. Additionally, funds for the Virginia Preschool Initiative and K-3 Class Size Reduction programs come out of the Lottery Proceeds Funds. The next category is Supplemental Education Programs.

Supplemental Education Programs make up less than 1% of total state funding, are not available to all, and are restricted by language in the Act. For example, in Title I schools, supplemental education services include "tutoring and academic enrichment services that are provided in addition to daily instruction" (Virginia Department of Education, 2020d). Virginia Teaching Scholarship Loan Program and National Board Certification teacher bonuses come from this fund. The final category is Federal Funds.

Finally, Federal Funds cover programs such as Elementary and Secondary Education Act (ESEA), Every Student Succeeds Act of 2015 (ESSA), and Individuals with Disabilities Education Act (IDEA). The U. S. Department of Education's website defines ESEA as the nation's national education law and longstanding commitment to equal opportunities to all students and ESSA as a bipartisan measure that reauthorized ESEA. IDEA governs how states and public agencies provide early intervention, special education, and related services to children and youth with disabilities. Furthermore, Federal funds support Carl Perkins Act, Adult Education & Family Literacy Act, and Nutrition Act on a reimbursement basis using formulas. While Virginia's Direct Aid Budget covers six categories, there are other budget items that will be discussed below.

Other budget items include general transportation which encompasses transportation expenses such as mileage, bus purchases, and percentage of allowable charges based on local composite index (LCI). School facilities are the responsibility of local school divisions and can be funded in three ways—cash, bonds, and bank loans. Career and Technical Education (CTE) is funded by SOQ and supplemented by federal funds such as Carl Perkins & Career and Technical Education Act. Special Education funding is an add-on. The funding is based on a staffing formula using Average Daily Membership (ADM) and theoretical number of teachers

and classified staff based on December 1 count. Using the Local Composite Index (LCI), funds are disbursed based on availability. Furthermore, Virginia provides additional funds for homebound, regional programs, jails, Private Day and Private Residential programs. The budget includes virtual education while food service must be self-supporting as they provide meals. Food services receive reimbursements for free and reduced-priced and donations from Federal/State/Local sources. Charter schools, non-public schools, and Virginia Retirement System also fall under the state budget.

Equity in Education

A review of school finance literature has shown that how equity is achieved in education has changed over time (Owings & Kaplan, 2013, Odden and Picus, 2004, & Briffault, 2007). Furthermore, equalized funding does not necessarily lead to equalized outcomes. Below I will discuss the progression of terms over time. Those terms are equalization, equality, equity, adequacy, and horizontal and vertical equity. First, equalization, equality, equity will be unpacked. Then, adequacy, horizontal and vertical equity will be examined.

Equalization, equality, equity may appear similar, yet they are different. Equalization is a process of balancing poorer community need for greater state support for education than wealthier communities (Owings & Kaplan, 2013). For example, more resources would be allocated to a school with lower socioeconomic status than a school with higher socioeconomic status. Equality is treating everyone the same while equity is giving people what they need (Owings & Kaplan, 2013). Equality would provide the same resources for all schools, whereas; equity would provide resources based on the school's needs. Basing resources disbursed on need, would result in a school with a large population of students in special education receiving more resources than a school with a smaller population of students in special education. In

conclusion, it is imperative that educational leaders understand the differences in equalization, equality, and equity. Next, adequacy, horizontal equity, and vertical equity will be explained.

Adequacy, horizontal equity, and vertical equity are often studied together. Below, each will be described. First, adequacy is providing sufficient resources to accomplish the job of educating students (Owings & Kaplan, 2013). Additionally, Odden and Picus (2004) offer a workable definition of adequacy as providing enough funds "to teach the average student to state standards, and then to identify how much each district/school requires to teach students with special needs-the learning disabled, those from poverty with educationally deficient backgrounds, and those without English proficiency-to the same high and rigorous achievement standards" (p. 25). Next, horizontal equity states that schools with similar needs receive equal funding shares. At the Federal level, horizontal equity would be the share of funding provided to one state is like that of another state with similar needs. In Virginia, students in District A should receive the same funding as District B if they have the similar profiles. Furthermore, at the local level, the share of revenues should be distributed similarly to School A and School B given they have similar profiles. Finally, vertical equity means providing funds to meet the needs of the school. Funding and resources should be distributed in accordance with different level of needs at each school. The level of needs is based on such factors as students with disabilities, socioeconomics, English Language Learners, race and ethnicity. For example, a school with a high number of special education programs would receive a larger share of revenue funds than a school with a low number of special education programs (Owings & Kaplan, 2013). The goal of education is not to treat everyone equally, but to strive for equity and adequacy in funding so that all students have access to a just K-12 education.

In conclusion, traditional studies of equity have examined equity among states or districts. Research supports the need to examine intradistrict equity—that is equity within one district (Berne & Stiefel, 1994; Heilig, Ward, Weisman, & Cole, 2014). While research has shed light on the need to examine intradistrict equity, the availability of resource data has been limited (Burke,1999 & Burke & White, 2001). Furthermore, federal and state policies advocate for a just education for all. IDEA and ESSA are just two of many policies that have been directed to support the need for additional funds to meet the needs of disadvantaged students. While funds are directed to address needs, the question remains if they are funneled equitably based on needs. At both the state and federal level, study after study has shown a discrepancy in the distribution (Burke, 1999 & Burke & White, 2001). Now that data are available at the school level, it is imperative that we examine intradistrict equity if we are to ever correct the inequity in education. Additionally, in their article The Alpha and Omega Syndrome: Is Intra-District Funding the Next Ripeness Factor, Owings and Kaplan (2010) discuss "fiscal disparities within school districts may be the next area "ripe" for litigation" (p. 1). Ripeness of litigation will be discussed below.

As stated previously, education budgets are being squeezed tighter and tighter while student needs are increasing. Educational leaders are being asked to do more with less funds. Educational funding has been a topic of research and the source of many court cases. It expands over time from how budgets are funded to state versus federal funding, and inter-district funding. There has been a multitude of court cases regarding access to education and equal education for all. Some historical cases include *Plessy v. Ferguson* (1896), *Brown v. Board of Education* (1954), *Serrano v. Priest* (1971), *San Antonio Independent School District v. Rodriguez* (1973) and *Abbott v. Burke* (1985). Owings and Kaplan ask the question—could fiscal disparities be the

next area of litigation? In their study, they question if now is the time and place for a call to change. Per pupil spending at two schools within the same district was examined, and the results found more money was spent per pupil at the school with less needs while less money was spent per pupil at the school with more needs. Funding inequities manifest in the areas of "teacher quality, class size, facilities' upkeep, the level of available technology, and other factors that can impact student outcomes" (Owings and Kaplan, 2010). As a result of the reauthorization of ESSA in 2015, per pupil data are being collected and reported by individual schools. Access to this data will be readily available as it will be published as part of schools' report cards. With data readily available, disparities will be easily identified. Upon discovery of disparities, will parents and community members rise and confront the inequities? The examination of equity using equity audits will allow schools to identify and begin to address areas of inequity before litigation arises. This study is designed to support and fill the hole in the literature that exists regarding intra-district equity. Equity audits are a means to identify areas of inequity.

Equity Audits

In their book, *Using Equity Audits to Create Equitable and Excellent Schools,* Skrla, McKenzie, & Scheurich, discuss equity and equity audits. They begin with a discussion about No Child Left Behind Act of 2001 (NCLB) having an explicit statement that achievement gaps between white and middle-and upper-income children, on one hand, and children of color and children from low-income homes, on the other, are unacceptable and must be eliminated. They go on to discuss that "Data show wide gaps in achievement between and among student groups based on race, ethnicity, family income, and language proficiency" (Skrla, McKenzie, & Scheurich, 2009 p. 5). There has been a significant amount of research regarding the gaps. While attempts have been made and some growth in these areas has occurred, the gaps still exist.

Skrla, McKenzie, & Scheurich posit that equity audits are a tool that leaders can use to identify and address closing these gaps.

While many like to blame the gaps on external causes, large and persistent patterns of inequity were found internal to schools—assumptions, beliefs, practices, procedures, and policies of schools. Equity audits are designed to provide insight into, discussion of, and practical responses to systemic patterns of equity in schools and school districts. The underlying assumption is the best public education is a right that everyone deserves. Skrla, McKenzie, & Scheurich (2009), a identify twelve indicators of equity and divide them into three categories. The three categories are teacher equity, programmatic equity, and achievement equity. Teacher equity is measured by teacher education, teacher experience, teacher mobility, and teacher quality. Programmatic equity includes special education, gifted and talented, bilingual education, and discipline. Achievement equity refers to state achievement tests, dropout rates, graduation tracks, and SAT/ACT/AP/IB performance. Teacher equity and programmatic equity will be the focus of this study of the five middle schools being examined.

In conclusion, this study will use data gathered for each middle school to examine teacher equity and programmatic equity across the schools and to identify any areas of inequities. Table 1 will be used to determine the per-pupil expenditure for each middle school in Anonymous school district. Additionally, intradistrict horizontal and vertical equity will be calculated. First, student enrollment will be collected including students on free or reduced-price lunch, students with disabilities, students identified gifted, English Language Learners, and ethnicity. The next area to be appraised is personnel— full time equivalent classroom teachers, student to teacher ratio, average teacher salary, number of administrators and professional staff, the level of education, teacher quality, and number of classified staff make up the personnel data.

Administrators include principals, assistant principals, administrative assistants, and deans. Professional staff includes teachers, school counselors, and nurses—anyone who has a license. Then, operation costs to include per-pupil expenditures and professional development expenditures will be examined. The analysis of this data will be used to examine teacher equity and programmatic equity as well as answer the research questions below:

1. Does variation exist among schools?
2. What is the per-pupil expenditure at each school?
3. When examining per-pupil expenditures, what differences exist?
4. To what extent does the district funding system meet the standards for horizontal and vertical equity?

CHAPTER 3

METHODOLOGY

The purpose of this study is to examine the relationship of intradistrict per-pupil expenditures across five middle schools in Anonymous school district for the 2018-2019 school year through equity audits. Broadly, the distribution of resources will be examined. Specifically, how intradistrict per-pupil expenditures are influenced by various demographic statistics and influence horizontal and vertical equity measures will be explored. The conceptual framework of this study includes Berne & Stiefel, who set the standard for horizontal and vertical equity. Using a framework of vertical and horizontal equity, equity across schools will be examined. Furthermore, Skrla, McKenzie and Scheurich identified twelve indicators of equity and divided them into three categories—Teacher Equity, Programmatic Equity, and Achievement equity. This study will focus on teacher equity and programmatic equity. Employing the simplified reconceptualization of equity auditing that Skrla, Scheurich, Garcia, & Nolly (2004) discuss and Owings & Kaplan (2010) employed, five middle schools in Anonymous school district will be examined for intradistrict equity. The schools used for this study will be five middle schools in an urban/suburban school district in Virginia. The school population is racially diverse but is not a representation of the city at-large. Recent economic decline has resulted in a decrease in school population, so moving forward a strong equitable education system is needed. These concepts frame the study. Research design will be unpacked next.

Research Design

This is a quantitative study that uses a multi-case study approach to look at the hard data gathered from multiple sites. Multi-case studies are used when comparing similar areas across

different points. The multi-case studies approach can lead to a richer and more comprehensive examination of the area of study. Furthermore, it enables the researcher to better understand the problems, issues, and other factors (Yin, 2003). Stake (1995) referred to this as a collective case study, where the researcher selects several research sites to examine for specific information. The multi-case study is suited to seek information from a manageable number of sites broad enough to explore the issue of focus but narrow enough to keep the research focused and feasible (Creswell, 2007). The researcher chose the Anonymous School District because it had a total of five middle schools. Comparing five middle schools made the analysis of data manageable. Below each middle school will be described.

Population of the Study

Five middle schools in an urban/suburban school district were the subject of this investigation. In order to maintain anonymity, each school was given a number and will be referred to as School 1, School 2, School 3, School 4, and School 5.

Table 2

School Student Demographic Data

School/Data		School 1	School 2	School 3	School 4	School 5
Enrollment	*6th*	224	228	213	322	231
	7th	192	206	223	299	191
	8th	197	213	248	334	196
	Total	613	647	684	955	618
Racial and Ethnic Groups	*Black*	431	276	497	492	424
	Hispanic	27	52	45	74	32
	White	100	267	70	295	113
	Asian	8	7	18	14	14
	Multiple Races	43	45	50	76	32
	American Indian	8	0	4	2	2
	Native Hawaiian	1	0	0	2	0

Students with Disabilities	60	60	127	167	89
Economically Disadvantaged	295	268	427	504	316
English Language Learners	12	13	45	14	11

Data Collection

With the new ESSA requirements mandating school districts to report per-pupil expenses by school, this study is timely. Using a multi-case study approach, data from multiple sites will be gathered and examined. A multi-case study was chosen to allow comparisons of multiple sites across similar data points to examine equity in per-pupil expenditures. Using data from Department of Education end of year reporting for 2018-2019, preliminary data will be verified and updated. Data will include student enrollment data, personnel data, and operational costs data. Gathered data will then be examined using the conceptual frameworks discussed above.

Analytical Methods

The data provided in Table 1 will be used to determine the per-pupil expenditure for each middle school in Anonymous school district. Additionally, intradistrict horizontal and vertical equity will be calculated. First, student data will be collected including enrollment, racial and ethnic groups, students identified as economically disadvantaged, students who qualify for free or reduced-price lunch, students with disabilities, students identified as English Language Learners and any special programs. The next area to be appraised is personnel—full time equivalent classroom teachers, student to teacher ratio, average teacher salary, number of administrators and professional staff, the level of education, teacher quality, and number of classified staff. Then, operational costs will be gathered and include per-pupil expenditures, professional development expenditures, and total spending for each school.

Upon completion of compiling data, total per student spending and cents spent per dollar will be calculated. Per-pupil expenditures are determined by dividing the total spending by the number of students. For example, if the total spending was $18,507,488 and the number of students was 2251, then $18,507,488 divided by 2251 equals a per pupil expenditure of $8221.90. Table 1 is a combination of the tool that Owings and Kaplan used in their Alpha and Omega study in conjunction with Skrla, McKenzie, & Scheurich's equity categories.

Table 1 includes data collected into three main areas: student data, personnel data, and operational cost data. Student data include enrollment, racial and ethnic groups, students identified as economically disadvantaged, students who qualify for free or reduced-price lunch, students with disabilities, students identified as English Language Learners, and any special programs at each school. Personnel data includes full time equivalent classroom teachers, student to teacher ratio, average teacher salary, number of administrators and professional staff, the level of education, teacher quality, and number of classified staff. Administrators include principals, assistant principals, administrative assistants, and deans. Professional staff includes teachers, school counselors, and nurses—anyone who has a license. Classified staff includes clerical, health clerks, and school security officers. Operational costs include per-pupil expenditures, professional development expenditures, and total spending for each school. Then, the data collected will be analyzed to determine any resource inequities in personnel, operations, per-pupil expenditures, and cents per dollar. Furthermore, horizontal, and vertical equity among the schools will be examined. Horizontal and vertical equity will be examined by per-pupil expenditures compared to the needs of the school. To further examine vertical equity, Berne & Stiefel's (Berne & Stiefel, 1984) and Verstegen and Driscoll's (Verstegen and Driscoll,

2008) weighting formulas will be used and the Apriori algorithm will be applied and cents per dollar will be calculated.

I will use the following research questions to guide my investigation:

1. Does variation exist among schools?
2. What is the per-pupil expenditure by school?
3. When examining per-pupil expenditures, what differences exist?
4. To what extent does the district funding system meet the standards for horizontal and vertical equity?

This is a quantitative study that uses a multi-case study approach to look at the hard data. Per-pupil expenditures of 2018-2019 school year data will be examined. Furthermore, horizontal and vertical equity will be examined. The differences will then be reviewed and discussed. Using the tool that Owings and Kaplan previously used in conjunction with Skrla, McKenzie, & Scheurich' s equity categories, I will analyze the needs of the schools and the distribution of resources across five middle schools in Anonymous school district.

Methodology

Data Selection and Data Collection

This study employs data collected from five middle schools in Anonymous school district. The schools were chosen based on access to the data as well as the fact that the district had five middle schools. Five middle schools produced data that were manageable to examine. The data collected are separated into three main areas: student data, personnel data, and operational costs data. Student data include enrollment, racial and ethnic groups, students identified as economically disadvantaged, students who qualify for free or reduced-price lunch, students with disabilities, students identified as English Language Learners and any special

programs. Full time equivalent classroom teachers, student to teacher ratio, average teacher salary, number of administrators and professional staff, the level of education, teacher quality, and number of classified staff make up the personnel data. Administrators include principals, assistant principals, administrative assistants, and deans. Professional staff includes teachers, school counselors, and nurses—anyone who has a license. Classified staff includes clerical, health clerks, and school security officers. Operational costs data include per-pupil expenditures, professional development expenditures, and total spending for each school. In order to carefully gather the data, an equity audit format previously used by Owings and Kaplan (2010) was used to collect and organize the data for analysis. Next, how the data will be analyzed is explained.

Data Analysis

Data for this study will be analyzed utilizing the equity principles described by Berne and Stiefel (1984). Horizontal and vertical equity are the first two measures. To begin, horizontal equity will be unpacked. Data for each school will gathered in Table 1. For horizontal equity to be present, schools with similar profiles would be receiving similar disbursement of funds, staffing, and resources. Then, vertical equity will be discussed. Horizontal and vertical equity will be measured by per-pupil expenditures. To further examine vertical equity, Berne & Stiefel's (Berne & Stiefel, 1984) and Verstegen and Driscoll's (Verstegen and Driscoll, 2008) weighting formulas will be used and the Apriori algorithm will be applied and cents per dollar will be calculated.

Vertical equity specifies that differently situated groups should be treated differently. Berne & Stiefel (1984) determined that differently situated groups are identified by their differing needs for resources to achieve at a standard level. Furthermore, Verstegen (2002) identified three groups of students who require additional resources to meet standard, academic

levels. The three groups are students with disabilities, students qualifying for free or reduced-priced lunches, and English language learners. For the purpose of this project, the three groups Verstegen identified will be used to determine vertical equity. The generally accepted principles of equity using weighted per-pupil expenditures for vertical equity analysis will be used (Blankenship, 2017). Verstegen and Driscoll (2008) determined standard weights for students who were classified as needing extra services such as: students qualifying for free or reduced-priced lunch, students with disabilities, and English language learners. Each of the measures are defined below:

1. Per-pupil expenditures (PPE): shall include actual personnel expenditures, including staff salary differentials for years of employment, and actual non-personnel expenditures such as operations and maintenance, professional development, field trip transportation, and instructional supplies. Per-pupil expenditures will not include capital construction costs. Per-pupil expenditures are determined by dividing the total spending by the number of students. For example, if the total spending was $18,507,488 and the number of students was 2251, then $18,507,488 divided by 2251 equals a per pupil expenditure of $8221.90.
2. Weighted Per-Pupil Expenditures: Verstegen (2015) defines weight as "the ratio of excess costs above the base to the basic per pupil funding amount". Students with disabilities will be counted as 2.0 because the additional cost for children in special education is 100% above average funding for a typical general education student (Verstegen, 2015). Students who qualify for free or reduce-priced lunch and English Language Learners will be counted as 1.5 because an additional 50% is required for children who are low income, as measured by eligibility for free and reduced-priced

lunch and those who are Limited English Proficient (LEP) Verstegen (2015). Then the weighted pupils are used as the pupil measure when conducting vertical equity analysis. Weighting students considers the additional revenues that should be received by schools to address the increased costs of specific groups of students.

3. Cents/Dollar: For every dollar spent at the school with the highest per-pupil expenditure, the cents per dollar are calculated by dividing each schools' per-pupil expenditure by the school with the highest per-pupil expenditures. For example, if you were comparing five schools—School A, School B, School C, School D, and School E and per-pupil expenditures were found for each school. School A had the highest per-pupil expenditure at $10,000. The other four schools' per-pupil expenditures would be divided by $10,000 to determine the cents per dollar. If School D had a per-pupil expenditure of $8,000, $8,000 would be divided by $10,000 to determine the cents per dollar were $0.80.
4. Apriori Algorithm: The Apriori algorithm is a practical means to assess equity among the schools. For this study, a 10% difference was identified as slightly inequitable, with 25% as moderately elevated inequitable, and 40% as notable inequitable.

Measures were taken to allow for variance across the data. Next, reliability and validity will be discussed.

Reliability and Validity

The researcher will collect data in three areas: students, personnel, and operational costs data. These data points were chosen as reliable and valid indicators when examining per-pupil expenditures. Student data include enrollment, racial and ethnic groups, students identified as

economically disadvantaged, students who qualify for free or reduced-price lunch, students with disabilities, students identified as English Language Learners and any special programs. Full time equivalent classroom teachers, student to teacher ratio, average teacher salary, number of administrators and professional staff, the level of education, teacher quality, and number of classified staff make up the personnel data. Administrators include principals, assistant principals, administrative assistants, and deans. Professional staff includes teachers, school counselors, and nurses—anyone who has a license. Classified staff includes clerical, health clerks, and school security officers. Operational costs data include per-pupil expenditures, professional development expenditures, and total spending for each school. School divisions had to report school level data regarding the data points chosen beginning with the 2018-2019 school year. Finally, the data were available through the Virginia Department of Education (VDOE) as school divisions were required to report more in-depth data beginning with the 2018-2019 school year.

Limitations and Delimitations

The researcher acknowledges the study has some limitations, or potential weaknesses that will be out of the control of the study. First, only five middle schools in an urban/suburban district will be studied. Second, specific data will be examined within each school. As a result, the study's findings are not expected to be generalizable beyond the one district or the five schools. Nevertheless, the study will provide a foundation for future use of equity audits to examine intradistrict per-pupil expenditures. As mentioned earlier, identifying inequities provides an awareness. Being aware of inequities is the first step in taking action to address them.

Assumptions of the Study

The researcher assumed the Anonymous school district followed the guidelines set forth by the Virginia Department of Education (VDOE). The researcher assumed that expenditure and demographic data retrieved from the VDOE website were accurate and complete. The researcher assumed that the free and reduced-priced lunch numbers reflected the level of poverty within each school.

Summary

The purpose of this chapter is to describe the research methodology of this study, describe the procedure used to collect data and discuss the statistical procedure used to analyze data. Using the Owings and Kaplan (2010) equity audit format, Berne and Stiefel (1984) equity analysis of schools, and Verstegen and Driscoll (2008) weighting formulas, equity will be examined among five Virginia middle schools. Horizontal and vertical equity are the first two measures to be examined. Horizontal and vertical equity will be examined by per-pupil expenditures compared to the needs of the school. The generally accepted principles of equity using weighted per-pupil expenditures for vertical equity analysis will be used (Blankenship, 2017). Berne & Stiefel's (Berne & Stiefel, 1984) and Verstegen and Driscoll's (Verstegen and Driscoll, 2008) weighting formulas will be used and the Apriori algorithm will be applied and cents per dollar will be calculated. Verstegen and Driscoll (2008) determined standard weights for students who were classified as needing extra services such as: students eligible for free or reduced-priced lunch, students with disabilities, and students identified as English language learners. Then, the weighted pupils are used as the pupil measure when conducting vertical equity analysis. The purpose of equity audits is to facilitate distribution of resources based on

student need, and ultimately, to improve the efficiency of how resources are adjusted to promote student achievement.

CHAPTER 4

FINDINGS

Purpose of the Study

The purpose of this study was to examine the relationship between intradistrict per-pupil expenditures in five middle schools in Anonymous school district using equity audits. Broadly, the distribution of resources was examined. Specifically, how intradistrict per-pupil expenditures were influenced by various demographic statistics and influenced horizontal and vertical equity measures. Using a framework of vertical and horizontal equity, equity across schools was examined. Employing the simplified reconceptualization of equity auditing that Skrla, Scheurich, Garcia, & Nolly (2004) discuss and Owings & Kaplan (2010) employed, five middle schools in Anonymous school district were examined for intradistrict equity. The answers to the following questions were sought.

1. Does variation exist among schools?
2. What is the per-pupil expenditure by school?
3. When examining per-pupil expenditures, what differences exist?
4. To what extent does the district funding system meet the standards for horizontal and vertical equity?

The findings are presented in three sections. The first section describes school-by-school characteristics and data found addressing Research Question 1 and 2. Next, section two compares the five schools across the characteristics and data for each school. Research Questions 1 and 3 are addressed in section two. Finally, vertical and horizontal equity is examined in section three which also addresses Research Question 4. All schools are described using the parameters listed below which were explained previously in the Methodology.

Definition of Parameters

The data provided in Table 1 was used to determine the per-pupil expenditure for each middle school in Anonymous school district. Additionally, intradistrict horizontal and vertical equity will be calculated. First, student data include enrollment, racial and ethnic groups, students identified as economically disadvantaged, students who qualify for free or reduced-price lunch, students with disabilities, students identified as English language learners and any special programs. The next area to be appraised is personnel data which include full time equivalent classroom teachers, student to teacher ratio, average teacher salary, number of administrators and professional staff, the level of education, teacher quality, and number of classified staff. Then, operational costs data include per-pupil expenditures, professional development expenditures, and total spending for each school.

Upon completion of compiling data, total per student spending and cents spent per dollar will be calculated. Per-pupil expenditures are determined by dividing the total spending by the number of students. For example, if the total spending was $18,507,488 and the number of students was 2251, then $18,507,488 divided by 2251 equals a per pupil expenditure of $8221.90. Table 1 is a combination of the tool that Owings and Kaplan used in their Alpha and Omega study in conjunction with Skrla, McKenzie, & Scheurich's equity categories. Table 1 includes data collected into three main areas: student data, personnel data, and operational cost data. Student data include enrollment, racial and ethnic groups, students identified as economically disadvantaged, students who qualify for free or reduced-price lunch, students with disabilities, students identified as English language learners and any special programs. Full time equivalent classroom teachers, student to teacher ratio, average teacher salary, number of administrators and professional staff, the level of education, teacher quality, and number of

classified staff make up the personnel data. Administrators include principals, assistant principals, administrative assistants, and deans. Professional staff includes teachers, school counselors, and nurses—anyone who has a license. Classified staff includes clerical, health clerks, and school security officers. Operational costs data include per-pupil expenditures, professional development expenditures, and total spending for each school.

Section one describes the characteristics and data found for each school and addresses Research Question 1: Does variation exist among schools? and Research Question 2: What is the per-pupil expenditure by school?

Beginning with School 1 continuing through School 5 each school's characteristics and data will be presented. The data will be organized into three categories: student data, personnel data, and operational costs.

School 1 Data

School 1 Student Data

Enrollment.

Based on the data available through Virginia Department of Education (VDOE) for the school year 2018-2019, the total student enrollment of School 1 was 955. School 1 is a middle school that houses 6th, 7th, and 8th graders. The total number of sixth graders was 322 students or 33.72% of the total population. The total number of seventh graders was 299 students or 31.31% of the total population. The total number of eighth graders was 334 or 34.97% of the total population. School 1 was also identified as a Title I School and with a School-Wide Program.

Ethnicity.

The ethnicity breakdown by total school enrollment will be discussed next. There were 492 Black students which made up 51.52% of the total student enrollment. There were 74 Hispanic students which made up 7.75% of the total student enrollment. There were 295 White students which made up 30.89% of the total student enrollment. There were 14 students identified as Asian which made up 1.47% of the total student enrollment. There were 76 students identified as Multiple Race which made up 7.96% of the total student enrollment. There were two students identified as American Indian which made up 0.21% of the total student enrollment. There were two students identified as Native Hawaiian which made up 0.21% of the total student enrollment.

Poverty.

Poverty was determined in multiple ways. First, the number of economically disadvantaged students was determined. Next, the number of students who were eligible for free or reduced-priced lunch was examined. The number of economically disadvantaged students was 504 or 52.77% of the total enrollment. The number of students who were eligible for free lunch was 681 or 71.31% of the total enrollment. No students qualified for reduced price lunch.

Programming.

Programming was determined in three ways—students with disabilities, English language learners, and gifted Students. The number of students with disabilities was 167 or 17.49% of the total enrollment. The number of English language learners was 14 or 1.47% of the total enrollment. There were no data available through VDOE for the number of gifted students at School 1.

School 1 Personnel Data

Number of Staff.

Personnel data were gathered using the 2018-2019 data available through Virginia Department of Education (VDOE), recommended Standards of Quality (SOQ) for staffing, and current staffing data available for the 2020-2021 school year. The source of the data will be indicated, respectively. Two areas of staffing were examined—professional staff and classified staff. Professional staff was defined as anyone who held a certification. Classified staff was defined as staff who did not hold a certification. For 2018-2019 school year, School 1 had 61.86 full time equivalent (FTE) classroom teachers with a student to teacher ratio of 15.42. Next, the personnel will be broken out.

Professional Staff.

Professional Staff was defined as anyone who held a certification. 2020-2021information from the school website indicated School 1 had one principal and three assistant principals which is reflective of Standards of Quality (SOQ) recommendations. For 2018-2019 school year, School 1 had 61.86 full time equivalent (FTE) classroom teachers. Based on Standards of Quality, School 1 should have two and a half school counselors, but 2020-2021 data showed they have three school counselors. Based on SOQ, School 1 should have one nurse and 2020-2021 data showed they have one nurse. Based on SOQ, School 1 should have one and a half librarians, but 2020-2021 data showed they have one librarian.

Below data that were available from VDOE regarding the 2018-2019 school year for School 1 will be unpacked. According to the budget information for 2018-2019, the average teacher salary was $48,378.11. Level of education of administrators and teachers and teacher quality will be provided next. Level of education is defined by the degree earned: 47% staff

held Bachelor's degree, 49% of the staff held Master's degrees, 1% held a Doctoral degree. and 3% identified as other. 19.4% of the staff were identified as provisional teachers, 9.7% were inexperienced, 1.4% were out of field teachers, and 1.4% were identified as out of field and inexperienced teachers. Next, the classified staff will be described for School 1.

Classified

Classified Staff was defined as staff who did not hold a certification. Classified staff consisted of clerical, health clerks, cafeteria monitors, cafeteria manager and staff, school security officers, and technology support specialist. According to Standards of Quality (SOQ) two and a half full time equivalent clerical staff should be allocated, but 2020-2021 data indicated only two clerical staff. By SOQ, a half health clerk should be allocated, but 2020-2021 data indicated one full time staff member. By SOQ, two cafeteria monitors and two school security officers should be allocated, but current data were not available. Next, operational costs will be discussed.

School 1 Operational Costs

School 1 Operational Costs include per-pupil school level expenditures, and per-pupil division level expenditures, and professional development expenditures (excluding adult education, community services, non-regular school day programs, capital purchases, debt service, food services and fund transfers. Per-pupil school level expenditures were $7,526 and per-pupil division level expenditures were $3,121 for a total per-pupil Expenditures of $10,647 with an additional $21,673 for excluded costs. The total operational costs were $10,390,870.00.

Table 3

School 1 Characteristics

Categories	**School 1 (Title I)**	
Students	**Number**	**Percentage**
Total Enrollment	955	
6th	322	33.72
7th	299	31.31
8th	334	34.97
Racial and Ethnic Groups		
Black	492	51.52
Hispanic	74	7.75
White	295	30.89
Asian	14	1.47
Multiple Races	76	7.96
American Indian/Alaska Native	2	0.21
Native Hawaiian/Pacific Islander	2	0.21
Economically Disadvantaged	504	52.77
Free & Reduced-priced Lunch Eligible	681	71.31
Students with disabilities	167	17.49
English Language Learners	14	1.47
Personnel		
Classroom Teachers (Full Time Equivalent)	61.86	
Student to Teacher Ratio	15.42	
Average Teacher Salary	$48,378.11	
Administrators/Professional	**SOQ**	**2020-2021**
Principals	1	1
Assistant Principals (based on funding formula)	3	3
School Counselors (enrollment/400 rounded to nearest .5)	2.5	3
Nurse (>,= to 300:1)	1	1
Librarians (.5FTE to 299, 1FTE at 300)	1.5	1
Level of Education		**2018-2019**
Bachelor's Degree		47
Master's Degree		49
Doctoral Degree		1
Other		3
Teacher Quality		

Provisional Teachers		19.4
Inexperienced Teachers		9.7
Out of Field Teachers		1.4
Out of Field and Inexperienced Teachers		1.4
Classified Staff	**SOQ**	**2019-2020**
Clerical (Attendance Clerk, Admin Asst, Fin. Off)	2.5	2
Health Clerks	0.5	1
School Security Officers (500-999=2) & SRO	2	
Operational Costs		
Per-pupil school level expenditures	$ 7,526.00	
Per-pupil division level expenditures	$ 3,121.00	
Total per-pupil expenditures	$ 10,647.00	
Professional development expenditures (excluded costs: adult education, community services, non-regular school day programs, capital purchases, debt service, food services, and fund transfers.)	$ 21,673.00	
Total Spending	$ 10,390,870.00	

School 2 Data

School 2 Student Data

Enrollment.

Based on the data available through Virginia Department of Education (VDOE) for the school year 2018-2019, the total student enrollment of School 2 was 684. School 2 is a middle school that houses 6th, 7th, and 8th graders. The total number of sixth graders was 213 students or 31.14% of the total population. The total number of seventh graders was 223 students or 32.60% of the total population. The total number of eighth graders was 248 or 36.26% of the total population. School 2 was also identified as a Title I School and with a School-Wide Program.

Ethnicity.

The ethnicity breakdown by total school enrollment will be discussed next. There were 497 students identified as Black which made up 72.66% of the total student enrollment. There were 45 students identified as Hispanic which made up 6.58% of the total student enrollment. - There were 70 students identified as White which made up 10.23% of the total student enrollment. There were 18 students identified as Asian which made up 2.63% of the total student enrollment. There were 50 students identified as Multiple Race which made up 7.31% of the total student enrollment There were four students identified as American Indian which made up 0.58% of the total student enrollment. No students were identified as Native Hawaiian.

Poverty

Poverty was determined in multiple ways. First, the number of economically disadvantaged students was determined. Next, the number of students who were eligible for free or reduced-priced lunch was examined. The number of economically disadvantaged students was 427 or 62.43% of the total enrollment. The number of students who were eligible for free lunch was 520 or 76.02% of the total enrollment. No students qualified for reduced price lunch.

Programming

Programming was determined in three ways—students with disabilities, English language learners, and gifted students. The number of students with disabilities was 127 or 18.57% of the total enrollment. The number of English language learners was 45 or 6.58% of the total enrollment. There were no data available through VDOE for the number of gifted students at School 2.

School 2 Personnel Data

Number of Staff.

Personnel data were gathered using the 2018-2019 data available through VDOE, recommended Standards of Quality (SOQ) for staffing, and current staffing data available for the 2020-2021 school year. The source of the data will be indicated, respectively. Two areas of staffing were examined—Professional Staff and Classified Staff. Professional Staff was defined as anyone who held a certification. Classified Staff was defined as staff who did not hold a certification. School 2 had 51.36 full time equivalent classroom teachers with a student to teacher ratio of 13.32.

Professional Staff.

Professional Staff was defined as anyone who held a certification. School 2 had one principal and two assistant principals. Based on SOQ, School 2 should have two school counselors, and the 2020-2021 data showed they have two school counselors. Based on SOQ, School 2 should have one nurse and 2020-2021 data showed they have one nurse. Based on SOQ, School 2 should have one and a half librarians, but 2020-2021 data showed they have one librarian.

Below data that were available from VDOE regarding the 2018-2019 school year for School 2 will be unpacked. According to the budget information for 2018-2019, the average teacher salary was $48,725.85. Level of education of administrators and teachers and teacher quality will be provided next. Level of education is defined by the degree earned. 60% staff held Bachelor's degree, 34% of the staff held Master's degrees, and 2% held a Doctoral degree. 22% of the staff were identified as provisional teachers, 13.6% were inexperienced, 1.7% were

out of field teachers, and 1.7% were identified as out of field and inexperienced teachers. Next, the classified staff will be described for School 2.

Classified

Classified staff was defined as staff who did not hold a certification. Classified staff consisted of clerical, health clerks, cafeteria monitors, cafeteria manager and staff, school security officers, and technology support specialist. According to SOQ 2.5 full time equivalents should be allocated for clerical staff, and 2020-2021 data indicated 3. By SOQ, a half health clerk should be allocated, but 2020-2021 data indicated one full time staff member. By SOQ two cafeteria monitors and two school security officers should be allocated, data available showed two school security officers and no data were available for cafeteria monitors. Next, operational costs will be discussed.

School 2 Operational Costs

School 2 Operational Costs include per-pupil school level expenditures, and per-pupil division level expenditures, and professional development expenditures (excluding adult education, community services, non-regular school day programs, capital purchases, debt service, food services and fund transfers. Per-pupil school level expenditures were $8,814 and per-pupil division level expenditures were $3,121 for a total per-pupil expenditure of $11,935 with an additional $14,853 for excluded costs. The total operational costs were $8,024,810.00

Table 4

School 2 Characteristics

Categories	School 2 (Title I)	
Students	**Number**	**Percentage**
Total Enrollment	684	
6th	213	31.14
7th	223	32.60
8th	248	36.26
Racial and Ethnic Groups		
Black	497	72.66
Hispanic	45	6.58
White	70	10.23
Asian	18	2.63
Multiple Races	50	7.31
American Indian	4	0.58
Native Hawaiian	0	0.00
Economically Disadvantaged	427	62.43
Free & Reduced-priced Lunch Eligible	520	76.02
Students with disabilities	127	18.57
English Language Learners	45	6.58
Personnel		
Classroom Teachers (Full Time Equivalent)	51.36	
Student to Teacher Ratio	13.32	
Average Teacher Salary	$48,725.85	
Administrators/Professional Staff	**SOQ**	**2020-2021**
Principals	1	1
Assistant Principals (based on funding formula)	2	2
School Counselors (enrollment/400 rounded to nearest .5)	2	2
Nurse (>,= to 300:1)	1	1
Librarians (.5FTE to 299, 1FTE at 300)	1.5	1
Level of Education		**2018-2019**
Bachelor's Degree		60
Master's Degree		34
Doctoral Degree		2
Teacher Quality		
Provisional Teachers		22
Inexperienced Teachers		13.6

Out of Field Teachers		1.7
Out of Field and Inexperienced Teachers		1.7
Classified Staff		
Clerical (Attendance Clerk, Admin Asst, Fin. Off)	2.5	3
Health Clerks	0.5	1
School Security Officers (500-999=2) & SRO	2	2
Technology Support Specialist		1
Operational Costs		
Per-pupil school level expenditures	$ 8,814.00	
Per-pupil division level expenditures	$ 3,121.00	
Total per-pupil expenditures	$ 11,935.00	
Professional development expenditures (excluded costs: adult education, community services, non-regular school day programs, capital purchases, debt service, food services, and fund transfers.	$ 14,853.00	
Total Spending	$ 8,024,810.00	

School 3 Data

School 3 Student Data

Enrollment.

Based on the data available through Virginia Department of Education (VDOE) for the school year 2018-2019, the total student enrollment of School 3 was 618. School 3 is a middle school that houses 6th, 7th, and 8th graders. The total number of sixth graders was 231 students or 37.38% of the total population. The total number of seventh graders was 191 students or 30.91% of the total population. The total number of eighth graders was 196 or 31.72% of the total population. School 3 was also identified as a Title I School and with a School-Wide Program.

Ethnicity.

The ethnicity breakdown by total school enrollment will be discussed next. There were 424 students identified as Black which made up 68.61% of the total student enrollment. There were 32 students identified as Hispanic which made up 5.18 of the total student enrollments. There were 113 students identified as White which made up 18.28% of the total student enrollment. There were 14 students identified as Asian which made up 1.47% of the total student enrollment. There were 32 students identified as Multiple Race which made up 5.18% of the total student enrollment. There were two students identified as American Indian which made up 0.32% of the total student enrollment. There were no students identified as Native Hawaiian.

Poverty

Poverty was determined in multiple ways. First, the number of economically disadvantaged students was determined. Next, the number of students who were eligible for free or reduced-priced lunch was examined. The number of economically disadvantaged students was 316 or 51.13% of the total enrollment. The number of students who were eligible for free lunch was 460 or 74.43% of the total enrollment. No students qualified for reduced price lunch.

Programming

Programming was determined in three ways—students with disabilities, English language learners, and gifted students. The number of students with disabilities was 89 or 14.40% of the total enrollment. The number of English language learners was 11 or 1.78% of the total enrollment. There were no data available through VDOE for the number of gifted students at School 3.

School 3 Personnel Data

Number of Staff.

Personnel data were gathered using the 2018-2019 data available through VDOE, recommended Standards of Quality (SOQ) for staffing, and current staffing data available for the 2020-2021 school year. The source of the data will be indicated, respectively. Two areas of staffing were examined—professional staff and classified staff. Professional staff was defined as anyone who held a certification. Classified staff was defined as staff who did not hold a certification. School 3 had 42.23 full time equivalent classroom teachers with a student to teacher ratio of 14.3.

Professional Staff.

Professional Staff was defined as anyone who held a certification. School 3 had one principal and although SOQ call for two assistant principals, they have three assistant principals. Based on SOQ, School 3 should have one and a half school counselors, but 2020-2021 data showed they have two school counselors. Based on SOQ, School 3 should have one nurse and 2020-2021 data showed they have one nurse. Based on SOQ, School 3 should have one and a half librarians, but 2020-2021 data showed they have one librarian.

Below data that were available from VDOE regarding the 2018-2019 school year for School 3 will be unpacked. According to the budget information for 2018-2019, the average teacher salary was $47,912.94. Level of education of administrators and teachers and teacher quality will be provided next. Level of education is defined by the degree earned. 47% staff held Bachelor's degree, 47% of the staff held Master's degrees, and no one held a Doctoral degree. 32.2% of the staff were identified as provisional teachers, 11.3% were inexperienced,

and there were no teachers identified as out of field teachers or out of field and inexperienced teachers. Next, the classified staff will be described for School 3.

Classified

Classified Staff was defined as staff who did not hold a certification. Classified staff consisted of clerical, health clerks, cafeteria monitors, cafeteria manager and staff, school security officers, and technology support specialist. According to SOQ two and a half full time equivalents clerical staff should be allocated, but 2020-2021 data indicated three. By SOQ, a half health clerk should be allocated, but 2020-2021 data indicated one full time staff member. By SOQ two cafeteria monitors and two school security officers should be allocated, current data indicated two security staff and no data available for cafeteria monitors. Next, operational costs will be discussed.

School 3 Operational Costs

School 3 Operational Costs include per-pupil school level expenditures, and per-pupil division level expenditures, and professional development expenditures (excluding adult education, community services, non-regular school day programs, capital purchases, debt service, food services and fund transfers. Per-pupil school level expenditures were $8,293 and per-pupil division level expenditures were $3.121 for a total of $11,414 with an additional $13,368 for excluded costs. The total operational costs were $ 7,043,178.00.

Table 5

School 3 Characteristics

Categories	School 3 (Title I)	
Students	**Number**	**Percentage**
Total Enrollment	618	
6th	231	37.38
7th	191	30.91
8th	196	31.72
Racial and Ethnic Groups		
Black	424	68.61
Hispanic	32	5.18
White	113	18.28
Asian	14	2.27
Multiple Races	32	5.18
American Indian	2	0.32
Native Hawaiian	0	0.00
Economically Disadvantaged	316	51.13
Free & Reduced-priced Lunch Eligible	460	74.43
Students with disabilities	89	14.40
English Language Learners	11	1.78
Personnel		
Classroom Teachers (Full Time Equivalent)	42.23	
Student to Teacher Ratio	14.3	
Average Teacher Salary	$47,912.94	
Administrators/Professional Staff	**SOQ**	**2020-2021**
Principals	1	1
Assistant Principals (based on funding formula)	2	3
School Counselors (enrollment/400 rounded to nearest .5)	1.5	2
Nurse (>,= to 300:1)	1	1
Librarians (.5FTE to 299, 1FTE at 300)	1.5	1
Level of Education		**2018-2019**
Bachelor's Degree		47
Master's Degree		47
Doctoral Degree		0
Teacher Quality		
Provisional Teachers		30.2

Inexperienced Teachers		11.3
Out of Field Teachers		0
Out of Field and Inexperienced Teachers		0
Classified Staff	**SOQ**	**2020-2021**
Clerical (Attendance Clerk, Admin Asst, Fin. Off)	2.5	3
Health Clerks	0.5	1
School Security Officers (500-999=2) & SRO	2	2
Technology Support Specialist		1
Operational Costs		
Per-pupil school level expenditures	$ 8,293.00	
Per-pupil division level expenditures	$ 3,121.00	
Total per-pupil expenditures	$ 11,414.00	
Professional development expenditures (excluded costs: adult education, community services, non-regular school day programs, capital purchases, debt service, food services, and fund transfers.	$ 13,368.00	
Total Spending	$ 7,043,178.00	

School 4 Data

School 4 Student Data

Enrollment.

Based on the data available through Virginia Department of Education (VDOE) for the school year 2018-2019, the total student enrollment of School 4 was 647. School 4 is a middle school that houses 6th, 7th, and 8th graders. The total number of sixth graders was 228 students or 35.24% of the total population. The total number of seventh graders was 206 students or 31.84% of the total population. The total number of eighth graders was 213 or 32.92% of the total population. School 4 was identified as a Gifted Magnet school and was not Title I.

Ethnicity.

The ethnicity breakdown by total school enrollment will be discussed next. There were 276 students identified as Black which made up 42.66% of the total student enrollment. There

were 52 students identified as Hispanic which made up 8.04% of the total student enrollment. There were 267 students identified as White which made up 41.27% of the total student enrollment. There were seven students identified as Asian which made up 1.08% of the total student enrollment. There were 45 students identified as Multiple Race which made up 6.96% of the total student enrollment. There were no students identified as American Indian or Native Hawaiian.

Poverty

Poverty was determined in multiple ways. First, the number of economically disadvantaged students was determined. Next, the number of students who were eligible for free or reduced-priced lunch was examined. The number of economically disadvantaged students was 268 or 41.42% of the total enrollment. The number of students who were eligible for free lunch was 245 or 37.87% of the total enrollment. The number of students who were eligible for reduced-priced lunch was 42 or 6.49% of the total student population.

Programming

Programming was determined in three ways—students with disabilities, English language learners, and gifted students. The number of students with disabilities was 60 or 9.27% of the total enrollment. The number of English language learners was 13 or 2.01% of the total enrollment. While there were no data available through VDOE for the number of gifted students at School 4, it is assumed that all 647 students at the gifted magnet school are identified as gifted.

School 4 Personnel Data

Number of Staff.

Personnel data were gathered using the 2018-2019 data available through VDOE, recommended Standards of Quality (SOQ) for staffing, and current staffing data available for the

2020-2021 school year. The source of data will be indicated, respectively. Two areas of staffing were examined—Professional staff and classified staff. Professional staff was defined as anyone who held a certification. Classified staff was defined as staff who did not hold a certification. School 4 had 43.48 full time equivalent classroom teachers with a student to teacher ratio of 14.88.

Professional Staff.

Professional Staff was defined as anyone who held a certification. School 4 had one principal and two assistant principals. Based on SOQ, School 4 should have two school counselors, and 2020-2021 data showed they have two school counselors. Based on SOQ, School 4 should have one nurse and 2020-2021 data showed they have one nurse. Based on SOQ, School 4 should have one and a half librarians, but 2020-2021 data showed they have one librarian.

Below data that were available from VDOE regarding the 2018-2019 school year for School 4 will be unpacked. According to the budget information for 2018-2019, the average teacher salary was $50,483.74. Level of education of administrators and teachers and teacher quality will be provided next. Level of education is defined by the degree earned. 41% of the staff held Bachelor's degree, 54% of the staff held Master's degrees, and no one held a Doctoral degree. 3.9% of the staff were identified as provisional teachers, 2% were inexperienced, and none were identified as out of field teachers or out of field and inexperienced teachers. Next, the classified staff will be described for School 4.

Classified

Classified Staff was defined as staff who did not hold a certification. Classified staff consisted of clerical, health clerks, cafeteria monitors, cafeteria manager and staff, school

security officers, and technology support specialist. According to SOQ two and a half full time equivalents should be allocated, but 2020-2021 data indicated three. By SOQ, a half health clerk should be allocated, but 2020-2021 data indicated one full time staff member. By SOQ 2 cafeteria monitors but current data were not available. By SOQ School 4 should be allocated two school security officers, data shows they have three. Finally, School 4 had a technology support specialist. Next, operational costs will be discussed.

School 4 Operational Costs

School 4 Operational costs include per-pupil school level expenditures, and per-pupil division level expenditures, and professional development expenditures (excluding adult education, community services, non-regular school day programs, capital purchases, debt service, food services and fund transfers. Per-pupil school level expenditures were $7,959 and per-pupil division level expenditures were $3,121 for a total of $11,080 with an additional $13,590 for excluded costs. The total operational costs were $ 6,991,731.00.

Table 6

School 4 Characteristics

Categories	School 4 (Magnet)	
Students	**Number**	**Percentage**
Total Enrollment	647	
6th	228	35.24
7th	206	31.84
8th	213	32.92
Racial and Ethnic Groups		
Black	276	42.66
Hispanic	52	8.04
White	267	41.27

Asian	7	1.08
Multiple Races	45	6.96
American Indian	0	0.00
Native Hawaiian	0	0.00
Economically Disadvantaged	268	41.42
Free Lunch Eligible	245	37.87
Reduced-priced Lunch	42	6.49
Students with disabilities	60	9.27
English Language Learners	13	2.01
Personnel		
Classroom Teachers (Full Time Equivalent)	43.48	
Student to Teacher Ratio	14.88	
Average Teacher Salary	$50,483.74	
Administrators/Professional Staff	**SOQ**	**2020-2021**
Principals	1	1
Assistant Principals (based on funding formula)	2	2
School Counselors (enrollment/400 rounded to nearest .5)	2	2
Nurse (>,= to 300:1)	1	1
Librarians (.5FTE to 299, 1FTE at 300)	1.5	1
Level of Education		
Bachelor's Degree		41
Master's Degree		54
Doctoral Degree		0
Teacher Quality		
Provisional Teachers		3.9
Inexperienced Teachers		2
Out of Field Teachers		0
Out of Field and Inexperienced Teachers		0
Classified Staff		
Clerical (Attendance Clerk, Admin Asst, Fin. Off)	2.5	3
Health Clerks	0.5	1
School Security Officers (500-999=2) & SRO	2	3
Operational Costs		
Per-pupil school level expenditures	$ 7,959.00	
Per-pupil division level expenditures	$ 3,121.00	
Total per-pupil expenditures	$ 11,080.00	

Professional development expenditures (excluded costs: adult education, community services, non-regular school day programs, capital purchases, debt service, food services, and fund transfers.	$ 13,590.00	
Total Spending	$6,991,731.00	

School 5 Data

School 5 Student Data

Enrollment.

Based on the data available through Virginia Department of Education (VDOE) for the school year 2018-2019, the total student enrollment of School 5 was 613. School 5 is a middle school that houses 6th, 7th, and 8th graders. The total number of sixth graders was 224 students or 36.54% of the total population. The total number of seventh graders was 192 students or 31.32% of the total population. The total number of eighth graders was 197 or 32.14% of the total population.

Ethnicity.

The ethnicity breakdown by total school enrollment will be discussed next. There were 431 students identified as Black which made up 70.31% of the total student enrollment. There were 27 students identified as Hispanic which made up 4.40% of the total student enrollment. There were 100 students identified as White which made up 16.31% of the total student enrollment. There were eight students identified as Asian which made up 1.31% of the total student enrollment. There were 43 students identified as Multiple Race which made up 7.01% of the total student enrollment. There were eight students identified as American Indian which made up 1.31% of the total student enrollment. There was one student identified as Native Hawaiian which made up 0.16% of the total student enrollment.

Poverty

Poverty was determined in multiple ways. First, the number of economically disadvantaged students was determined. Next, the number of students who were eligible for free or reduced-priced lunch was examined. The number of economically disadvantaged students was 295 or 48.12% of the total enrollment. The number of students who were eligible for free lunch was 275 or 44.86% of the total enrollment. The number of students who were eligible for reduced-priced lunch was 56 or 9.14% of the total student population.

Programming

Programming was determined in three ways—students with disabilities, English language learners, and gifted students. The number of students with disabilities was 60 or 9.79% of the total enrollment. The number of English language learners was 12 or 1.96% of the total enrollment. There were no data available through VDOE for the number of gifted students at School 5.

School 5 Personnel Data

Number of Staff.

Personnel data were gathered using the 2018-2019 data available through VDOE, recommended Standards of Quality (SOQ) for staffing, and current staffing data available for the 2020-2021 school year. The source of the data will be indicated, respectively. Two areas of staffing were examined—professional staff and classified staff. Professional staff was defined as anyone who held a certification. Classified staff was defined as staff who did not hold a certification. School 5 had 42.67 full time equivalent classroom teachers with a student to teacher ratio of 14.37.

Professional Staff.

Professional Staff was defined as anyone who held a certification. School 5 had one principal and two assistant principals. Based on SOQ, School 5 should have one and a half school counselors, but 2020-2021 data showed they have two school counselors. Based on SOQ, School 5 should have one nurse and 2020-2021 data showed they have one nurse. Based on SOQ, School 5 should have one librarian, and 2020-2021 data showed they have one librarian.

Below data that were available from VDOE regarding the 2018-2019 school year for School 5 will be unpacked. According to the budget information for 2018-2019, the average teacher salary was $48,888.85. Level of education of administrators and teachers and teacher quality will be provided next. Level of education is defined by the degree earned. 42% staff held Bachelor's degree, 57% of the staff held Master's degrees, and 2% held a Doctoral degree. 10.4% of the staff were identified as provisional teachers, 6.3% were inexperienced, and no teachers were reported as out of field teachers or out of field and inexperienced teachers. Next, the classified staff will be described for School 5.

Classified

Classified staff was defined as staff who did not hold a certification. Classified staff consisted of clerical, health clerks, cafeteria monitors, cafeteria manager and staff, school security officers, and technology support specialist. According to SOQ two and a half full time clerical staff should be allocated, but 2020-2021 data indicated three. By SOQ, a half health clerk should be allocated, but 2020-2021 data indicated one full time staff member. By SOQ two cafeteria monitors and two school security officers should be allocated, current data were not available regarding cafeteria monitors although three school security officers were listed as well as a technology specialist. Next, operational costs will be discussed.

School 5 Operational Costs

School 5 Operational Costs include per-pupil school level expenditures, and per-pupil division level expenditures, and professional development expenditures (excluding adult education, community services, non-regular school day programs, capital purchases, debt service, food services and fund transfers. Per-pupil school level expenditures were $7,996 and per-pupil division level expenditures were $3,121 for a total of $11,117 with an additional $18,274 for excluded costs. The total operational costs were $ 6,632,748.00.

Table 7

School 5 Characteristics

Categories	**School 5**	
Students	Number	Percentage
Total Enrollment	613	
6th	224	36.54
7th	192	31.32
8th	197	32.14
Racial and Ethnic Groups		
Black	431	70.31
Hispanic	27	4.40
White	100	16.31
Asian	8	1.31
Multiple Races	43	7.01
American Indian	8	1.31
Native Hawaiian	1	0.16
Economically Disadvantaged	295	48.12
Free Lunch Eligible	275	44.86
Reduced-priced Lunch	56	9.14
Students with disabilities	60	9.79
English Language Learners	12	1.96
Personnel		
Classroom Teachers (Full Time Equivalent)	42.67	
Student to Teacher Ratio	14.37	

Average Teacher Salary	$48,888.85	
Administrators/Professionals	**SOQ**	**2020-2021**
Principals	1	1
Assistant Principals (based on funding formula)	2	2
School Counselors (enrollment/400 rounded to nearest .5)	1.5	2
Nurse (>,= to 300:1)	1	1
Librarians (.5FTE to 299, 1FTE at 300)	1.5	1
Level of Education		**2018-2019**
Bachelor's Degree		42
Master's Degree		57
Doctoral Degree		2
Teacher Quality		
Provisional Teachers		10.4
Inexperienced Teachers		6.3
Out of Field Teachers		0
Out of Field and Inexperienced Teachers		0
Classified Staff	**SOQ**	**2020-2021**
Clerical (Attendance Clerk, Admin Asst, Fin. Off)	2.5	3
Health Clerks	0.5	1
School Security Officers (500-999=2)	2	2
Operational Costs		
Per-pupil school level expenditures	$ 7,996.00	
Per-pupil division level expenditures	$ 3,121.00	
Total per-pupil expenditures	$ 11,117.00	
Professional development expenditures (excluded costs: adult education, community services, non-regular school day programs, capital purchases, debt service, food services, and fund transfers.	$ 18,274.00	
Total Spending	$ 6,632,748.00	

The first section described the school-by-school characteristics and per-pupil expenditures addressing Research Question 1 and 2. Next, section two compares the five schools across the characteristics and data for each school.

Comparison of School Data

Next, section two compares the five schools across the characteristics and data gathered for each school. Research Question 1: Does variation exist among schools? and Research Question 3: When examining per-pupil expenditures, what differences exist? are addressed. The discussion will begin with enrollment moving to personnel and concluding with expenditures.

Student Data.

Below, the school enrollment data will be compared across the five schools beginning with total school enrollment and ending with students identified with disabilities. Total school enrollment ranged from a high of 955 at School 1 to a low of 613 at School 5 (See Figure 1). Grade level enrollment percentage within each school ranged in the following manner—*School 1*: 31.31% to 34.97%; *School 2*: 31.14% to 36.26%; *School 3*: 30.91% to 37.38%; *School 4*: 31.84% to 35.24%; and *School 5*: 31.32% to 36.54% (See Figure 2). School enrollment percentage among the schools by grade level varied no more than 6.89%. In sixth grade enrollment percentage ranged from 31.14% to 37.8%, while in seventh grade enrollment percentage ranged from 30.91% to 32.6%, and eighth grade enrollment percentage ranged from 31.72% to 36.26% (See Figure 3). Students identified as economically disadvantaged among the schools ranged from 41.42% at School 4 to 62.43% at School 3 (See Figure 4). Students eligible for free lunch ranged from 76.02 % at School 2 to 37.87% at School 4. While students eligible for reduced-priced lunch ranged from 9.14% at School 5 to 0% at Schools 1,2, and 3 (See Figure 5). students with disabilities ranged from 18.57% at School 2 to 9.27% at School 4 (See Figure

6). Students identified as English language learners ranged from 1.47% at School 1 to 6.58% at School 2 (See Figure 7). Next, personnel data will be unpacked.

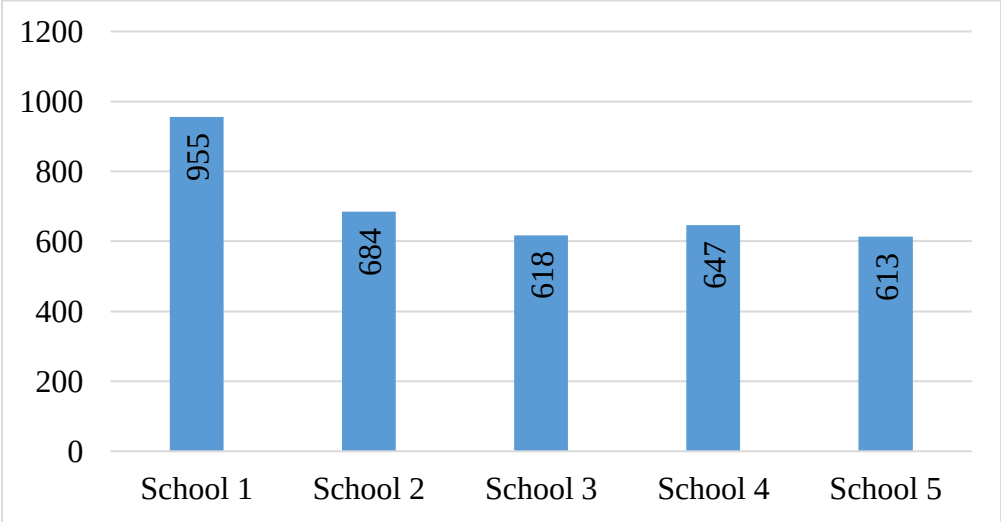

Figure 1. Total Enrollment Numbers by School

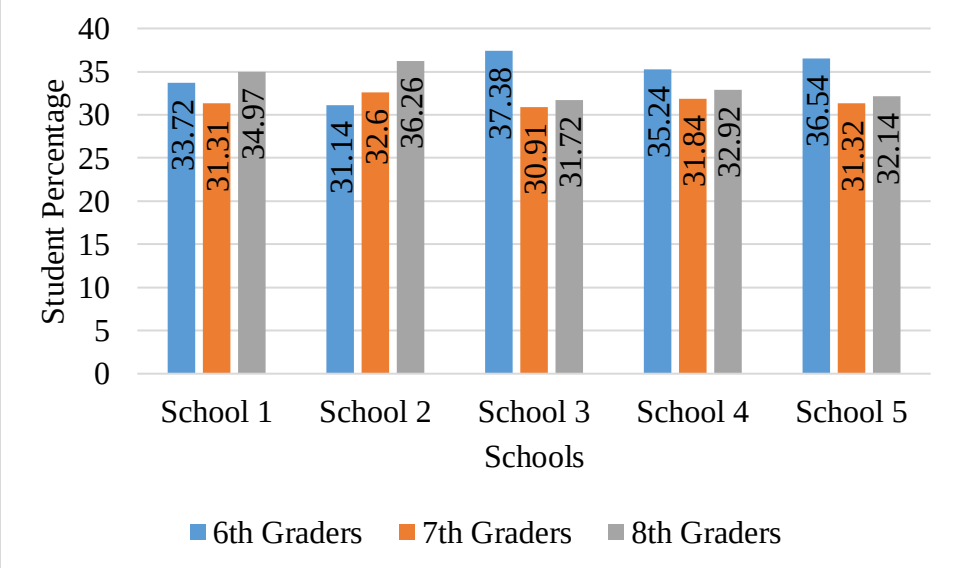

Figure 2. Grade Level Student Enrollment Percentage by School

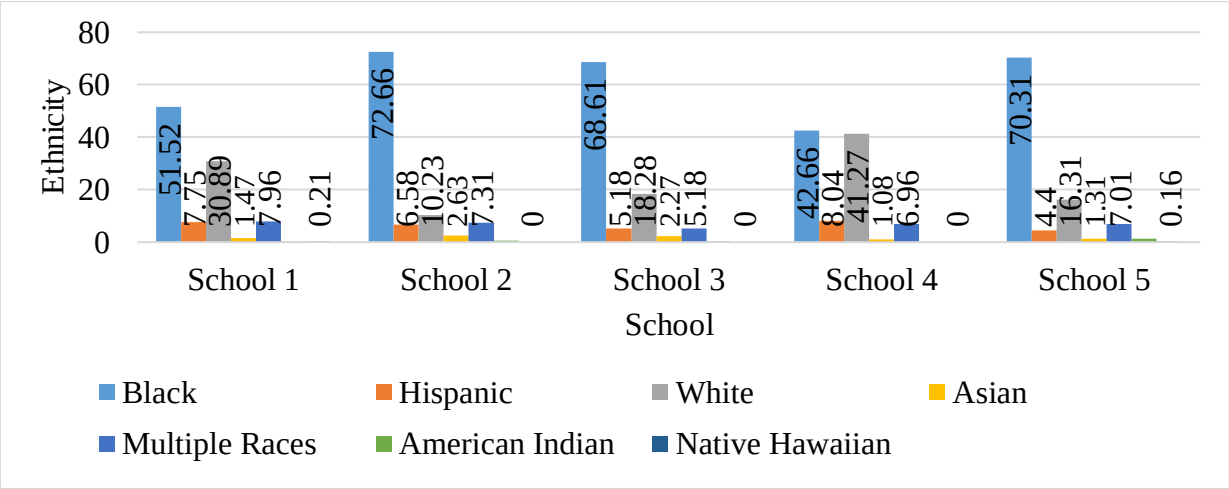

Figure 3. Ethnicity by School

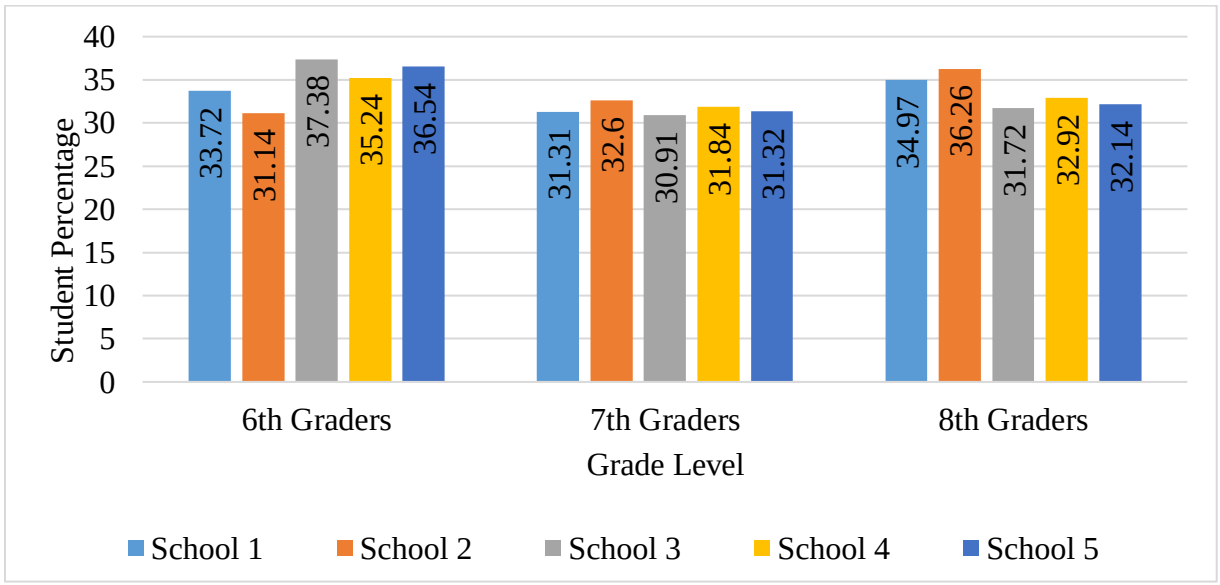

Figure 4. School Enrollment Percentage by Grade Level

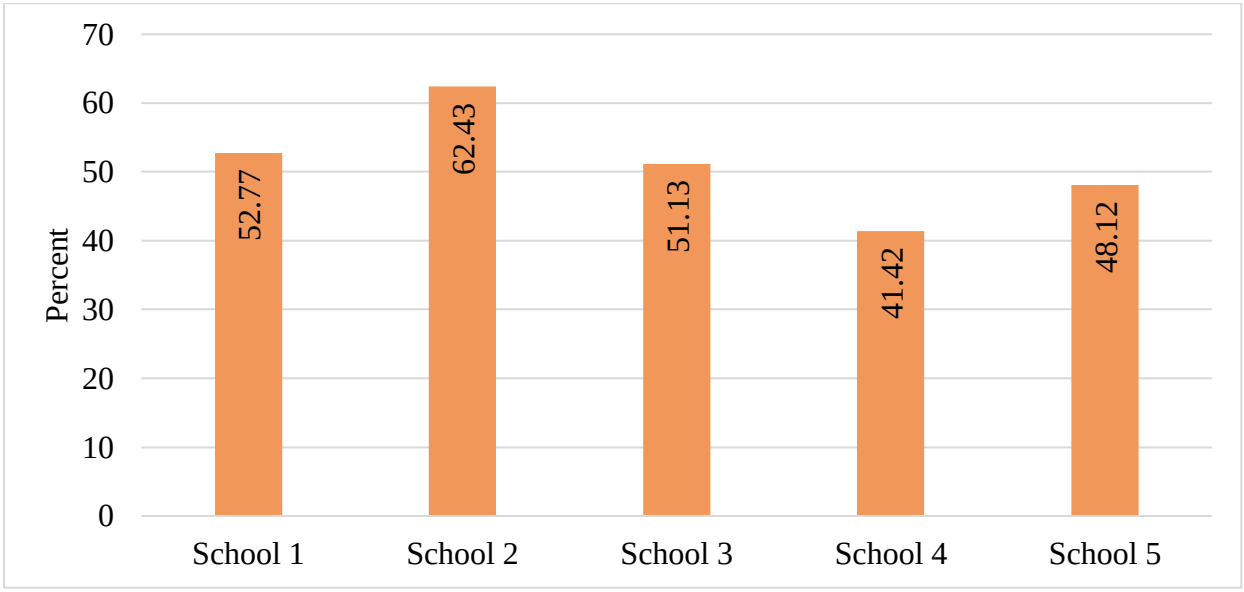

Figure 5. Percentage of Students Identified as Economically Disadvantaged

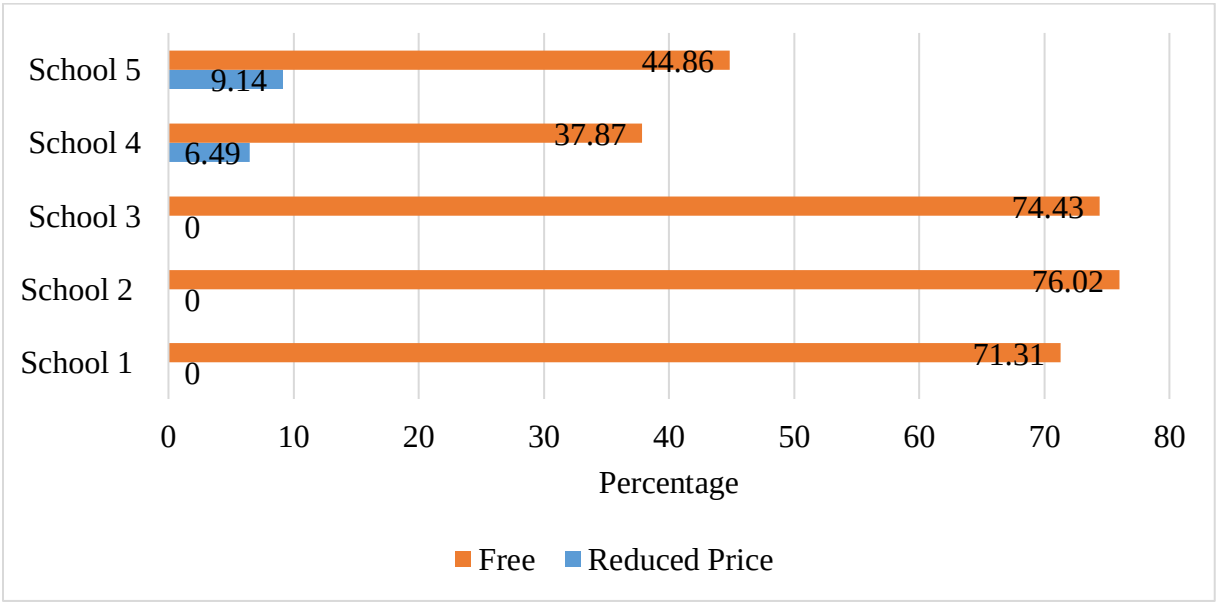

Figure 6. Percentage of Students Eligible for Free or Reduced-priced Lunch

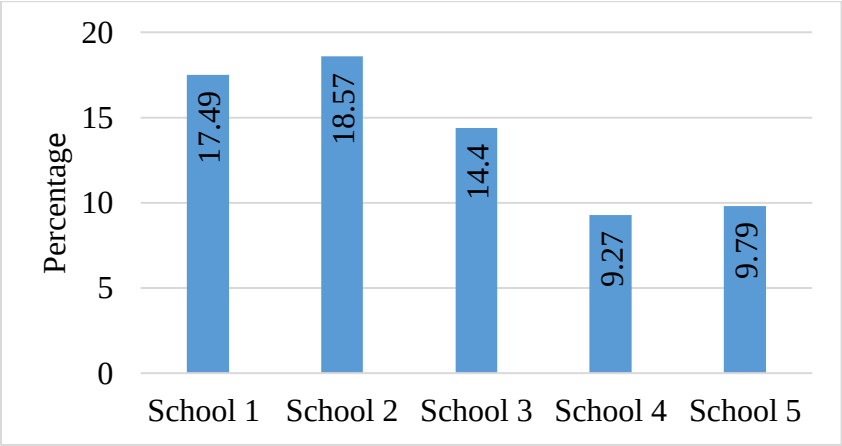

Figure 7. Percentage of Students with Disabilities

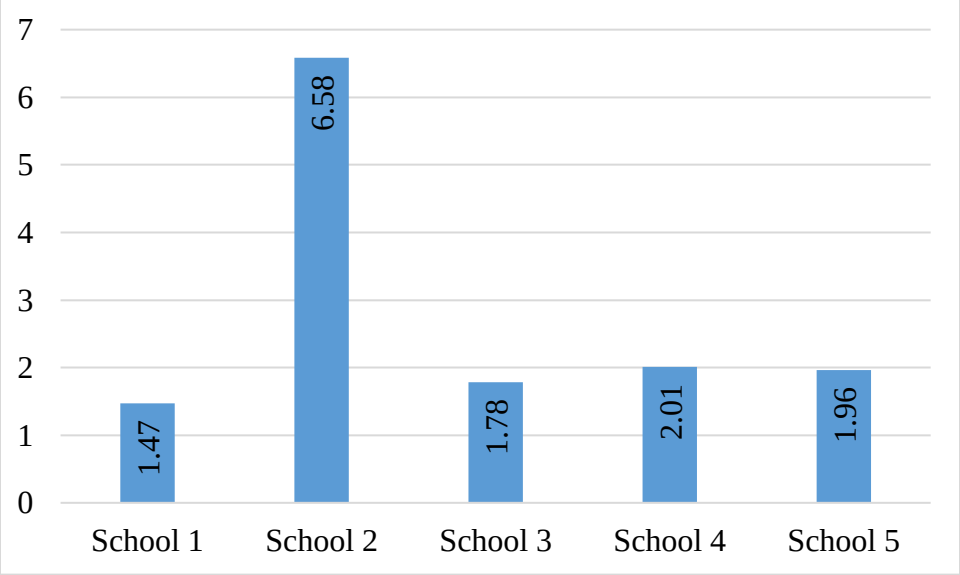

Figure 8. Percentage of English Language Learners

Personnel Data.

Next, school personnel data comparisons will be noted. Data will be presented in the following order: full time equivalent classroom teachers, student to teacher ratio, average teacher salaries, level of education, teacher quality, professional and classified staffing. Full time equivalent teachers ranged from 42.23% at School 3 to 61.86% at School 1 (See Figure 9). student to teacher ratio ranged from 13.32 at School 2 to 15.42 at School 1 (See Figure 10). The

average teacher salaries ranged from $47,912.94 at School 3 to $50,483.74 at School 4 (See Figure 11). The level of education was designated by the number of teachers who had earned a bachelor's degree, a master's degree, and Doctoral Degree. The number of teachers who had bachelor's degrees ranged from a low of forty-two teachers at School 5 to a high of sixty at School 2. School 2 had a low of thirty-four teachers with master's degrees, while School 5 had a high of fifty-seven teachers with master's degrees. School 1, School 2, and School 5 had one, two, and two teachers respectively who had earned a doctoral degree (See Figure 12). Teacher quality is classified as provisional, inexperienced, out of field, and out of field and inexperienced. Teachers with provisional certifications ranged from 3.9 at School 4 to 30.2 at School 3. Inexperienced teachers ranged from 2.0 at School 4 to 13.6 at School 2. School 3, School 4, and School 5 had no teachers listed as out of field and therefore no teachers listed as out of field and inexperienced. School 1 had 1.4 out of field teachers and 0.4 out of field and inexperienced teachers while School 2 had 1.7 teachers listed as out of field and out of field and inexperienced respectively (See Figure 13). Finally, professional and classified staffing were examined. The Standards of Quality (SOQ) set a standard based on enrollment. There was little variance when the five schools were compared based on SOQ in either professional or classified staffing. Operational costs will be compared in the next section.

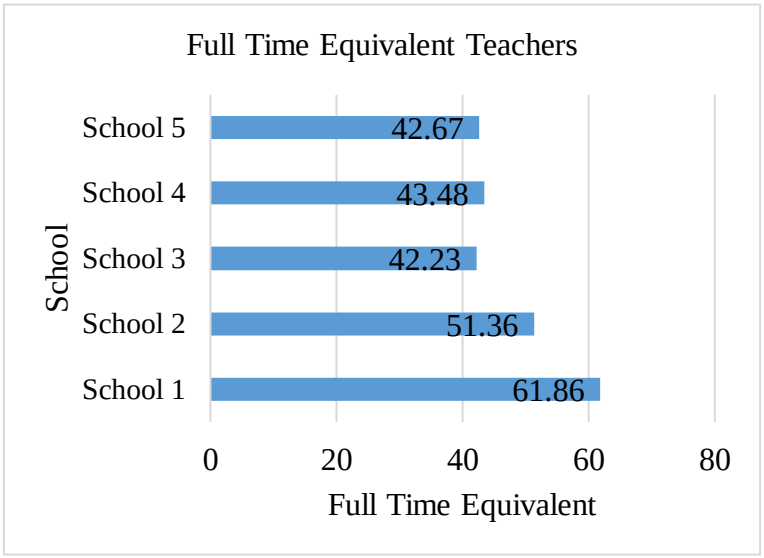

Figure 9. Full Time Equivalent Teachers

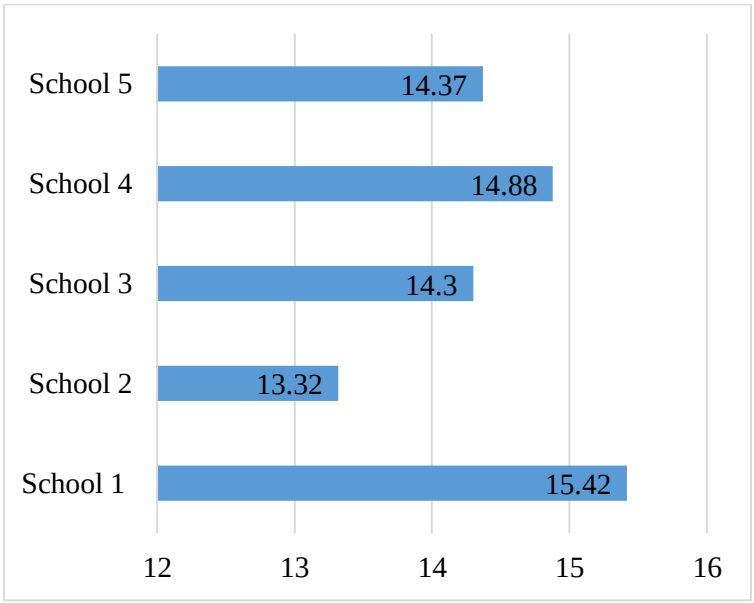

Figure 10. Student to Teacher Ratio

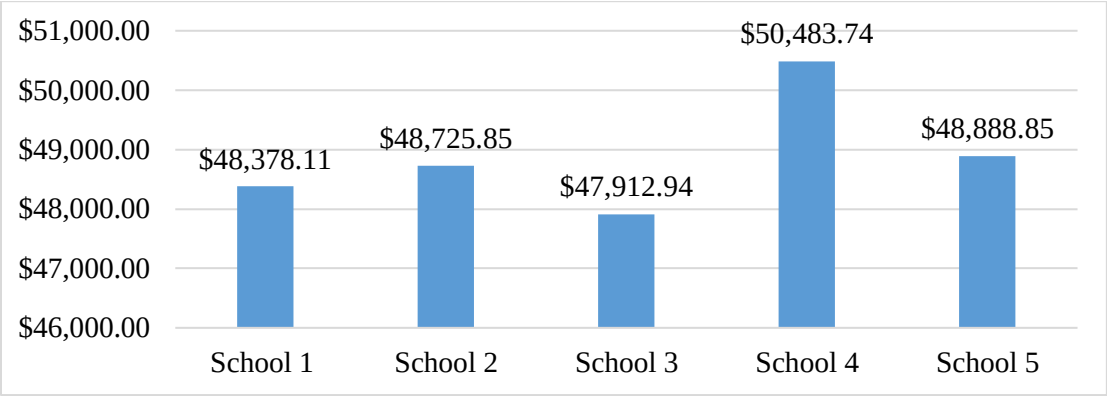

Figure 11. Average Teacher Salaries

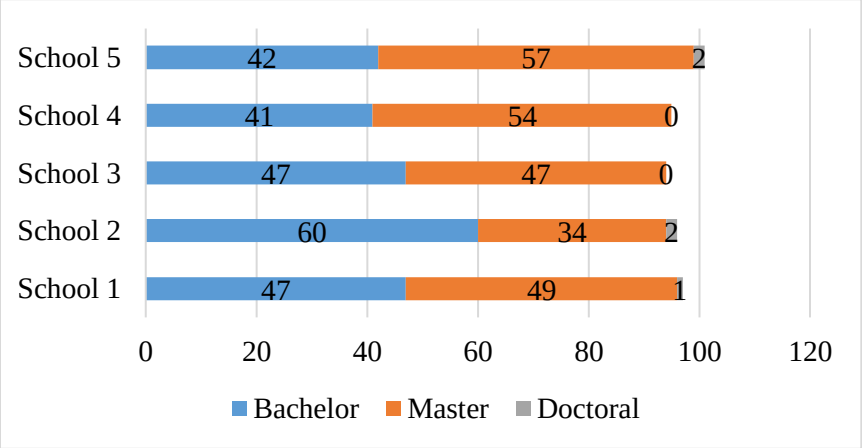

Figure 12. Level of Teacher Education

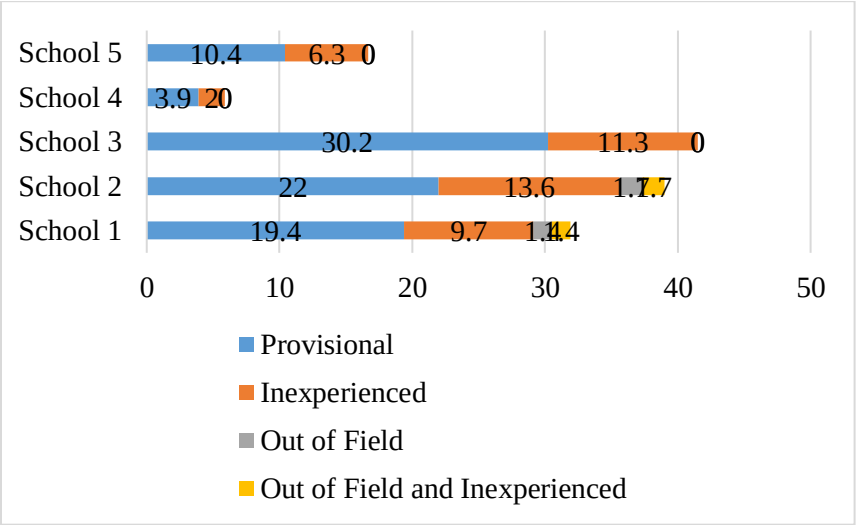

Figure 13. Teacher Quality

Operational Costs.

Section three will compare expenditures across the five schools. First, total spending will be compared. Then, per-pupil expenditures will be discussed. Figure 14 shows the total spending at each school. Total spending ranges from six million to ten million. Because total spending does not account for differences in student enrollment, per-pupil expenditures were used to compare the schools. Per-pupil expenditures range from $10,647 at School 1 to $11, 935 at School 2 (See Figure 15).

Additionally, per-pupil expenditures were weighted using Verstegen's weighting of students with specific needs. Verstegen (2002) identified three groups of students who require additional resources to meet standard, academic levels. The three groups are students with disabilities, students qualifying for free or reduced-priced lunches, and English language learners. For the purpose of this project, the three groups Verstegen identified will be used to determine vertical equity. The generally accepted principles of equity using weighted per-pupil expenditures for vertical equity analysis will be used (Blankenship, 2017). Verstegen and

Driscoll (2008) determined standard weights for students who were classified as needing extra services such as: students qualifying for free or reduced-priced lunch, students with disabilities, and English language learners. Verstegen (2015) defines weight as "the ratio of excess costs above the base to the basic per pupil funding amount". For each school, the students with disabilities were counted twice, because according Verstegen it costs twice as much to educate a student with a disability when compared to a non-disabled student. The students qualifying for free or reduced-priced lunch and student who identified as English Language Learners (ELL) have been weighted as one and a half because it cost one and half more to educate them. The weighted totals were then multiplied by the current per-pupil expenditures resulting in a new weighted total. This process was repeated two more times using 1.5 and 1.25 for students with disabilities, and 1.25 and 1.125 for students who qualified for free or reduced-priced lunch or identified as ELL. Adjusting the weights provides variance to account for the fact some students may be counted more than once since individual student data were not available (See Figure 16).

Then the weighted per-pupil expenditures are used as the measure when conducting vertical equity analysis. Weighting students considers the additional revenues that should be received by schools to address the increased costs of specific groups of students. While literature has come to a definitive conclusion that increased money results in increased achievement, there is no scale to measure against to determine a level of equity. Apriori algorithm is a practical means to assess equity among the schools. For this study, a 10% difference was identified as slightly, with 25% as moderately elevated inequitable, and 40% as notable inequity.

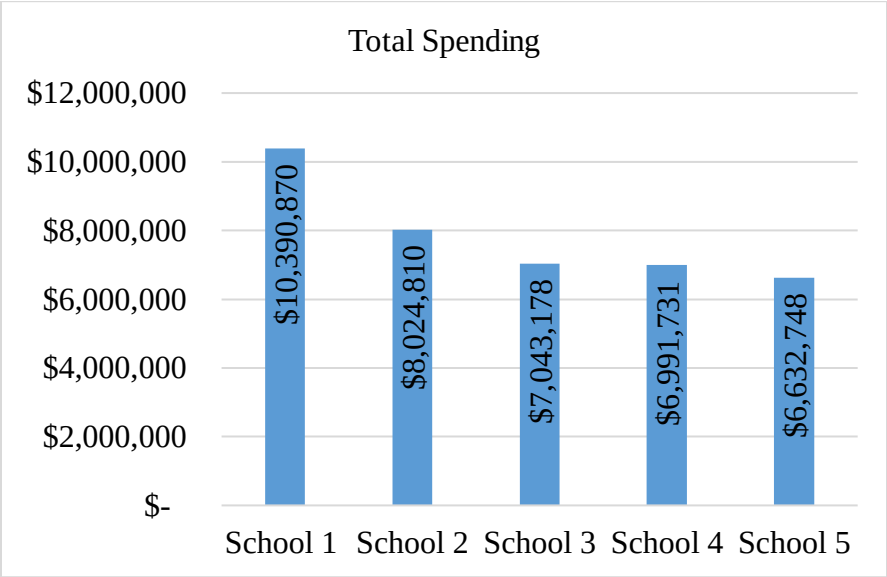

Figure 14. Total Spending

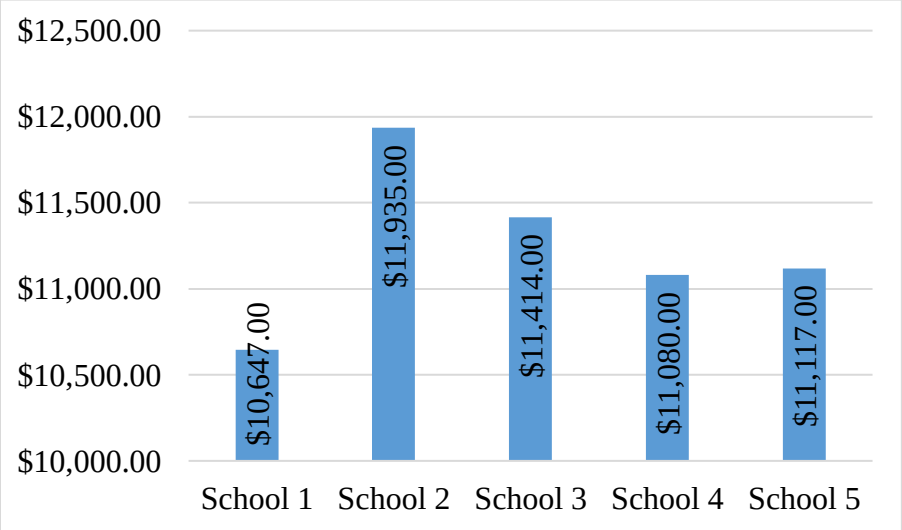

Figure 15. Per-Pupil Expenditures

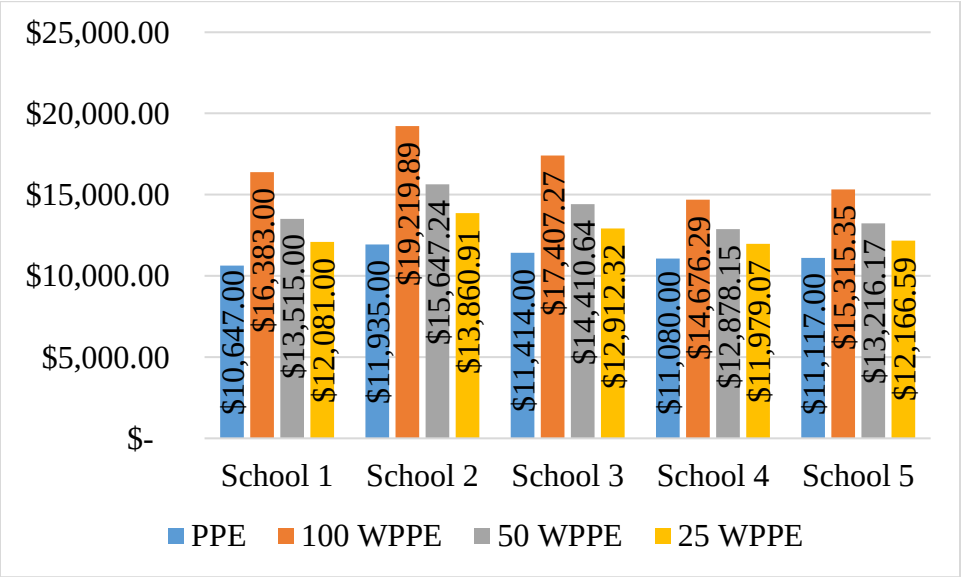

Figure 16. Weighted Per-pupil Expenditures

Summary

The purpose of this study was to examine the relationship between intradistrict per-pupil expenditures in five middle schools in Anonymous school district using equity audits. This chapter compares the five schools across the characteristics and data gathered for each school. Research Question 1: Does variation exist among schools? and Research Question 3: When examining per-pupil expenditures, what differences exist? are addressed. Chapter 4 presented the findings of this study. Each school's data were unpacked across three categories—student data, personnel data, and operational costs data. Additionally, a comparison was made among the schools. Chapter 5 will present the conclusions drawn from this study and recommendations for future research and for the district will be discussed.

CHAPTER 5

CONCLUSIONS AND DISCUSSIONS, LMITATIONS, AND RECOMMENDATIONS

The purpose of this study was to examine the relationship between intradistrict per-pupil expenditures in five middle schools in Anonymous school district using equity audits. To understand the relationship between horizontal and vertical equity and per-pupil expenditures, the following research questions were addressed:

1. Does variation exist among schools?
2. What is the per-pupil expenditure by school?
3. When examining per-pupil expenditures, what differences exist?
4. To what extent does the district funding system meet the standards for horizontal and vertical equity?

Chapter 5 presents the conclusions drawn from this study and recommendations for further study. First, the conclusions and discussions will be presented and followed by limitations. Finally, using the finding and conclusions, recommendations for future research and for the district will be discussed.

Conclusions and Discussions

The conclusions presented below will be organized by research question. First, does variation exist among schools will be discussed. Next, what is the per-pupil expenditure by school, grade, and program will be examined. Then, when examining per-pupil expenditures, what differences exist will be unpacked. Finally, to what extent does the district funding system meet the standards for horizontal and vertical equity will be reviewed. Variations among the schools will be discussed first.

To answer Research Question 1: Does variation exist among schools?, characteristics of each school will be examined. An examination of the five schools revealed three were identified as Title I—School 1, School 2, and School 3 and one School 4 was identified as a magnet school. The schools were compared on the following characteristics: student data, personnel, and operational costs. Student data include enrollment, racial and ethnic groups, economically disadvantaged, students with disability (SWD), and English language learners (ELL). Full time equivalent classroom teachers, student to teacher ratio, average teacher salary, number of administrators and professional staff, the level of education, teacher quality, and number of classified staff make up the personnel data. Administrators include principals, assistant principals, administrative assistants, and deans. Professional staff includes teachers, school counselors, and nurses—anyone who has a license. Operational costs are examined as per-pupil expenditures and total spending. First, student data will be discussed.

Student Data

Student data include enrollment, racial and ethnic groups, economically disadvantaged, students with disability (SWD), and English Language Learners (ELL). Total enrollment ranged from 613 students to 955 students. School 2, School 3, School 4, and School 5 all had 600 students. School 1 had 955 students which was 271 more students than School 2 and 342 more students than School 5 (See Figure 1). Overall, the enrollment numbers appear to be evenly split across all schools with the exception of School 1. School 4, which is the magnet school, had comparable enrollment to the other middle schools.

Next, grade level enrollment percentage by school (See Figure 2) and school level enrollment percentage by grade level (See Figure 4) will be examined. Grade level enrollment

percentage by school and school level enrollment percentage by grade level had very little variance.

Ethnicity within and among the schools will be examined next. The greatest percentage of student ethnicity within each school was students who identified as Black. School 4, the Magnet School, had the lowest number of students identified as Black (See Figure 17) and the most identified as white (See Figure 18). The magnet school is for gifted students and should be reflective of the district racial enrollment. If that was the case, the enrollment at the magnet school should have a higher percentage of students identified as black not the lowest. Additionally, it should have a lower percentage of students identified as white to be aligned with district racial enrollment. This discrepancy is indicative of inequity. Next, the level of poverty will be examined.

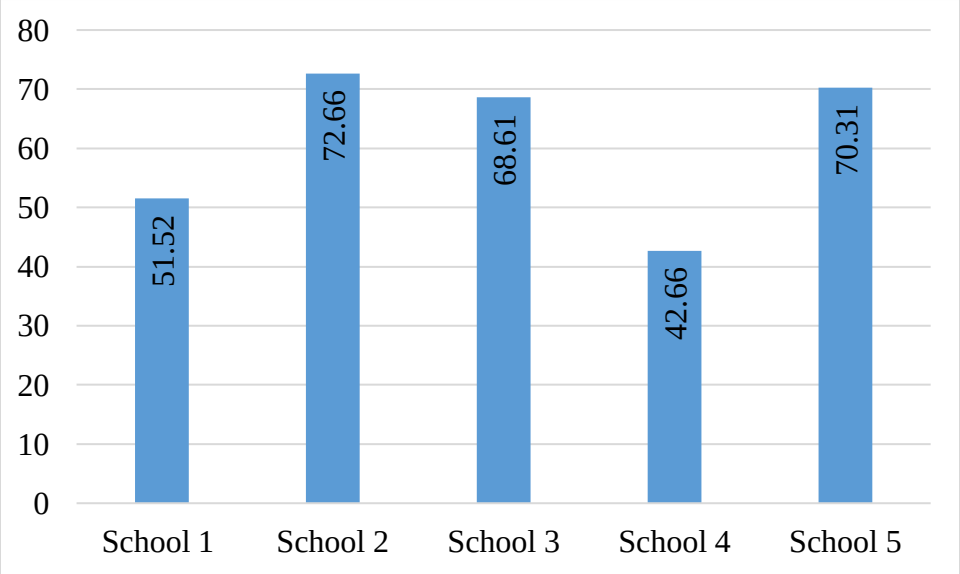

Figure 17. Percentage of Enrollment of Students Identified as Black

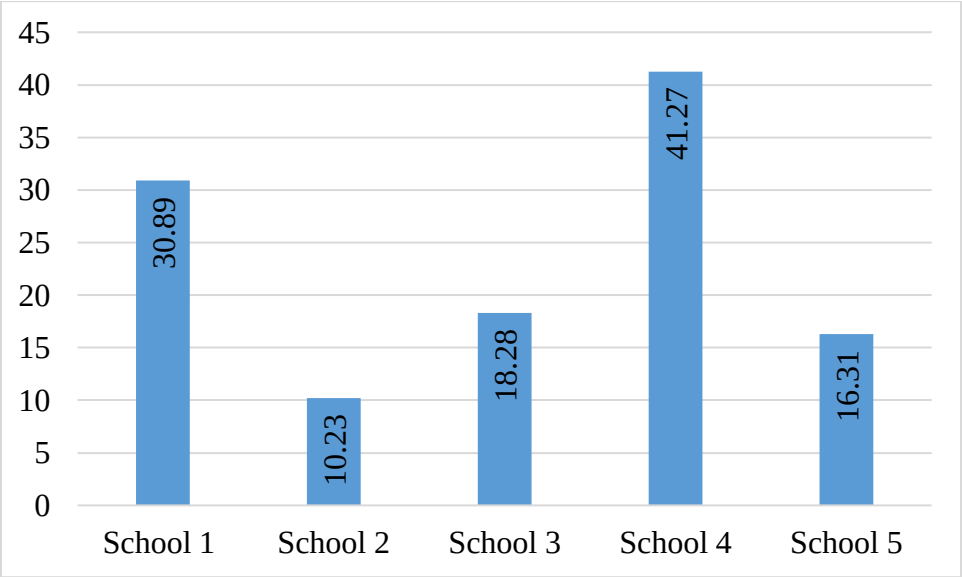

Figure 18. Percentage of Enrollment of Students Identified as White

Two characteristics that identify level of poverty are the percent of students identified as economically disadvantaged and identified as eligible for free and reduced-priced lunch. Economically disadvantaged students across the five schools will be discussed followed by the students identified as eligible for free or reduced-priced lunch. The percent of economically disadvantaged students ranged from a low of 41.42% to a high of 62.43%. School 4, the gifted magnet school, had the lowest percent of students identified as economically disadvantaged at 41.42% while School 2 had the highest indicating the most need (See Figure 19). When examining the number of student eligible for free or reduced-priced lunch, Schools 1, 2, and 3 did not have any students eligible for reduced-priced lunch. School 4 and 5 had 6.49% and 9.14% respectively and the two lowest percentages of students eligible for free lunch. School 4 is identified as the magnet school and had a much lower percentage of lower poverty students (See Figure 20). In conclusion, based on level of poverty, School 4, the gifted magnet school, had the lowest indicators of poverty. Since School 4 is identified as a gifted magnet school, one

would assume that the student achievement is high. Given that this school is a magnet school where students are selected to attend, the statistics for poverty do not mirror the division-wide statistics. One might conclude that smarter students are not students of poverty. More realistically the data support that poverty has an impact on student achievement. Furthermore, the higher the percentages for economically disadvantaged and free or reduced-priced lunch indicate more student needs. Increased student need requires increased programming.

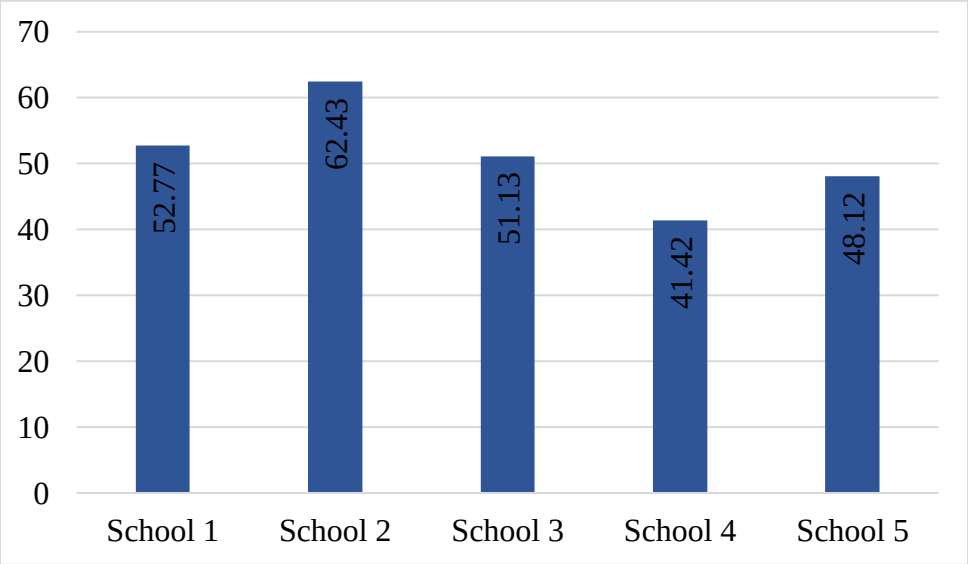

Figure 19. Percentage of Students Identified as Economically Disadvantaged

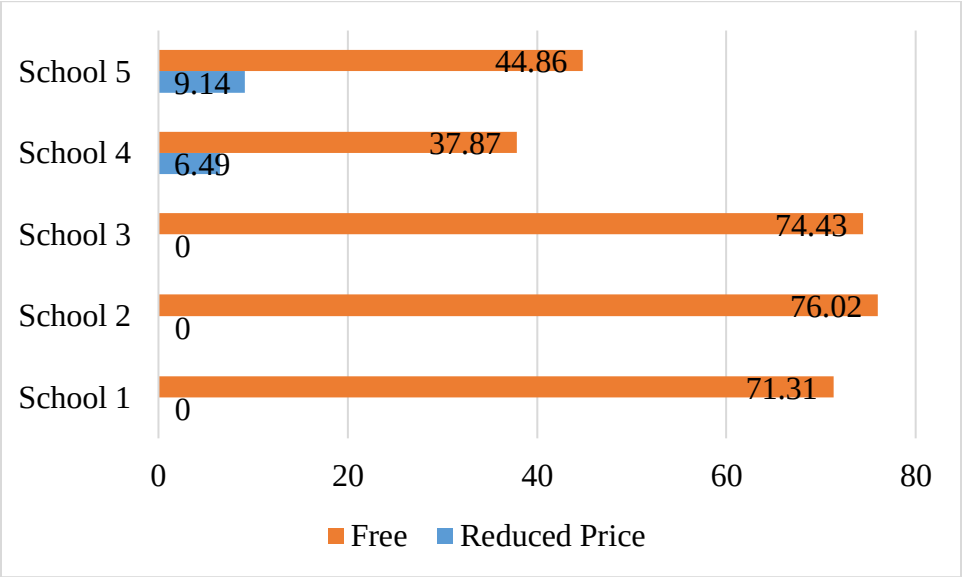

Figure 20. Percentage of Students Eligible for Free or Reduced-priced Lunch

Programming available at each school will be discussed next. Data for two programs were available and reviewed among the five school. The two programs were programs for students with disabilities and students who were English language learners. As shown in Figure 21 and 22, there was variation among the schools when programming was compared. It should be noted that three of the schools were identified as Title I and one school was a gifted magnet school. First, programming for students with disabilities will be examined. Then, programming for English language learners will be unpacked.

Programming for students with disabilities was available in all five schools. School 2 identified as a Title I school and highest level of poverty had the highest number of students with disabilities. School 4, which was the gifted magnet school, had the lowest number of students with disabilities. In examining the percent of students with disabilities across schools, the three schools identified as Title I had the three highest percentages of students with disabilities when compared to School 4, the gifted magnet and School 5 which was not identified as Title I. In

conclusion, there is variation among the schools regarding students with disabilities. English language learners will be unpacked next.

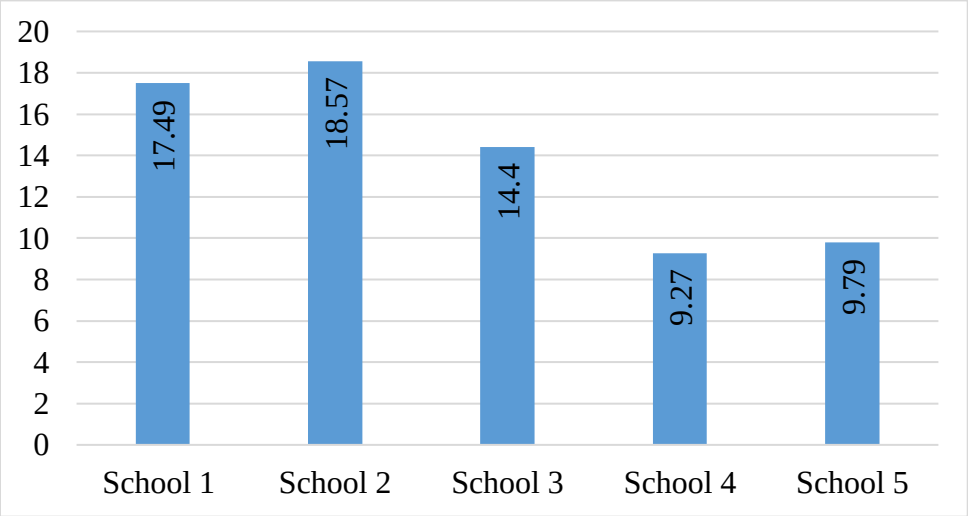

Figure 21. Percentage of Students with Disabilities

As shown in Figure 22, each school had a program for English language learners. School 2, which has been previously identified as the school with the highest needs, has the highest level of English language learners at 6.58%. School 1 was the lowest with 1.47% followed by School 3 with 1.78%. School 5 had 1.96% while School 4 had 2.01% which was the second highest percentage. In conclusion, there was variation found among the schools for English language learners.

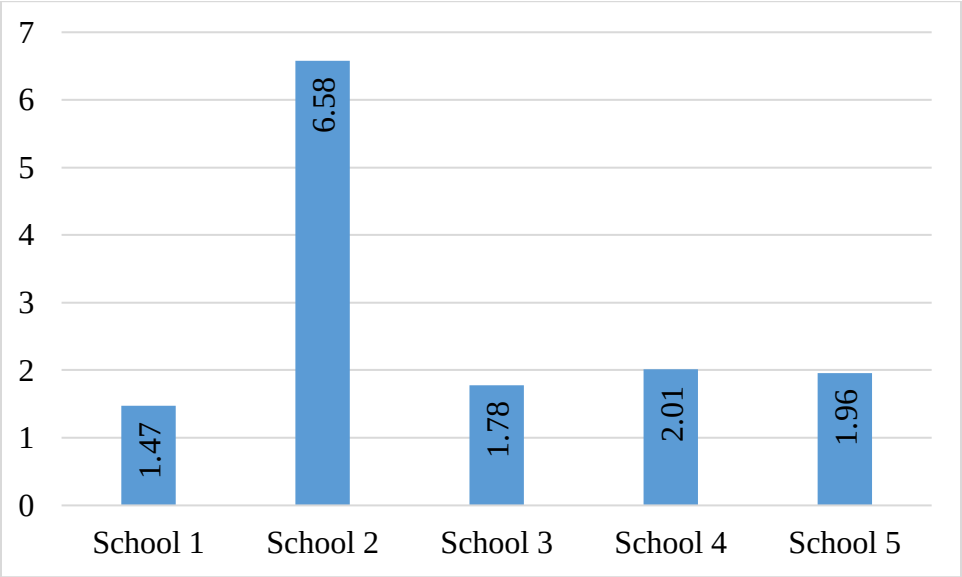

Figure 22. Percentage of English Language Learners

Enrollment characteristics have been unpacked and compared across the five schools. Enrollment characteristics define the needs of the school. Personnel characteristics will be explored next.

Personnel

According to the Virginia Department of Education (VDOE) website "On October 17, 2019, the Board of Education prescribed new Standards of Quality for the Commonwealth's public schools. The new standards are aligned with the Board of Education's goals of promoting educational equity, supporting educator recruitment and retention, and helping students and schools achieve the board's graduation and accreditation requirements." Standards of Quality set staffing standards based on student enrollment numbers. Staffing to or above the Standards of Quality strengthens schools' abilities to meet the needs of their students. In the following section, school personnel across the five schools will be discussed.

Personnel characteristics examined include full-time equivalent classroom teachers, student to teacher ratio, average teacher salary, number of administrators/professionals, level of education, teacher quality, and classified staff. Full-time equivalent classroom teachers indicate the number teachers within a school. The allocation of classroom teachers is usually based on the number of students rather than on the needs of the school. Therefore, a school with higher enrollment should have higher full time equivalent classroom teachers. The student to teacher ratio shows the number of teachers in relationship to the number of students. A higher ratio indicates a lower number of students per teacher while a lower ratio indicates a higher number of students per teacher. Lower ratios allow for more personalized and focused instruction of students by teachers; therefore, schools with the highest need should have the lowest student to teacher ratio. The average teacher salary is an indicator of the experience of the teachers. A higher average salary indicates teachers with more experience. Examining full time equivalents, student to teacher ratio, and average salary across the five schools, brought to attention differences. As shown in Figure 23, full time equivalents ranged from a high of 61.86 at School 1 to a low of 42.23 at School 3. School 1 did have the highest number of students enrolled while School 3's enrollment number fell second to lowest. As shown in Figure 24, the student to teacher ratio ranged from a low at School 2 of 13.32% to a high at School 1 of 15.42%. Using the needs of the school as an indicator for lower student to teacher ratios, School 2 has the highest needs and therefore should and does have the lowest student to teacher ratio. School 4 has the lowest needs based on percent of students eligible for free or reduced-priced lunch and therefore should have the highest student to teacher ratio. School 4 has the second highest student to teacher ratio. School 1 has the highest student to teacher ratio but fell third in needs. Finally, average teacher salary will be unpacked. As shown in Figure 25, School 4, the Magnet

School, has the highest average teacher salary which would indicate that the teachers are more experienced even though the student needs are the lowest among the schools. School 2's average teacher salary fell in third place when their needs are the highest.

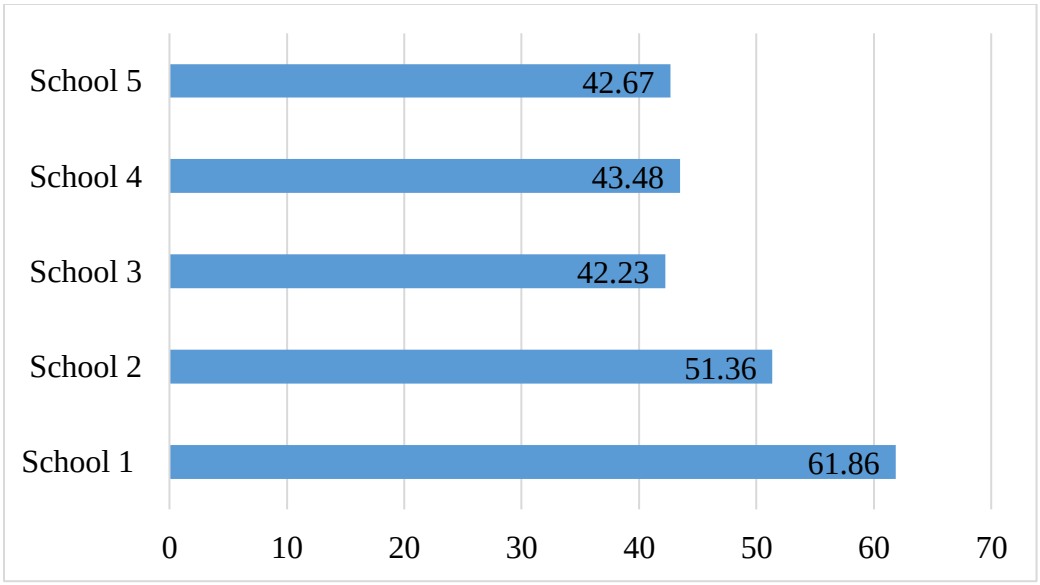

Figure 23. Full Time Classroom Teacher Equivalent

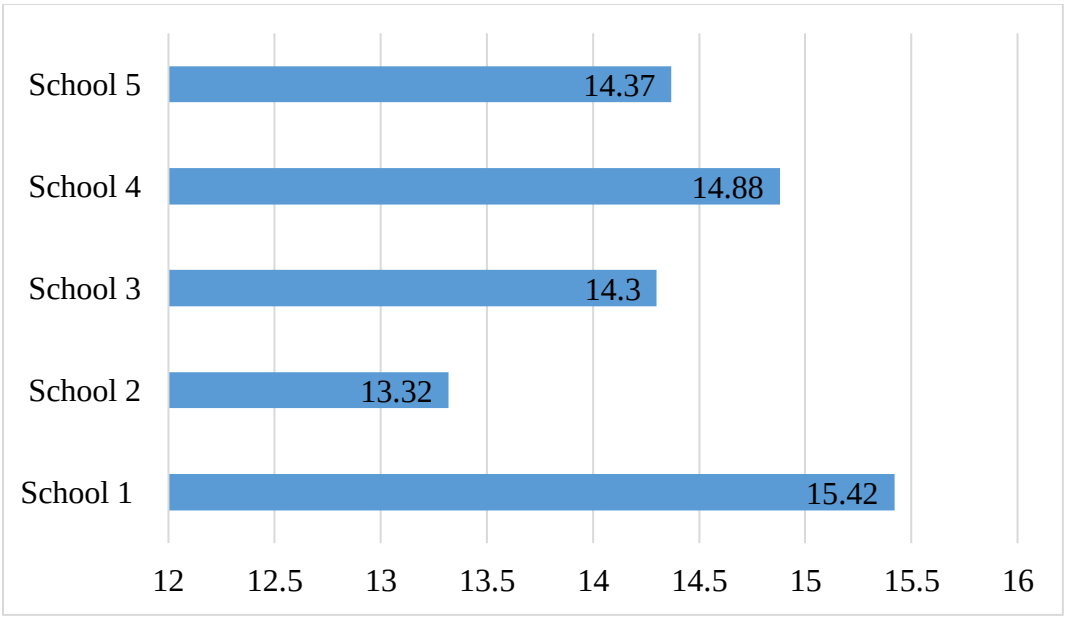

Figure 24. Student to Teacher Ratio

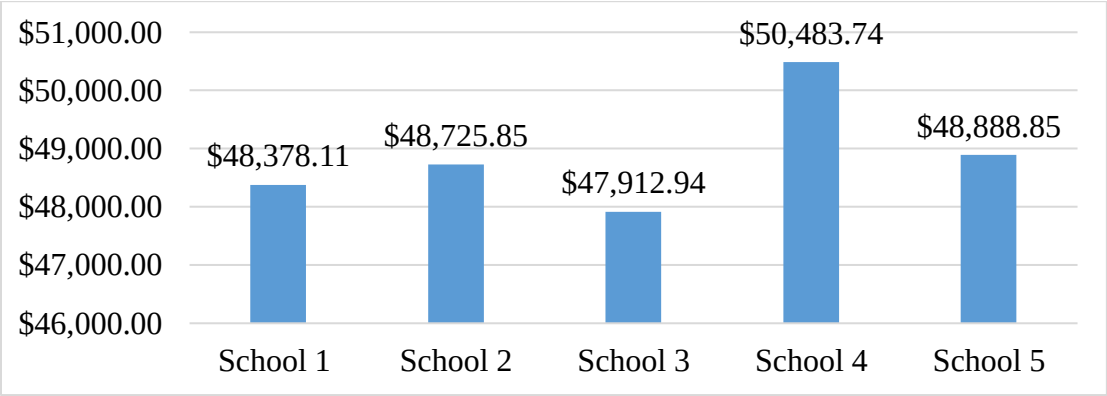

Figure 25. Average Teacher Salary

Next, staffing will be unpacked. The Standards of Quality (SOQs) set forth staffing minimums for administrators, professional staff, and classified staff. School Quality Profiles provide additional information regarding level of education and teacher quality. First, administrators and professional staff will be discussed. 2020-2021 staff information was used as 2018-2019 staffing information was not available. Administrator and professional staffing met or exceeded the recommendations across the five schools except for librarians. By SOQ, each school should have had one and a half librarians, but they each had only one. Furthermore, SOQ for staffing is based on student number not on the needs of the school; therefore, while staffing may be equal, it is not equitable. Next, teacher educational level will be discussed. As shown in Figure 26 teacher education is delineated by degrees—Bachelors, Masters, and Doctoral. Schools with high needs should have the most experienced teachers. In reviewing the staffing across the five schools, School 2, the neediest school, had the highest percentage of teachers with Bachelor's and Doctoral degrees, but the lowest percentage of teachers with Master's degrees. School 4, the school with the least need, had the lowest percentage of teachers with Bachelor's degrees, the highest percentage of teachers with Master's degrees, but no teachers with doctoral degrees. Next, teacher quality will be explored. Teacher quality is determined by the licensing

of teachers. According to the Virginia Department of Education School Quality Profiles, provisional teachers are general and special education teachers who are teaching with provisional licenses, teachers identified as teaching out of field are not fully endorsed for the content they are teaching, while teachers identified as inexperienced have less than one year of classroom experience (See Figure 27). School 4 which had the least number of needs had better qualified teachers because they had the lowest amount of provisional, inexperienced, out of field, and out of field and inexperienced. School 2 which had the greatest needs had the least qualified teachers because they had the greatest percentage of inexperienced, out of field, and out of field and inexperienced. Finally, classified staff will be examined. Classified staff were defined as clerical (attendance clerks, administrative assistants, and financial officers), health clerks, and School Security Officers. Data were not available for cafeteria staff, custodial staff, or teacher assistants. As shown in Figure 28, there was very little variation in clerical staff and health clerks. School 4 had more school security officers than the other four schools. Limited data were available regarding technology support specialists—only two schools (School 2 &3) listed technology support specialists and the SOQs did not indicate a specific number of staff.

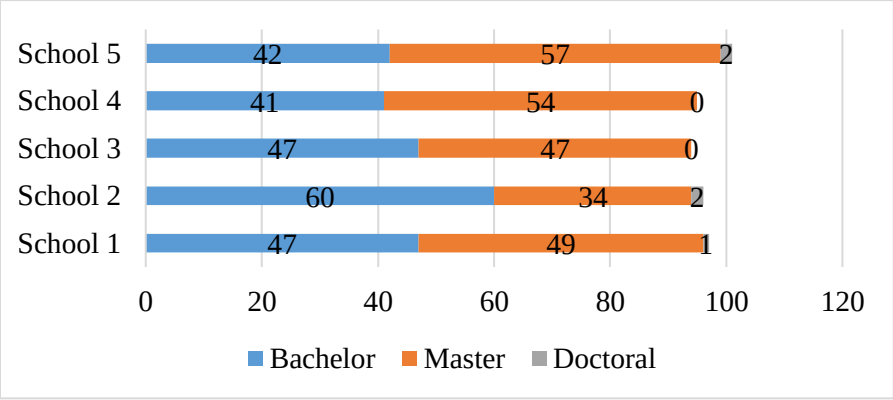

Figure 26. Percentage of Teachers' Level of Education

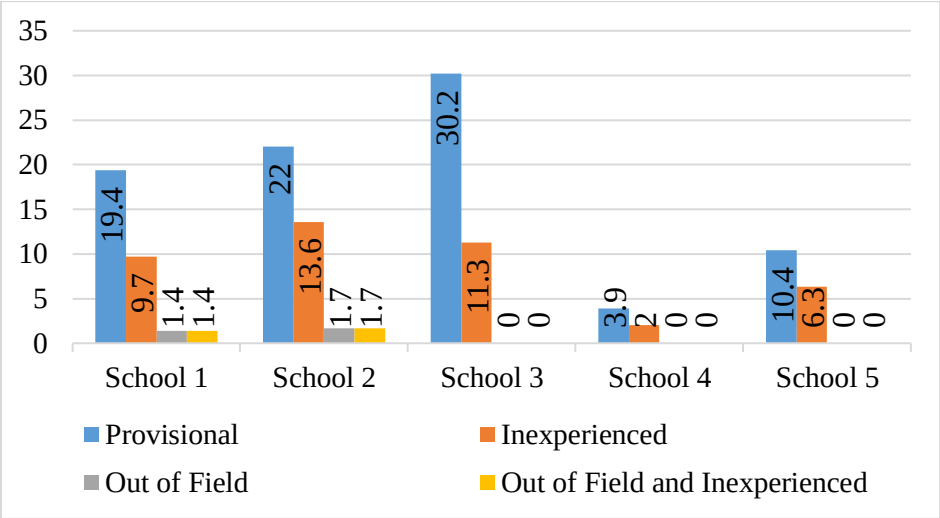

Figure 27. Percentage of Teachers' Licensing and Experience

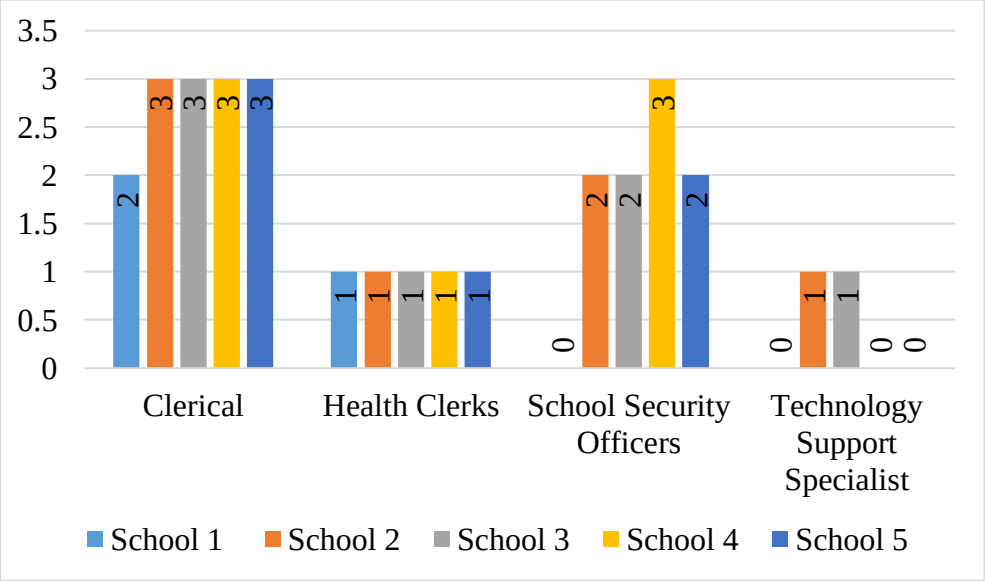

Figure 28. Classified Staff (0 indicates data were not available)

Personnel characteristics examined included full-time equivalent classroom teachers, student to teacher ratio, average teacher salary, number of administrators/professionals, level of education, teacher quality, and classified staff. Data were compared among the schools and conclusions drawn. Given that each school had differing needs, the personnel data were very similar. While all schools should have qualified personnel, high needs school require more high-

quality personnel than lower needs schools. Unpacking the personnel data did reveal equal but not equitable staffing. Next, operational costs will be explored.

Operational Costs

In the section below, operational costs will be unpacked. Operational costs data include per-pupil expenditures, professional development expenditures, and total spending for each school. Per-pupil expenses for each school were examined to address the following:

- Research Question 2: What is the per-pupil expenditure by school?
- Research Question 3: When examining per-pupil expenditures, what differences exist?
- Research Question 4: To what extent does the district funding system meet the standards for horizontal and vertical equity?

While school funding formulas often allocate resources equally, equally does not address the various needs of each school. Equity addresses the allocation of resources based on the identified needs of individual schools. Horizontal equity is defined as funding equals equally, and vertical equity means the treatment of unequals requires appropriate unequal treatment (Owings & Kaplan, 2013).

First, per-pupil expenses will be discussed. Per-pupil expenses are computed by dividing the expenses of each school by the enrollment of each school. The per-pupil expenses for each school were compiled and analyzed among the five schools. As shown in Figure 29, there was little variation among the per-pupil expenditures. With a high per-pupil expenditure of $11,935 at School 2 and a low per-pupil expenditure of $10,647, there was a difference of $1,288. As previously discussed, the needs of each school were different but even though there were different needs at each school there was little difference in the per-pupil expenditures. For example, School 2 has been identified as the school with the highest needs and School 4 as the

school with the lowest needs. When their per-pupil expenditures were determined, School 2's per-pupil expenditures were only $855 more than School 4. Since the needs of each school were different, the closeness of the per-pupil expenditures indicates inequitable school funding among the schools.

Per-pupil expenditures only provide part of the picture regarding school funding. Another way to compare the schools is to examine the schools' per-pupil expenditures by determining the cents per dollar. For every dollar spent at the school with the highest per-pupil expenditure, the cents per dollar are calculated by dividing each schools' per-pupil expenditure by the school with the highest per-pupil expenditures.

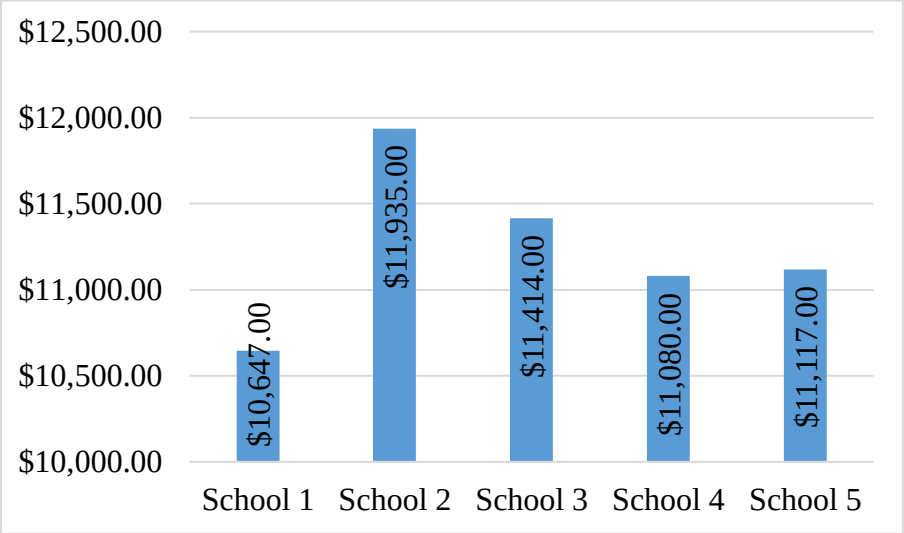

Figure 29. Per-Pupil Expenditures

As shown in Figure 30, for each dollar spent at School 2, $0.96 was spent at School 3, $0.93 was spent at School 4 and School 5, and $0.89 was spent at School 1. To this point, per-pupil expenditures were examined based on actual per-pupil expenditures for 2018-2019 school year. In the next section, the weighted per-pupil expenditures will be examined.

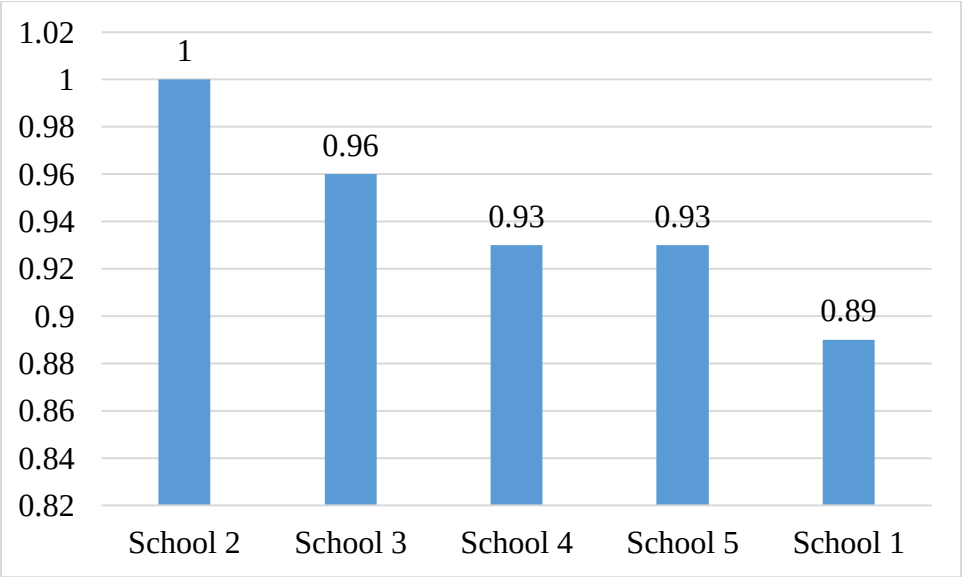

Figure 30. Cents per Dollar

To answer the final research question: "To what extent does the district funding system meet the standards for horizontal and vertical equity" weighted per-pupil expenditures were calculated. Per-pupil expenditures are determined simply by dividing operational costs by student enrollment. In its basic form, per-pupil expenditures do not consider the differing needs of students enrolled in a school. Verstegen (2002) identified three groups of students who require additional resources to meet standard, academic levels. The three groups are students with disabilities, students qualifying for free or reduced-priced lunches, and English language learners. For the purpose of this project, the three groups Verstegen identified were used to determine vertical equity. The generally accepted principles of equity using weighted per-pupil expenditures for vertical equity analysis will be used (Blankenship, 2017). Verstegen and Driscoll (2008) determined standard weights for students who were classified as needing extra services such as: students qualifying for free or reduced-priced lunch, students with disabilities, and English language learners. Verstegen (2015) defines weight as "the ratio of excess costs

above the base to the basic per pupil funding amount". Students with disabilities will be counted as 2.0 because the additional cost for children in special education is 100% above average funding for a typical general education student (Verstegen, 2015). Students who qualify for free or reduce-priced lunch and English language learners will be counted as 1.5 because an additional 50% is required for children who are low income, as measured by eligibility for free and reduced-priced lunch and those who are English language learners (ELL) Verstegen (2015). Then, the weighted pupils are used as the pupil measure when conducting vertical equity analysis. Weighting students considers the additional revenues that should be received by schools to address the increased costs of specific groups of students. While literature has come to a definitive conclusion that increased money results in increased achievement, there is no scale by which to measure what is equitable and what is not. Apriori algorithm is a practical means to assess equity among the schools. For this study, a 10% difference was identified as slightly inequitable, with 25% as moderately elevated inequitable, and 40% as notable inequitable.

For each school, the students with disabilities were counted twice, because according Verstegen, it costs twice as much to educate a student with a disability when compared to a non-disabled student. The students qualifying for free or reduced-priced lunch and student who identified as English language learners (ELL) have been weighted as one and a half because it cost one and half more to educate them. The weighted totals were then multiplied by the current per-pupil expenditures resulting in a new weighted total. This process was repeated two more times using 1.5 and 1.25 for students with disabilities, and 1.25 and 1.125 for students who qualified for free or reduced-priced lunch or identified as ELL to provide a range of weighted per-pupil expenditures from 100%, to 50%, and finally 25% (See Figure 31). Adjusting the

weights provides variance to account for the fact some students may be counted more than once since individual student data were not available. While School 2 did have the highest per pupil expenditure, $11,935.00, when Verstegen's weighting system was applied the per-pupil expenditures were discrepant. At 100% weighting, the per-pupil expenditures should have been $19,219.89. At 50% weighting, the per-pupil expenditures should have been $15,647.24. At 25% weighting, the per-pupil expenditures should have been $13,860.91. Calculating weighted per-pupil expenditures was completed for each of the five schools. Per-pupil expenditures were discrepant as high as $7,284.89 and as low as $1,925.91 per student. The discrepancies did not correlate with the level of needs at the schools and indicated inequitable school funding among the schools.

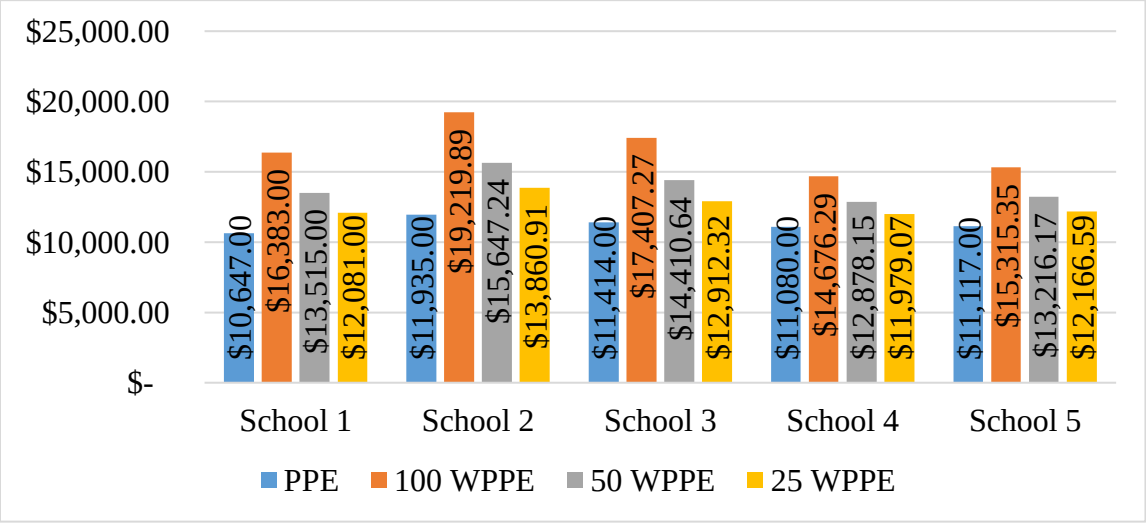

Figure 31. Weighted Per-Pupil Expenditures

The examination of vertical and horizontal equity can go one step further by computing the cents per dollar using the weighted per-pupil expenditures at the differing percentages. As shown in Figure 32, at 100% weighted per-pupil expenditures (WPPE), for every dollar spent at School 4, $0.96 was spent at School 5, $0.89 was spent at School 2 and School 3 $0.83, and

$.083 was spent at School 1. At 50% WPPE, for every dollar spent at School 4, $0.96 was spent at School 5, $0.89 was spent at School 2 and School 3 $0.83, and $0.83 was spent at School 1. At 25% WPPE, for every dollar spent at School 2, $0.99 was spent at School 4 and School 5, $0.98 was spent at School 3, and $0.91was spent at School 1. The cents per dollar discrepancies show that the neediest school did not get the most money indicating inequity among the schools.

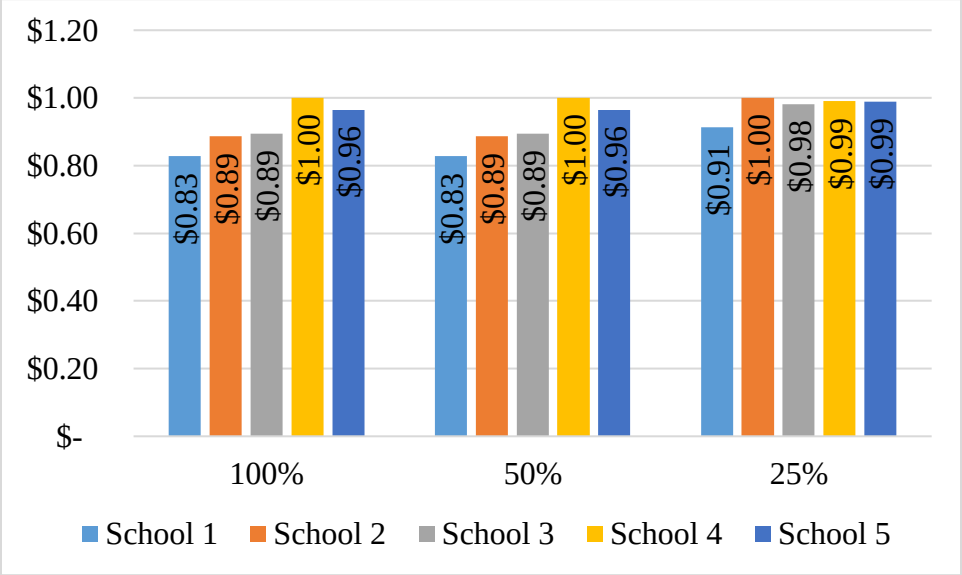

Figure 32. Weighted Cents per Dollar

For each school, the ratio of the PPE and WPPE was calculated and the Apriori algorithm applied. The Apriori algorithm is a practical means to assess equity among the schools. The ratio was calculated by dividing the actual PPE by the WPPE. For this study, a 10% difference was identified as slightly inequitable, with 25% as moderately elevated inequitable, and 40% as notable inequitable. As shown in Table 8, at 100% weighted per-pupil expenditures, all schools were moderately discrepant. At 50% weighted per-pupil expenditures, all schools were slightly discrepant. At 25% weighted per-pupil expenditures, School 1, School 2, and School 3 were slightly discrepant, while School 4 and School 5 were less than 10% discrepant.

Table 8

Weighted Per-Pupil Expenditures Ratio Calculated at 100%, 50%, and 25%

	100%	50%	25%
School 1	Moderately	Slightly	Slightly
School 2	Moderately	Slightly	Slightly
School 3	Moderately	Slightly	Slightly
School 4	Moderately	Slightly	<10
School 5	Moderately	Slightly	<10

The conclusions presented were organized to address each research question. First, it was determined that variation did exist among the five schools examined. Next, per-pupil expenditure by school was discussed. Then, per-pupil expenditures were examined. Exploring the per-pupil expenditures in relationship to the differing needs of the schools, the analysis revealed differences that indicated equity was not present. Finally, the district funding system was explored to determine if the district funding system met the standards for horizontal and vertical equity. Neither horizontal nor vertical equity was present. A discussion of the limitations of the study will be next followed by recommendations for future research and for the district.

Limitations

The researcher acknowledges the study has some limitations, or potential weaknesses that were out of the control of the study. First, only five middle schools in an urban/suburban district were studied. Second, specific data were examined within each school. As a result, the study's findings are not generalizable beyond the one district or the five schools.

Second, in December 2015, Every Student Succeeds Act (ESSA) was passed. As part of ESSA, state educational agencies (SEAs) and local educational agencies (LEAs) must prepare

and report annual report cards that include LEA and school-level per-pupil expenditures (ESSA, 2015). Specifically, sections 1111(h)(1)(C)(x) and 1111(h)(2)(C) require an SEA and all its LEAs, to report "the per-pupil expenditures of Federal, State, and local funds, including actual personnel expenditures and actual non-personnel expenditures of Federal, State, and local funds, disaggregated by source of funds, for each local educational agency and each school in the State for the preceding fiscal year." The data must be reported beginning with the 2018-2019 school year. As discussed, the data sought for the study was to be readily available as schools were required by ESSA to report the data to the Virginia Department of Education (VDOE). While the Virginia School Quality Profiles provided significant amounts of data, there were data not available to the researcher. The following data were not available to the researcher:

1. Demographic Data: Number of gifted students at each school, breakdown of data on the student level for free or reduced-priced lunch, students with disabilities, and English language learners.
2. Personnel Data: Number and salaries of 2018-2019 professional staff employed such as administrators, teachers, guidance and school counselors, nurses, and school librarians. Number and salary of 2018-2019 classified staff such as clerical, health clerks, cafeteria monitors, cafeteria manager and staff, school security officers and/or school resource officers, technology support specialists, and teacher assistants.
3. Operational Costs: while per-pupil expenditures were available in the Virginia School Quality Profiles, disaggregated data were not available for operations and maintenance, professional development, field trip transportation, and instructional supplies.

Nevertheless, the study will provide a foundation for future use of equity audits to examine intradistrict per-pupil expenditures. As mentioned earlier, identifying inequities provides an awareness. Being aware of inequities is the first step in taking action to address them.

Recommendations

Using the finding and conclusions, recommendations for future research and for the district will be discussed. A review of the findings of the study suggests the following recommendations for future research:

1. Conducting a similar study with full access to student level data from state departments of education.
2. Working directly with local school districts to conduct equity audits at the school level.
3. Use data gained, to examine and implement strategies that work towards equity.
4. Study strategies aimed at creating equity to determine if equity is being achieved.
5. Conduct a similar study and include student achievement data.
6. Conduct similar study and include student achievement data and school facility data.

A review of the findings of the study suggests the following recommendations for the district to consider:

1. Using school level data that was not available to the researcher to examine equity at each school within the district.
2. Using Verstegen's weighted system to allocate staff and funds to schools.
3. Offer incentives for more qualified teachers to teach and stay at the high-needs schools.

4. Review the policies for recruiting and selecting students at the magnet school to ensure an enrollment more representative of the district.

Conclusion

When examining equality and equity, Rick Lavoie's quote "Fair doesn't mean giving every child the same thing, it means giving every child what they need" comes to mind (Rosen & Lavoie, 2004). The focus of this study was to examine equity in order to provide a just and equitable education for all students. Without access to a just K-12 education the disenfranchised continue to be disenfranchised limited in their contribution to or the power to make change within society.

Creating access to a just K-12 education for all, requires an examination of equity—both horizontal and vertical. Horizontal equity is defined as funding equals equally, and vertical equity means the treatment of unequals requires appropriate unequal treatment (Owings & Kaplan, 2013). As educational leaders are faced with meeting the variety of student needs with less resources, the allocations of resources need to be allocated in such a way to provide access to a fair and just educational experience for all students regardless of their ethnicity, family income, or ability. Of importance are the marginalized students who are disenfranchised in public schools. Marginalized students include students of color, students with disabilities, English Language Learners, and students of poverty. As accountability continues to be a focal point, a focused effort to change how we meet the needs of all students is imperative. Resource allocations have been shown to correlate with student achievement (Betts, Rueben, & Danenberg, 2000) and should be allocated based on student need. Additionally, school leaders need to be aware of the varying needs of students and how to allocate resources to address them.

This study examined intra-district funding across five middle schools. Student data, personnel data, and operational cost data were collected, organized, and analyzed to determine per-pupil expenditures, horizontal equity, and vertical equity. To understand the relationship between horizontal and vertical equity and per-pupil expenditures, the following research questions were addressed:

1. Does variation exist among schools?
2. What is the per-pupil expenditure by school?
3. When examining per-pupil expenditures, what differences exist?
4. To what extent does the district funding system meet the standards for horizontal and vertical equity?

While accessing the data was difficult, inequity was noted in that funds were not allocated based on student need. The actual per-pupil expenditures showed very little variance across the five schools even though each school had differing needs. When using a weighted per-pupil expenditure, the gaps were even more evident. The schools with the highest needs did not consistently have the highest quality of teachers. Staffing allocations were based purely on enrollment numbers and while they were equal, they were not equitable. Based on the findings, recommendations for future research and for the district were made. Continued work in this area is required to create access to a just K-12 education for all.

Table 1

School Characteristics

Categories	**School #**	
Students	Number	Percentage
Total Enrollment		
6th		
7th		
8th		
Racial and Ethnic Groups		
Black		
Hispanic		
White		
Asian		
Multiple Races		
American Indian		
Native Hawaiian		
Economically Disadvantaged		
Free Lunch Eligible		
Reduced-priced Lunch		
Students with disabilities		
English Language Learners		
Personnel		
Classroom Teachers (Full Time Equivalent)		
Student to Teacher Ratio		
Average Teacher Salary		
Administrators/Professionals	**SOQ**	**2020-2021**
Principals		
Assistant Principals (based on funding formula)		
School Counselors (enrollment/400 rounded to nearest .5)		
Nurse (>,= to 300:1)		
Librarians (.5FTE to 299, 1FTE at 300)		
Level of Education		**2018-2019**
Bachelor's Degree		
Master's Degree		
Doctoral Degree		
Teacher Quality		
Provisional Teachers		

Inexperienced Teachers		
Out of Field Teachers		
Out of Field and Inexperienced Teachers		
Classified Staff	**SOQ**	**2020-2021**
Clerical (Attendance Clerk, Admin Asst, Fin. Off)		
Health Clerks		
School Security Officers (500-999=2)		
Operational Costs		
Per-pupil school level expenditures		
Per-pupil division level expenditures		
Total per-pupil expenditures		
Professional development expenditures (excluded costs: adult education, community services, non-regular school day programs, capital purchases, debt service, food services, and fund transfers.		
Total Spending		

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