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Changing Diversity in U.S. Schools: The Impact on Elementary Student Performance and Achievement

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**CHANGING DIVERSITY IN U.S. SCHOOLS:
THE IMPACT ON ELEMENTARY STUDENT PERFORMANCE AND
ACHIEVEMENT**

by

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ABSTRACT
CHANGING DIVERSITY IN U.S. SCHOOLS:
THE IMPACT ON ELEMENTARY STUDENT PERFORMANCE AND
ACHIEVEMENT

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Old Dominion University, 2009
Director: William A. Owings

Schools in the United States have experienced changes in their demographic profile during the last half century. During this changing time, schools have experienced court involved desegregation and have experienced fluctuations in their populations with regard to both race and socioeconomic status. Existing studies on segregation have focused primarily on Black and White students, neglecting the increasing Hispanic population of U.S. schools. This study provides more data to the expanding research on the impact of diversity on student performance. The study examined whether diversity and teacher quality of a school can predict academic performance on state-mandated tests, while controlling for school level poverty. In this quantitative study, the researcher also analyzed whether a difference existed between the predictability of pass rates and advanced pass rates for African American, Hispanic, and White students in Virginia's elementary schools. Overall, the study found the selected schools to differ from the national trends actually showing an increase in diversity, largely due to an increase in Hispanic students and a decrease in White students. The data revealed that the impact of poverty is difficult to disentangle from the issues of diversity and teacher quality. Finally, the data revealed that the effects of poverty, diversity, and teacher quality are more significant for Reading than for Math and have more of an effect on some racial groups than on others.

This dissertation is dedicated to my wonderful and supportive family. Particularly to my husband, JC, who has encouraged and supported me in every venture and to our children Erin and Jack who are the true joy of our lives. I also dedicate this to my parents, Barbara and Peter Flannery, who emphasized the value and importance of education and teaching throughout my life.

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Most importantly, this process would have stopped before it began were it not for the constant love and support of my family. To my husband, JC, your sacrifices have not gone unnoticed and your love and understanding made this possible. To Erin and Jack, you are the greatest blessings in my life and I will never understand what I did to deserve to have you as my children.

“We all should know that diversity makes for a rich tapestry, and we must understand that all the threads of the tapestry are equal in value no matter what their color.”

-Maya Angelou

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CHAPTER 1

Introduction

Educators in the United States have a legal and ethical obligation to ensure some level of equity and equality of opportunity for all students. Throughout the history of American public schools, there have been many changes in the demographic profile of enrolled students. In the 1950s, schools began the journey toward achieving a measure of racial integration within the schools due to the legal requirements laid out by *Brown v. Board of Education of Topeka, Kansas* (1954). In recent years, however, courts have declared some school districts that were previously under court order to integrate, as unitary, thereby removing court oversight. Additionally, in 2007, the United States Supreme Court rendered a decision in *Parents Involved in Community Schools v. Seattle School District* establishing limitations on the ways in which school districts could work to achieve integrated schools. The case restricts the ways school districts can use students' race to create pupil assignment plans. As school districts strive to maintain a semblance of racial and socioeconomic integration within schools, under new court rulings, it will become important for states and citizens to determine whether there is a compelling state interest in creating and maintaining integrated and diverse schools within communities.

One manner of determining the existence of a compelling state interest is to research the short-term and long-term implications for students who attend schools of varying rates of diversity. There seems to be consistency among researchers that long-term benefits exist for students of all races in terms of collegiate attendance, interracial relationships, business networking, attitudes toward other races, and overall social

development (Borman et al, 2004; Rumberger & Palardy, 2005; Sinha et al, 2005). The research on short-term results is mixed. This study sought to add to the body of research regarding the effect of school level diversity on the academic achievement of its students. As results from these studies are determined, it will be incumbent upon states and localities to ascertain if there is a rationale for working to achieve a measure of racial and economic integration within schools, and if so, how to go about achieving that balance within the confines of legal rulings and court decisions.

The researched problem for this study is whether school diversity (based upon Ethnic Diversity Index [EDI]) and teacher quality have an impact on student performance over and above poverty. Three research questions will be examined during this study.

They are

1. What is the racial and economic composition of a purposeful sample of Virginia public elementary schools over time using 1997-1998, 2002-2003, and 2007-2008 school year data?
2. Do poverty, teacher quality, and diversity of schools effectively predict performance on Grade 5 Reading Virginia Standards of Learning examinations for student subgroups in selected districts? and
3. Do poverty, teacher quality, and diversity of schools effectively predict performance on Grade 5 Mathematics Virginia Standards of Learning examinations for student subgroups in selected districts?

Background and Context

On May 17, 1954, when Chief Justice Earl Warren delivered the Supreme Court's majority opinion on *Brown*, he may not have envisioned the 55 years that would follow and the tremendous tumult this decision would create.

Segregation of white and colored children in public schools has a detrimental effect upon the colored children. The impact is greater when it has the sanction of the law, for the policy of separating the races is usually interpreted as denoting the inferiority of the Negro group. A sense of inferiority affects the motivation of a child to learn. Segregation with the sanction of law, therefore, has a tendency to [retard] the educational and mental development of Negro children and to deprive them of some of the benefits they would receive in a racial[ly] integrated school system (*Brown v. Board of Education* majority decision).

He may not have thought that in 2009, some schools in the United States would be well entrenched on a path toward resegregation in effect undoing gains made during the 1960s, 1970s, and 1980s. In years characterized by litigation, community upheaval, and in some cases, community healing, the United States moved away from Jim Crow segregation and toward integration—at least of public facilities. While facilities are now, in theory, integrated, the educational opportunities for students often are not. Tracking, resource allocation, and faculty turnover all play a role in high-risk schools that negatively influence students and affect their performance. The rapid increase of the Hispanic population within the United States has led to another grouping of minority students found in racially and economically segregated schools. Both Hispanic and Black students are often found in segregated, high-poverty schools with limited resources

(Orfield & Lee, 2004). Likewise, charter and private schools tend to be some of the most segregated schools as well with student bodies that are predominantly white (Frankenberg & Lee, 2003).

Beginning in the late 1980s and early 1990s, school districts across the country began to notice the trend toward a new era of segregation based upon existing de facto segregation found in neighborhood schools as well as a change in the demographics of urban school districts. Surprisingly to some, this trend is most noticeable, not in the South, but in New York, Michigan, Illinois, and California when measured in terms of Black exposure to White students and Blacks in White majority schools (Orfield & Lee, 2004). However, additional research initiated in 2007, shows the trend toward resegregation of schools is occurring almost exponentially in these very southern states as they are most directly affected by the removal of court orders (Frankenberg, & Lee, 2002). *Brown v. Board of Education of Topeka, Kansas* (1954) was decided and then litigated in the years following the decision and continues to have daily implications for American students as resegregation through neighborhood schools continues to plague the United States.

An additional component to the issue of resegregation is the era of high-stakes accountability in which this trend is increasing. In January of 2002, President George W. Bush signed P.L. 107-110, more commonly known as the No Child Left Behind legislation, with bipartisan support of both Democrats and Republicans. This act required schools and school districts to publicly report the performance of students while disaggregating data into historically underserved groups by race, poverty level, and disability status. Additionally, specific measures were put into place to ensure teacher

quality at all US schools. A resulting phenomenon which has continued to gain the attention of educators and the public is the achievement gap between subgroups of students. As school districts strive to meet standards set by No Child Left Behind, they are looking toward a variety of data that may indicate why some schools struggle more than others. While educators often identify socioeconomic status as a significant factor in predicting academic achievement or other measures of student performance, researchers are examining whether the diversity of a school or lack thereof may also play a role.

Social Justice in Education

Social justice terminology has multiple meanings to different organizations often entangled with political influences. There is, for example, disagreement about the predominance of a notion for economic egalitarianism in some social justice definitions. For the purposes of examining the role of social justice in the integration of public schools, it is possible to look at social justice through the lens of social justice for human rights. Human rights include the basic needs to which all humans are entitled. Much current discourse in education centers on the theory of Maslow's hierarchy of needs and its applicability to educational settings (see Figure 1). For policy makers and educational leaders, it is crucial that they consider not only the efficiency with which a school or district operates, but the humanistic aspect to meeting the diverse needs of children. The inherent needs, according to Maslow, include physical, security, social, ego, and self-actualization.

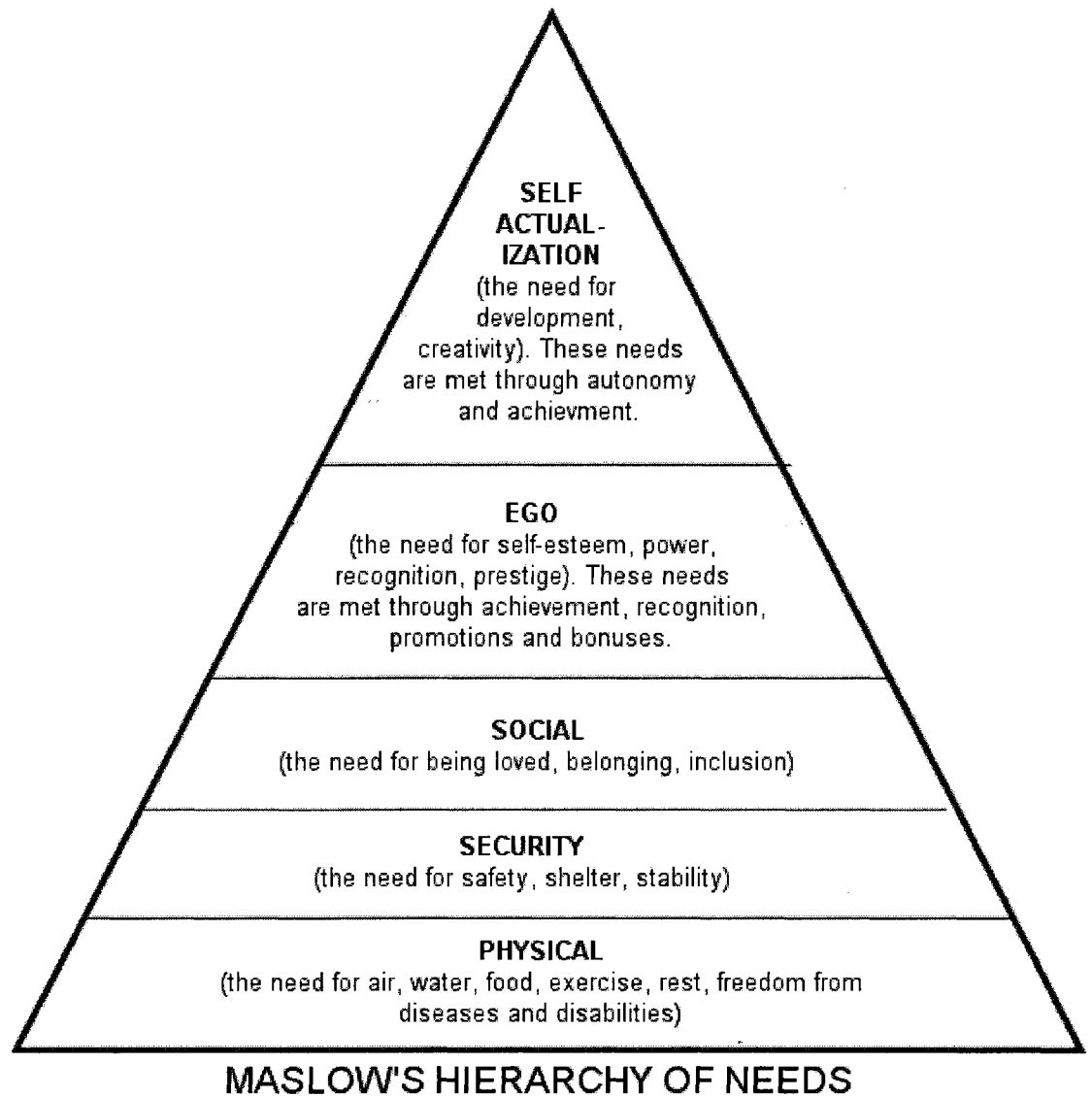


Figure 1. Maslow's Hierarchy of Needs

(<http://www.omafra.gov.on.ca/english/rural/facts/96-001.htm>).

As school districts consider policies, programs, and curriculum, it is crucial that children's most basic needs are met in order to assist them in reaching their full potential. For example, if children have not been fed breakfast, it will be challenging for them to focus on academic endeavors during the day. Therefore, schools must ensure that students have access to breakfast either at home or through school. As these basic needs

are met, the school begins to focus on helping develop students in other ways. Students who are met with only the basic physical needs, but not encouraged to strive for more through high expectations and opportunities for improvement and growth will begin to engage in a stage of learned helplessness. It is clear that academic achievement is negatively affected by teachers with low expectations and that these low expectations are more prominent in schools with a higher concentration of minority or economically disadvantaged students (Purkey & Smith, 1983). Schools that enroll high proportions of students from minority or economically disadvantaged backgrounds suffer from a multitude of factors related to a decrease in fiscal and human resources. These schools tend to have a more challenging time recruiting and retaining teachers and suffer from high teacher turnover rates (Ingersoll, 2003; Jacob, 2007; Loeb, Darling-Hammond, & Luczak, 2005; Mayer, 2002). Students who attend such schools are also less likely to be provided access to challenging curricula and have more of a focus on basic and vocational skills (Gamoran, 1987, Levin, 2007; Oakes, Gamoran & Page, 1992). These school level factors exist in a population of students who have some of the highest educational needs, such as early literacy issues and special education needs. Therefore, it is imperative that schools work to achieve equality of resources and expectations at all schools and to encourage a measure of socioeconomic and racial integration.

Role of Educational Leaders

Schools have often relied on studies, such as the well known and highly debated Coleman Report (Coleman, 1966), to offer explanations for poor student performance. The report points to the insurmountable socioeconomic and familial factors at play in student performance. The report was used to mitigate the effects of student funding,

curriculum, and teacher quality on student performance, while pointing to a student's socioeconomic factor as the primary force behind attainment. Educational researchers have long debated the outcomes and methods used in this study, but it is clear that it is difficult to isolate the multitude of school and individual factors at play in student performance. One renewed area of interest is the role the building or school leadership plays in effecting student performance. According to Leithwood, Louise, Anderson, and Wahlstrom (2004, pp. 5, 17), "leadership is second only to classroom instruction among all school-related factors that contribute to what students learn at school" and "is widely regarded as a key factor in accounting for differences in the success with which schools foster the learning of their students."

Educational leaders, then, stand to exert tremendous influence on the educational outcomes of students. There are several considerations for educational leaders in the area of diversity. What are educational leaders doing at the district level to ensure a diverse socioeconomic and racial student composition? What are educational leaders at the building level doing to ensure high quality programs and teachers for all students? What can educational leaders do to ensure that school segregation within the school building through tracking and student identification processes is diminished? Given that leaders do have a key ability to foster change within their schools, they must be able to monitor the impact of diversity on student outcomes and facilitate measures to maintain conditions which lead to the highest benefit for students.

Research Purpose and Questions

The purpose of this study was to add to the literature and research discussing student academic achievement based upon the diversity level of the school they attend.

The study specifically examines the state test results of Virginia's elementary schools through the lens of diversity level, poverty level, and teacher quality. The following research questions were used to address the purpose of this study:

1. What is the racial and economic composition of a purposeful sample of Virginia public elementary schools over time using 1997-1998, 2002-2003, and 2007-2008 school year data?
2. Do poverty, teacher quality, and diversity of schools effectively predict performance on Grade 5 Reading Virginia Standards of Learning examinations for student subgroups in selected districts? and
3. Do poverty, teacher quality, and diversity of schools effectively predict performance on Grade 5 Mathematics Virginia Standards of Learning examinations for student subgroups in selected districts?

Importance/Significance of the Study

In light of the scrutiny placed upon school districts by *No Child Left Behind*, it is important for districts to maintain an awareness of all factors which could contribute to improvements in the academic achievement of students. It becomes all the more important for districts to examine mechanisms for meeting the needs of historically underserved populations of minority students as well as for newly emerging groups of minority students, such as those who are Hispanic.

Methods

Research Design

In order to address the stated research questions, the design of this study included a combination of causal-comparative, correlational, and descriptive research. The causal-

comparative research allowed the researcher to conduct ex post facto studies to determine if there is an effect of resegregation and diversity on academic performance. The correlational design determined and identified a possible relationship between two key variables. Finally, the descriptive design allowed the researcher to explore the current phenomenon of diversity and poverty in elementary schools in Virginia. Quantitative methods were used and included the reporting and analysis of descriptive statistics; multiple regression analysis using SOL scores as dependent variables and poverty, diversity, and teacher quality as independent variables; and correlational analysis to examine the relationship between variables.

Sample

The sample for this study included a purposeful sample of districts in Virginia. In order to best capture the trends in diversity of schools, it was important to examine districts that had substantial enough populations to demonstrate such shifts. Therefore, the metropolitan areas of Northern Virginia, Tidewater, and Richmond were used. Of Virginia's 132 school districts, 24 were included in the sample. The selected districts were based upon the State Superintendent's Education Division List which divides the state into geographic regions. Regions 1, 2, and 4 were selected representing the three metropolitan areas referenced above which led to $n = 53$ districts. In order to recognize the power of shifts in elementary diversity within a district, districts with five or fewer elementary schools were not used in the study. Upon completion of the final screening, the sample size included 24 districts encompassing 592 K-5 or K-6 elementary schools.

Data Collection and Sources

For this quantitative study, existing data sources were used. The researcher collected pass rates on Virginia Standards of Learning Grade 5 examinations for Mathematics and English (Reading) for each selected school for African American, Hispanic, and White students. Grade 5 was chosen as a cumulative measure of student achievement in elementary school. Furthermore, students in grade 5 engage in content and concepts that include more abstract and critical thinking skills, than the more discrete concepts in the third grade curriculum. The ethnic diversity index, percentage of students eligible for free or reduced lunch, and the percentage of teachers rated as highly qualified were collected for each school. All data were available through the Virginia Department of Education or the individual school report cards.

Analysis Techniques

The quantitative analysis methods of correlational analysis, descriptive analysis, and multiple regression analysis will be used to fully analyze the data.

Conclusion

As Mickelson (2008) has pointed out, the racial and economic segregation of schools is not a phenomenon over which humans have no ability to change. As politicians and school district leaders draw boundaries for attendance and craft pupil assignment policies, they have the ability and often utilize the process as an opportunity to create a certain racial and economic composition of the schools. This study adds to the literature that should guide the policies used to create these assignment plans. It is important and vital that the integration of schools be placed back on the agendas of those in the power to affect such composition.

Overview of the Study

Chapter I includes an introduction, background information, statement of the research problem, and the research questions addressed in the study. The key terms utilized in the study are defined for purposes of clarification. Chapter 2 includes a “Review of the Literature.” This review provides information regarding the history of the desegregation and resegregation of public schools, the current trends toward diversity, the short-term and long-term implications of attending diverse schools, the existing achievement gap and suggestions for mechanisms districts can use to integrate. Chapter 3 includes a discussion of the “Methodology” which provides information about the research design and methodology used in the collecting and analyzing the collected data. Chapter 4 includes the analysis and discussion of data as they relate to the research questions. Finally, Chapter 5 includes a discussion of the findings as well as implications for research and practice. It also includes a discussion of the limitations of the study and suggestions for future studies that can continue to expand this area of research.

Definitions of Terms

Segregation: The policy of separating people of different races, classes, or ethnic groups, in public facilities, such as schools, housing, and businesses, especially for the purpose of discrimination.

Desegregation: The process by which the federal government ordered and oversaw the dismantling of the segregated system of schooling in the United States. This process was initiated by the *Brown v. Board of Education* decision of 1954.

Resegregation: The trend of U.S. schools to move toward racially segregated schools. This trend has increased with the removal of court orders and cessation of school districts' intentionality in racial composition of schools.

Integration: The ideal state of ethnic representation in schools. Fully integrated schools incorporate a cross section of economic, racial, and cultural backgrounds. This state brings people of different backgrounds into equal association with one another.

Neighborhood Schools: A school a student attends because the student is a resident within the attendance area surrounding that school. This term has a multitude of definitions and raises many questions as to whether the attendance lines are drawn holding communities intact or for political purposes. For the purposes of this paper, it will indicate the notion that schools are comprised of surrounding communities which often represent de facto segregation of families and households.

Ethnic Diversity Index: This index, developed for studies in California, measures the diversity or variety of the student body in a particular school using the proportional representation of each ethnic group. The formula for this index is

$$EDI(x_1...x_6) = C_1 + C_2 * d((x_1, x_2, ..., x_6) (1/6, 1/6, ..., 1/6))$$

The index will become smaller the further from even distribution the population moves.

The equation includes proportions of each race/ethnicity identified by the state

represented by x_1 through x_6 in the equation. In this study, since there are six ethnic

groups, a school with a perfect diversity index ($EDI = 100$) had equal representation of each group, or $1/6$ ($1/5$ in 1997-1998) of the school population from each ethnic group.

The first constant C_1 is consistently equal to 100 to ensure the positive nature of the EDI.

C_2 is calculated using the formula $C_2 = -\frac{100\sqrt{n(n-1)}}{n-1}$. The negative constant is used to

increase the index for schools closest to the point of even distribution.

Unitary School District: Unitary is a term used by the courts to describe a school system that is no longer racially segregated. It carries significant weight as it removes court oversight and required measures for maintaining or achieving integration.

No Child Left Behind: Public Law 107-110 was passed on January 8, 2002 with bipartisan support of both Democrats and Republicans and signed into law by President George W. Bush. In addition to reauthorizing the Elementary and Secondary Education Act, it requires states to administer state-wide tests annually to all students. The results are disaggregated by subgroups and Adequate Yearly Progress (AYP) is required.

Teacher quality: Research demonstrates that teacher quality is the highest school level factor that can affect student performance, yet it is difficult to create a universally agreed upon list of characteristics that constitute a quality teacher. In this document, teacher quality is based strictly upon the NCLB definition in order to make comparisons with available data. In order to be considered highly qualified in the United States based upon the No Child Left behind Act signed in 2002, teachers must hold a Bachelor's degree, have full state certification, and demonstrate competency in the core subjects they teach.

Poverty: The percentage of students eligible for free or reduced lunch was used as a measure of poverty for each individual school. The author acknowledges that poverty is a complex issue with many facets, but limited the definition for consistent comparison purposes.

CHAPTER 2

Introduction

Beginning in 1954 with *Brown v. Board of Education of Topeka, Kansas*, the United States began a journey to achieve racial integration in its public schools. Throughout this period, the notion of racial integration changed from a focus on Black-White integration and began to include other minorities, such as the increasing population of Hispanic students. Several persistent challenges emerge from this focus on diversity and integration including equity of resources, equity of access, and equity of treatment. Educators, bound by federal and state standards, continue to work toward a system that includes equity as a priority and focuses on the achievement of all students, with particular attention to those students who are historically underserved.

Statement of the Research Problem

School districts must ensure all students reach their full potential through both short-term and long-term measurements. This goal should apply to all students, regardless of race, ethnicity, or poverty status. In order to do this, districts must maintain awareness through data analysis of the short-term academic achievement levels of their students and disaggregate that data to look for unacceptable trends.

Research Purpose and Questions

The purpose of this study was to determine whether the diversity level of a school impacts student performance. The following research questions addressed the purpose of this study:

1. What is the racial and economic composition of a purposeful sample of Virginia public elementary schools over time using 1997-1998, 2002-2003, and 2007-2008 school year data?
2. Do poverty, teacher quality, and diversity of schools effectively predict performance on Grade 5 Reading Virginia Standards of Learning examinations for student subgroups in selected districts?
3. Do poverty, teacher quality, and diversity of schools effectively predict performance on Grade 5 Mathematics Virginia Standards of Learning examinations for student subgroups in selected districts?

Overview of the Chapter

Chapter 2 includes a “Review of the Literature.” This review will assist in painting a complete picture of the development of the racial and economic composition of schools beginning with the era of desegregation and continuing to the current status of school diversity. Additionally, this chapter explores the relevant themes of: current trends, short term implications, long term implications, the achievement gap, the role of poverty, the role of teacher quality, and future implications of school diversity.

The Faces in American Schools

In 1954, the United States Supreme Court handed down a significant ruling that permanently changed the face of American schools and had an impact on the Civil Rights Movement as a whole. Segregation for Black students declined substantially and continued to decline through the mid 1980s at which time, several important court decisions removed the requirements for desegregation of public schools. Concurrently, as demonstrated by the 2000 Census, the Hispanic population within the United States has

grown exponentially in the last several decades. High birth rates and increased immigration have contributed to this growth. Hispanic enrollment in public schools has tripled since 1968. During that same period, the Black student population has increased by 30% and the White student population decreased by 17% (Frankenburg & Lee, 2002; Orfield & Lee, 1994). As the racial composition of schools changes, it is important for researchers to examine the effects of such shifts. Figure 2 demonstrates the racial breakdown of students in the 2007 school year demonstrating the three largest ethnic groups served by US public schools—White (55%), Hispanic (21.1%), and Black (16.6%) students.

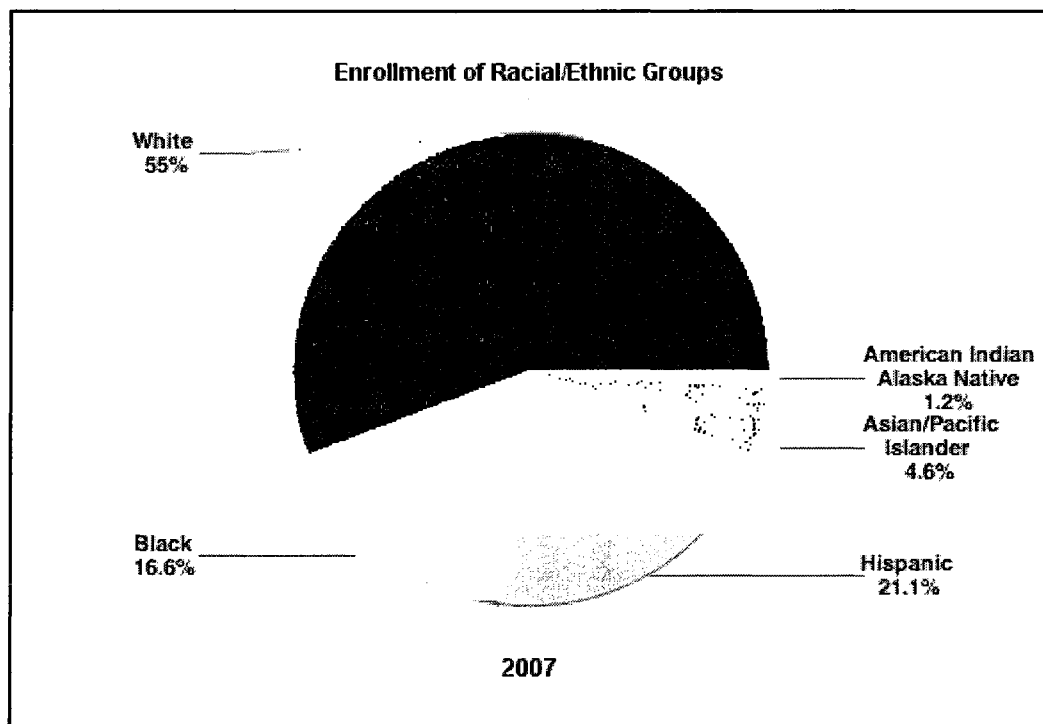


Figure 2. Enrollment of Racial/Ethnic Groups in U.S. Schools

(<http://www.schooldatadirect.org>)

Additionally, it is important for researchers to consult the historical path schools have taken to reach their current demographics.

Brown v. Board of Education Case

In the Jim Crow years both preceding and following the 1954 decision, it was commonplace in southern states for most public facilities—restaurants, swimming pools, stores, transportation, and schools to exist in a segregated fashion. The Civil Rights movement would do much to question these norms and demand change and just treatment for all citizens. Many historians might argue that the *Brown* decision was an impetus for such change and that society in fact may have changed more quickly than the schools did.

The parents who fought to have their children placed in schools did so for a variety of reasons—social justice, academic, and convenience to name a few. The underlying factor for most parents was that education was the key to social and financial mobility (Kusimo, 1999; Perlstein, 2004). Blacks had fought for many years dating back to slavery for education—sometimes at great risk to themselves and their children..

The initial *Brown* decision created the inevitability necessary for this substantial social change. When Americans feel a specific social norm will change whether they like it or not, it sometimes causes them to stop fighting against it. Pettigrew (2004) claims that the *Brown* follow-up decision, commonly referred to as *Brown II* in 1955 actually weakened the speed with which equal access was granted by as many as a dozen years. When the Supreme Court rendered *Brown II*, it required school districts to comply with integration “with all deliberate speed”—a phrase easily manipulated and misinterpreted. In reality, most affected school districts did not fully achieve any measure of integration

until the late 1960s when the courts seemed to lose patience and want older cases off their dockets and so issued orders that resulted in the integration of the public schools (Horsford, 2007).

Post-Brown Compliance and Enforcement

In the years immediately following the *Brown* decisions, some states and localities moved very quickly to begin a system of integration without incident. Desegregation, however, was not consistently enforced nor implemented. Authors and researchers often cite five stages of desegregation as absolute defiance, token compliance, modest compliance, massive integration, and resegregation (Kusimo, 1999; Blanchett et al., 2005). Educational administrators were most likely to show indifference or outright resistance to integration in the earliest years (Perlstein, 2004). Even the NEA maintained separate affiliates long past desegregation (Horsford, 2007). In reality, districts that claimed desegregation occurred did so by closing the Black schools and busing the impacted children to schools that were previously all White. Another effect of desegregation and perhaps an unintended consequence was the 38,000 Black educators in seventeen states who lost their jobs between 1954 and 1965. The losses of these educators was substantially felt by students because they often served as surrogate parents to Black children and were highly regarded within their communities (Kusimo, 1999). School districts in the 1950s and 1960s pointed to the dramatic increase in pay for Black educators. In some cases, these teachers saw 250% increases in salary. The story is incomplete, however, if the picture does not include the fact that these teachers were significantly underpaid prior to this era. Even today, education as a whole is struggling to achieve parity in hiring of Black educators (Gursky, 2002).

The challenge faced by federal supporters of integration was that the enforcement of integration law often fell to state governmental officials or judges. In Virginia, for example, there were several examples of both absolute defiance and token compliance. Organized by the U.S. Senator Harry F. Byrd to mobilize Virginians, the state formulated the plan known as massive resistance. This notion provided a legal way to defy federal law by claiming that education was a state responsibility and as such the federal government should not have the power to dictate how the state ran the educational system. The Virginia legislature then gave the power to the Governor to ensure that no child be forced to attend an integrated school. Governor J. Lindsay Almond, Jr. exercised this power by closing several districts in the Commonwealth of Virginia, including Warren County, Charlottesville, and Norfolk. Its own County Board of Supervisors later closed Prince Edward County Schools for more than five years. In 1964, a decade after *Brown*, Virginia passed the Virginia Pupil Placement Act to regulate the integration process. This act allowed parents to request transfers to other schools, but that these transfers could not upset the orderly administration of schools, competent instruction of enrolled students, or threaten the health, safety, education, and general welfare of currently enrolled students (Horsford, 2007; Norfolk School Papers). This vague language was often used as a legal mechanism to continue segregation.

While these types of extreme measures did not occur everywhere, it did take some maneuvering to achieve integration. Some states used freedom of choice plans where parents could select a district school of their choice, or managed choice plans where they could choose from a few schools in their geographic region. Ultimately, however, busing or the practice of transporting students out of neighborhoods into other schools to achieve

racial balance became the final step to compliance. Busing became the drive for large-scale litigation and increased the emotional involvement of many community members in affected areas.

Norfolk, VA and the Experience of Desegregation

Norfolk is located in the Tidewater area in southeastern Virginia. In 1954, like many cities, Norfolk operated segregated schools at each level. In the years following the *Brown* decision, the city's schools made small attempts at integration, usually in response to a court order and always resulting in no transfer of students. The city residents and city government fought integration through legal means as well as through both public and private intimidation (Norfolk School Papers). Most courts and officials made the determination that the city of Norfolk and its residents wanted to maintain segregated schools and so their behavior complied with their constituents' wishes. Mayor Duckworth of Norfolk noted in a news conference in 1958 that, "We know that the colored here pay less than 5% of the taxes and make up 75% of the jail population. The City of Norfolk has done more for its Negroes within its limits than any city in the south—barring none. We have spent \$50 million in slum clearance, on schools. We have demonstrated what the colored population has meant to us" (Norfolk School Papers). These types of comments were typical and according to letters and statements by prominent political and school figures were consistent with the opinions of that group. Norfolk, however, like all cities eventually faced the reality of having to comply with the court-ordered desegregation.

On September 19, 1958, U.S. District Judge Walter Hoffman issued an order in continuation of *Leola Pearl Beckett v. School Board of the City of Norfolk* that said

Norfolk must immediately begin to integrate its schools. On September 27, 1958, the Norfolk School Board placed seventeen Black children into previously all white schools in compliance with the judge's order. The school board chose seventeen Black children from the 151 that completed the application and testing process that year. On September 27, 1958, as part of massive resistance, the same day the children were to start at school, the Governor closed the six affected schools in Norfolk and placed them under state control. In all, this affected more than 10,000 white students and the seventeen Black students (the Norfolk 17). In the months that followed, students found avenues to education through private schools and relocation, but mostly through highly organized tutoring groups. During these months, more than one government official issued public pleas for the Black families to withdraw their requests. On December 10, 1958, Councilman Layton said he "implored to the hearts of colored citizens to open school and not request implementation of the federal court order." Councilman Abbott reiterated his sentiment when he said, "Now you have 17 Negroes keeping 10,000 white children from school." In February of 1959, the schools reopened with fewer students—by one estimate almost 2500 fewer. Some students relocated, married, entered the workforce, or entered the armed forces (Horsford, 2007; Norfolk School Papers).

Many private schools and academies opened and flourished during this time—in a segregated fashion. Through the Virginia Pupil Placement Act, many Norfolk area private schools secured funding for children who attended their schools to avoid integration. Prince Edward County, VA was another school district closed to avoid integration, although this district closed for five years. Prince Edward Academy essentially enrolled all the White children in that county while the Black children had no

access to education for five years. When the district finally reopened its schools, Whites were slow to return. In 1971-1972 school years, there were only 80 White students K-12 out of a total 1604 students in the system (Brookover, 1993).

During the 1960s and 1970s, southern school districts struggled to implement the court-ordered integration in the face of political and community opposition. Districts faced internal challenges of teachers and administrators who did not want to work with students of an opposite race and in many cases had to force involuntary transfers to maintain court-ordered quotas. Similarly, to the NEA, Norfolk schools operated separate departments for Blacks and Whites—even to the point of cafeteria staff meeting separately and faculty being listed under separate headings in the directories. As Black students began to apply for transfers to predominantly white schools in Norfolk, the district developed a rigorous evaluation system including an examination of records, health requirements, the academic achievement of the student in comparison to the requested school, residence, physical and moral fitness, mental ability (IQ), social adaptability, and cultural background compared to the requested school. The apparent goal and result of these stringent requirements was to give the appearance of compliance, while maintaining the status quo. Through examination of the papers and records, it is difficult to determine what specific criteria evaluators used in terms of grades and IQ requirements. As the courts and groups such as the NAACP became frustrated with the roadblocks to integration, additional court cases were filed and more court orders were disseminated. As the 1960s closed, Norfolk still had not achieved integration and stronger measures needed to be implemented to comply with the court orders (Norfolk School Papers).

The court documents demonstrate Norfolk's attempt to create an image of equality through comparison of numbers of teachers and resources. There is a parallel to the mantra of *Plessey v. Ferguson* that as long as separate facilities were equal, that was acceptable. This was the very notion overturned by *Brown*. The administrators who prepared these documents used the fact that English was offered at both schools as evidence of equity, but upon further examination, when it is clear that the expectations and levels of courses offered are drastically different, this continues the subordination of one race below another.

The mandatory busing between paired schools in Norfolk, VA began in September of 1971. Within the first weeks of busing, enrollment in the district dropped by 5000 students—within the next two years, an additional 8000 students left the district—mostly white. Four years later, in February of 1975, Judge Mackenzie deemed Norfolk a unitary school district—which meant that it was no longer segregated—a very important legal order as it released Norfolk from further court monitoring. This order came at a time when integration was defined as one school enrolling eleven Black students out of 1000. As the enrollment of white students continued to drop—termed “white flight”—the School Board became concerned that despite busing, an integrated school district would be impossible to achieve. It examined a multitude of other districts around the country to gain ideas about how best to deal with the challenges. The school board voted in 1983 to end cross-town busing of elementary students, but to continue it for middle and high school. Although they were challenged in the *Riddick v. School Board of the City of Norfolk* case, in 1986 their decision to cease busing was upheld when the U.S. Supreme Court refused to review the lower court decision. In the years that

followed, the district established a Community Oversight Committee to oversee the equity among schools and resources, but disbanded itself in 1991 because the committee members felt their purpose and goals had been achieved (Norfolk School Papers; Horsford, 2007).

Current Trends in School Diversity

Beginning in the 1980s and continuing now, schools are returning to segregation levels not seen since the 1960s in some areas (Orfield, & Lee, 2004). Additionally, educators worry that segregation is now taking place through measures such as ability grouping and special education (Kusimo, 1999; Landsberg, 1995; Blanchett, et al., 2005; Waks, 2005). This resegregation also is the result of neighborhood schools in a country where de facto segregation in neighborhoods is commonplace. It is important to have a full understanding of the status of schools with regard to this important issue. Educators must consider not only the academic consequences of such segregation, but also the social implications for students both now and into their futures.

Current Statistics

Landsberg (1995) points out that every U.S. President since *Brown* has demonstrated the belief that the result of desegregation is right and just and should be continued, but that none of these same individuals has taken any steps to enforce the ruling. The Department of Education, responsible for oversight of discrimination, under *Brown* has only thirteen attorneys to oversee and handle discrimination cases. Some might think thirteen is enough to handle this massive caseload, but these same attorneys are also responsible for discrimination in higher education and sex and disability

discrimination at all levels of education. Researchers argue that this issue cannot be a priority when the government gives it so few resources (Landsberg, 1995).

Since this issue goes largely unregulated and since most districts are no longer required to comply with court orders, resegregation as a pattern has increased (Orfield & Lee, 2004; Orfield & Lee, 1994; Orfield & Lee, 2006). The percentage of Black students in 50-100% minority schools has seen an increase in every region since 1991 as shown in Table 1.

Table 1

Percentage of Black Students in 50-100% Minority Schools by Region

Region	1968	1988	1991	2001	2005
South	80.9	56.5	60.1	69.8	72.0
Border	71.6	56.9	59.3	67.9	70.0
Northeast	66.8	77.3	75.2	78.4	78.0
Midwest	77.3	70.1	69.7	72.9	72.0
West	72.2	67.1	69.2	75.8	77.0

(Orfield & Lee, 2004; Orfield & Lee, 2006)

This type of resegregation is common in all areas—urban, suburban, and rural—and in all regions around the country.

Beginning in the early 1990s, there has been a consistent increase in the level of segregation found in schools (Orfield & Lee, 2004; Orfield & Lee, 2006; Caldas & Bankston, 1998). This increase is due to de facto neighborhood segregation, urban area demographics, and an increasing tendency of courts and the executive branch to cease

enforcement of existing integration orders. It appears as though this trend will continue at least for the short-term, as politically it seems unlikely there will be a resurgence of busing. It is, therefore, important, to examine the effects—both short-term and long-term of students attending segregated schools. Researchers tend to agree that disaggregating data related to segregation levels is challenging at best. There are a host of related effects of high poverty and highly segregated schools that all affect student achievement. There does seem to be some consensus regarding the notion that long-term effects of students attending schools that are more integrated are positive, but short-term effects are mixed (Sinha et al., 2005; Borman et al., 2004; Ensign, 2002; Mickelson, 2001; Rumberger & Palardy, 2005; Caldas & Bankston, 1998).

The manner in which a school is designated as segregated is often defined through indices related to ethnicity. Sinha et al (2005) set out to create an empirical definition of a neighborhood school. In doing so, they raised the issue that more must be considered than whether or not a child attends school in the proximity of his/her home. This study also examined, the makeup of all the neighborhoods attending the school and the quality of each neighborhood. Additionally, segregation is not simply defined by a recipe of ethnic breakdown, although some researchers, such as those reported by Mickelson (2001) state the ideal make-up for academic performance is 61-90% White and 10-39% Black or Hispanic. Most researchers, however, focus on factors outside of ethnicity to include tracking or challenging academic opportunities as an additional method of segregation despite building integration (Borman et al, 2004; Ensign, 2002; Rumberger, & Palardy, 2005).

Short Term and Long Term Implications of Diversity in Schools

There is also the challenge of examining the effect of diversity on academic achievement. As previously mentioned, there do seem to be long-term benefits for both Blacks and Whites who attend an integrated school. These long-term effects tend to focus more on social development as well as career, educational, and networking opportunities (Sinha et al, 2005; Borman et al, 2004; Rumberger & Palardy, 2005). In terms of short-term academic achievement, the reviews are mixed. A 1984 study for the National Institute of Education led by Thomas Cook looked at 157 studies and demonstrated an increased mean for reading performance, but no significant effect on Mathematics scores. Due to small sample sizes and non-normal distributions, researchers discarded 138 studies making it difficult to generalize results to the population (Mickelson, 2001).

Academic achievement is clearly affected by funding, teacher quality, instructional resources, and poverty. Borman et al. (2004) used a multivariate analysis to further examine performance on the FCAT (Florida state exam) using typical predictors compared to segregation as a predictor. Utilizing percentages of Black representation in schools as a grouping factor, they found that both Black segregated and integrated schools scored lower than White segregated schools. The difference, however, was relatively small between White segregated and integrated schools indicating that for White students, there may not be a significant difference in terms of attending a White segregated or integrated school. Black students, however clearly benefitted from attending an integrated school as shown in Table 2.

Table 2

Mean scores on FCAT based upon diversity of schools for elementary level

Variable	Black segregated <i>M</i> <i>N</i> = 309	Integrated <i>M</i> <i>N</i> = 920	White segregated <i>M</i> <i>N</i> = 318
% passing reading	31.85	54.63	55.83
% passing Mathematics	27.25	46.38	51.25

The researchers did note that both instructional quality and academic expectations were lower at the Black segregated schools, but gave no indication as to how these were measured. Similarly, Rumberger & Palardy (2005) used the National Longitudinal Study of 1988 to determine whether SES of the school is as significant as SES of the student. In doing so, they studied what has the most impact on student achievement—racial diversity, economic diversity, or prior achievement of classmates. They determined that SES of the school was more significant than the racial composition. An interesting piece of their study, however, is that they noted racial composition had a larger effect on history and science than on Mathematics and reading, where it was negligible. Few other studies give results on history and science and this may be an area for further research.

It is also significant that researchers examine the demographic characteristics of Black students who attend majority white segregated schools. According to Gosa & Alexander (2007), Black students who are more affluent or whose parents are more highly educated do perform at higher levels than Black students without these

advantages. The authors point out, however, these students still underperform when compared to their White counterparts, and in fact, tend to perform closer to White students from the poorest socioeconomic status.

Ultimately, researchers do agree that segregated schools bring with them the effects consistent with high poverty schools—high student mobility, high teacher turnover, lower numbers of credentialed teachers teaching in subject area, and lower academic standards. As educators try to address each of the problems within the system with appropriate solutions, the effects of segregation is yet another area that needs further study.

Achievement Gap

Members of the public as well as educators may inquire as to why this issue holds significance. The achievement gap, which exists between minority students and White students, is a constant focus of concern for educators. The challenge is how to identify the reasons for the gap and how to overcome it. Researchers often identify socioeconomic status and poverty as explanations for poor academic performance among minority students. In fact, minority students are more likely to be eligible for free or reduced lunch and more likely to attend high-poverty schools (KewalRamani et al., 2007). Additionally from the same report, minority students are also:

- Less likely to be enrolled in preschool programs
- More likely to have the lowest AP exam scores
- More likely to be suspended from school
- More likely to be retained or expelled
- More likely to dropout

These challenges have the final obstacle of quality teacher employment and retention. With all of these issues, resegregation might seem like one more to add to a seemingly insurmountable mountain. It is important, however, that educators and researchers always keep the full picture at hand and not ignore any area that might improve achievement. In 1971, the gap between minority and majority students for 12th grade reading was 52.87%; in 1988, that gap had dropped to 20.3%; but, in 1992, the gap had risen again to 36.8% (Waks, 2005). These numbers are evident at the elementary level as well and across disciplines. Virginia summarizes the performance of its students through its state report card. The state disaggregates its reporting by subgroup to comply with reporting requirements of No Child Left Behind. In Virginia, for example, during the 2007-2008 school year, Standards of Learning test results at the 5th grade level demonstrated an achievement gap in the double digits. That gap increased further when results were examined at the advanced proficiency level as shown in Table 3.

Table 3

SOL pass rates for selected AYP subgroups for 5th grade exams

Test and Pass Level	African American	Hispanic	White
Mathematics Pass	81	81	92
Mathematics Advanced Pass	38	40	60
Reading Pass	82	84	93
Reading Advanced Pass	27	31	49

(Virginia School Report Card, 2007-2008, <https://p1pe.doe.virginia.gov/reportcard/>).

If research determines that diversity in schools in fact play a role in academic achievement beyond socialization and emotional development, it would be critical for school districts to seek ways to improve diversity.

Role of Poverty

As the impact of diversity is considered as a factor in student achievement, one cannot ignore the effects of socioeconomic status and poverty. While individual socioeconomic status including generational poverty is important in examining this issue, school level poverty also should be examined. Schools with a lack of diversity, specifically, those with a high concentration of minority students also display a high concentration of poverty. Orfield & Lee (2004) report that in 2001-2002, 43% of all U.S. schools contained less than 10% Black and Latino students. Of these highly concentrated White schools, only 15% had more than half of their students eligible for free/reduced lunch. Conversely, 88% of schools with high concentrations of minority student had more than half of their students eligible for free/reduced lunch. Therefore, as students continue to attend neighborhood schools in increasing numbers, students who come from high poverty neighborhoods will be more likely to attend high poverty/high minority schools. The relationship between race and poverty is illustrated by examining the distribution of students in US public schools by race and poverty level as shown in Table 4. The percentage of White and Asian students who qualify for free/reduced lunch is consistently lower when compared to Black and Latino students.

Table 4

Distribution of students by percent poor in US public schools, 2005-06

% Poor	% White	% Black	% Latino	% Asian	% American Indian
0-10	20	5	7	23	17
11-20	17	5	5	14	6
21-30	16	7	7	12	8
31-40	14	9	8	11	9
41-50	12	11	9	9	11
51-60	9	11	10	8	11
61-70	6	12	11	6	11
71-80	3	13	12	6	10
81-90	2	14	14	6	8
91-100	1	13	15	4	9
Total (In Millions)	28	8	10	2	1

(Orfield, & Lee, 2007)

The effects of attending high poverty schools are discussed consistently throughout the literature. Rumberger & Palardy (2005) identified school level poverty has having more of an effect than racial composition on student performance. Therefore, minority students face the triple challenge characterized by individual poverty, school level poverty, and school level segregation.

Role of Teacher Quality

As previously stated, there are a multitude of characteristics associated with high minority and high poverty schools. One such example is the quality of teachers within those schools and the connection to teacher turnover and teacher expectations. According to Quality Counts (2003), “Students in high-poverty, high-minority, and low-performing schools have less access to well-qualified teachers” (p. 9). The report acknowledged that research regarding teacher quality is inconsistent; however on every measure, students in high minority and high poverty schools are at a disadvantage. Whether one defines teacher quality through coursework, years experience, degrees attained, licensure, test scores, or teacher training program quality, students in these schools come up short.

Teachers in high poverty and high minority schools also tend to report less favorable working conditions. They report students being unprepared to learn, lack of parent involvement, fewer resources, student absenteeism, student disrespect for teachers, and discipline issues at a higher rate than low poverty, low minority schools. This may be connected, then, to the high rate of mobility of teachers from these schools, particularly those with seniority and more years of experience (Quality Counts, 2003; Haycock, 2008).

Future Implications

As educators continue to research the implications of racial and economic diversity on student performance, the question remains whether this is a priority for states and communities? Preliminary research by Pettigrew in 2004 indicates that Black children who attend desegregated schools are more likely to attend and finish college, work with White coworkers, have better jobs, live in interracial neighborhoods, have

somewhat higher incomes, have more White friends and contacts, and a more positive attitude toward Whites. Additionally, Whites who attend integrated schools have a more positive attitude about Blacks (Pettigrew, 2004; Orfield & Lee, 2004). If these are valued outcomes, then it seems clear that this issue deserves attention.

Researchers are inconsistent when discussing the manner in which districts should go about ensuring diverse schools. There seems to be agreement that a return to busing may not be ideal. Principals and teachers ultimately will control the success of any initiative at the school level (Blanchett, 2005). It is clear that when teachers and administrators focus on things they can control, such as instructional strategies, as opposed to things outside of their control, such as socioeconomic and demographic factors, students perform better. Therefore, teachers who seem to sometimes have a disconnect between how they teach and how students learn need to focus on culturally competent instruction (Kusimo, 1999; Pettigrew, 2004; Blanchett, 2005). Other methods to achieve a return to integration include:

- equitable funding systems
- equity challenges in federal court
- enforcement of existing statutes
- legal consequences for noncompliance
- increased public support for education
- appointment of judges who will focus on maintaining the spirit and letter of *Brown*
- federal aid to areas who need to improve segregation
- active recruitment of minorities into the education field

- publication of the benefit to all children of education in an integrated environment
- financial incentives and rewards to schools who effectively implement racial tolerance programs and integration initiatives
- use magnet programs and charter schools as well as open enrollments to encourage crossing neighborhoods
- alteration to grade configurations within districts, i.e. one school for K-2 and another for 3-5 combining the populations

(Orfield & Lee, 2004; Blanchett, 2005).

CHAPTER 3

Methodology

Introduction

As racial and economic diversity in schools continues to change, it will be important for educational leaders to examine the short and long term implications of the changing demographics of schools. The purpose of this study was to examine the relationship between the diversity level of schools and the performance of students on Mathematics and English reading academic examinations, while controlling for factors that are typically known to predict student performance. This chapter discusses the procedures, measures, and methods used in this study. This portion includes both a description of the research design and the quantitative framework used. These issues are followed by a discussion of the sample, instruments, data analysis, and limitations of the study.

Despite a growing trend toward resegregation that began in the early 1990s, little quantitative research has been published examining the academic performance of students with consideration to the diversity of the student body of which they are a part. There is substantial qualitative research to look at the lived experiences and perspectives of students, teachers, and administrators that focuses primarily on long-term implications. This study sought to further develop the quantitative body of knowledge related to short term academic performance.

It was important to use quantitative data analysis methods to control for factors that typically contribute to academic performance. Therefore, this study used a multiple

regression analysis to study the impact of diversity and teacher quality of a school on academic performance in English reading and Mathematics while controlling for poverty.

The following research questions were addressed in this study:

1. What is the racial and economic composition of a purposeful sample of Virginia public elementary schools over time using 1997-1998, 2002-2003, and 2007-2008 school year data?
2. Do poverty, teacher quality, and diversity of schools effectively predict performance on Grade 5 Reading Virginia Standards of Learning examinations for student subgroups in selected districts? and
3. Do poverty, teacher quality, and diversity of schools effectively predict performance on Grade 5 Mathematics Virginia Standards of Learning examinations for student subgroups in selected districts?

Research Design

Quantitative studies generally derive from the positivist approach leading to the notion that knowledge is only based on sense experience and relies heavily on the scientific method. While this study is quantitative, the researcher's approach is more closely aligned to the pragmatic philosophy. Pragmatists generally look for real world answers to real world problems. According to Patton (2002), pragmatism focuses on "practical problem-solving, real world-decision making, action research, policy analysis, and organizational or community development" (p. 145). The researcher expected to add to the existing qualitative body of knowledge with quantitative information that will assist districts and states in making research based decisions about school assignment and zoning policies that can have an impact on student achievement. The researcher

acknowledges that this issue is far too complex to address through only one method, but rather multiple studies, including quantitative studies such as this one, should be consulted and considered in the process.

In order to address the stated research questions, the design of this study included a combination of causal-comparative, correlational, and descriptive research methods. The causal-comparative research study allowed the researcher to conduct ex post facto studies to determine if there was an effect of diversity on academic performance. The correlational design determined and identified relationships between key variables. Finally, the descriptive design explored the current phenomenon of diversity and poverty in elementary schools in Virginia. Quantitative methods were used and included the reporting and analysis of descriptive statistics; multiple regression analysis using Standards of Learning scores as dependent variables and poverty, diversity, and teacher quality as independent variables; and correlational analysis to examine the relationship between variables.

Participants

Sample

The sample for this study included a purposeful sample of districts in Virginia. In order to best capture the trends which exist in resegregation, it was important to examine districts that had substantial enough populations to demonstrate such shifts. Therefore, the metropolitan areas of Northern Virginia, Tidewater, and Richmond were used. Of Virginia's 132 school districts, 24 were included in the sample. The selected districts were based upon the State Superintendent's Education Division List which divided the state into geographic regions. Regions 1, 2, and 4 were selected representing the three

metropolitan areas referenced above which led to $n = 53$ districts. In order to recognize the power of shifts in elementary diversity within a district, districts with five or fewer elementary schools were not used in the study. Upon completion of the final screening, the sample size included 24 districts encompassing 592 K-5 or K-6 elementary schools. Therefore, 56,046 fifth graders in the selected districts were included out of the 89,893 fifth grade students across the state representing 62% of all of Virginia's fifth graders (Virginia School Report Card, 2008, <https://p1pe.doe.virginia.gov/reportcard/>).

The study did not focus on individual student performance, but rather school performance. School data were reviewed for implausible or impossible scores. Schools that had no record of 2007-2008 Standards of Learning scores or ethnic breakdown were discarded from the study. Schools that did not have data for the other selected years were retained, but only for the analyses that held applicable data. Schools with fewer than 10 students in any subgroup reporting category are not required to report scores for those subgroups. Due to the large number of schools in this category, these schools were retained in the study, but again, the missing values were eliminated list wise. Researchers view this as a weakness of subgroup reporting indicating that these loopholes place the burden for subgroup performance on urban schools where subgroup representation tends to be highest (Stiefel et al., 2007).

Data Collection and Instruments

Measures

The researcher first examined the demographic data for selected elementary schools based upon self-report by schools to the Virginia Department of Education. These data were collected for the 1997-1998, 2002-2003, and 2007-2008 and descriptive

statistics were reported. This study focused on the impact of diversity, which included a racial breakdown of students within each school building. Within the examined schools, ethnicities were collected in six (five in 1997-1998 as collected by the VA Department of Education when there was no “Other” category) categories to match the Virginia Department of Education disaggregation and will include Black, White, Asian, American Indian, Hispanic, and Other. The information provided a clear picture about the state of ethnic segregation or diversity in Virginia’s public schools over time. This information was then used in further data analysis to disaggregate academic achievement based upon standardized test results.

The researcher utilized measures to assess the other research questions in the areas of academic achievement, poverty, diversity, and teacher quality.

Academic achievement. In June of 1995, Virginia began its effort to change its assessment and accreditation practices by enacting the Standards of Learning (SOL) in four main content areas. Students are assessed in grades 3, 5, and 8 as well as in specific high school courses through standardized tests. The scores for these students are tied to their ability to graduate and school performance data is made public through the Virginia School Report Card. These scores also provide the mechanism for Virginia to demonstrate that all students are meeting minimum benchmarks required by No Child Left Behind. To measure academic achievement for this study among students, English Reading and Mathematics SOL pass rates on the 2007-2008 Standards of Learning tests were used for fifth grade students. The pass rates and advanced pass rates were collected for White, Black, and Hispanic students as these comprise the three largest ethnic groups represented in the state.

Poverty. The percentage of students eligible for free or reduced lunch was used as a measure of poverty for each individual school. The National School Lunch Program is a federally funded program that provides free or low-cost breakfast and lunch to eligible students. Children from families with an income below 130% of the poverty level are eligible for free lunch; while, children from families with an income between 130-185% of the poverty level are able to receive reduced-price meals. For the period of 2008-2009, families of four who make \$27,560 or less qualify for free lunch; while families of four who make between \$27,561 and \$39,220 are eligible for reduced lunch (United States Department of Agriculture, 2008). While there is disagreement among researchers about the best way to measure poverty, this measurement is consistently used and referenced as a basic measure of the poverty of children in a school. In Virginia, approximately 31% of students were eligible for this program in both 1995 and 2001, according to the Kids Count program. Local school districts ranged from having 4% to 73% of their students eligible in 2001 (Voices for Virginia's Children, 2003). For the year examined, 2007-2008, an average of 33.01% of Virginia's students were eligible for free or reduced lunch prices with a range of 8.99-75.6% (Virginia School Report Card, 2008, <https://p1pe.doe.virginia.gov/reportcard/>).

School diversity. Measuring the diversity of a school is challenging at best. There are a variety of measures used in current research including ethnic proportions, neighborhood profiles, and categorizing schools based upon proportion of a specific ethnic group representation, to name a few (Borman, et al., 2004; Gorard & Taylor, 2000). While each of these methods provides part of the picture, the researcher sought to use an index that provided a consistent way to measure ethnic representation across

school districts and regions. Therefore, to measure segregation level, the ethnic diversity index (EDI) was computed for the 2007-2008 school year (Education Data Partnership, 2008, <http://www.ed-data.k12.ca.us/articles/EDITEchnical.asp>). This index, developed for studies in California, measures the diversity or variety of the student body in a particular school using the proportional representation of each ethnic group. The formula for this index is

$$EDI(x_1...x_6) = C_1 + C_2 * d((x_1, x_2, ..., x_6) (1/6, 1/6, ..., 1/6))$$

The index will become smaller the further from even distribution the population moves.

The equation includes proportions of each race/ethnicity identified by the state

represented by x_1 through x_6 in the equation. In this study, since there are six ethnic

groups, a school with a perfect diversity index (EDI = 100) had equal representation of each group, or 1/6 (1/5 in 1997-1998) of the school population from each ethnic group.

The first constant C_1 is consistently equal to 100 to ensure the positive nature of the EDI.

C_2 is calculated using the formula $C_2 = -\frac{100\sqrt{n(n-1)}}{n-1}$. The negative constant is used to

increase the index for schools closest to the point of even distribution. This formula

provides a mechanism for taking into consideration the number of ethnic groups

represented. This index provided a consistent and rational way to make comparisons

between schools; however, it assumed an equal value for each ethnicity despite how that

ethnicity may be represented in the general population, which the researcher accounted

for in the discussion.

Teacher quality. There is no factor that is internal to schools that has more impact on student achievement than the quality of the instruction the pupil receives (Leithwood, Louis, Anderson, & Wahlstrom, 2004). Therefore, the researcher considered it necessary

to examine the teacher quality at the schools included in the study. In order to be considered highly qualified in the United States based upon the No Child Left Behind Act signed in 2002, teachers must hold a Bachelor's degree, have full state certification, and demonstrate competency in the core subjects they teach. This nationally accepted definition for qualified was used by the researcher as a measure of teacher quality. Virginia reports through their school report cards the percentage of teachers not meeting the federal definition of highly qualified. This statistic was collected for the 2007-2008 school year for each school in the study. The state average for 2007-2008 shows 98% of core classes taught by highly qualified teachers; however, that number was lower in schools of high poverty (Virginia School Report Card, 2008, <https://p1pe.doe.virginia.gov/reportcard/>).

Method

Descriptive statistics were examined to determine the phenomenon of diversity and poverty as they currently exist in selected elementary schools in Virginia. The researcher screened data and examined the descriptive results for trends to report. Specifically, the researcher looked for changes in demographics of schools over time.

Several multiple regression analyses were conducted using the SOL pass and advanced pass rates on English Reading and then Mathematics for Black, White, and Hispanic as independent variables. Dependent variables included free/reduced lunch percentage, ethnic diversity index (EDI), and the percentage of teachers failing to meet the federal definition of highly qualified. The researcher examined the significance of the individual factors on pass rates and determined if significance exists to create an equation which can be used to predict future scoring trends.

For purposes of initial screening, data were examined through several stages of preliminary univariate diagnostics. First, frequencies and histograms were examined to look for impossible or implausible data. To ensure the presumption of normality, additional data screening was conducted on the continuous variables examining both skewness and outliers. The researcher examined data using bivariate diagnostics. Scatter plots for the criterion versus continuous predictors were created and analyzed to examine linearity and homoscedasticity.

The final quantitative method was correlative analysis. The researcher compared key variables in relation to each other. The Pearson r (Pearson product-moment correlation coefficient) was calculated to examine the possibility of linear relationships.

Limitations

While this study will add to the quantitative literature regarding the impact of diversity on academic performance, it did not inexhaustibly address all variables that could impact student achievement. For example, the researcher was not able to obtain information regarding parental educational level, generational poverty, or early and prenatal care of children. The lack of this information limited the generalizeability of the results.

Additionally, the study only examined one educational level in one state, making it difficult to generalize results to the nation as a whole or to other states whose standards and testing measurements may be different. Additional studies should be conducted on Virginia's middle and high schools to determine if the results are replicated. Finally, a mixed methods approach to this study would have allowed the researcher to further study

the attitudes and lived experiences of students, faculty and administrators within the studied schools. Doing so would provide a wider breadth of knowledge.

The manner in which each research question was studied including the data source, measure, and analysis tool is listed in Figure 3.

Research Question	Data Source	Measure	Statistical Analysis
What is the racial and economic composition of a purposeful sample of Virginia public elementary schools over time using 1997-1998, 2002-2003, and 20047-2008 school year data?	VA DOE School report cards	Ethnic breakdown by school Free & reduced lunch	Descriptive Correlational
Do poverty, teacher quality, and diversity of schools effectively predict performance on Grade 5 Reading Virginia Standards of Learning examinations for student subgroups?	VA DOE School report cards	Free & reduced lunch Teachers highly qualified EDI Pass rates SOL tests	Descriptive Multiple Regression analysis
Do poverty, teacher quality, and diversity of schools effectively predict performance on Grade 5 Mathematics Virginia Standards of Learning examinations for student subgroups?	VA DOE School report cards	Free & reduced lunch Teachers highly qualified EDI Pass rates SOL tests	Descriptive Multiple Regression analysis

Figure 3 *Methodology matrix*

Summary

The purpose of this quantitative study was to determine if there was predictability to the nature of the relationship between ethnic diversity within a school and the academic performance indicators for students. In addressing the research questions, the researcher used descriptive, causal-comparative, and correlational analyses to conduct ex post facto research on existing data sets from the state for students' performance.

CHAPTER 4

Results

Introduction

Chapter 4 presents statistical analysis and relevant data to the research questions for this study:

1. What is the racial and economic composition of a purposeful sample of Virginia public elementary schools over time using 1997-1998, 2002-2003, and 2007-2008 school year data?
2. Do poverty, teacher quality, and diversity of schools effectively predict performance on Grade 5 Reading Virginia Standards of Learning examinations for student subgroups in selected districts? and
3. Do poverty, teacher quality, and diversity of schools effectively predict performance on Grade 5 Mathematics Virginia Standards of Learning examinations for student subgroups in selected districts?

This chapter includes results from descriptive analysis, correlation analysis, and regression.

Descriptive Statistics of Continuous Variables

The researcher collected descriptive statistics for each continuous variable used in the study. Table 5 reports these data.

Table 5

Descriptive statistics for variables

Variable	<i>M</i>	<i>SD</i>	<i>Skewness</i>
Proportion Free/Reduced Price Lunch	.358	.253	.457
Ethnic Diversity Index 2007-2008	39.84	17.75	-.340
Ethnic Diversity Index 2002-2003	34.34	18.26	-.060
Ethnic Diversity Index 1997-1998	32.5	16.78	.080
%Teachers highly qualified	98.55	2.78	-2.6
%African American passing math	79.58	11.42	-.119
%African American advanced pass math	40.03	15.58	.159
%African American passing reading	76.99	11.63	-.273
%African American advanced pass reading	28.88	12.12	.469
%Hispanic passing math	82.58	12.91	-.673
%Hispanic advanced pass math	40.87	18.22	.547
%Hispanic passing reading	85.97	10.42	-.960
%Hispanic advanced pass reading	32.46	15.53	.779
%White passing math	93.56	6.06	-1.339
%White advanced pass math	62.63	15.44	-.252
%White passing reading	94.49	5.37	-2.142
%White advanced pass reading	52.54	14.58	-.225

Racial and Economic Composition of Virginia 5th Graders over Time

To examine the status of diversity in Virginia as it related to the national trends, the researcher collected data for ethnic group proportions for each selected school for 1997-1998, 2002-2003, and 2007-2008 school years. The representation held fairly constant for all ethnic groups over time except White (which has dropped) and Hispanic (which has risen). Table 6 shows the mean proportion of each ethnic group for selected schools in three separate school years.

Table 6

Mean proportion of ethnic groups for selected schools in selected years

Ethnic Group	1997-1998	2002-2003	2007-2008
Other	Not reported	.02	.04
American Indian	.00	.00	.00
Asian	.06	.07	.07
Black	.27	.31	.30
Hispanic	.06	.10	.13
White	.61	.51	.45

(Virginia School Report Cards, 2008, 2003, 1998).

Using these proportions, which are self-reported by each school in September of each school year, the ethnic diversity index (EDI) was computed. Based upon this measure as shown in Table 7, the composition of elementary schools in the selected areas for Virginia showed increasing diversity which appears to be based upon the drop in White students and increase in Hispanic students.

Table 7

Mean ethnic diversity index for selected years

School Year	MEDI
1997-1998	32.5
2002-2003	34.34
2007-2008	39.84

Schools that contained high rates of minority students also had higher rates of students who qualified for free or reduced price lunch indicating a higher rate of poverty. While all the correlations between racial proportion and poverty were significant at $p < .01$ as shown in Table 8, the correlations for Black and White students demonstrated the greatest strength. The correlational data show the higher the proportion of Black students at the school, the higher the poverty percentage; while, the higher the proportion of White students at the school, the lower the poverty percentage.

Table 8

Correlation of racial proportion to free and reduced lunch eligibility 2007-2008

Ethnic proportion	Free/Reduced Price Lunch Percentage
Black Students	.774**
Hispanic Students	.283**
White Students	-.846**

**Correlation is significant at the .01 level

As the researcher prepared to conduct the regression analyses, it was important to examine descriptive data as they related to the impact of poverty and diversity on pass

and advanced pass scores as separate variables rather than as a group effect. Therefore, dummy coding was used to categorize minority status and poverty status into two groups. Then, the researcher examined the pass and advanced scores for the three studied ethnic groups based upon minority and poverty status of the school as shown in Tables 9-10. In each case, the lower school pass rates were found with schools with higher minority and poverty representation. The one exception to this was for the pass and advanced pass rate for Hispanic students which was higher in the higher poverty and higher minority schools. Overall, the differences in the means between groups were more substantial for Reading than for Math. For example, for White students advanced pass rate, there was a 12.9 difference in mean between the two poverty groups for Reading, but only a 4.29 difference for Math. Additionally, the differences in means between the groups were more substantial for the advanced pass scores than for the standard pass scores. For example, for Black students reading pass score rates, there was a 2.31 difference in mean between the two minority groups for the standard pass score, but a 5.17 difference for the advanced scores. Therefore, the impact of poverty and minority status appears to have more of an effect on the rate of students passing at the advanced level than at the standard level.

Table 9

Mean Pass rates for Reading

Ethnic group	0-50%	51-100%	0-50%	51-100%
	F/R Lunch	F/R Lunch	Minority#	Minority
Black Students Pass	86.21	83.62	86.53	84.22
Hispanic Students Pass	87.19	83.62	87.75	84.15

White Students Pass	94.89	91.76	94.96	92.80
Black Students Advanced Pass	31.10	25.94	31.95	26.78
Hispanic Students Advanced Pass	33.82	30.17	34.30	29.93
White Students Advanced Pass	54.17	41.27	54.82	44.46
#Minority is defined by Hispanic plus Black students				

Table 10

Mean Pass rates for Math

Ethnic group	0-50%	51-100%	0-50%	51-100%
	F/R Lunch	F/R Lunch	Minority#	Minority
Black Students Pass	83.70	83.04	83.10	83.59
Hispanic Students Pass	82.10	83.52	82.28	83.95
White Students Pass	93.79	91.72	94.08	91.98
Black Students Advanced Pass	40.66	39.40	40.50	39.99
Hispanic Students Advanced Pass	41.13	40.62	41.80	41.51
White Students Advanced Pass	63.35	59.06	63.80	59.86
#Minority is defined by Hispanic plus Black students				

The economic and diversity descriptive data helped to set the stage for the regression analyses to determine the level and complexities of the relationship between these variables.

Data Screening for Regression Analyses

The researcher ran multiple diagnostics on the data prior to running the multiple regression analyses to ensure the assumptions for multiple linear regressions were met.

To begin, data were examined through several stages of preliminary univariate data screening. First, frequencies and histograms were examined to look for impossible or implausible data. The frequency table revealed missing values in multiple test score variables. These missing variables were examined and it was determined that the variables were missing because the identified schools did not meet minimum subgroup reporting standards. Schools are not required to report scores in disaggregated fashion if $N \leq 10$ for that particular group (Steifel, et al., 2007). Therefore, there were schools in the sample that did not have scores reported for every ethnic category, reducing the sample size and generalizeability of results. These missing data were eliminated list wise to maximize the useable data. Table 11 shows the missing values for each category.

Table 11

Values missing in each score reporting category

Category	<i>N</i> missing	%Missing
English Pass and Advanced Pass Black	200	33.8
English Pass and Advanced Pass Hispanic	394	66.7
English Pass and Advanced Pass White	96	16.2
Math Pass and Advanced Pass Black	206	34.9
Math Pass and Advanced Pass Hispanic	396	67.0
Math Pass and Advanced Pass White	99	16.8
Sample <i>N</i> = 591		

To ensure the presumption of normality, additional data screening was conducted on the continuous variables to examine both skewness and outliers. There were no significant outliers in any of the variable ranges. Skewness was acceptable at *Skewness* \leq

+/- 1.0 for each of the variables to be used in the regression analysis as shown in Table 4, with the exception of the percentage of teachers classified as highly qualified. This variable was negatively skewed (*Skewness* = -2.6) due to the high percentage of cases with 100% of the teachers rated as highly qualified (68.4%). As 404 of the 591 cases held the same value, the researcher sought to transform the variable for use in the multiple regressions. The arcsine transformation was used on this variable to improve the skewness which calculates the arcsine of the square root of the proportion of highly qualified teachers (Berenson, Levine, & Goldstein, 1983). The transformation was successful in inducing normality into a more acceptable range *Skewness* = -1.3.

The researcher then examined data using bivariate diagnostics. Scatter plots for the criterion versus continuous predictors were created and analyzed to examine linearity and homoscedasticity. When the scatter plots were examined for independent variables on the test scores, there was an overall linear relationship for each.

Finally, the researcher examined the correlations among the included variables. This helped provide preliminary information about relationships between variables prior to examining the results of the regression. As shown in Tables 12-13, there were several significant correlative relationships among variables. The poverty level of a school was negatively correlated with passing at the standard level for all three ethnic groups in Reading, but not for Black or Hispanic students in Math. When examining the impact of poverty on advanced pass scores, the highest correlations were among Black and White students in Reading and White students in Math. Generally, the higher poverty schools demonstrated lower performance in standard and advanced pass rates. The strongest correlations among any variables were for poverty and the pass rates of White students

($r = -.307, -.214, -.474, -.170$) suggesting that White students who attend schools with higher rates of free/reduced price lunch eligibility demonstrate lower pass rates.

The ethnic diversity index was significantly correlated with standard pass rates for Math for both Hispanic and White students, but for no other ethnic groups. The ethnic diversity index was not significantly correlated with pass or advanced pass rates in Reading for either Black or Hispanic students indicating little relationship of diversity to student test scores. However, there were strong and significant negative correlations for White students in both Math and Reading at the advanced pass level. In other words, the higher the diversity of a school, the lower the advanced pass rate for White students in Math and Reading. It was difficult to disentangle this effect from poverty as the highly diverse schools also demonstrated high poverty.

Teacher quality had a statistically significant positive correlation to Reading pass rates for Black and White students. However, there was a statistically significant negative relationship between teacher quality and Hispanic performance on Math tests. These trends were also reflected at the advanced pass score levels. These correlations indicated a negative relationship between teacher quality rates and Hispanic pass rates for Math.

Table 12

Correlations among regression variables for pass scores

Dependent Variables	%Students	EDI	%Teachers
	F/R Lunch		H.Q.
Reading pass rate for Black students	-.161**	.064	.113*
Reading pass rate for Hispanic students	-.159*	-.020	.008

Reading pass rate for White students	-.307**	-.054	.102*
Math pass rate for Black students	-.024	-.070	.084
Math pass rate for Hispanic students	.046	-.167*	-.243**
Math pass rate for White students	-.214**	-.185**	-.005
*Correlation significant at the .05 level			
**Correlation significant at the .01 level			

Table 13

Correlations among regression variables for advanced pass scores

Dependent Variables	%Students F/R Lunch	EDI	%Teachers H.Q.
Reading pass rate for Black students	-.237**	-.007	.146**
Reading pass rate for Hispanic students	-.120	.065	.097
Reading pass rate for White students	-.474**	-.143**	.120**
Math pass rate for Black students	.065	-.046	.096
Math pass rate for Hispanic students	.002	-.068	-.154*
Math pass rate for White students	-.170**	-.134**	-.026
*Correlation significant at the .05 level			
**Correlation significant at the .01 level			

Each of these relationships provided helpful information to gain the complete picture of the relationships among variables.

Multiple Regression Analyses

To examine the possibility of a predictive relationship among the independent variables and test scores at the standard and advanced pass rates, multiple regression analyses were conducted. The process was used to evaluate whether school diversity levels and teacher quality were able to predict pass and advanced pass rates on the Standards of Learning test for Math and English Reading for Grade 5 for Black, Hispanic, and White students over and above the expected predictor of poverty. The variables were input using the Enter method providing first for the expected predictor of poverty, then looking at the predictors of diversity and teacher quality.

Do Poverty, Teacher Quality, and Ethnic Diversity Predict Academic Performance in English Reading?

The first six regression analyses were run for Grade 5 English Reading Standards of Learning scores. The results indicated that five of the six regression equations that used poverty as a predictor were significant, with the only exception being the Hispanic advanced pass rate which could not be predicted by the model. Additional results indicated that two of the six regression equations using all predictors were significant as show in Table 14—those for the White pass rate and the Black advanced pass rate.

Table 14

Results of regression analyses for English Reading

Group	R ² F/R Lunch	R ² All Predictors	R ² Change
Black Pass	.026**	.032	.006
Hispanic Pass	.025*	.026	.000
White Pass	.094**	.106	.012*

Black Advanced Pass	.056**	.078	.022*
Hispanic Advanced Pass	.014	.036	.022
White Advanced Pass	.225**	.231	.007

* $p < .05$

The equation for the White pass rate was significant, $R^2 = .106$, $F(2, 491) = 3.296$, $p = .038$, accounting for 10.6% of the variance in pass rates. As shown in Table 15, the predictor of poverty through free/reduced price lunch eligibility was significant with a p value of .000, a t -value of -6.915, and a standardized beta of -.324. The negative beta indicated that White students attending a school with a lower rate of poverty were predicted to perform better on the English Reading exam than students at schools with high poverty rates.

Table 15

Selected results of the multiple linear regression analysis for pass rates of White students

Variable	Unstandardized coefficient	Standardized coefficient	t	Significance
{Constant}	88.875		24.309	.000
F/R Lunch	-8.573	-.324	-6.915	.000
EDI	.026	.077	1.663	.097
arcsintchrquality	4.590	.085	1.959	.051

The equation for the Black advanced pass rate, $R^2 = .078$, $F(2, 387) = 4.629$, $p = .010$ accounting for 7.8% of the variance in advanced pass rates. As shown in Table 16, the predictor of poverty through free/reduced lunch eligibility was significant with a p

value of .000, a t -value of -4.729, and a standardized beta of -.250. The predictor of teacher quality was also significant with a p value of .020, a t -value of 2.338, and a standardized beta of .116. The beta weights for the significant predictors indicated that Black students attending a school with a lower rate of poverty and higher rate of highly qualified teachers were predicted to have higher rates of advanced pass scores on the English Reading exam than students at schools with high poverty rates and low rates of highly qualified teachers.

Table 16

Selected results of the multiple linear regression analysis for advanced pass rates of Black students

Variable	Unstandardized coefficient	Standardized coefficient	t	Significance
{Constant}	17.379		1.935	.054
F/R Lunch	-12.649	-.250	-4.729	.000
EDI	-.065	-.098	-1.875	.062
arcsinchrquality	13.194	.116	2.338	.020

Post-operative diagnostics were then conducted to ensure that the assumptions were met. The tolerance values were examined and no multicollinearity was present with all tolerance indices values greater than .01. There were 1% of values on Mahalanobis Distance for the White pass and advanced pass rates above the critical value of 16.27 indicating multivariate outliers. Upon inspection of a histogram of the residuals, they appear to be normally distributed with the exception of the few outliers. Schools above the critical values tended to have high poverty and high Black student population. The

identified schools contained more than 75% of students eligible for free/reduced lunch and more than 75% Black students.

Do Poverty, Teacher Quality, and Ethnic Diversity Predict Academic Performance in Mathematics?

The next six regression analyses were run for Grade 5 Math Standards of Learning scores. The results indicated that two of the six regression equations that used poverty as a predictor were significant. Poverty, however, only was able to predict pass rates for White students, not for Black or Hispanic students. Additional results indicated that three of the six regression equations using all predictors were significant—those for the Hispanic pass rate, White pass rate, and White advanced pass rate as shown in Table 17.

Table 17

Results of regression analyses for Math

Group	R ² F/R Lunch	R ² All Predictors	R ² Change
Black Pass	.001	.013	.012
Hispanic Pass	.002	.083	.081**
White Pass	.046**	.058	.013*
Black Advanced Pass	.004	.017	.012
Hispanic Advanced Pass	.000	.026	.026
White Advanced Pass	.029**	.041	.013*

* $p < .05$

** $p < .01$

The equation for the Hispanic pass rate was significant, $R^2 = .083$, $F(2, 191) = 8.442$, $p = .000$, accounting for 8.3% of the variance in pass rates. As shown in Table 18, the predictor of poverty through free/reduced lunch eligibility was not significant for Hispanic student performance; however, the predictors of EDI and teacher quality were significant. The predictor of diversity (EDI) was significant with a p value of .027, a t -value of -2.234, and a standardized beta of -.155. The predictor of teacher quality was significant with a p value of .001, a t -value of -3.305, and a standardized beta of -.233. The beta weights for the significant predictors indicated that Hispanic students attending a school with a lower rate of diversity and lower rate of highly qualified teachers were predicted to have higher rates of pass scores on the Math exam than students at schools with high EDI and high rates of highly qualified teachers.

Table 18

Selected results of the multiple linear regression analysis for pass rates of Hispanic students

Variable	Unstandardized coefficient	Standardized coefficient	t	Significance
{Constant}	129.229		10.395	.000
F/R Lunch	1.003	.016	.222	.825
EDI	-.162	-.155	-2.234	.027
arcsintchrquality	-25.767	-.233	-3.305	.001

The equation for the White pass rate was significant, $R^2 = .058$, $F(2, 488) = 3.240$, $p = .040$ accounting for 5.8% of the variance in advanced pass rates. As shown in

Table 19, the predictor of poverty was significant with a p value of .000, a t -value of -3.527, and a standardized beta of -.170. The predictor of diversity (EDI) was significant with a p value of .012, a t -value of -2.525, and a standardized beta of -.120. The beta weights for the significant predictors indicated that White students attending a school with a lower rate of poverty and lower rate of diversity were predicted to have higher rates of pass scores on the Math exam than students at schools with high poverty and a high rate of diversity.

Table 19

Selected results of the multiple linear regression analysis for pass rates of White students

Variable	Unstandardized coefficient	Standardized coefficient	t	Significance
{Constant}	98.345		23.195	.000
F/R Lunch	-5.105	-.170	-3.527	.000
EDI	-.046	-.120	-2.525	.012
arcsintchrquality	-.901	-.015	-.332	.740

Finally, the equation for the White advanced pass rate was significant, $R^2 = .041$, $F(2, 480) = 3.151$, $p = .044$ accounting for 4.1% of the variance in advanced pass rates. As shown in Table 20, the predictor of poverty was significant with a p value of .001, a t -value of -3.425, and a standardized beta of -.156. The predictor of diversity (EDI) was significant with a p value of .015, a t -value of -2.449, and a standardized beta of -.111. The beta weights for the significant predictors indicated that White students attending a school with a lower rate of poverty and lower rate of diversity were predicted to have

higher rates of advanced pass scores on the Math exam than students at schools with high poverty and a high rate of diversity.

Table 20

Selected results of the multiple linear regression analysis for advanced pass rates of White students

Variable	Unstandardized coefficient	Standardized coefficient	<i>t</i>	Significance
{Constant}	76.904		6.932	.000
F/R Lunch	-10.857	-.156	-3.425	.001
EDI	-.103	-.111	-2.449	.015
arcsintchrquality	-4.327	-.028	-.610	.542

Post-operative diagnostics were then conducted to ensure that the assumptions were met. The tolerance values were examined and no multicollinearity was present with all tolerance indices values greater than .01. There were 1% of values on Mahalanobis Distance for the White pass and advanced pass rates above the critical value of 16.27 indicating multivariate outliers. Upon inspection of a histogram of the residuals, they appear to be normally distributed with the exception of the few outliers. Schools above the critical values tended to be high poverty and high Black student population. The identified schools contained more than 75% of students eligible for free/reduced lunch and more than 75% Black students.

Findings Summary

Overall, the findings presented in this chapter indicated a complex interconnection between poverty, diversity, and teacher quality. There was clearly a strong and significant correlation between poverty and diversity in that the data revealed the higher the representation of Black and Hispanic students, the higher percentage of students eligible for free/reduced lunch. Conversely, schools with higher proportions of White students tended to have lower poverty. Due to this high correlation, it was challenging to then unpack the effects and relationships of diversity. Additionally, the proportion of teachers who were highly qualified according to NCLB requirements was also significantly negatively correlated with poverty ($r = -.168$). Upon further examination of teacher quality and ethnic representation, the rate of highly qualified teachers was lower at schools with higher proportions of Black and Hispanic students and the converse was true for schools with higher proportions of White students as shown in Table 21.

Table 21

Correlations of teacher quality and ethnic proportion

Ethnic Group	Correlation to Teacher Quality
Black	-.115
Hispanic	-.158
White	.169

The data also revealed several important trends regarding the standard and advanced pass rates of Black, Hispanic, and White students. Results of correlational and regression analyses revealed:

- The higher poverty and higher minority schools displayed lower pass rates at both the standard and advanced pass levels.
- The negative effects of poverty were larger for Reading than for Math.
- The negative effects of poverty and minority status were larger for advanced pass rates than for standard pass rates.
- Hispanic students performed more successfully on SOL tests in schools with a lower proportion of highly qualified teachers.
- White students were more affected by increased diversity and increased poverty in the manner of lower test score pass rates than either Black or Hispanic students.
- Black and Hispanic students were not affected by the diversity of the school (based on EDI) except at the advanced pass rates for Hispanic students in Math.
- Diversity and teacher quality were significantly able to predict scores over and above poverty for Hispanic pass rates in Math, White pass and advanced pass rates in Math, White pass and advanced pass rates in Reading, and Black pass rates in Reading.

The specific research questions posed in this study addressed trend data as well as an examination of data for predictive ability. The research questions with a summary of key responses are listed below.

1. What is the racial and economic composition of a purposeful sample of Virginia public elementary schools over time using 1997-1998, 2002-2003, and 2007-2008 school year data?
 - The EDI of the selected elementary schools in VA has increased over time indicating a growth in diversity.
 - The increased diversity is due to a drop in White students and an increase in Hispanic students, with other categories holding steady.
 - Poverty and ethnic representation are strongly and significantly correlated.
 - For the 2007-2008 school year, the studied schools' free/reduced price lunch rate ranged from 0-97% of students eligible with a mean of 35.8%.
2. Do poverty, teacher quality, and diversity of schools effectively predict performance on Grade 5 Reading Virginia Standards of Learning examinations for student subgroups in selected districts?
 - Yes for White pass and advanced pass rates and Black pass rates
3. Do poverty, teacher quality, and diversity of schools effectively predict performance on Grade 5 Mathematics Virginia Standards of Learning examinations for student subgroups in selected districts?
 - Yes for Hispanic pass rates, and White pass and advanced pass rates

The data suggest that schools should consider poverty, diversity, and teacher quality as mechanisms for addressing student achievement gaps, but that schools must also consider the way in which these factors are correlated in their analysis.

CHAPTER 5

Discussion and Implications

Introduction

Chapter 1 included an introduction to the study as well as the background and context necessary to understand the issues surrounding the desegregation of public schools. The chapter included a statement of the research problem, research questions, significance of the study, and an overview of methods used. Chapter 2 included a “Review of the Literature.” This review provided information about the changing demographics of American schools, the history of desegregation, current national and Virginia state statistics, and information regarding the short and long term implications of segregated schooling. Chapter 3 included a discussion of the methodology including information about the research design, sample, measures, analysis methods, and limitations. Chapter 4 included analysis of the data relevant to the research questions. This final chapter will include a summary of the findings, discussion, limitations, and implications for research and practice. Suggestions for future continued research will be made.

Methods Summary

The quantitative research design of this study allowed for descriptive, correlational, and regression analyses to be conducted. The study included a purposeful sample of Virginia elementary schools. The sample was chosen to include the most populated areas of the state with the largest school districts where changing trends in school demographics could most likely be observed. Longitudinal data were collected regarding the ethnic makeup of the 591 schools included in the study. Additionally, the

free/reduced price lunch eligibility and percentage of highly qualified teachers (NCLB) were collected for the 2007-2008 school year. Finally, standard pass and advanced pass scores were collected for Black, Hispanic, and White students for the 2007-2008 school year for English Reading and Math state exams.

Major Findings of Study

Overall, the findings indicated a complex interconnection between poverty, diversity, and teacher quality. There was a strong and significant correlation between poverty and diversity in that the data revealed the higher the representation of Black and Hispanic students, the higher percentage of students eligible for free/reduced price lunch. Conversely, schools with higher proportions of White students tended to have lower poverty. Due to this high correlation, it is challenging to then unpack the effects and relationships of diversity. Additionally, teacher quality was significantly correlated with ethnic groups in that the higher teacher quality percentage schools were predominantly schools with higher proportions of White students.

The data also revealed several important trends regarding the standard and advanced pass rates of Black, Hispanic, and White students. Results of correlational and regression analyses revealed:

- The higher poverty and higher minority schools displayed lower pass rates at both the standard and advanced pass levels.
- The negative effects of poverty were larger for Reading than for Math.
- The negative effects of poverty and minority status were larger for advanced pass rates than for standard pass rates.

- Hispanic students performed more successfully on SOL tests in schools with a lower proportion of highly qualified teachers.
- White students were more affected by increased diversity and increased poverty as demonstrated by lower test score pass rates than either Black or Hispanic students.
- Black and Hispanic students were not affected by the diversity of the school (based on EDI) except at the advanced pass rates for Hispanic students in Math.
- Diversity and teacher quality were significantly able to predict scores over and above poverty for Hispanic pass rates in Math, White pass and advanced pass rates in Math, White pass and advanced pass rates in Reading, and Black pass rates in Reading.

Limitations

Despite the significant findings within the study, it is important not to overstate the generalizeability of the results. The study focused only on highly populated areas in Virginia, making it difficult to generalize results to other areas of Virginia or nationally. The results may well vary state to state based upon the scoring structures and reporting of the individual state assessment programs. Additionally, the study focused only on the elementary level leaving room for additional research into middle and secondary schools.

It was difficult to fully determine the trend of diversity in the selected Virginia schools. The researcher only had access to data reaching back to the 1997-1998 school year. Although diversity has in fact increased in the schools for the years studied, this trend only was examined for the last ten years. It would have been beneficial to have data reaching back several more decades to gain a true sense of the racial changes in the

schools. Data beginning in the 1950's would show a more accurate picture of segregated schools moving into more integrated ones following the implementation of desegregation, busing, and then removal of such methods.

Upon completion of the regression analyses, it was clear that the results would have been augmented by collecting test and poverty data for the other years used in computing the diversity index (2002-2003 and 1997-1998). It might prove difficult to conduct future studies collecting that information, however, as teacher quality rates and disaggregated test data are not be available for years prior to the full implementation of No Child Left Behind for all districts in the study.

The study was also limited by the focus on school level factors. Therefore, the findings only apply to groups of students who attend schools with the ascribed characteristics. Individual students within schools certainly may defy the revealed trends. A focus on individual student performance would allow additional variables to strengthen the model, including attendance data, generational poverty, generational educational attainment, and longitudinal student performance to name a few.

A final limitation was the missing scores of multiple schools. Highly segregated schools of any one ethnic group may leave some trends hidden. Due to the minimum subgroup reporting standards, highly segregated schools did not have to report pass rates of underrepresented ethnic groups. This fact may be relevant to the multivariate outliers discovered in high minority and high poverty schools.

Implications

There are a variety of implications from this study that have both theoretical and practical applications for educators and social scientists. As schools become more diverse

in their ethnic and socioeconomic makeup, it will be important for educational leaders to consider their leadership style and school culture in achieving student success. Sather (1999) stated that “previously identified problems of schooling such as lowered achievement, high dropout rates, and problems in the teaching profession are consequences of much deeper and more fundamental problems in schools” (p. 512). Sather goes on to point out that the two fundamental problems include negative school interpersonal relationships and the feeling that some minority students and families view schools and staffs to be racist and prejudiced. School leaders will need to thoroughly consider these issues if they are to solve these underlying problems.

Virginia is one state that appears to be increasing in diversity within schools, as opposed to resegregating. This accomplishment brings with it new challenges in addressing the needs of various cultural and ethnic groups. Virginia should be encouraged by the results of this and other studies indicating that their levels of integration are better than national averages. This study determined that in fact, diversity in the selected schools has increased over the last ten years. This finding was consistent with Orfield & Lee’s (2004) study, which found that Virginia ranked among the top 10 states in the country for Black exposure to White students. This trend did not hold true, however, for Hispanic students where Virginia was the 18th most segregated state. Additionally, it is important to note and consider that the increased diversity in schools found in this study is due to an increase in Hispanic students and a decrease in White students. It is difficult to ascertain from these data whether exposure of one race to another has actually increased.

Another significant implication of this study is the important role of poverty on student achievement and the highly correlated relationship between minority status and poverty in schools. According to Frankenberg & Lee (2004), “the isolation of Blacks and Latinos has serious ramifications: this isolation is highly correlated with poverty, which is often strongly related to striking inequalities in test scores, graduation rates, courses offered, and college-going rates. Virtually no attention is being paid to this troubling pattern in the current discussion of educational reform even though it is very strongly related to many outcomes the reformers wish to change” (p. 22). This study also found significant correlations between poverty levels and student performance. Schools will need to further examine what can be accomplished in communities and schools to address some of the needs of students who come from impoverished backgrounds. Virginia, for example, is considering a universal Pre-K program in addition to district level initiatives for summer bridge programs for students entering Kindergarten. These types of programs may provide a needed boost to the youngest students who enter school behind due to reading deficiencies and a lack of overall background knowledge including phonetic awareness.

As previously mentioned, an important aspect of the result of increased diversity was the increase in the Hispanic population within the studied schools. These data were consistent with national trends including the 2000 Census which revealed that the Hispanic population within the United States has grown exponentially in the last several decades. High birth rates and increased immigration have contributed to this growth. Hispanic enrollment in public schools has tripled since 1968. (Frankenburg & Lee, 2002; Orfield & Lee, 1994). According to Frankenberg (2009), the U.S. Hispanic population is

also characterized by a young mean age, an increased likelihood to marry across race, and a larger family size. As each of these items is considered and as the population continues to grow, communities and the nation will have to re-examine the reporting categories for ethnicity on demographic collection forms. An additional component to the increase in the number of Hispanic students is the impact of teacher expectations. This study revealed an unexpected trend in that higher teacher quality actually corresponded to lower test scores in Math for Hispanic students. McKown & Weinstein (2008) found that teachers demonstrated lower expectations for African American and Latino students with similar records of achievement than for children of European American and Asian American descent and that this teacher action negatively impacted student achievement. This is a concerning trend which educational leaders must examine and research both within their school building and within individual classrooms. It is also conceivable that Hispanic students in need of English Language instruction receive that for Language Arts, but not for Math or other subjects. This could explain the potential for a smaller achievement gap in Reading than in Math. Additionally, this would provide some clarity into the teacher quality issue demonstrating that perhaps it is not the quality of the teacher, but rather the background in English Language instruction that makes the difference for Hispanic students.

Having discussed the impact of poverty, diversity, and teacher quality on student performance, the researcher turned to a discussion of the most significant effects revealed by the study. The first such effect was that the impact of the three predictor variables was consistently higher for Reading than for Math. In other words, the effects of poverty, diversity, and teacher quality affected student performance more on Reading exams than

on Math exams. This finding was consistent with other studies such as Borman et al.'s 2004 study which focused on the Florida state test, the FCAT as well as a meta-analysis conducted by Thomas Cook in 1984. This result initiated a line of questioning into why students were less affected in Math performance than in Reading performance. Was the difference based upon background knowledge, early reading instruction, the inherent differences in the subject matter, or the curriculum and instruction of the subjects?

Researchers have conducted various studies related to reading instruction for elementary students, including a meta-analysis researched by Jeynes in 2008. This meta-analysis found improved results in minority students who were given phonics instruction, rather than whole language instruction. One difference between Math and Reading instruction is the dispute among educators in Reading about the most effective approach, whereas Math instruction may have remained more constant throughout the years. Another difference for students in reading is the wide array of background knowledge and experiences which can augment reading comprehension. Marzano (2004) discusses the need for teachers to focus on building students' memory capabilities and by focusing on increasing background knowledge to improve language arts performance and communication skills. According to a report by ETS in 2008, 30% of kindergartners come to school with an understanding of letter-sound relationships, but there is discrepancy among different racial groups. Thirty-four percent of White students generally enter with this knowledge, while only 20% of Black and Hispanic children do. This same report also demonstrated the cumulative differences in language experience by age 4 indicating that the differences are significant between professional, working-class, and welfare families (Beswick, & Sloat, 2006). It is plausible that the deficiencies in background knowledge for things such

as phonetic awareness, nursery rhymes, or even common childhood fairy tales may exist more commonly in children from impoverished backgrounds. According to Frankenberg & Lee (2004), children in poverty tend to be less healthy, have weaker preschool experiences, have only one parent, and move frequently.

In addition to the differences between Reading and Math scores, there were differences in the effects on certain ethnic groups. For example, the predictability of scores based upon the regression equation was significant for White students more than for Hispanic or Black students. This indicated that the factors of teacher quality and diversity had more of a significant effect for White students. The White standard pass scores for Reading were significantly negatively affected by teacher quality. When teacher quality was lower, test scores could be predicted to be lower. For Math, however, White students were not affected by teacher quality, but were significantly affected by diversity. Poverty was the most significant predictor for White Math performance in the regression equations, but diversity also was significant at both the standard and advanced pass levels. In both cases, White students' test scores were lower when the diversity was higher, when controlling for poverty.

There is little research regarding the perceptions and behaviors of White students in comparison to the demographic makeup of their schools. Most of the existing body of research either focuses on the experiences and performance of White students in higher education or international settings. Research in business did provide some insight as to the discovered pattern. Much of what is associated with the behavior or cultural norms of specific gender or race is tied to the power and status ascribed to that group (Ely & Thomas, 2001). The researchers continued to say that when the group ascribed with the

highest status is in the minority, their positions and statuses are often challenged leading to reduced self-expectations and performance. Additionally, productivity seemed to be highest in organizations where cultural diversity was a transparent and discussed benefit to the organization. This productivity was not apparent until some time had passed to allow for an understanding and knowledge of cultural and linguistic differences (Ely & Thomas, 2001; Watson, Kumar, & Michaelsen, 1993). This information could be used in educational settings to highlight the need to conduct cultural sensitivity and awareness training among both faculty and students. It would be beneficial to add to the existing literature to determine if additional multicultural awareness and competence programs would improve performance. As a whole, however, White students continue to perform well on assessments with a substantial achievement gap between minorities. Therefore, it is advisable to continue to focus research on assisting those populations of students who have been historically underserved, such as Black and Hispanic students.

Finally, there were interesting results as they related to minority students. There appeared to be little to no effect on short-term academic achievement of minority students because of the diversity level of the school they attended. These results mirrored other trends in that the effects were more noticeable at the advanced pass levels, however, the differences in Mean scores were more affected by poverty level than by minority level. In fact, Hispanic and Black students both scored higher at schools with higher percentages of minority students in Math. Reading achievement, however, was more affected by poverty level with Mean differences of more than 2 percentage points between high and low minority schools. First, it must be stated that because of minimum reporting requirements, minority students' scores were more frequently missing in this

data set, which could affect the results. These results may also mirror the effects found in the work groups in business. Minority students who attend schools where they are the majority may, in fact, have additional statuses ascribed to them increasing self-perception and expectations. Finally, this information is consistent with previous literature which has held that the long-term benefits of integrated schooling are clear, while the short-term results on assessments are less apparent.

Future Research

Due to the demonstrated significant findings in this study, there is reason to believe that all three predictor variables may have an impact on student achievement. Therefore, continued research either replicating or expanding this study should be done. The research should/could include:

- Focus on individual student performance rather than school level performance
- Change the measure of diversity
- Replicate for middle and high schools
- Design long-term quantitative studies
- Studies of within school segregation

Individual Student Performance

Using national longitudinal data related to individual student performance and demographic factors, a regression analysis could be conducted that could provide a stronger model of prediction. In doing so, generational poverty could be considered in addition to parental educational attainment. These and other factors could help determine a more concrete answer as to the true effect of diversity of schools on student achievement.

Change the measure of diversity

Several studies examined for this review of literature included different mechanisms for measuring diversity. These included the use of dummy coding proportions of ethnic group representation, measuring minority exposure to White students, and examining neighborhood segregation levels relevant to school segregation levels. Using a different measure of diversity may lead to different results and should be compared.

Replication for other school levels

As this study only examined the results of elementary schools in the most populated areas of Virginia, the study could be replicated for middle and high schools and the sample geographic area expanded. Additionally, the study could be replicated at the national level using NAEP scores.

Long-term Quantitative Studies

This research design considered three predictor variables regressed on 5th grade student pass scores. The majority of the literature available for quantitative studies related to diversity focus on student test scores. It would be useful and would expand our knowledge if additional quantitative results were examined and if they were examined longitudinally. For example, information regarding graduation rate, college acceptance, persistence in college, and median income of students could be tracked and compared to the diversity of the schools the student attended. Due to the limited access to data, this may be a study that needs to be completed through a university-school district partnership over time.

Within School Segregation

A final area for future study is that of within school segregation. This study sought to look at basic ethnic representation and student performance; however, it fell short of looking at within school trends such as student advising, grouping, and tracking. According to Mickelson (2001), “because resegregation in classrooms through tracking may undermine any potential benefits of school-level desegregation, the effects of tracking on academic outcomes also must be considered in assessing the effects of desegregation on the racial gap in achievement” (p. 220). As teachers and counselors provide students with guidance as to their course scheduling, or as teachers assign students to leveled groups, it has become clear that tracks and groups tend to be racially isolated. Mickelson also reports that race/ethnicity is the most controversial correlate to tracking, yet tracking often leads to the type of unequal educational opportunities that desegregation was supposed to mitigate. A study regarding within school segregation would provide much needed and added valuable information to the literature regarding the effects of segregated schooling.

Summary

Based upon the statistical analyses used in this research design, there was a complicated interrelationship between poverty, diversity, and teacher quality. For each predictor, however, there were significant findings for certain ethnic groups that make continued research in this area worthwhile. Additionally, there is ample evidence to support educators and policymakers in their quest to achieve equal educational opportunity through programs that seek to mitigate the long term effects of poverty,

programs that work to improve multicultural competence and relations, and programs that seek to provide schools with the highest needs with the highest qualified staffs.

Conclusion

According to Orfield & Lee (2004), “the immediate question is about the possibility of progress in a society with huge minority populations, massive segregation, a court system that has dismantled critically important policy tools and a public that supports desegregation, but has no consensus on how to get it (p. 39).” The combined effect of poverty, diversity, and teacher quality is an issue that school districts should consider when examining policies related to school assignment and school choice, as well as the creation of charter schools. Politicians and educators are not rendered helpless in addressing these issues, although the methods they use to achieve any type of socioeconomic and racial balance have been severely limited by the courts. There are, however, suggestions for what can be accomplished within the legal umbrella of today. Orfield & Lee (2004) provide suggestions for educational leaders and politicians including:

- Help multiracial schools deal positively with issues of race relations, multicultural curricula, and classroom operation.
- Recruit young people from minority groups into the education profession
- Use housing subsidy programs to provide low income families access to middle and upper class schools.
- Provide information to the public about the long-term benefits for children of all races, not just minorities that come from attending a diverse school. These

benefits include learning to live and work in multiracial communities, colleges, and work experiences.

- Implement plans that reward communities and metro areas that work to provide subsidized and affordable housing in suburbs and market it to minorities as well as Whites.

As school district leaders continue to work toward achieving the equality of educational opportunity found in the spirit of the *Brown* decision, there are a variety of creative solutions that can be implemented to improve the short and long term results for American students.

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Articles under Review

In Press

Clayton, J., Crum, K., & Rhett, A. (In Press). Segregation and poverty: Impacts on reading achievement and leadership implications. *International Journal of Urban Educational Leadership*.

Clayton, J. (In Press). Case study: Teacher with a learning disability: Legal issues and district approach. *Journal of Case Studies in Educational Leadership*.

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