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# Student, Teacher, School, And District Determinants Of Elementary School Accountability Classification In The Detroit Metropolitan Region

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# STUDENT, TEACHER, SCHOOL, AND DISTRICT DETERMINANTS OF ELEMENTARY SCHOOL ACCOUNTABILITY CLASSIFICATION IN THE DETROIT METROPOLITAN REGION

by

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## DEDICATION

"Our deepest fear is not that we are inadequate. Our deepest fear is that we are powerful beyond measure. It is our light, not our darkness, that most frightens us. We ask ourselves, 'Who am I to be brilliant, gorgeous, talented, and fabulous?' Actually, who are you not to be?"

--Marianne Williamson

This dissertation is dedicated to my daughter, Indya, a talented and bright individual. I hope the completion of this project serves as an inspiration to follow her dreams and to always believe in herself.

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# CHAPTER 1: INTRODUCTION

## Background

Education in the United States is facing challenges, whether from global competition, underachievement of certain populations, or the drop-out rate of high school students. Politicians and educators have debated that the way to cure societal ills or secure America's place as an economic superpower is through the underpinnings of education. At one point in America's history, the purpose of education was to improve the social and political power of an elite few ("The Landscape of Public Education," 2011). In the past 100 years, education has evolved to provide opportunities to increase the political, financial, and social capital of all people (Tyack & Cuban, 1995). Most stakeholders in education agree that reforms are needed in the American educational system (Payne, 2011).

The federal government's first Department of Education (DOE) was created in 1867 for the purpose of collecting information that could help establish effective school systems ("United States Department of Education," 2012b, para.4). While the federal government continued to be involved in the role of education, significant expansion did not occur until the mid-20$^{th}$century and the current United States DOE, with cabinet status, was not founded until 1979 (Stallings, 2002). This extension of the federal government's role in education also included the concept of providing a free and appropriate education (FAPE) for students with disabilities (United States Department of Education [USDOE], 2010, para.2).

In 1965, during the Civil Rights Era, President Lyndon Johnson engineered passage of the Elementary and Secondary Education Act (ESEA) to create equal

educational opportunities for all people, with an emphasis on those living in poverty. (New America Foundation, 2014). ESEA provides federal funds to schools and school districts serving students with low socioeconomic status (New America Foundation, 2014). According to the New America Foundation (2014), ESEA is the largest source of federal spending on elementary and secondary education.

Educators and legislators continue to search for ways to improve student achievement and create educational equality through school accountability. Legislators have revised ESEA in efforts to find the correct formula that can increase school quality. Originally passed in 2002, the No Child Left Behind Act (NCLB) revised ESEA (New America Foundation, 2014). NCLB forced states to establish systems that hold schools and school districts accountable through high-stakes testing (Dee & Jacob, 2011). The purpose of this bipartisan effort was to make schools responsible for ensuring that 100% of all students would be proficient by the year 2014. The act required all states to test students in grades 3-8 in reading and mathematics, and once in grades 10-12 (New America Foundation, 2014). Students were tested once in science in grades 3-5, 6-8, 10-12 (New America Foundation, 2014). States were required to create accountability systems for schools that included overall student achievement, as well as strategies to ensure the achievement of students in certain subgroups (e.g., economically disadvantaged, ethnic groups, gender, special education; Dee & Jacob, 2011).

Schools that failed to have a sufficient number of students score at a proficient level each year or failed to improve over the prior year would not achieve adequate yearly progress (AYP; New America Foundation, 2014). NCLB could sanction schools that did not meet AYP after two years, resulting in options that were punitive financially for these

schools (New America Foundation, 2014). NCLB was scheduled to be reauthorized in 2007 (Michelman, 2012), however, the debate between educators and politicians on how to restructure NCLB or if it should be restructured at all was still in process in 2014. At the start of 2014, many schools across the country were far from the 100% proficiency mark. The United States Department of Education (USDOE) has implemented changes to the No Child Left Behind act. A White House Press Release read:

> States can request flexibility from specific NCLB mandates that are stifling reform, but only if they are transitioning students, teachers, and schools to a system aligned with college-and career-ready standards for all students, developing differentiated accountability systems, and undertaking reforms to support effective classroom instruction and school leadership. (The White House, Office of the Press Secretary, 2011, para. 2).

In the state of Michigan, legislators have enacted several accountability systems over the past decade. According to the present accountability system, many Michigan schools continue to struggle to educate students adequately. The state of Michigan applied for an ESEA flexibility waiver and was approved by USDOE in 2012. The flexibility waiver allowed the state to change the 100% proficiency requirement for the 2013-14 school year, and instead establish annual measurable objectives (AMOs) in reading/language arts and mathematics that are ambitious, but presumably achievable (USDOE, 2012a). The USDOE (2012a) has outlined several general provisions of the ESEA flexibility waivers. Under these provisions, Michigan's accountability system focuses on ranking schools from top-to-bottom (TTB; USDOE, 2013a).

Based on the state of Michigan's District and School Accountability website, the TTB ranking evaluates schools by their students' achievement in all core subject areas: reading, mathematics, science, and social studies using the Michigan Education Assessment Program tests. Schools are accountable for three areas of their performance:

achievement, improvement, and achievement gap. Additionally, high schools must include their graduation rate as a factor. Since the 2010-11 school year, the state of Michigan has used data and the TTB ranking to assign a specific color and designation for schools. Currently, schools are assigned a color from green to purple, and are designated as reward, focus, and priority schools. This information is made public for parents and the community-at-large (Michigan Department of Education [MDE], 2013a). Schools are either rewarded or sanctioned based on their designations (USDOE, 2013a).

Schools and districts that are sanctioned or are publicly denigrated in the media are forced to re-evaluate instructional practices and allocation of resources. Sanctions for priority schools include 12 requirements of which three are pertinent to this research: develop and implement one of the four federally approved intervention models for reform and obligate 10% of Title I monies to reform, send letter of status notification to parents, and if applicable, set-aside 20% of Title I funds to support students (MDE, n.d.). Schools labeled as focus schools have several requirements that include notifying parents of their status, setting-aside Title I funds, and reporting quarterly progress to the Board of Education (MDE, 2013c).

Reward schools receive communication and identification from the media and their promising practices are highlighted at the State of Michigan School Improvement Conference. At the present time, the State of Michigan is seeking corporate support and federally funded grants for reward schools (MDE, 2012).

**Statement of the Problem**

This research focused on traditional elementary public schools and public charter schools with the designation of *reward, focus*, *priority* and *no designation*. Touted among

schools, legislators, and the media, Reward schools are identified as achieving with high standards, with focus or priority schools failing part or all of their student populations. According to Michigan's Elementary and Secondary Education Act (ESEA) Flexibility Request (USDOE, 2013a), schools are identified for the following reasons:

**Reward schools** are in the top 5% of the Top-to-Bottom ranking. In addition to the top 5%, there are three additional ways the Michigan Department of Education (MDE) will add schools to this category. These schools are designated as 'Beating the Odds," "High Progress," or schools that show continuous improvement.

Schools that are designated as "Beating the Odds" outperform schools with similar risk factors and demographic makeup. Additionally, schools that are in the top 5% of schools on the improvement metric in the Top-to-Bottom ranking may be added to the reward group. The improvement metric for "High Progress" schools is computed by taking the mean of the improvement z scores for each applicable subject area. Schools that are "High Progress" and have an accountability scorecard color designation of red cannot be identified as reward. The final category that may be added to reward status are schools that show continuous improvement beyond the 2022 proficiency targets (beginning in 2013). An indication of this type of continuous improvement means schools must have 85% of students score proficient in each applicable subject area and have a positive improvement slope in all subject areas for the four-year rate.

**Focus Schools** are schools with the largest achievement gaps, defined as the difference between the average scale score for the top 30% of students and the bottom 30% of students. These schools are determined from the achievement gap component within the Top-to-Bottom ranking.

**Priority Schools** are schools in the bottom 5% of the Top-to-Bottom list. These schools had to have at least one of the following criteria:

- Michigan's Department of Education includes the bottom 5% of Title I schools. If the bottom 5% overall does not include 5% of the state's Title I schools (i.e., there are too few Title I schools in that group), the cutoff is set within the Top-to-Bottom list to a level that includes 5% of the total Title I schools.
- Schools that received a School Improvement Grant (SIG) in 2010 or 2011 to implement a turnaround model were included in the priority category. Schools were eligible for this grant based on student achievement data from 2007-2009. Recipient schools were identified as Persistently Low-Achieving (PLA; MDE, 2010).
- Schools that were identified as a PLA school in 2010 or 2011 were in the priority category. Identification was based on student proficiency levels and academic improvement rates in mathematics and reading; whether a school was in corrective action, restructuring, or improvement; and if a secondary school had a graduation rate below 60%. All previous PLA schools were classified as priority schools while they developed or implemented a reform plan per their original placement on the PLA list. Schools remained in this category for four years.

**Schools with no designations**

- Schools that do not meet the criteria for reward, priority, or focus. These schools form the majority of schools in Michigan.

Michigan's accountability system is heavily based on testing data and outcomes. While differences in academic achievement among schools classified as reward, focus or priority are important, factors such as student characteristics and resource levels need to be explored to more accurately predict designation labels. Student, teacher, school, and district factors were considered for this study.

**Student demographics**

*Percentage of students who receive free or reduced lunch status by school (economically disadvantaged)* - As supported by extensive research, socioeconomic status is one of the strongest predictors of student outcomes (Berliner, 2009; Lubienski & Crane, 2010).

*Percentage of students with special needs*- Students with special needs require teachers with a higher level of expertise (Feng & Sass, 2010). Due to the need for alternative testing that coincides with a student's Individualized Education Program (IEP), schools that serve large populations of students with special needs are often penalized by their standardized assessment scores (Darling-Hammond, 2007).

*Racial/ethnic composition of the student population* – Minority students are routinely taught by the least experienced and least-prepared teachers in schools where curriculum resources are inequitable (Darling-Hammond & Post, 2000). Furthermore, the probability that a school would be designated as failing increases in proportion to the number of demographic groups served by the school (Novak & Fuller, 2003).

*Percentage of students who are English Language Learners* – "NCLB defines a Limited English Proficient student as one 'whose difficulties in speaking, reading, writing, or understanding the English language may be sufficient to deny the individual the ability

to meet the State's proficiency level of achievement on State assessments" (Darling-Hammond, 2007, p.249). Hence, schools that have a large percentage of students who meet these criteria may have more difficulty passing state assessments.

The federal government refers to this student population as Limited English Proficiency students, while the state of Michigan uses the terms English Language Learner. For the purpose of this study, these terms will be used interchangeably.

*Attendance* – Students with better attendance records have higher student achievement (Balfanz & Byrnes, 2013).

**Teacher demographics**

*Pupil-teacher ratio* – Studies have shown that smaller class-size produces positive effects on students at the elementary level (Whitehurst & Chingos, 2011).

*Average teacher salary* –According to Hanushek (2010), increased teacher salaries affect student achievement positively only when such salaries are used to attract and retain more effective teachers.

*Years of teaching experience* – According to Rice (2010), students perform better with teachers who have experience in comparison to teachers in their first years of teaching. However, the effects of teaching experience are marginal after the first years of teaching.

*Percentage of teachers with graduate degrees* – the research has shown mixed results in regards to whether teachers with graduate degrees have a positive effect on student achievement at the elementary level (Rice, 2003).

**Other school and district level data**

*Total enrollment* – Research has shown a negative effect of large school size on student academic achievement (Fowler Jr. & Wahlberg, 1991).

Research on how funding affects student achievement has yielded mixed results (Lips, Watkins, & Fleming, 2008). After studying the effects of per-pupil expenditures on academic outcomes, Hanushek concluded that there is no relationship or that the relationship is weak or inconsistent. However, Hedges and Greenwald studied the same data set and concluded that increasing per-pupil expenditures has a significant positive influence on student achievement (Lips, Watkins, & Fleming, 2008).

When examining funding for schools and districts, this paper considered finances in the following ways:

*Foundation allowance* – This is the key figure used in the state's financing of local school districts and is intended to represent a district's per-pupil revenue for general operating purposes (Olsen & LaFaive, 2007).

*Revenue per pupil* (including Title I funds, etc.) – This figure includes revenue from federal, state, local, and intergovernmental revenue sources (US Census Bureau, 2013).

*Instructional expenditures per pupil* – Expenditures include instructional costs for regular, special, and vocational programs offered in both the regular school year and summer school. However, it does not include instructional support, student support or other support activities (US Census Bureau, 2013).

*General fund balance* – Referred to as fund equity, it typically consists of three components: cash on hand – funds available for district use; accounts receivable – state aid payments; and inventory or prepaid assets – includes teaching, custodial expenses,

office supplies, and fuel in storage tanks. Several other factors may affect the general fund including: level of non-homestead tax base in the district, trend of fund balance level, and declining enrollment (Michigan School Business Officials [MSBO], n.d.).

*Mobility rate or change in school enrollment within a school year* – the change in student enrollment can result in a myriad of problems for schools. Since funding is based on number of pupils within a school, declining enrollment creates a loss of funding and is an indicator of fiscal stress (MSBO, n.d.). Higher mobility rates are associated with challenges in instructional delivery, classroom management, and the school environment, resulting in lower student achievement. These educational outcomes affect transient students and their stable classroom peers (Hartman & Leff, 2002).

**Purpose of the Study**

The purpose of this study is to examine student, teacher, school and district factors that contribute to elementary schools being classified as reward, focus, or priority schools in Metro Detroit.

**Research Questions**

This dissertation addresses the following research questions:

1. What factors predict student achievement in elementary schools? Specifically, what factors can be used to predict the percent of students scoring at proficient or advanced levels on the reading and mathematics MEAP tests?
2. What factors predict whether an elementary school would be classified as a reward, focus, or priority school? Specifically, what commonalities and/or patterns are present in elementary schools with the above designations in the tri-county area of Oakland, Macomb, and Wayne counties?

## Significance of the Study

The federal government has created a political and educational environment that penalizes schools that are unable to educate all students effectively (New America Foundation, 2014). This same system rewards schools that are seemingly able to create an environment of high academic achievement. This study examines student, teacher, school and district determinants and their impact on student achievement, school designation, and school ranking. Furthermore, the study considers if the accountability system should be restructured so that it is adequately comparing and assessing student achievement.

## Limitations

The following limitations may affect the ability to generalize the findings:

- The study is limited to three proximate counties, Macomb, Oakland, and Wayne, in Michigan. The findings may not be generalizable to schools in other counties in Michigan or to other states.
- The study is limited to elementary schools with K through 5$^{th}$ grade configurations. The findings may not be generalizable to middle or high schools as the accountability standards are different at the secondary level.
- The study is limited to public K-5 elementary schools in Macomb, Oakland, and Wayne counties. This configuration included a small sample (5.4%) of charter schools, and thus, may not adequately measure the impact of student, teacher, school, and district characteristics on charter schools.

- The study is limited to a cross-sectional analysis of one year of data. This raises issues of reliability. An analysis of a panel of three or more years of data could yield more reliable findings.
- Pupil-teacher ratios are an imprecise indicator of class size. Pupil-teacher ratios do not account for frequently intense teaching resources targeted toward Title I, special education, or bilingual services in schools (Hanushek, 1998). The better indicator of class size is the average number of students in a regular classroom (Mayer, Moore, Mullens, & Ralph, 2001).
- Average teacher salary, percentage of teachers with graduate degrees, and percentage of teachers with fewer than 5 years of experience are reported to the state at the district level. However, within a district, these characteristics can vary widely across schools, depending on the demographic make-up of each particular building. Due to this limitation, this study may not be able to fully gauge the effect of each of these characteristics on the academic proficiency, school classification, or school ranking.

**Definition of Key Terms**

*Michigan Educational Assessment Program (MEAP)* - The MEAP is the assessment used for the current public scorecards in the state of Michigan completed by general education students in third through ninth grades. This assessment is given in five subject areas: reading, writing, mathematics, science, and social studies. The MEAP performance levels are (1) Advanced, (2) Proficient, (3) Partially Proficient, and (4) Not Proficient. Results are used in Michigan's accountability system (MDE, 2013a).

*No Child Left Behind Act (NCLB)* – Passed in 2002, it revised the Elementary and Secondary Education Act (New America Foundation, 2014). This act forced states to establish systems that held schools and school districts accountable through high-stakes testing (Dee & Jacob, 2011). The purpose of this bipartisan effort was to make schools responsible for ensuring that 100% of all students were proficient by the year 2014.

*Race to the Top* – In 2009, President Obama and the U.S. Secretary of Education, Arne Duncan, announced the Race to the Top (RTT) competitive grants to support education reform and innovation in classrooms (USDOE, 2009).

*Title I* – "Title I, Part A (Title I) of the Elementary and Secondary Education Act, as amended (ESEA) provides financial assistance to local educational agencies (LEAs) and schools with high numbers or high percentages of children from low-income families to help ensure that all children meet challenging state academic standards. Federal funds are currently allocated through four statutory formulas that are based primarily on census poverty estimates and the cost of education in each state. (USDOE, 2014, para. 1)."

Top-to-Bottom Ranking (TTB) – TTB is part of Michigan's current accountability system. Schools are ranked by percentile calculated using student assessment data in achievement, improvement in achievement over time, and measurement of the largest achievement gap between any two subgroups within a school (MDE, 2013b).

**Summary**

The educational system has evolved into an environment created to prepare all students adequately to be productive citizens. Raising the quality of schools is believed necessary to secure a place in the global economy. Hence, legislators have looked for ways to increase student achievement and school quality. Through NCLB and the ESEA

flexibility waivers, states have created accountability systems that measure schools through high-stakes test scores. These accountability systems are believed to have a positive impact on raising student achievement. Although, according to Kober, Chudowsky, and Chudowsky (2008), research cannot determine the extent to which increases in student achievement have occurred because of NCLB.

In Michigan, the accountability system includes ranking schools through the TTB ranking and providing schools with a color designation. Some schools also receive a label of reward, focus, or priority. With the respective designations, schools are hailed or sanctioned based on status.

This research examines student, teacher, school, and district characteristics that contribute to an elementary school being classified as reward, priority, or focus schools in the Metro Detroit area. The significance of this study is to ensure that the accountability system is not designating schools based on factors beyond the school's control.

# CHAPTER 2: LITERATURE REVIEW

## Introduction

In this era of accountability, states are mandated to create systems to measure student achievement in schools and school districts. The No Child Left Behind (NCLB) Act forced states to establish systems that hold schools and school districts accountable through high-stakes testing (Dee & Jacob, 2011). In the state of Michigan, the current accountability system focuses on ranking schools from top-to-bottom (TTB) primarily based on Michigan Education Assessment Program (MEAP) outcomes (Michigan Department of Education [MDE], 2013b).

According to MDE (2013b), the TTB ranking evaluates schools based on the achievement of students in all core subject areas: reading, mathematics, science, and social studies using the MEAP test outcomes. Schools are accountable for three areas of their performance: overall achievement, improvement, and achievement gap. Using the data, factors other than performance and the TTB ranking, the state of Michigan assigns schools with a color from green to purple, and may designate them as reward, focus, or priority schools. Most schools in Michigan do not have a respective designated label, however, the schools that have labels are either rewarded or sanctioned, based on their designations (MDE, 2013b).

This chapter presents a comprehensive review of literature on factors associated with student achievement as it relates to school accountability. The purpose of this study is to examine student, teacher, school, and district determinants that contribute to elementary schools being classified as reward, focus, or priority schools. Factors that predict student achievement in elementary schools, along with factors that can predict an

elementary school's classification as a reward, focus, or priority school are investigated. Specifically explored are the commonalities and/or patterns that are present when evaluating elementary schools with the above designations in the tri-county area of Macomb, Oakland, and Wayne counties.

The review of the literature examines the recent history of educational reforms, including the move to an era of accountability, the need for high-stakes testing, and the influence of the accountability movement on the state of Michigan's current school systems. Since student achievement is primarily measured by the results of high-stakes testing in the current structure, the literature will consider how student, teacher, school, and district factors affect student achievement. The purpose is to determine if schools with specific demographics may be more susceptible to poor or excellent outcomes.

The topics that are included in this discussion are: educational reform, standards-based reform and the accountability movement, No Child Left Behind, Race To The Top, Elementary and Secondary Education Act flexibility waiver, history of Michigan's accountability system, Michigan's current accountability system, student demographics, teacher demographics, other school -level and district-level data and inferences for forthcoming study.

**Educational Reform**

A reform of any nature usually is predicated by a concern or need. Various reasons have been presented on why the American education system needs to be reformed. While educational reforms have been implemented since the mid-1800s (Tyack & Cuban, 1995), for the purposes of this research, reform efforts since the mid-20$^{th}$ century are detailed.

The 1957 Soviet launch of Sputnik motivated the first example of comprehensive federal education legislation (United States Department of Education [USDOE], 2012a). In the midst of the Cold War with the Soviet Union, Americans were afraid that their students lacked the mathematical and scientific skills necessary to help the country compete technologically. As a result, Congress passed the National Defense Education Act (NDEA) in 1958. NDEA provided substantial funding for the support of mathematics, science, and foreign language instruction for students in the K-12, vocational, and college arenas (USDOE, 2012b).

While in the midst of the Cold War and with a focus on ensuring that United States' students would be more technologically advanced, the country became engaged in civil unrest. The Civil Rights movement that began in 1955 became a catalyst for change in the USDOE (USDOE, 2012b). In the 1960s, the USDOE's equal access mission emerged, leading to the creation of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, and Section 504 of the Rehabilitation Act of 1973 that prohibited discrimination based on race, sex, and disability (USDOE, 2012b).

One of the most significant roles that the federal government has played in education occurred in 1965, during the Civil Rights Era, when President Lyndon Johnson signed the Elementary and Secondary Education Act (ESEA) to create equal educational opportunities for all people, with an emphasis on students living in poverty (New America Foundation, 2014). ESEA provided federal funds to schools and school districts serving students with low socioeconomic statuses (New America Foundation, 2014). According to the Federal Education Project, ESEA was the largest source of federal spending on elementary and secondary education. Programs created under ESEA changed how

schools and districts addressed the needs of all economically disadvantaged students when compared to their more advantaged peers (New America Foundation, 2014; Skinner & Lomax, 2010).

During this same time period, in response to the Civil Rights Act of 1964, a survey was conducted to ascertain the available educational opportunities, or the lack thereof, for students based on race, religion, country of origin, and/or color at all levels of the United States (Coleman, 1966). This document, called “The Coleman Study,” was the first time that a comprehensive collection of data was made available for the entire nation, based on certain specifications. This report found that most students attended segregated schools, 80% of Whites and 65% of Blacks attended schools with student populations that were predominately 90 to 100% of their respective race. Findings indicated that the influence of school resources was modest in comparison to family and educational background, as it related to student achievement (Coleman, 1966).

As the Civil Rights Era came to an end, the federal government continued the mission towards equity and passed laws that protected students with disabilities, such as the Individual with Disabilities Education Act, and the 504 Rehabilitation Act. Also during the 1970s, Title IX was passed prohibiting education discrimination against a student based on their sex (Skinner & Lomax, 2010).

In 1983, the country’s senses were heightened again, when the National Commission on Excellence in Education (NCEE) formed by the US Secretary of Education, Terrel Bell, released the report, *A Nation at Risk* (“A Nation at Risk,” 2004). This report stated that America would not be able to compete in a global economy without educational reform (Tyack & Cuban, 1995). *A Nation at Risk* (1983) stated, "the

educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a Nation and a people" (p. 5). Several statistics were used to substantiate this statement. These statistics were based on testimony given to the NCEE (Gardner, 1983).

The five major recommendations of the NCEE were related to content, time, leadership and fiscal support, standards and expectations, and teaching (Gardner, 1983). In addition to adopting rigorous and measurable standards, K-12 schools were encouraged to increase content expectations in mathematics, English, science, social studies, computer science, and foreign language. According to the report, more time on homework and extended school days and school year should be explored. The report also indicated attendance policies with sanctions and incentives along with standardized achievement tests should be implemented. Moreover, colleges and universities should develop more demanding admission policies to strengthen the high school graduation requirements (Addonizio & Kearney, 2012; Haertel & Herman, 2005; Gardner, 1983).

States began to respond to the NCEE recommendations through gubernatorial actions, as well as congressional actions. Michigan's response was "Better Education for Michigan Citizens: A Blueprint for Action," which included recommendations on systemic education reform for local and intermediate school districts (Addonizio & Kearney, 2012; Meeting the Accountability Challenge, 2002). The public concern with the perceived erosion of the American educational system gave momentum to key initiatives that were pertinent to the standards and accountability movement (Hamilton, Stecher, & Yuan, 2012).

**Standards-based Reform and the Accountability Movement**

Policy makers at the federal and state levels responded to the public debate of how to improve schools in various ways. Some states created accountability systems through minimum-competency examinations (Hamilton, Stecher, & Yuan, 2012). In 1989, President George H. Bush convened a national educational summit that showcased the best educational practices in numerous states. This meeting was the first educational summit since the Great Depression. The results of this summit included the agreement to develop a set of National Education Goals that were ambitious and realistic performance goals (Addonizio & Kearney, 2012; New York State Department of Education, 2014).

The federal government responded by passing Goals 2000: Educate America Act, which established a framework for local educational agencies to implement federal programs (Earley, 1994). Goals 2000, passed in 1994, was a major change agent in shifting states to standards-based reform. Funded by this act, almost all states embarked on creating standards if they had not already completed this task (Armour-Garb, 2007).

To complement Goals 2000, the Improving America Schools Act (IASA) was passed in October of 1994 (Superfine, 2008). This expanded ESEA in the most substantial way since its implementation in 1965 (Wong & Meyer, 1998). Among the changes rendered by the IASA, states would have to develop standards and assessments to receive Title I funds. States also would have to determine if schools met adequate yearly progress (AYP) for all students, with attention to those students who were economically disadvantaged. Schools would be identified if they failed to meet AYP for improvement, and would be subjected to corrective action, if needed (Superfine, 2008).

In the context of standards-based reform, accountability is part of a broader integrated policy package that provides incentives and consequences for students, teachers, schools, or districts to perform (Hamilton et al., 2012; Figlio & Loeb, 2011). The rationale for accountability in the school system is that stakeholders – parents, students, the community, policy makers – should be able to monitor activities of the schools. If stakeholders are able to monitor the schools effectively, the schools would be more likely to work in the best interests of the stakeholders, thus improving student outcomes (Figlio & Loeb, 2011).

While a single definition does not exist for standards-based accountability, according to Hamilton et al. (2012), most discussions include the following components: (a) academic expectations – students learn uniform, challenging content standards, (b) alignment of key elements of the education system – instructional delivery system to promote attainment of the standards, (c) assessments of student achievement – assessments tied to standards, (d) support and technical assistance – training and consultation for identified deficiencies, and (e) accountability – incentives and sanctions for schools based on student performance.

Over the last few decades, accountability has become the focus of both Democratic and Republican federal administrations' education policies (Figlio & Loeb, 2011). Assessing schools using standardized student test scores provides members of the general public with information regarding how well schools and school districts are doing in comparison to other schools and school districts or to outside performance standards (Figlio & Loeb, 2011). Much of the recent activity in the accountability

movement can be directly attributed to the restructuring of the Elementary and Secondary Education Act ([ESEA] Skinner & Lomax, 2010).

**No Child Left Behind Act (NCLB)**

Originally passed in 2001, NCLB revised ESEA and dramatically broadened the scope of the federal government in K-12 education (Dee & Jacob, 2011; New America Foundation, 2014). Under NCLB, states were required to establish accountability systems that hold all public schools and school districts accountable through high-stakes testing (Dee & Jacob, 2011). The purpose of this bipartisan effort was to make schools responsible for ensuring that 100% of all students would be proficient by the year 2014.

The act required all states to test students in grades 3 through 8 in reading and mathematics, and once in grades 10 through 12 (New America Foundation, 2014). Students are tested once in science in grades 3 through 5, 6 through 8, and 10 through 12 (New America Foundation, 2014). States were mandated to create accountability systems for schools that included overall student achievement, as well as strategies to ensure the achievement of students in certain subgroups (e.g., economically disadvantaged, racial/ethnic groups, gender, special education; Darling-Hammond, 2007; National Center on Educational Outcomes, 2003). Schools that failed to have a sufficient number of students score at a proficient level each year or failed to improve over the prior year would not achieve adequate yearly progress (AYP; New America Foundation, 2014). Under NCLB, states could sanction schools that did not meet AYP after two years, resulting in options that were punitive financially for these schools (New America Foundation, 2014). Options for “failing” schools include restructuring and offering students public school choice and/or supplemental services (Darling-Hammond, 2007; New

America Foundation, 2014). In addition to raising student achievement, NCLB mandated that all teachers had to be highly qualified and schools had to provide educational choice (Darling-Hammond, 2007).

When NCLB was introduced, it was hailed by Civil Rights advocates because it addressed populations of students who were considered disenfranchised in American public schools (Darling-Hammond, 2007). Since its implementation, NCLB has received a plethora of criticisms from school officials and policy makers. More than 20 states, dozens of school districts, and a national teachers' association have officially protested NCLB (Darling-Hammond, 2007). Examples of protesting included the State of Utah giving priority to state accountability systems over federal legislation when conflict arises, and a lawsuit from the state of Connecticut alleging unfunded mandates (Dobner, 2005; Mackinac Center of Public Policy, 2005).

One criticism of NCLB is that the federal government added a financial burden on states and schools. Previously, under IASA, states were required to assess students once in grades 3 through 5 and once in grades 6 through 9 (Superfine, 2008). NCLB did not fund the increased requirement to assess students each year in grades 3 through 8. Additionally, schools that were considered "failing" would have to fund supplemental education services, such as tutoring, or after-school programs for students who still attended their schools (Darling-Hammond, 2007). Concurrently, schools were penalized financially if their students did not make adequate yearly progress. If a school did not make adequate yearly progress within a two year period, the respective school would have to give the students the option to transfer to a different school (Darling-Hammond, 2007). Thus, the state aid for those students would follow them to the new school.

Critics found the expectation that all students will reach 100% proficiency equally problematic. Holding schools and school districts accountable for high-stakes testing in which all students must be proficient is invalid without addressing the inequities in educational opportunities among schools. In the United States, the wealthiest schools can spend 10 times more per pupil than the poorest schools (Darling-Hammond, 2007). Despite this difference, all schools are expected to meet the same 100% proficiency target. As well, it is difficult for certain subgroups to reach 100% proficiency. According to section 9101(25) of NCLB, a limited English proficient (LEP) student is defined as an individual:

> Whose difficulties in speaking, reading, writing or understanding the English language may be sufficient to deny the individual
>
> (i) the ability to meet the state's proficient level of achievement on state assessments describe in section 1111(b)(3)
>
> (ii) the ability to successfully achieve in classrooms where the language of instruction is English, or
>
> (iii) the opportunity to fully participate in society (NCLB Act of 2001, 2002).

By the Act's own definition of LEP, students may not be able to meet proficiency on state assessments. Once students gain proficiency in English, they are transferred out of this subgroup, making it impossible for this subgroup to reach 100% proficiency (Darling-Hammond, 2007).

An unintended consequence of NCLB is the "diversity penalty." Since schools are required to meet targets for every subgroup on every test, schools that are more diverse could have more than 30 different targets (Darling-Hammond, 2007). Failure to meet one target means that a school potentially would not meet adequate yearly progress.

Another unintended consequence is the narrowing of curriculum to teach to the test. The Center for Education Policy surveyed 349 representative school districts and found that 62% of these districts had increased the amount of time devoted to English and mathematics since the enactment of NCLB (Rothstein, Jacobsen, & Wilder, 2008). These increases were greatest in urban districts or in districts that were being sanctioned due to low student performance. While this change may seem like a positive influence on schools, these same districts decreased the amount of time spent on social studies, science, and recess (Rothstein et al., 2008), resulting in an unbalanced curriculum system in many districts.

When determining if the enactment of NCLB has had a positive effect on student achievement, Dee and Jacob (2011), studied the impact of NCLB using a comparison of the test-score changes across states that had school accountability policies similar to NCLB in place prior to implementation to states that did not. Using a comparative interrupted time series design, Dee and Jacob found mixed results. By 2007, NCLB appeared to generate statistically significant increases in the mathematics achievement of fourth graders with the effect size of .23. These gains were concentrated among groups of students who were White, Hispanic, and/or economically disadvantaged (Dee & Jacob, 2011). Moderate and targeted improvements were found for eighth graders in the area of mathematics. However, no consistent or reliable evidence was obtained that indicated NCLB improved achievement for fourth grade students in the area of reading (Dee & Jacob, 2011).

The Center of Education Policy studied state score trends from 2002 through 2007 and drew five main conclusions:

1. Reading and mathematics achievement on state tests have increased in most states. These gains were larger at the elementary and middle school grades than at the high school level.
2. Trends on the NAEP reading and mathematics assessments were in the same positive direction as state assessments, although the gains of the NAEP were smaller than those on state tests. The exception was 8th grade reading, where fewer states showed gains on the NAEP than on state tests.
3. The achievement gap, in states with sufficient data, has narrowed more often than it has widened since 2002. This is true particularly for African-American students and those students who are considered economically disadvantaged.
4. Gaps on the NAEP followed the same trends of narrowing more often than widening with the exception of 8th grade mathematics. Student achievement widened more often than it narrowed for most subgroups. Overall, the NAEP show a less positive picture of narrowing the achievement gap than state assessments.
5. Since many interconnected policies and programs are focused on raising student achievement, the Center of Education Policy could not determine the extent to which increases in student achievement have occurred because of NCLB (Kober, Chudowsky & Chudowsky., 2008).

Fuller, Wright, Gesicki, and Kang (2007) studied the relationship between the NAEP and NLCB. Fuller et al. surmised the NAEP mean scale scores in reading increased each year from 1971 through 2004, but flattened out in the three years following implementation of NCLB. Also, Fuller et al. (2007) found that in 2004, NAEP mathematics

scores were two grade levels higher than their counterparts in 1973. However, growth in mathematics was slower post-2003 than it was prior to the implementation of NCLB.

Despite the Kober et al. (2008) conclusion that gains could not be attributed to NCLB at the state level, a press release from the USDOE in 2006 pointed to improved NAEP scores as evidence that NCLB was working (Dee & Jacob, 2011).

In relation to the achievement gap, Fuller et al. (2007) found similar patterns in the NAEP. In reading, racial/ethnic gaps decreased from 1970 to 1992, widened from 1992 to 1994, and then narrowly decreased until 2002. No further narrowing has occurred in the area of reading since 2002. In regards to mathematic achievement, the achievement gap between African-Americans and Caucasians narrowed by half a grade level between 1992 and 2003, but no further decrease has occurred since 2005. However, the achievement gap between Latinos and Caucasians has continued to close post-NCLB (Fuller et al., 2007). With the host of mixed results, changes in student achievement cannot be linked conclusively to NCLB reforms.

**Race to the Top (RTT)**

In 2009, President Obama and the U.S. Secretary of Education, Arne Duncan, announced the Race to the Top (RTT) competitive grants to support education reform and innovation in classrooms (USDOE, 2009). RTT was authorized under the American Recovery and Reinvestment Act of 2009 (AARA). The first round of grants totaled $4.35 billion with a promise of a total of $10 billion in reforms (USDOE, 2009). RTT asked states to create reforms based on four specific areas:

1) Adopt standards and assessments that prepare students to succeed in college and the workplace and to compete in the global economy;

2) Build data systems that measure student growth and success, and inform teachers and principals about how they can improve instruction;

3) Recruit, develop, reward, and retain effective teachers and principals, especially where they are needed the most;

4) Turn around lowest-achieving schools (USDOE, 2009, para. 7).

Many states adopted the Common Core State Standards in an effort to fulfill the RTT requirement of adopting standards that allow students to be college and career ready. Competition for the RTT grant triggered major education reform legislation in Michigan, in hopes of being considered for the additional monies from the federal government (Michigan Association of School Boards [MASB], n.d.). Some key components of Michigan education reform included: reform for failing schools, Michigan merit curriculum modifications, changes in the drop out age, Schools of Excellence charters, cyber schools, teacher and administrator evaluations, merit pay, and requirement for algebra II (MASB, n.d.). However, Michigan was not awarded the Race to the Top Funds under phase 1, 2, or 3 (USDOE, 2013b). Michigan has been awarded the 2013 RTT-Early Learning Challenge that gives Michigan $51 million to develop high quality early learning and developmental programs throughout the state (USDOE, 2013b).

**Elementary and Secondary Education Act Flexibility Waiver**

Although scheduled for reauthorization in 2007, NCLB is still being debated between politicians and educators on how or if it should be restructured (Michelman, 2012). As most schools have not reached the 100% proficiency mark, the United States Department of Education (USDOE) has implemented changes to NCLB. According to a White House press release (2011):

> States can request flexibility from specific NCLB mandates that are stifling reform, but only if they are transitioning students, teachers, and schools to

> a system aligned with college- and career-ready standards for all students, developing differentiated accountability systems, and undertaking reforms to support effective classroom instruction and school leadership (para 2).

Under the flexibility waiver, states were not required to reach 100% proficiency at the end of the 2013-14 school year, rather states were allowed to set annual measurable objectives (AMOs) in reading/language arts and mathematics that are ambitious, but achievable (USDOE, 2012a). The USDOE (2012a) has outlined several general provisions of the ESEA flexibility waivers, including:

1. Flexibility Regarding the 2013–2014 Timeline for Determining Adequate Yearly Progress (AYP).
2. Flexibility in Implementation of School Improvement Requirements.
3. Flexibility in Implementation of LEA Improvement Requirements.
4. Flexibility for Rural LEAs.
5. Flexibility for School-wide Programs.
6. Flexibility to Support School Improvement.
7. Flexibility for Reward Schools.
8. Flexibility Regarding Highly Qualified Teacher (HQT) Improvement Plans.
9. Flexibility to Transfer Certain Funds.
10. Flexibility to Use School Improvement Grant (SIG) Funds to Support Priority Schools (pp. 1-2)

Additionally, three optional waivers are available for a state that may wish to request flexibility. For the purpose of this study, the optional waiver for which Michigan was approved is:

11. *Flexibility Regarding Making AYP Determinations*: A State Educational Agency (SEA) and its Local Educational Agency (LEAs) would no longer be required to comply with the requirements to make AYP determinations for LEAs and schools, respectively. Instead, an SEA and its LEAs must report on their report cards performance against the

> AMOs for all subgroups identified in ESEA, and use performance against the AMOs to support continuous improvement in Title I schools ([pg. 6] USDOE, 2013a).

As of December 2013, 42 states, the District of Columbia, and Puerto Rico have received ESEA flexibility waivers and are not subjected to sanctions under NCLB (USDOE, 2013a).

**History of Michigan's Accountability System**

Mirroring the 1960s rhetoric from federal legislators on the need to improve schools, Michigan lawmakers have spent several decades creating and restructuring systems aimed at improving student outcomes. The Michigan Education Assessment Program (MEAP) was initiated in 1969 by the State Board of Education (Michigan Department of Education [MDE], 2007). Initially, the state assessment was norm-referenced and developed by a commercial tester (MDE, 2007). Also in 1969, the State Board of Education passed Common Goals of Michigan Education (Keller, 1977). The Common Goals of Michigan Education were the goals in which the assessment would theoretically be based (Keller, 1977). These initiatives were the pillars of Michigan's Six Step Accountability Model. Adopted by the state of Michigan's Board of Education, this accountability model consisted of:

1. establishing the goals,
2. setting performance objectives based on the goals,
3. developing assessments based on performance objectives,
4. creating a delivery system that ensures educational services that encourages children to achieve,
5. evaluating the delivery system's effectiveness,

6. making recommendations for changes based on the previous five steps (Addonizio & Kearney, 2012; Keller, 1977, pg. 171).

While the first three steps were implemented, the remaining three were never fully executed under this initiative (Addonizio & Kearney, 2012).

By 1979, a new set of goals were adopted that reorganized the framework of the Common Goals of Education (Meeting the Accountability Challenge, 2002). The new framework was organized by student learning and systems responsibilities. Local school boards were encouraged to use this framework for goal setting and policy development (Meeting the Accountability Challenge, 2002).

Michigan's State Board of Education gave new recommendations just four years later in a response to the USDOE's "Nation at Risk" report. Adopted in 1984, "Better Education for Michigan Citizens: A Blueprint for Action" included recommendations on systemic education reform for local and intermediate school districts, the governor and legislators, and institutions of higher learners (Addonizio & Kearney, 2012; Meeting the Accountability Challenge, 2002). This report called for new state school accreditation and thus, the Michigan Accreditation Program (MAP I) became operational in 1988 (Addonizio & Kearney, 2012).

In 1990, Public Act (PA) 25 was developed to hold schools accountable for engaging in ongoing school improvement and opportunities for parent and community involvement (Meeting the Accountability Challenge, 2002). The key elements of PA 25 included:

- *School Improvement* – schools are required to develop school improvement plans, create school improvement teams that include parents and teachers, and to measure progress toward achievement of plan objectives (Meeting the Accountability Challenge, 2002, pg.5).

- *Core Curriculum* – the state established a model core curriculum and proposed learning outcomes for all students. Local school districts were encouraged to align their curricula with the state's core curriculum, and to notify district residents if the curriculum was not aligned (Meeting the Accountability Challenge, 2002, pg.5).

- *Accreditation* – schools were regularly evaluated on the basis of their curricula, staffing, and facilities, and on their compliance with the requirements of the school improvement process. This accreditation component would be known as MAP II (Addonizio & Kearney, 2012; Meeting the Accountability Challenge, 2002, pg. 5).

- *Annual Education Report* – all schools were required to publish an annual report providing information to parents and community members on student achievement, parent participation, accreditation status, and other factors related to the implementation of the school improvement plan. They were also required to hold a public meeting to review the report (Meeting the Accountability Challenge, 2002, pg. 5).

PA 25's deficiency was the inability for schools to self-assess the efficacy of their school improvement process. To correct this deficiency, the law was amended in 1995 to include student performance on the MEAP as an indicator of school accreditation (Addonizio & Kearney, 1995; Meeting the Accountability Challenge, 2002). The state's challenge was to restructure the current accreditation program in a way that would accommodate the MEAP data. This restructuring would be the creation of MAP III (Addonizio & Kearney, 2012).

By this time in history, one of the most impactful legislations was passed as a bipartisan effort. Under NCLB, every state was required to create or tweak their accountability system to fit the federal requirements. In an effort to align federal and state requirements, the Michigan State Board of Education approved Education Yes! —A Yardstick for Excellent Schools in 2002 *(*Flanagan, 2011). Three separate measures for academic performance were developed: achievement status, achievement change, and

achievement growth (Addonizio & Kearney, 2012). Furthermore, Education Yes! set standards for continuous improvement, and measured the need for support and intervention for schools (Flanagan, 2011).

However, consequences of the Michigan accreditation and NCLB were not aligned. Schools that failed to miss the mark for two of the requirements were not distinguished from schools that failed to miss the mark by 40 points. Thus, Education Yes! was redesigned into the Michigan School Accreditation System (MI-SAS) and was approved by the State Board of Education in 2009 (Flanagan, 2011). With MI-SAS, changes included using a data dashboard style report instead of a single letter grade, calculating proficiency for students who had attended a full academic year, and using MEAP, MEAP-Access, MI-Access or MME to determine proficiency (Flanagan, 2011).

Just one year later, MI-SAS was revised to align with new federal accountability measures and renamed the Michigan School Accreditation and Accountability System ([MI-SAAS] Flanagan, 2011). MI-SAAS was aligned with the Michigan Department of Education focus on accountability to be college-and career-ready (Flanagan, 2011).

**Michigan's Current Accountability System**

According to Flanagan (2011), Michigan's current accountability system, MI-SAAS, has three major components.

1) *Factors other than performance on state tests* – the current accountability system takes into account the number of teachers with Michigan certification, curricula and assessments offered, number of students tested, and published materials such as the Annual Report and the school's School Improvement Plan.

2) *Statewide Top to Bottom Ranking* – achievement, improvement in achievement over time, the largest achievement gap between any two subgroups. Schools are considered accredited if their ranking is at or above 20th percentile. Interim accreditation is for ranks greater or equal to 6th percentile but less than 20th percentile. Schools are unaccredited if their rank is less than the 6th percentile. Assessment data scores only use those of students at the school for a full academic year prior to the assessment.
3) *Appearance on the list of persistently lowest achieving schools (PLA)* – If a school appears on the PLA list, the school will be considered unaccredited.

By the nature of percentile rankings, there will always be schools in the bottom quintile. Therefore, a Sunset Clause was written in which MI-SAAS would be rewritten when 80% of students score proficient or higher in 80% of the Michigan schools, as long as the scores are tied to college-and career-readiness (Flanagan, 2011).

In addition to the three major components, the dashboard includes data collected by the state that include financial, enrollment, and demographic information. Districts and/or schools are able to submit additional information, such as points of pride and local outcomes (Flanagan, 2011).

**Michigan Education Assessment Program (MEAP).** At the heart of Michigan's accountability system is high-stakes testing. The current public scorecard is based on MEAP, MEAP-Access or MI-Access, or a combination of the three. Students take the aforementioned assessments based on their eligibility. More students take the MEAP than the MEAP-Access or the MI-Access, the latter two assessments are determined by an Individualized Education Plan or 504.

The Michigan Education Assessment Program (MEAP) was initiated in 1969 by the State Board of Education (MDE, 2007). Initially, the state assessment was norm-referenced and developed by the commercial tester, Educational Testing Service (Addonizio & Kearney, 2012; MDE, 2007). The original achievement test included four basic skill areas: reading comprehension, vocabulary, English expression, and mathematics (Addonizio & Kearney, 2012). By the 1973-74 school year, the MEAP no longer used a norm-reference approach and moved to a criterion-referenced assessment (Addonizio & Kearney, 2012).

Over past decades, the MEAP has been transformed in a variety of ways. In the 2013-14 school year, the achievement test included assessing all students in grades 3 through 8 in the area of reading and mathematics, students in grades 4 and 7 were assessed in the area of writing, students in grades 5 and 8 in the area of science, and students in grades 6 and 9 were assessed in the area of social studies (MDE, 2013a).

Students received one of four performance levels on any area of the MEAP. The levels are as follows:

Level 1 Advanced

Level 2 Proficient

Level 3 Partially-Proficient

Level 4 Not Proficient

Students were considered proficient if their performance levels were at Level 1 or 2 (MDE, 2013a).

Most students take the MEAP assessment, however, alternate assessments are available for students with disabilities in grades 3 through 8 who have a valid

Individualized Education Program (IEP), and struggle to meet grade-level proficiency in the same time frame as their peers. Students can take the MEAP-Access which is based on Modified Achievement Standards and can give these assessments to as many students who are appropriately identified (MDE, 2013a)**.** However, only 2% of proficient scores on the MEAP-Access can be counted towards the overall proficiency rate. The exception is if the school district has not used all of the entire 1% proficiency scores under MI-Access. Schools can give more than 2% of their students, the MEAP-Access, however, they will count as non-proficiency scores if the district is over their proficiency limit (MDE, 2013a). However, exceeding the 2% proficiency rate is not advantageous, as the school and district will be penalized.

MI-Access is an alternative assessment given to students with special needs who have cognitive impairments and an individualized education program (IEP). Only 1% percent of proficient scores can be counted at the district level, unless the district applies for a waiver (MDE, 2013a).

In the spring of 2015, Michigan instituted the Michigan Student Test of Educational Progress (M-STEP). This assessment replaces the MEAP and will be used for future TTB rankings. Current TTB rankings are still based on the MEAP.

**Michigan School Accountability Scorecards.** Under the current accountability system, Michigan School Accountability Scorecards have replaced the Michigan School Report Cards that reported AYP. The Michigan School Accountability Scorecards are a diagnostic tool that uses student assessment data, graduation or attendance rates, and information on compliance with federal and state requirements (MDE, 2013a). This paper examines scorecard components for schools that had students for a full academic year.

**Scorecard components.** According to the MDE's (2013a), Michigan School Accountability Scorecards, the following are components of the Scorecard:

- *Participation* – all students are expected to participate in standardized testing. The participation target is 95% for all schools, districts, or subgroups that have at least 40 students. For schools that have at least 30 students, but less than 39 students, no more than two students can be excluded from taking the test. Schools that have less than 30 students assessed within an assessed grade-level, data will be collected from the three most recent years.

- *Attendance Rate* – The target for attendance rate is 90%.

- *Graduation Rate* – The target for graduation rate is 80%.

- *Educator Evaluations* – This section is worth 5% of the proficiency points. All teachers are expected to be evaluated on their effectiveness. Therefore, the target rate is for 100% of all teachers to have an evaluation ranking. Under this heading is the expectation that all enrolled students will be included in the Teacher Student Data Link (TSDL). The target rate is that 95% of all students will be linked in TSDL.

- *Compliance Factors* – This section is worth 5% of the proficiency points and is based on the completion of two documents: the School Improvement Plan and the School Indicator Report. These are self-reported by school personnel.

- *Proficiency* – Proficiency, for the purposes of the scorecard, is based on students who have attended the school for a full academic year (FAY). Those students who receive a performance level 1 or 2 on the MEAP, MEAP-Access, or MI-Access are considered proficient. Proficiency targets are differentiated by school or district. The goal is for all schools to reach 85% proficiency by the year 2021-2022. Based on the proficiency rate of the 2011-12 school year, the difference between the 2011-12 school year score and 85% is subtracted and the difference divided by 10. The quotient is the expected growth that a school is supposed to see incrementally each year (MDE, 2013a).

  *Provisional proficiency* is possible for students who are within two conditional standard errors of measurement of the proficiency cut score. This takes into account identifying false positives (schools identified as proficient when they really are not) or identifying false negatives (schools identified as not proficient when they really are).

  *Growth proficiency*-The state of Michigan is participating in a growth pilot under the USDOE. There are two ways that students can reach proficiency under this model, even if the student did not reach the proficiency cut score. If a student increases their performance level from the previous year's

assessment or if a student continues to receive “improvement” or “significant improvement” on an assessment, that student may be considered proficient, even if the student did not reach the proficiency cut score. This growth model is used only for reading and mathematics, since those assessments are given to each student, each year from 3rd through 8th grade.

*Multi-year averaging* – For schools, districts, and subgroups that will not meet the proficiency target in a single year, multi-averaging of scores can take place for up to three consecutive years. Each year’s score is weighted by the number of FAY students who were assessed, and the proficiency score is recalculated.

*Safe Harbor* – This type of proficiency allows schools that have met the proficiency target with single year or multi-year averaging to be considered Safe Harbor if they have had substantial improvement. To determine if a school has made a sufficient level of improvement, the distribution of improvement rate for schools in each grade level is considered over the previous four years. Schools that have a distribution of improvement rate data in the 80th percentile will be considered Safe Harbor. If four years of data does not exist, a three-year improvement slope is used. If there are only two years of data, the school, district, or subgroup must show a decrease in their non-proficient rate by 10%.

*Small Schools* – Schools that have less than 30 FAY students have proficiency targets based on the 2011-12 proficiency averages for all schools. The averages are calculated for each content area (MDE, 2013a).

**Color status.** The scorecards are based on a six color-scale: (a) green represents attainment of 85% of the possible points, (b) lime represents at least 75% of the possible points, but less than 85%, (c) yellow is for at least 60% of the possible points, but less than 75%, (d) orange represents at least 50% of the possible points, but less than 60%, (e) red represents less than 50%, and (f) purple represents schools that do not have students who attended a full-academic year (MDE, 2013a, pg.4). In addition to an overall color score, each component such as participation, educator evaluations, and compliance factors are scored on a two color green/red scale. A three-color green/yellow/red scale is used for proficiency, graduation, and attendance. Some components have measured

areas called cells. For example, participation rate is a component that will receive a color as a whole based on participation cells for any subject area for which the school assesses students (MDE, 2013a, pg.4).

Cells in a component that uses the two-color green/red scale are calculated for each traditional public and public charter school. Educator evaluations and compliance factors components are worth 5% of a school or district's possible proficiency points and are based on whether the target is met (green) or not met (red). The participation component does not receive any points, but is considered in the calculation (MDE, 2013a).

Each cell in a component that uses the three-color green/yellow/red scale is given the following point system: (a) a green cell indicates the target was met and is worth two points, (b) a yellow cell is worth one point and indicates a Safe Harbor or an improvement target was met instead of the actual target, and (c) a red cell is equal to zero points and indicates that neither the actual target, Safe Harbor, nor the improvement target was met (MDE, 2013a). The only exception is the proficiency rating for students who have scores in the bottom 30%. If this subgroup meets the Safe Harbor requirement, their cell is awarded a green color worth two points. This modification is based on the fact that this group does not have high achievers to reach proficiency traditionally.

**Subgroups.** Targets for participation, proficiency, graduation, and attendance must be met for the school or district as a whole and for any valid subgroup. There are 12 potential subgroups for a school and 13 potential subgroups for a district (see Table 1). The minimum size for a subgroup is almost always 30 students. The "All Students"

group will display even if the entire school or district has fewer than 30 students. The table below notes any exceptions to this rule (MDE, 2013a, p. 7).

Table 1

*Subgroups as Defined by the MDE*

| Group/Subgroup | Usage |
|---|---|
| All Students | Always used; schools and districts |
| Bottom 30% | Need at least 30 students in the All Students group; proficiency component only; schools and districts |
| American Indian or Alaska Native | Schools and districts |
| Asian | Schools and districts |
| Black or African-American | Schools and districts |
| Hispanic | Schools and districts |
| Native Hawaiian or Pacific Islander | Schools and districts |
| Two or more races (multiracial) | Schools and districts |
| White or Caucasian | Schools and districts |
| Economically Disadvantaged | Schools and districts |
| English Language Learners | Schools and districts |
| Students with Disabilities (special needs) | Schools and districts |
| Shared Educational Entity (SEE) | Districts |

(MDE, 2013a, p. 7)

A valid subgroup includes at least 30 students in most cases. However, subgroups are calculated differently in very large schools or districts. Schools and districts with more than 3,000 students have a minimum subgroup size based on 1% of its total population, up to a maximum size of 200 (MDE, 2013a). Students who are reported as home-schooled or non-public are not included in accountability calculations (MDE, 2013a). Schools that are more diverse are at-risk for being accountable for more subgroups than a school that has heterogeneous population. Darling-Hammond (2007) calls this the “diversity penalty.”

**Audit checks.** Audit checks are done when the total points for a scorecard is calculated. All schools classified as priority schools in the top-to-bottom (TTB) ratings are given red scorecards. Individual red cells can hurt a school or school district. For example, in the assessment participation category, if a school has two red cells for the “All Students” group or more than two red cells for any subgroup, or a combination of the two classifications, the audit outcome is a red scorecard. The following table shows how an individual red cell can affect the overall outcome of a school’s or district’s report card.

Table 2

*Audit Checks and Outcomes*

| Scorecard Component | Audit Check | Audit Outcome (If check is true) |
|---|---|---|
| Top to Bottom Ranking Label | Is school labeled a Priority school? | Red Scorecard |
| Assessment Participation | Does school/district have at least two red cells for the "All Students" group? | Red Scorecard |
| Assessment Participation | Does school/district have more than two red cells for any subgroup? | Red Scorecard |
| Assessment Participation | Does school/district have one red cell for the "All Students" group and at least two red cells for any subgroup? | Red Scorecard |
| Assessment Participation | Does school/district have two red cells for any subgroup? | Orange Scorecard |
| Assessment Participation | Does school/district have one red cell for the "All Students" group and one red cell for any subgroup? | Orange Scorecard |
| Assessment Participation | Does school/district have one red cell for the "All Students" group? | Yellow Scorecard |
| Assessment Participation | Does school/district have one red cell for any subgroup? | Yellow Scorecard |
| Assessment Proficiency | Does school/district have at least one red cell in any subgroup, except the bottom 30% subgroup? | Yellow Scorecard |
| Assessment Proficiency | Does school/district have at least one red cell in any bottom 30% subgroup? | Lime Scorecard |
| Graduation | Does school/district have a red cell for the "All Students" group? | Yellow Scorecard |
| Attendance | Does school/district have a red cell? | Yellow Scorecard |
| Educator Evaluations | Does school/district have a red cell? | Yellow Scorecard |
| Compliance Factors | Does school/district have a red cell? | Yellow Scorecard |

(MDE, 2013a, p. 6)

**Top-to-Bottom ranking (TTB).** The Top-to-Bottom list ranks schools by percentile on their student performance in all tested content areas. Within each subject, schools are accountable for achievement, improvement, and narrowing the achievement gap. Additionally, high schools must include graduation rates in their ranking. Any school with at least two years of assessment data for 30 or more full-academic-year students are ranked.

All traditional public and public charter schools are measured through the TTB ranking. This measurement occurs despite the differences in student demographics, school level data, and teacher demographics.

**Labels.** Schools may be designated as a reward, focus, or priority school based on their Top-to-Bottom ranking (USDOE, 2012a). According to Michigan's Elementary and Secondary Education Act (ESEA) Flexibility Request, schools are identified for the following reasons:

*Reward Schools* are in the top 5% of the Top-to-Bottom ranking. In addition to the top 5%, MDE will add any school that meets one of the following three criteria:

- is designated as a "Beating the Odds" school (school that is outperforming schools with similar risk factors and demographic makeup), or
- is in the top 5% of schools on the improvement metric in the Top-to-Bottom ranking (USDOE, 2012a.). The improvement metric for "High Progress" schools is computed by taking the mean of the improvement z scores for each applicable subject area. Schools that have an accountability scorecard of red cannot be identified as reward.
- shows continuous improvement beyond the 2022 proficiency targets (beginning in 2013). Continuous improvement of these "High Proficiency" schools must have 85% of students proficient in each applicable subject area and have a continuously positive improvement slope in all subject areas for the four year rate.

*Focus Schools* are schools with the largest achievement gaps, defined as the difference between the average scale score for the top 30% of students and the bottom 30% of students in each school. These schools are determined from the achievement gap component within the Top-to-Bottom ranking (USDOE, 2012a). Focus Schools can be overall high-achieving schools, however, due to their achievement gap, they are labeled as focus schools.

*Priority Schools* are schools in the bottom 5% of the Top-to-Bottom list.

- The official metric requires that Michigan include the bottom 5% of Title I schools. If the bottom 5% overall does not include 5% of the state's Title I schools (i.e., there are too few Title I schools in that group), the cutoff is set within the Top-to-Bottom list to a level that includes 5% of the total Title I schools.
- Any school that was a School Improvement Grant (SIG) recipient in 2010 or 2011 to implement a turnaround model.
- Any school that was identified as a Persistently Low-Achieving (PLA) school in 2010 or 2011 (i.e., all previous PLA schools were classified as Priority schools while they are developing or implementing a reform plan per their original placement on the PLA list. Schools remain in this category for four years USDOE, 2012a).

*Schools with no designations* do not meet the criteria for reward, focus, or priority. These schools comprise the majority of schools in Michigan.

### *Student Demographics*

As part of the ESEA flexibility waiver and NCLB, each state is required to monitor academic performance by student demographics. This accountability measure is to ensure that all students, regardless of classification, reach proficiency.

Student demographics may play a role in how schools serve students. This section reviews the research on student demographics and the influence they may have on academic achievement.

**Percentage of students who are economically disadvantaged.** Both the income gap and the achievement gap between high-and low-income families continue to widen (Reardon, 2011). While the widening of the achievement gap is complex and interconnected, socioeconomic status is considered one of the strongest predictors of academic achievement (Berliner, 2009; Lubienski & Crane, 2010; Reardon, 2011). Schools that participate in The National School Lunch program offer free or reduced lunch based on the annual federal poverty guidelines issued by the Department of Health and Human Services (Child Nutrition Programs—Income Eligibility Guidelines, 2014). Thus, the indication of a school's poverty rate can be somewhat measured by the student population which receive free or reduced lunch.

There are several out-of-school factors disproportionately affecting low-income families and having a significant effect on learning opportunities for students (Berliner, 2009). Examples are as follows:

*Inadequate medical, dental, and/or vision care*- In 2012, the uninsured rate for children in poverty was 12.9% compared to a 7.7% uninsured rate for children not in poverty (DeNavas-Walt, Proctor, & Smith, 2013). Medicaid and the Children's Health

Insurance Program provide coverage for many children in poverty and more than 57% of all American children in the 2012 fiscal year were covered by these plans (“The State of America’s Children 2014,” 2014). Nevertheless, children in poor families in most states are six times more likely to be in less than optimal health as compared with children in higher income families (Berliner, 2009).

Half of all children and two-thirds of children from ages 12-19 from low-income families have had tooth decay. These children have more untreated tooth decay than their peers from higher-income families (Centers for Disease Control [CDC], 2011). According to the CDC (2011), tooth decay and gum disease is associated with pain, dysfunction, school absences, difficulty concentrating, diabetes, and heart disease.

As well, children from households with income below the poverty level are less likely to see an eye care provider than their peers from households in which incomes are equal to or higher than the poverty level. Children without vision insurance are three times more likely to go without eyeglasses when needed than their insured peers (“Access to Health and Vision Care Services under SCHIP”, n.d.)

Students who suffer from inadequate health care of any kind are at risk for absenteeism, as well as for having behavioral issues associated with an inability to concentrate in the classroom. Schools can mitigate some of the health concerns by having medical professionals, such as nurses, within the school setting. Due to budget constraints, many public schools cannot provide this service.

*Food insecurity*-- Food insecurity is defined as having, or unable to acquire, enough food to meet the needs of all family members (Food Security in the U.S., 2014). According to Berliner (2009), it i*s a challenge in both* urban and rural communities. Food

insecurity was found to be 3.4 times higher in households with incomes below the official poverty line and 2.7 times higher in households with children headed by a single woman (Berliner, 2009).

At the very base of Maslow's hierarchy of needs are the physiological requirements of hunger, thirst, and bodily comforts (Huitt, 2007). Without a child's physiological needs being met, it can be difficult for a child to grow academically and socially to his/her fullest potential. While the National Lunch program is essential for these students, it does not meet the needs of the other two essential meals. Some schools offer breakfast programs, but the capacity to complete homework or fully focus on school may be hindered when a child is not assured that he/she can receive the required three meals a day.

*Family situations and family stress*-- Researchers continue to explore the connection between poverty and family stress-related issues. In a study conducted in Michigan of low-income preschool children, 46.7% of the children had been exposed to at least one incident of violence in the family (Berliner, 2009). Aggressive behavior, depression, anxiety, decreased social competence, and diminished academic performance are some problems often manifested in children who are exposed to violence in the homes (Berliner, 2009).

*Academic readiness*- Significant disparities between low-income and high-income families become evident through language proficiency by 18 months of age, with a 6-month gap between the two groups by the time a child is 24 months old (Fernald, Marchman, & Weisleder, 2013). Analyzing the Early Childhood Longitudinal Study (ECLS)-1998 data, West, Denton, and Germino-Hausken (2000) concluded that children's performance in reading, mathematics, and general knowledge increased with

the mother's level of education. Students in families where the mother had more education were more likely to score in the highest quartile in the same respective areas (West et al., 2000).

The lack of academic readiness means that when starting kindergarten an achievement gap often exists between students from low and high socioeconomic statuses. Schools that have a disproportionate number of students who are from low-income families must service these students who are coming to school with a deficit. This need places a strain on school resources.

**Percentage of students with special needs.** While little evidence supports the need for general education students to have teachers with advanced degrees, students with special needs require teachers with a higher level of expertise (Feng & Sass, 2010). A study conducted by Feng and Sass (2010) found higher achievement gains in mathematics for special needs students who were taught by a teacher with an advanced degree. This finding was true of all students with special needs who received mathematics instruction in the general education classroom.

For students who received some or all of their mathematics instruction in a special education course, a significant correlation in a positive direction was found between mathematics achievement and advanced degree attainment. Students who received all of their reading instruction in a special education course saw a significant correlation in a positive direction between reading achievement and advanced degree attainment (Feng & Sass, 2010). Schools that have large special needs populations may lack adequate funds to attract and retain teachers with graduate degrees. These students may be at a disadvantage for receiving high quality instruction.

Students with special needs have Individualized Education Programs (IEP) which may include accommodations and/or curriculum and assessments modifications (Darling-Hammond, 2007; USDOE, 2006). These students may be administered alternative standardized assessments only if the number of students needing these tests is less than 2% of all students tested within a district (Darling-Hammond, 2007; MDE, 2013a). If more than 2% of tested students are administered an alternative standardized assessment, then a school would have to count the additional students' scores as non-proficient (MDE, 2013a). Exceeding the 2% proficiency rate is not advantageous, as the school and district will be penalized. Thus, schools that serve large populations of students with special needs are often penalized by standardized assessments scores (Darling-Hammond, 2007).

**Racial/Ethnic composition of the student population.** The diversity of a student population can offer challenges when ranking schools by standardized test scores. Race and ethnicity often overlap with socioeconomic challenges. Certain minority groups have challenges that are disproportionate to their non-minority peers.

One out of three children of color is poor, Black (39.6%), Hispanic (36.8%), and American Indian/Native Alaskan (33.7%) represent the poorest of races/ethnicities ("State of America's Children 2014," 2014). In Michigan, over half of the Black children are poor ("State of America's Children 2014," 2014). Since, socioeconomic status is one of the strongest predictors of students' outcomes (Berliner, 2009; Lubienski & Crane, 2010), schools that service low-income students and/or minorities have challenges that are not as common in schools that service non-minorities and students from higher-income

families. The challenges that are associated with low-income status include inadequate medical care, food insecurity, family stress, and lack of academic readiness.

Minority students are routinely taught by teachers with the least experience (Darling-Hammond & Post, 2000). In their study, Clotfelter, Ladd, and Vigdor (2007) found that students who received free or reduced lunch had the highest percentage of teachers with less than three years of experience. This lack of teaching experience is problematic, as teachers with fewer than three years of experience are less effective than teachers with more than three years of experience (Clotfelter, Ladd, & Vigdor, 2007). Harris and Sass (2011) found that the largest gains from experience occur in the first years of teaching, however, there are continued gains beyond the first five years of a teacher's career. Students taught by inexperienced teachers are still expected to meet the same standards as students with experienced teachers. This unacknowledged condition may be detrimental to schools that have an inordinate amount of inexperienced teachers.

Furthermore, the probability that a school would be designated as failing increased in proportion to the number of demographic groups served by the school (Novak & Fuller, 2003). Schools that serve numerous subgroups have additional achievement targets for each subgroup under No Child Left Behind and the ESEA flexibility waiver. In Fuller and Novak's Policy Brief (2003), when comparing schools with identical test score averages, schools with more subgroups were more likely to miss their achievement targets.

A disproportionate rate of children of color are attending schools with high minority populations than non-minorities. According to Berliner (2009), less than 1% of Caucasian students attend a school with more than 90% minorities. However, approximately 40% of

students who are considered African-American or Latino, attend schools where minorities are at least 90% of the majority (see Table 3).

Table 3

*Percentage of Students in 90-100% Minority Schools, 2006-07*

| Group | Percent of Students in 90-100% Minority Schools |
|---|---|
| Caucasian | 0.9 |
| African-American | 38.5 |
| Latino | 40.0 |
| Asian | 16.2 |
| American Indian | 20.2 |

(Berliner, 2009, p. 8)

**Percentage of students who are English language learners.** According to Darling-Hammond (2007):

> NCLB defines a Limited English Proficient (LEP) student as one "whose difficulties in speaking, reading, writing, or understanding the English language may be sufficient to deny the individual the ability to meet the State's proficiency level of achievement on State assessments." (p. 249)

By the Act's definition of LEP, students may not be able to meet proficiency on state assessments. Once students gain proficiency in English, they are transferred out of this subgroup, making it impossible for this subgroup to reach 100% proficiency (Darling-Hammond, 2007). Hence, schools that have a large percentage of students who meet these criteria may have more difficulty passing state assessments.

**Attendance.** According to a study conducted by Gottfried (2010), attendance has predictive capabilities for reading and mathematics test performance and elementary students' grade point averages in an urban setting. These significant correlations in a positive direction provide support that attendance is a robust predictor of academic

achievement for students in urban settings (Gottfried, 2010). Gottfried stated that his results may not be generalizable to other settings.

However, Balfanz and Byrnes (2012) used a national data set and determined that chronic absenteeism in kindergarten was associated with low performance in first grade. These results affected low-income children twice as much. Likewise, chronic absenteeism affected low-income students more than higher-income students (Balfanz & Byrnes, 2012).

Student demographics have an effect on student achievement. All schools have challenges; however, schools with certain distinct populations may have challenges that have a negative influence on student achievement.

**Teacher Demographics**

**Pupil-teacher ratio.** Studies have shown that smaller class-size produces positive effects on students at the elementary level (Whitehurst & Chingos, 2011). In the Tennessee Project STAR study, early elementary students in small classes benefited by approximately .25 of a standard deviation. The effect size was .23 for reading and .27 for mathematics (Mosteller, 1995). These gains seem to benefit minority children more within the first two years of the experiment (Mosteller, 1995). A quasi-experimental study found consistent results of the Tennessee STAR project, and maintained that smaller class size was related to student achievement (Zahorik, Molnar, & Smith, 2003).

No published research has been found that definitively and empirically established an ideal class size. The Tennessee study compared classes of 13 to 17 students with classes of 22 to 26 students (Mosteller, 1995). The study completed in Wisconsin by Zahorik et al (2003), used a 15:1 student teacher ratio.

Pupil-teacher ratios are an imprecise indicator of class size because they do not account for frequently intense teaching resources targeted toward Title I, special education, or bilingual services in schools (Hanushek, 1998). The better indicator of class size is the average number of students in a regular classroom (Mayer, Moore, Mullens, & Ralph, 2001).

**Average teacher salary.** Increased teacher salaries affect student achievement positively only when such salaries are used to attract and retain more effective teachers (Hanushek, 2010, Loeb & Page, 2000). The results of whether financial incentives have an influence on student achievement are mixed, with most studies showing that teacher salaries have little or no affect (Fryer Jr., 2011; Jones, Alexander, Rudo, Pan, Vaden-Kiernan., 2006).

**Years of teacher experience.** Studies suggest that students learn more from experienced teachers than they do from less experienced teachers (Darling-Hammond, 2000; Chingos & Peterson, 2010; Clotfelter, et. al., 2007). This impact is stronger in mathematics and more consistent at the elementary and middle school levels (Clotfelter, et. al., 2007). According to Rice (2010), teachers with less than three years of experience are less effective than teachers with more than three years of experience, however, the overall effectiveness seems to marginalize after the first years of teaching. Thus, a teacher with 20 years may not be any more effective than a teacher with five years of experience (Rice, 2010). Harris and Sass (2011) found that the largest gains from experience occur in the first years of teaching, however, there are continued gains beyond the first five years of a teacher's career. These findings are of particular concern for minorities and low-income students who often are taught by new, inexperienced teachers.

**Teachers with graduate degrees.** The research has shown mixed results in regards to whether teachers with graduate degrees have a positive effect on student achievement at the elementary level (Rice, 2003). Published research has not been found that supports a statistically significant effect of a graduate degree on student achievement at the elementary level (Clotfelter, et. al, 2007; Hanushek & Rivkin, 2006). Moreover, the importance of a teacher's degree is whether he/she holds a degree in mathematics or science. Teachers who are certified in mathematics and have Bachelor of Arts and Masters of Arts in mathematics are associated with higher student mathematics test scores (Goldhaber & Brewer, 1997). Teachers with bachelor's degree in science are associated with higher student science test scores. There is no significant relationship between degree level and test scores in English or history (Goldhaber & Brewer, 1997)

Research indicates that students with special needs require teachers with a higher level of expertise (Feng & Sass, 2010). A significant correlation in a positive direction was found between mathematics and reading achievement and advanced degree attainment for students who received some or all of their mathematics and reading instruction in special education courses.

**Other School and District Level Data**

**Total enrollment.** The research on the benefit of school size on student achievement at the elementary level is mixed. There is no definitive answer by researchers on what constitutes a smaller school. Researchers have accepted a smaller elementary school to be in the range of 300 to 400 students (Cotton, 1996).

In a review of the research on small school size, Cotton (1996) found academic achievement in smaller schools to be at least equal to and sometimes superior to

achievement in larger schools. Other researchers have concluded that students in smaller schools have higher academic achievement (Walsey et al., 2000). In a study of Chicago elementary schools, researchers concluded that smaller schools, enrolling less than 400 students, have a positive direct and indirect effect on student achievement through teacher attitudes (Lee & Loeb, 2000). In their study of four states, Howley and Bickel (2000) found that smaller school size decreased the effects of poverty on student achievement. However, Howley (1996) concluded that school size affects achievement through the lens of socioeconomic status. Thus, a larger school size serves students of affluence better than it serves poorer students.

**Mobility rate.** The change in student enrollment can result in a myriad of problems for school districts. In Michigan, funding is based on number of pupils within a school (MSBO, n.d.). Declining enrollment often means a loss of revenue. This loss is occurring while educational costs, such as health insurance and utilities, are increasing (Jimerson, 2006).

If educational expenditures were stable, the loss of students within a school or district would most likely result in higher per-pupil costs. Many educational expenses are fixed, such as maintaining structural buildings and transportation. The loss of students may cause funds to be distributed among a smaller group of students resulting in higher per-pupil costs (Jimerson, 2006). Thus, declining enrollment can create a loss of funding and be an indicator of fiscal stress (MSBO, n.d.).

Moreover, higher mobility rates are associated with challenges instructional delivery, classroom management, and the school environment, resulting in lower student achievement. Inconsistent classroom and school composition contribute to the

challenges within the educational environment. Students who are economically disadvantaged, minorities, immigrants, homeless, farmworkers, and foster children are disproportionately represented in the transient population. However, these educational outcomes affect transient students and their stable classroom peers (Hartman & Leff, 2002).

**Financial Data.** School finances incorporate all sources of revenue and expenditures that school districts use to fund their schools. Types of school funding include foundation allowance, and revenue per pupil (including Title I funds, etc.). School budgets include instructional expenditures per pupil and general fund balance.

The role of funding on student achievement has been the subject of much debate. According to Darling-Hammond (2007), even within states, the spending ratio between high and low spending schools is typically at least 2 or 3 to 1. Yet, research on the how funding affects student achievement has yielded mixed results (Lips, Watkins, & Fleming, 2008).

Two opposing bodies of research have developed on the subject of school finances. Both bodies of research can agree that students benefit from having funding that is linked to factors of student success (Venteicher, 2005). However, Hanushek (1997) asserted that no significant or consistent relationship has been found between school resources and student achievement. Therefore, giving schools additional money may not raise student success. For funding to have a positive effect, it must be used to promote factors for success (Hanushek, 1997). There are no uniform descriptions of these factors because schools and school districts are unique entities that respond to specific factors in different ways. In the absence of having a definition of these factors, guarantees cannot

be made that additional funding will be used judiciously and/or effectively (Hanushek, 1997).

Hedges and Greenwald concluded that increasing per-pupil expenditures has a significant positive impact on student achievement (Greenwald, Hedges, & Laine, 1996; Lips, Watkins, & Fleming, 2008; Venteicher, 2005). According to Greenwald, Hedges, and Laine (1996), specific factors such as: smaller schools, small class size, teacher quality, etc., can lead to an increase in academic achievement. Increasing the funding for schools would allow them to utilize funds in ways that improve the school, thus, contributing to improved student achievement.

**Inferences for the Study**

Despite differences in schools, all students are expected to meet the same 100% proficiency target. While this is a noble target that sets high expectations for all students, it does not appear to be attainable under current circumstances.

Using an accountability system to implement change in education reform is not an effective tool when the system does not take into account student, teacher, school and district factors. The data suggests that schools with higher levels of diversity, more poverty, and greater numbers of special needs and ELL students are more likely to be labeled as priority schools. Conversely, schools that are homogenous and without poverty are more likely to be classified in the top percentile and labeled as high-achieving reward schools.

Moreover, the accountability system with which we measure students, continues to change, often annually. This timing does not allow the system an opportunity to

evaluate its feasibility. Instead of focusing on rewarding and sanctioning schools and school districts, legislators need to focus on systemic change.

**Summary**

The mandate for educational reform, as reflected in the literature, originated from the assertion that America was at risk of losing its reputation as the dominant political and economic power in the world if student achievement did not improve. In the ensuing years, these concerns have caused legislators and the public-at-large to search for ways in which schools can be held accountable for the academic achievement of all students.

The accountability movement, while well intentioned, lacks the focus on factors such as student, teacher, school and district level determinants that affect academic outcomes. Reform should include federal and state-level support that is necessary to address these challenges and ensure that schools are equipped with the correct resources and/or have the capacity to implement the appropriate action strategies. This study will attempt to illuminate the challenges within the accountability system and recommend changes for policy makers and future research.

# CHAPTER 3: METHODOLOGY

## Introduction

This chapter presents the methods used to collect and analyze the data needed to address the research questions developed for this study. The topics included in this discussion are a restatement of the purpose, research design, setting for the study, population, data collection tools and procedures, and data analysis. Each of these topics is presented separately.

The purpose of this study is to examine student, teacher, school and district characteristics that contribute to elementary schools being classified as reward, focus, or priority schools in the Metro Detroit area.

## Research Design

A nonexperimental research design is used in this study. This type of research design is used when investigating the relationship among the variables of interest. These variables include school designation (reward, focus, or priority), student demographics (total enrollment, ethnic/racial composition, percentage of economically disadvantaged, percentage of students with special needs, percentage of English language learners), teacher characteristics (percentage of teachers with graduate degrees, teaching experience, pupil-teacher ratio), and school/district characteristics (MEAP scores for math and reading [third through fifth grade], attendance rate, mobility rate, foundation allowance, revenue per pupil,  instructional expenditures per pupil, average teacher salary, general fund balance per pupil),. The data used has been collected from publicly available databases maintained by the Michigan Department of Education (MDE).

## Setting for the Study

Three counties, Macomb, Oakland, and Wayne, in southeast Michigan are examined in this study. Each of the three counties has urban, suburban, and rural areas. Oakland County is one of the most affluent counties in the country, while Wayne County is home to the only large city that has filed for bankruptcy. These counties have a total estimated combined population of 3,861,683 (U. S. Census Bureau, 2014), with 74 public school districts and 154 charter schools providing educational services to their students (Macomb Intermediate School District, n.d.; Oakland Schools Intermediate School District, n.d.; Wayne RESA, n.d.). The study is limited to K-5 elementary schools (n = 333) in 56 public school districts and 18 charter schools for a total combined student population of 142,619 (Michigan Department of Education, 2014).

## Population

The population for this study is traditional public and public charter schools in Metro Detroit. These schools provide educational services to students from Kindergarten through high school. For the purposes of this study, only elementary schools with students in Kindergarten through 5$^{th}$ grade will be examined. Schools that include students in sixth through eighth grades and schools that were newly established and did not have a top-to-bottom ranking were excluded from this study.

## Sample

The sample includes data from the MDE websites and National Center for Educational Statistics (NCES) website for the 333 traditional public and charter elementary schools in Macomb, Oakland, and Wayne Counties. These websites are

publicly available and no permission is required to access the data. No individuals have been contacted to provide data for the study.

**Data Collection Tools**

Three websites were accessed for the study: Michigan Department of Education (MDE) and National Center for Education Statistics (NCES). The data collected is from the 2013-14 Michigan School Data District Accountability Scorecard that includes data from predominately from the 2012-13 academic year. This period provides the most comprehensive data available for the study. Data obtained from the MDE and NCES are stored in an Excel file and presented in Table 4.

Table 4

*Variables in the Study*

| Type | Variable | Source |
|---|---|---|
| Student | • Race/ethnicity<br>• % economically disadvantaged students<br>• % special needs students<br>• % English language learners | MDE websites<br>NCES |
| Teacher | • Pupil teacher ratio<br>• Years of teaching experience<br>• % of teachers with graduate degrees | MDE websites<br>NCES |
| School/District | • School designation (reward, focus, priority, none)<br>• Total enrollment<br>• Foundation allowance<br>• Revenue per pupil<br>• Instructional expenditures per pupil<br>• General fund balance per pupil<br>• Mobility rate<br>• Charter school<br>• Attendance rate<br>• MEAP test results for reading and mathematics<br>• Average teacher salary | MDE websites |

**Data Analysis**

The data obtained from the MDE and NCES websites was analyzed with IBM-SPSS 23 and divided into two sections. The first section provides a description of the

schools using frequency distributions, crosstabulations, and measures of central tendency and dispersion used to provide a profile of the traditional public and charter elementary schools included in the sample. The second section utilizes multiple linear regression and multinomial logistic regression analyses to determine which of the independent variables (student, teacher, school, and district characteristics) can be used to predict outcomes in the percentage of students scoring advanced or proficient on the MEAP reading and mathematics assessment scores and school designation labels.

In the first research question, a multiple linear regression analysis was used to determine which of the student, teachers, school and district factors can be used to predict the percentage of children scoring at proficient or advanced on the MEAP tests for the 2012-2013 academic year. This analysis is appropriate as the dependent variable is continuous. All decisions on the statistical significance of the findings will be made using a criterion alpha level of .05. Table 5 presents the statistical analyses used to address each research question.

The second research question was addressed using a multinomial logistic regression analysis to determine which of the independent variables can predict the dependent variable, school designation. Multinomial logistic regression predicts the category membership or the probability of category placement on a dependent variable based on multiple independent variables (Starkweather & Moske, 2011). Multinomial logistic regression is used when the dependent variable has more than two categories. This is appropriate for this study as school designations have four levels: reward, focus, priority, and none. This analysis does not have to meet the assumptions of parametric statistics: normality, homoscedasticity, and linearity. Approximately 10 cases were

needed for each independent variable (Schwab, as cited in Starkweather & Moske, 2011). However, the independent variables must be independent of each other.

Table 5

*Statistical Analysis*

| Research Question | Variables | Statistical Analysis |
|---|---|---|
| 1. What factors predict student achievement in elementary schools? Specifically, what factors can be used to predict the percent of students scoring at proficient or advanced levels on the reading and mathematics MEAP tests? | <u>Dependent Variables</u><br>Percent of students scoring proficient on MEAP reading and mathematics tests<br><br><u>Independent Variables</u><br>Racial/ethnic composition<br>% economically disadvantaged students<br>% special needs students<br>% English language learners<br>Attendance rate<br>Pupil teacher ratio<br>Average teacher salary<br>Years of teaching experience<br>% of teachers with graduate degrees<br>Foundation allowance per pupil<br>Revenue per pupil<br>Instructional expenditures per pupil<br>General fund balance per pupil<br>Mobility rate<br>Charter Schools<br>Total enrollment | Ordinary least squares regression analyses will be used to determine which of the student, teacher, and school characteristics can be used to predict percentage of students scoring advanced and proficient on MEAP reading and mathematics tests.<br><br>Independent variable (charter schools) was dummy coded to allow its use in the multiple linear regression analysis.<br><br>Prior to completing the multiple linear regression analyses, an intercorrelation matrix will be used to determine which of the independent variables are significantly related to the dependent variable. Only those independent variables that are significantly related to the dependent variable will be used in the multiple linear regression analyses. |

| Research Question | Variables | Statistical Analysis |
|---|---|---|
| 2. What factors predict whether an elementary school would be classified as a Priority, Reward, or Focus school? Specifically, what commonalities and/or patterns are present in elementary schools with the above designations in the tri-county area of Oakland, Macomb, and Wayne counties? | <u>Dependent Variable</u><br>School designation (reward, focus, priority, none)<br><br><u>Independent Variables</u><br>Racial/ethnic composition<br>% economically disadvantaged students<br>% special needs students<br>% English language learners<br>Attendance rate<br>Pupil teacher ratio<br>Average teacher salary<br>Years of teaching experience<br>% of teachers with graduate degrees<br>Total enrollment<br>Foundation allowance<br>Revenue per pupil<br>Instructional expenditures per pupil<br>General fund balance per pupil<br>Mobility rate<br>Charter schools<br>Total enrollment | Multinomial logistic regression analyses was used to determine which of the student, teacher, school, and district characteristics can be used to predict the school designation label (reward, focus, priority, or none). |

# CHAPTER 4: RESULTS OF DATA ANALYSES

The results of the data analyses that were conducted to address the research questions are presented in this chapter. The chapter is divided into three sections. The first section uses descriptive statistics to provide a profile of the schools included in the study, with baseline statistics on the quantitative variables presented in the second section. Results of the inferential statistical analyses used to address the research questions are presented in the third section of the chapter.

The federal government has created a political and educational environment that penalizes schools unable to educate all students effectively (New America Foundation, 2014). This same system rewards schools that are seemingly able to create an environment of high academic achievement. The purpose of this study was to examine student, teacher, school, and district characteristics that contribute to an elementary school being classified as reward, priority, or focus schools in the Metro Detroit area.

The variables included in the study are: student demographics (percentage economically disadvantaged, percentage English language learners, percentage students with special needs, and student ethnic/racial composition), teacher characteristics (average salary, percentage of teachers with graduate degrees, percentage of teachers with fewer than 5 years of experience), and school or district characteristics (charter/public school, total enrollment, foundation allowance, revenue per pupil, instructional expenditures per pupil, general fund balance per pupil, total enrollment, mobility rate/change in school enrollment within a year). These characteristics were correlated with the percentage of students scoring proficient or advanced on Michigan Education Assessment Program (MEAP) reading and mathematics tests as well

as school designation label. The data were obtained from publicly available databases maintained by the Michigan Department of Education (MDE) and the National Center for Education Statistics (NCES).

**Description of the Schools Included in the Study**

The study was limited to K-5 elementary schools that had top-to-bottom rankings (n = 333) in three counties: Macomb (23.4%), Oakland (37.8%), and Wayne (38.7%). A total of 333 elementary schools in 56 public school districts and 18 charter schools included in this study had a total combined student population of 142,619 (Michigan Department of Education, 2014). The number of schools in the three counties and their geographic classifications as described by NCES are summarized using frequency distributions for presentation in Table 6.

Table 6

*Frequency Distributions: Schools by County and Locale*

| County | Frequency | Percent |
|---|---|---|
| Macomb | 78 | 23.4 |
| Oakland | 126 | 37.8 |
| Wayne | 129 | 38.7 |
| Total | 333 | 100.0 |
| Locale | | |
| Urban | 20 | 6.0 |
| Suburban | 302 | 90.7 |
| Rural/Fringe | 11 | 3.3 |
| Total | 333 | 100.0 |

Oakland and Wayne counties accounted for 126 (37.8%) and 129 (38.7%) of the schools in this study, respectively. Macomb county had fewer schools (n = 78, 23.4%).

Twenty (6.0%) of the schools used in this study were located in urban areas, 302 (90.7%) were located in suburban areas, and 11 (3.3%) were located in the rural fringe.

The type of school, charter or traditional public, was obtained from the 2013-14 state data files. The results of the frequency distributions used to summarize these data are presented in Table 7.

Table 7

*Charter Schools*

| School is a charter school | Frequency | Percent |
|---|---|---|
| No | 315 | 94.6 |
| Yes | 18 | 5.4 |
| Total | 333 | 100.0 |

Eighteen (5.4%) of the 333 elementary schools were public charter schools. The charter schools represented were limited those with K-5 grade configurations. Schools that were newly opened and/or had not yet received a Top-to-Bottom ranking from the state of Michigan were excluded in this study as they had no accountability designation. Michigan's accountability system requires all schools with valid data to be ranked from top-to-bottom (TTB), assigned a color from green to purple, and have a designation of reward, focus, priority, or no label.

Through the TTB ranking, schools are ordered based on student assessment data in achievement, improvement in achievement over time, and measurement of the largest achievement gap between any two subgroups within a school (MDE, 2013b). The assignment of color designations is based on a six color-scale: (a) green represents attainment of 85% of the possible points, (b) lime represents at least 75% of the possible points, but less than 85%, (c) yellow is for at least 60% of the possible points, but less

than 75%, (d) orange represents at least 50% of the possible points, but less than 60%, (e) red represents less than 50%, and (f) purple represents schools that do not have students who attended a full-academic year (MDE, 2013a, pg.4).

Reward schools are in the top 5% of the Top-to-Bottom ranking. In addition to the top 5%, there are three additional ways the Michigan Department of Education (MDE) adds schools to this category. These schools are designated as 'Beating the Odds," "High Progress," or schools that show continuous improvement.

Schools designated as "Beating the Odds" outperform schools with similar risk factors and demographic makeup. Schools in the top 5% on the improvement metric in the Top-to-Bottom ranking may be considered "High Progress." The improvement metric for "High Progress" schools is computed by taking the mean of the improvement z (standardized) scores for each applicable subject area. Schools that are "High Progress" but have an accountability scorecard color designation of red cannot be identified as reward.

Schools may be added to reward status if they show continuous improvement beyond the 2022 proficiency targets (beginning in 2013). An indication of this type of continuous improvement means schools must have 85% of students score proficient in each applicable subject area and have a positive improvement slope in all subject areas for the four-year rate.

Focus Schools are schools with the largest achievement gaps, defined as the difference between the average scale score for the top 30% of students and the bottom 30% of students. These schools are determined from the achievement gap component within the Top-to-Bottom ranking.

Priority Schools are schools in the bottom 5% of the Top-to-Bottom list. These schools met at least one of the following criteria:

- Michigan's Department of Education requires that this category include the bottom 5% of Title I schools. If the bottom 5% overall does not include 5% of the state's Title I schools (i.e., there are too few Title I schools in that group), the cutoff is set within the Top-to-Bottom list to a level that includes 5% of the total Title I schools.
- Schools that received a School Improvement Grant (SIG) in 2010 or 2011 to implement a turnaround model are included in the priority category. Schools were eligible for this grant based on student achievement data from 2007-2009. Recipient schools were identified as Persistently Low-Achieving (PLA; MDE, 2010). During the years from 2007-2009, the state of Michigan had not yet started ranking schools.
- Schools that were identified as a PLA school in 2010 or 2011 were in the priority category. Identification was based on student proficiency levels and academic improvement rates in mathematics and reading; whether a school was in corrective action, restructuring, or improvement; and if a secondary school had a graduation rate below 60%. All previous PLA schools were classified as priority schools while they developed or implemented a reform plan per their original placement on the PLA list. Schools stayed in this category for four years.

The final category consists of schools with no designation. These schools do not meet the criteria for reward, focus, or priority and form the majority of schools in Michigan.

Table 8

*Frequency Distributions: School Designation Label*

| School Designation Label | Frequency | Percent |
|---|---|---|
| None | 227 | 68.2 |
| Reward | 49 | 14.7 |
| Focus | 39 | 11.7 |
| Priority | 18 | 5.4 |
| Total | 333 | 100.0 |

The majority of schools (n = 227, 68.2%) had no label, 49 (14.7%) were designated reward schools, 39 (11.7%) were designated focus schools and 18 (5.4%) had priority status.

A reward status can be attained in multiple ways, consequently the frequency distribution was refined to differentiate reward schools in the top 5% for achievement from reward schools for the alternate reasons: beating the odds, improvement metric, and continuous improvement beyond the 2022 proficiency target. Table 9 presents results of this analysis.

Table 9

*Frequency Distributions: Delineation of Reward Schools*

| Reward Schools | Frequency | Percent |
|---|---|---|
| High Achievement | 36 | 73.5 |
| Beating the Odds, etc. | 13 | 26.5 |
| Total | 49 | 100.0 |

Thirty-six (73.5%) schools received reward status for High Performance. The remaining 13 (26.5%) had reward status for the remaining three reasons.

## Description of the Quantitative Variables

Descriptive statistics were used to summarize the remaining variables, including total enrollment, racial/ethnic composition of the students, percentage economically disadvantaged, percentage students with special needs, percentage English language learners, teacher variables, and selected school/district characteristics. Table 10 presents the descriptive statistics.

Table 10

*Descriptive Statistics: Student, Teacher, School, and District Characteristics*

| | | | | Range | |
|---|---|---|---|---|---|
| **Student Characteristics** | Number | Mean | SD | Minimum | Maximum |
| Student ethnicity (percent of total enrollment) | | | | | |
| American Indian | 333 | .27 | .36 | 0.00 | 3.46 |
| African American | 333 | 18.12 | 25.93 | 0.00 | 100.00 |
| Asian | 333 | 4.85 | 7.62 | 0.00 | 63.01 |
| Hispanic | 333 | 6.42 | 11.42 | 0.00 | 91.00 |
| Hawaiian | 333 | .09 | .19 | 0.00 | 1.46 |
| Caucasian | 333 | 67.14 | 26.56 | 0.00 | 99.33 |
| Multiracial | 333 | 3.11 | 2.38 | 0.00 | 11.03 |
| Economically disadvantaged (percent of total enrollment) | 333 | 45.59 | 28.65 | 1.74 | 100.00 |
| Students with special needs (percent of total enrollment) | 333 | 10.83 | 4.27 | 1.63 | 27.30 |
| English language learners (percent of total enrollment) | 333 | 12.29 | 17.60 | .90 | 86.66 |
| **Teacher Characteristics-District Level** | | | | | |
| Master's or higher (in %) | 333 | 71.15 | 14.44 | 8.70 | 87.21 |
| Teachers with 5 years or less experience (in %) | 333 | 27.88 | 15.41 | 10.11 | 100.00 |
| Pupil-teacher ratio | 333 | 24.05:1 | 3.04 | 14:1 | 34:1 |
| **School characteristic** | | | | | |
| Total Enrollment | 333 | 433.31 | 128.07 | 58.00 | 1,000.00 |
| **School characteristics-percent** | | | | | |
| Reading and math proficiency | 333 | 44.11 | 19.72 | 5.00 | 88.40 |
| Attendance rate | 333 | 94.90 | 2.62 | 79.20 | 96.00 |
| Mobility rate | 326 | 5.55 | 3.73 | 1.48 | 27.59 |
| **District Finances (per pupil)** | | | | | |
| Foundation allowance | 333 | 7,938.51 | 1,017.92 | 7,026.00 | 11,084.00 |
| Revenue | 333 | 9,827.31 | 1,357.97 | 7,518.00 | 13,825.00 |
| Instructional expenditures | 333 | 6,261.02 | 952.65 | 3,000.00 | 5,516.00 |
| Teacher salary | 331 | 65,893.97 | 8,606.48 | 33,024.00 | 79,908.72 |
| General fund balance | 333 | 699.27 | 1,161.00 | -3,533.44* | 5,161.96 |

*A negative fund balance signifies a school district budget deficit

When examining the descriptive statistics, distinct differences were found among the schools. The ethnic/racial make-up of schools varied from 99% for Caucasian

students to 100% African American. In some schools, less than 2% of the students qualified for free or reduced lunch, while other schools had 100% of their students eligible for free or reduced lunch. The percent of students receiving special education services ranged from 1.63% to 27.30%, with a mean of 10.83% (SD = 4.27%).

The mean foundation allowance was $7,983.51 (SD = $1,017.92), while revenue per pupil had a mean of $9,827.31 (SD = $1,357.97). Substantial differences among districts in revenue per pupil were noted with a range from $7,518.00 to $13,825.00. Teachers' salaries, which are based on district finances, teacher experience, and teacher education levels, also varied widely, from $33,024.00 to $79,908.72, with a mean of $65,893.97 (SD = $8,606.48). The general fund balance per pupil ranged from a negative $3,533.44 to $5,151.96, with a mean of $699.27 (SD = $1,161.00).

The percent of students who scored in the proficient or advanced categories in reading and mathematics ranged from 5.00% to 88.40%, with a mean of 44.11% (SD = 19.72%). Attendance rates also varied from 79.20% to 96.00%. The mean attendance rate was 94.90% (SD = 2.62%). The mean for the mobility rate, was 5.55% (SD = 3.73%), with a range from 1.48% to 27.59%. The mobility rate documents students who change schools within a given school year. A student is considered mobile if he or she exits a school before the end of the school year or transfers into a school mid-year (MDE, 2015). It does not represent movement of students at the beginning of a school year.

**Research Questions**

Two research questions were developed for this study. Each of these questions was addressed using inferential statistical analysis. All decisions on the statistical significance of the findings were made using a criterion alpha level of .05.

**Research question one.**

This study intends to answer the following research question: What factors predict student achievement in elementary schools? Specifically, what factors can be used to predict the percentage of students scoring at proficient or advanced levels on the reading and mathematics MEAP tests?

Stepwise multiple linear regression analysis was used to model the relationship between the independent variables named earlier in this chapter and the dependent variable of percentage of students who scored either advanced or proficient on reading and mathematics MEAP assessments. The reading and mathematics tests are separate components of the MEAP. However, this study used the Michigan Department of Education reported combined percentage of students at the proficient or advanced levels as a single measure for both subject areas tested. This measure was used as the dependent variable. The purpose of this analysis is to predict the dependent variable based on the influence of the independent variables: student, teacher, school, and district characteristics. An intercorrelational matrix that provides the zero-order correlations of the dependent and independent variables is presented in Table 11.

Table 11

*Intercorrelational Matrix - Percentage of Students Scoring Advanced or Proficient on Reading and Mathematics MEAP Tests (N = 333)*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1 | --- | | | | | | | |
| 2 | -.33** | --- | | | | | | |
| 3 | .19** | .07 | --- | | | | | |
| 4 | -.09 | -.11* | -.03 | --- | | | | |
| 5 | .36** | -.10 | .15** | -.04 | --- | | | |
| 6 | -.56** | .47** | -.19** | -.11 | -.18** | --- | | |
| 7 | -.28** | .05 | -.02 | .14* | -.14* | -.12* | --- | |
| 8 | .13* | <.01 | <.01 | .04 | .07 | -.10 | -.06 | --- |
| 9 | .55** | -.43** | .15** | .04 | -.07 | -.88** | -.27** | .10 |
| 10 | .07 | -.17** | -.05 | .02 | .13* | .02 | -.07 | .02 |
| 11 | -.87** | .34** | -.23** | .04 | -.30** | .57** | .29** | -.17** |
| 12 | -.21** | -.20** | -.28** | .07 | -.23** | .10 | .05 | -.07 |
| 13 | -.20** | .05 | .10 | -.05 | .11* | -.17** | .34** | -.07 |
| 14 | .37** | -.62** | .05 | .05 | .16** | -.24** | -.13* | .10 |
| 15 | -.25** | .88** | .05 | -.10 | -.02 | .40** | -.03 | .05 |
| 16 | -.28** | -.30** | .04 | .12* | -.09 | .03 | .25** | -.05 |
| 17 | -.23** | -.19** | -.09 | -.10 | .20** | <.01 | -.19** | .08 |
| 18 | -.08 | -.15** | -.19** | -.05 | .06 | .30** | .15** | -.04 |
| 19 | .20** | -.52** | -.19** | <.01 | .16** | -.11* | .03 | <.01 |
| 20 | .34** | -.67** | .04 | .05 | .25** | -.40** | -.09 | .02 |
| 21 | .36** | .17** | .19** | -.07 | .17** | -.21** | -.25** | .15** |
| 22 | .57** | -.43** | .15** | .06 | .18** | -.71** | -.10 | .17** |
| 23 | -.58** | .30** | -.28** | -.02 | -.11 | .63** | .07 | -.13* |

*p < .05; **p < .01

Note: 1 reading and mathematics proficiency; 2 type of school (traditional public/charter); 3 total enrollment, 4 percentage American Indian, 5 percentage Asian, 6 percentage African American, 7 percentage Hispanic, 8 percentage Hawaiian, 9 percentage Caucasian, 10 percentage multiracial, 11 percentage economically disadvantaged, 12 percentage special needs students, 13 percentage English language learners, 14 percentage of teachers with Master's degree or higher, 15 percentage of teachers with fewer than 5 years of experience, 16 pupil-teacher ratio, 17 foundation allowance, 18 revenue per pupil, 19 instructional expenditure per pupil, 20 average teacher salary, 21 general fund balance per pupil, 22 attendance rate, 23 mobility rate

Table 11 (Continued)

*Intercorrelational Matrix - Percentage of Students Scoring Advanced or Proficient on Reading and Mathematics MEAP Tests*

| | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | --- | | | | | | | |
| 10 | -.12* | --- | | | | | | |
| 11 | -.58** | -.07 | --- | | | | | |
| 12 | -.07 | .23** | .14* | --- | | | | |
| 13 | .01 | -.30** | .39** | -.29** | -- | | | |
| 14 | .23** | .18** | -.39** | .01 | -.13* | --- | | |
| 15 | -.36** | -.08 | .26** | -.21** | <.01 | -.60** | --- | |
| 16 | -.12* | .08 | .21** | .25** | -.05 | .18** | -.34** | --- |
| 17 | .01 | .10 | -.17** | -.11* | .12* | .33** | -.16** | -.42** |
| 18 | -.37** | -.02 | .14* | <.01 | .17** | .25** | -.18** | -.06 |
| 19 | .05 | <.01 | -.11* | .02 | .09 | .44** | -.55** | -.05 |
| 20 | .34** | .15** | -.35** | -.03 | .04 | .65** | -.73** | .21** |
| 21 | .25** | .17** | -.37** | -.19** | -.12* | -.09 | .24** | -.48** |
| 22 | .68** | .03 | -.57** | -.16** | .05 | .34** | -.37** | -.24** |
| 23 | -.62** | .08 | .61** | .19** | .04 | -.29** | .26** | .19** |

*p < .05; **p < .01

Note: 1 reading and mathematics proficiency; 2 type of school (traditional public/charter); 3 total enrollment, 4 percentage American Indian, 5 percentage Asian, 6 percentage African American, 7 percentage Hispanic, 8 percentage Hawaiian, 9 percentage Caucasian, 10 percentage multiracial, 11 percentage economically disadvantaged, 12 percentage special needs students, 13 percentage English language learners, 14 percentage of teachers with Master's degree or higher, 15 percentage of teachers with fewer than 5 years of experience, 16 pupil-teacher ratio, 17 foundation allowance, 18 revenue per pupil, 19 instructional expenditure per pupil, 20 average teacher salary, 21 general fund balance per pupil, 22 attendance rate, 23 mobility rate

Table 11 (continued)

*Intercorrelational Matrix - Percentage of Students Scoring Advanced or Proficient on Reading and Mathematics MEAP Tests*

| | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| 8 | | | | | | | |
| 9 | | | | | | | |
| 10 | | | | | | | |
| 11 | | | | | | | |
| 12 | | | | | | | |
| 13 | | | | | | | |
| 14 | | | | | | | |
| 15 | | | | | | | |
| 16 | | | | | | | |
| 17 | -- | | | | | | |
| 18 | .66** | -- | | | | | |
| 19 | .66** | .68** | -- | | | | |
| 20 | .39** | .17** | .55** | -- | | | |
| 21 | .32** | -.24** | -.13* | .06 | -- | | |
| 22 | .20** | -.24** | .13* | .45** | .38** | -- | |
| 23 | -.13* | .19** | -.10 | -.38** | -.31** | -.70** | -- |

*p < .05; **p < .01

Note: 1 reading and mathematics proficiency; 2 type of school (traditional public/charter); 3 total enrollment, 4 percentage American Indian, 5 percentage Asian, 6 percentage African American, 7 percentage Hispanic, 8 percentage Hawaiian, 9 percentage Caucasian, 10 percentage multiracial, 11 percentage economically disadvantaged, 12 percentage special needs students, 13 percentage English language learners, 14 percentage of teachers with Master's degree or higher, 15 percentage of teachers with fewer than 5 years of experience, 16 pupil-teacher ratio, 17 foundation allowance, 18 revenue per pupil, 19 instructional expenditure per pupil, 20 average teacher salary, 21 general fund balance per pupil, 22 attendance rate, 23 mobility rate

According to the intercorrelational matrix, charter schools have a strong positive association with inexperienced teachers ($r = .88$, $p < .001$), as defined by teachers who have been teaching fewer than 5 years. According to Rice (2010), students perform better with teachers who have experience in comparison to teachers in their first years of teaching. Harris and Sass (2011) found that the largest gains from experience occur in the first years of teaching, but also found continued gains beyond the first five years of a teacher's career.

Considering the prior association with inexperienced teachers, it is not surprising that charter schools have a strong negative relationship with teacher salaries ($r = -.67$, $p<.001$) and teachers who have Master's degrees ($r = -.62$, $p < .001$). Table 11 demonstrates that teachers with Master's degrees have a positive association with teacher salaries ($r = .65$, $p < .001$). Furthermore, inexperienced teachers are less likely to have Master's degrees ($r = -.60$, $p < .001$), and, earn lower teacher salaries ($r = -.73$, $p<.001$).

At charter schools, one can expect inexperienced teachers, teachers without Master's degrees, and lower teacher salaries. Additionally, charter schools have a strong negative correlation to instructional expenditure per pupil ($r = -.52$, $p < .001$), signifying that less money is spent for instruction in charter schools. Charter schools have no property tax base and often must cover capital costs with operating revenue.

The percentage of economically disadvantaged students proved to be an integral part of this study; there are highly correlated variables that should be noted. A positive association was found between the percentage of economically disadvantaged students and African-American students ($r = .57$, $p < .001$). The percentage of economically

disadvantaged students was negatively related to the percentage of Caucasian students ($r = -.58$, $p < .001$) and the attendance rate ($r = -.57$, $p < .001$). Economically disadvantaged students were more likely to be African-American, and less likely to be Caucasian. Schools with higher percentages of economically disadvantaged students were more likely to have lower attendance rates.

In addition to the high correlation between race/ethnicity and economic status, race/ethnicity was also strongly associated with school attendance. Caucasian students had a relatively high attendance rate ($r = .68$, $p < .001$) and low mobility rate ($r = -.62$, $p<.001$). Conversely, African-American students had high mobility ($r = .63$, $p < .001$) and low attendance ($r = -.71$, $p < .001$). Thus, schools with a higher percentage of Caucasian students were more likely to have a higher attendance rate and less mobility, while the opposite was true of schools with a higher percentage of African-American students.

As expected, foundation allowance was positively correlated with revenue per pupil ($r = .66$, $p < .001$) and instructional expenditures per pupil ($r = .66$, $p < .001$). Revenue per pupil was shown to be positively associated with instructional expenditures per pupil ($r = .68$, $p < .001$). The findings indicate that schools with higher foundation allowances tend to have higher revenue per pupil and spend more money on instruction.

The results of the intercorrelational matrix were used to determine which of the independent variables would be used in the ordinary least squares multiple linear regression analysis to address the research question. The independent variables, student, teacher, school and district characteristics, were used to predict the percentage of children scoring at proficient or advanced levels on the MEAP tests for the 2012-2013 academic year. This analysis was appropriate as the dependent variable is continuous.

All decisions on the statistical significance of the findings were made using a criterion alpha level of .05. Table 12 presents the regression results.

Table 12

*Stepwise Multiple Linear Regression Analysis – Percentage of Students Scoring Advanced or Proficient on Reading and Mathematics MEAP Tests*

| Independent Variable | Constant | b-weight | β-weight | Δ $R^2$ | t | Sig |
|---|---|---|---|---|---|---|
| Included Variables | | | | | | |
| Percentage economically disadvantaged students | 75.69 | -.61 | -.88 | .75 | -29.33 | <.001 |
| Percentage English language learners | | .17 | .15 | .02 | 5.25 | <.001 |
| Per pupil instructional expenditures | | <.01 | .15 | .01 | 4.01 | <.001 |
| Pupil-teacher ratio | | -.60 | -.09 | <.01 | -3.55 | <.001 |
| Percentage multiracial | | .53 | .06 | <.01 | 2.41 | .016 |
| Revenue per pupil | | <-.01 | -.09 | <.01 | -2.34 | .020 |
| Multiple R | .89 | | | | | |
| Adjusted $R^2$ | .79 | | | | | |
| F Ratio | 208.63 | | | | | |
| DF | 6, 317 | | | | | |
| Sig | <.001 | | | | | |

Six independent variables entered the stepwise multiple linear regression equation, accounting for 79% of the variance in the percentage of students scoring at advanced or proficient levels on the reading and mathematics MEAP assessments, F (6, 317) = 208.63, p =<.001. The percentage of economically disadvantaged students entered the stepwise multiple linear regression equation first, explaining 75% of the variance in the dependent variable, (β = -.88, t = -29.33, p =<.001). The negative coefficient on the percentage economically disadvantaged variable indicates that schools with a higher percentage of such students have a lower percentage of students scoring advanced or proficient on the reading and mathematics tests. This finding is consistent with a vast body of research dating back to the Coleman Study (Berliner, 2009; Coleman, 1966; Lubienski & Crane, 2010; Reardon, 2011).

The percentage of English language learners entered the regression equation, accounting for 2% of the variance in the percentage of students scoring advanced or proficient on reading and mathematics tests, (β = .15, t = 5.25, p =<.001). Schools with a greater percentage of students who are English language learners have a higher percentage of students scoring at advanced or proficient levels on the standardized tests. While these findings appear to conflict with the research literature that indicates English language learners have trouble passing state assessments, further research is needed to identify the specific groups that comprised the English language learners within this study. The English language learner population encompasses multiple ethnic and racial groups, and may vary by school district. Students within the ELL population may perform differently depending on their ethnicity (e.g., Hispanic and Asian). This is discussed further in the chapter.

An additional 1% of the variance in the percentage of students scoring advanced or proficient on reading and mathematics MEAP tests was explained by per pupil instructional expenditures, (β = .15, t = 4.01, p = <.001). While the remaining three independent variables, pupil-teacher ratio (β = -.09, t = -3.55, p = <.001), percentage of students with two races (β = .06, t = 2.41, p = .016) and revenue per pupil (β = -.09, t = -2.34, p = .020), were statistically significant, they accounted for less than 1% of the variance in the dependent variable.

All else equal, schools with lower pupil-teacher ratios have a higher percentage of students scoring advanced or proficient on MEAP reading and mathematics assessments. Additionally, a higher percentage of students scoring at advanced or

proficient levels are enrolled in schools with higher instructional expenditures and revenue per pupil.

Schools with a higher percentage of students who are considered multiracial tend to have a higher percentage of students scoring at advanced or proficient levels on the reading and mathematics MEAP tests. However, there is no research literature that supports or negates this finding. The multiracial category is for any student who identifies as originating from two or more races, and does not yield a lot of information unless one is aware of the specific racial/ethnic composition of the students within this group.

Sixteen variables were excluded from the stepwise regression: charter school, total enrollment, percentage American Indian, percentage Asian, percentage African-American, percentage Hispanic, percentage Hawaiian, percentage Caucasian, percentage students with special needs, percentage of teachers with a Master's degree or higher, percentage of teachers with fewer than 5 years of experience, foundation allowance, teacher salary, general fund balance per pupil, attendance rate, and mobility rate. These variables did not enter the stepwise regression as they were not significantly associated with the dependent variable, percentage of students scoring at proficient or advanced levels in reading and mathematics.

The variables included in the stepwise multiple linear regression equation best explain the percentage of students scoring proficient or advanced in the areas of reading and mathematics. While economically disadvantaged students explained 75% of the variance in the dependent variable, it should be noted that economically disadvantaged students were highly correlated with several excluded variables: African-American students, Caucasian students, and attendance rate. Schools with high proportions of

economically disadvantaged students were more likely to have a higher proportion of African-American students and a lower proportion of Caucasian students. Schools with higher percentages of economically disadvantaged students were less likely to have high attendance rates. Moreover, foundation allowance was excluded through the stepwise regression, and was highly correlated with two included variables: revenue per pupil and instructional expenditure per pupil.

**Research question two.**

This study answered the following research question: What factors predict whether an elementary school would be classified as a reward, focus, or priority school? Specifically, what commonalities and/or patterns are present in elementary schools with the above designations in the tri-county area of Macomb, Oakland, and Wayne counties?

While research question one focused on using demographic markers to identify academic proficiency, research question two focused on using the same demographic markers to classify schools as reward, focus, or priority. Classification is based on a school's overall academic achievement, improvement over time, and achievement gap.

A stepwise multinomial logistic regression was used to determine which of the independent variables predict the dependent variable. Multinomial logistic regression predicts the category membership or the probability of category placement on a dependent variable based on multiple independent variables, and is used when the dependent variable has more than two categories (Starkweather & Moske, 2011). This is appropriate for this study as the schools are distributed across four categories: reward, focus, priority, and none.

Many assumptions associated with linear regression are not required with multinomial logistic regression, including linearity, normality, homoscedasticity, and scale of measurement. A linear relationship between the dependent and independent variables is not required for this analysis, nor is the assumption that the sampling distribution of the mean is normal. Further, there is no assumption that the dependent variable exhibits equal variance across the range of values for each independent variable (homoscedasticity). Finally, unlike multiple linear regression analysis, which requires the independent variables to be continuous (interval or ratio), the independent variables in logistic regression can be nominal, ordinal, or continuous. In this study, the membership category is a nominal variable, with four categories: reward, focus, priority, and none.

Categorical variables, school designation and public school/charter, were dummy coded for the purposes of this study. The categorical dependent variable, school designation, had three possible outcomes that included reward, focus, or priority. Schools without a designation were used as the reference/omitted category. The independent variables in this analysis included charter/traditional public school, total enrollment, percentage American Indian students, percentage Asian students, percentage African American students, percentage Hispanic students, percentage Hawaiian students, percentage Caucasian students, percentage Multiracial students, percentage economically disadvantaged students, percentage students with special needs, percentage English language learners, percentage of teachers with Master's degrees or higher, percentage of teachers with fewer than five years of experience, pupil-teacher ratio, per pupil foundation allowance, revenue per pupil, instructional expenditure per pupil, average teacher salary, general fund balance per pupil, attendance rate, and

mobility rate. Nine of the 333 schools had missing values and were eliminated from the analysis. Two of the nine schools were missing teacher salary information, and the remaining schools that were eliminated lacked data on their mobility rate. Thus, results were based on a sample of 324 schools. Table 13 provides the model fitting information.

Table 13

*Model Fitting Information*

| Model | Model Fitting Criteria | Likelihood Ratio Tests | | |
|---|---|---|---|---|
| | -2 Log Likelihood | Chi-Square | DF | Sig |
| Intercept only | 622.02 | | | |
| Final | 465.85 | 156.17 | 24 | <.001 |

The -2 log likelihood measures the sum of the probabilities associated with the predicted outcomes. Lower values of the log likelihood indicate a better fitting statistical model because lower values are associated with less unexplained variance. The intercept did not control for any of the predictor variables and was used to predict the outcome variable. The chi-square obtained on the final model fit was statistically significant, $\chi^2$ (24) = 156.17, $p < .001$ indicating a good fit. These results provide evidence to reject the null hypothesis. The findings indicate the existence of a statistically significant relationship between the independent variables and the dependent variable, school designation. The findings of the logistic regression are presented in Table 14.

Table 14

*Likelihood Ratio Tests*

| | Model Fitting Criteria | Likelihood Ratio Tests | | |
|---|---|---|---|---|
| Independent Variables | -2 Log Likelihood | Chi-Square | DF | Sig |
| Percentage Asian | 479.31 | 13.46 | 3 | .004 |
| Percentage Mulitracial | 473.83 | 7.80 | 3 | .046 |
| Percentage economically disadvantaged | 486.36 | 20.52 | 3 | <.001 |
| Percentage special need students | 475.13 | 9.28 | 3 | .026 |
| Percentage ELL | 467.10 | 1.25 | 3 | .740 |
| Revenue per pupil | 474.60 | 8.76 | 3 | .033 |
| Attendance Rate | 481.33 | 15.49 | 3 | .001 |
| Mobility rate | 477.87 | 12.03 | 3 | .007 |

As noted earlier, the -2 (log likelihood) statistic is the sum of the probabilities associated with the predicted outcomes. The chi-square test to determine the statistical significance of each of the independent variables that entered the stepwise multinomial analysis is the difference between the -2 log likelihood for the model and the -2 log likelihood for each independent variable. Statistical significance is based on 3 degrees of freedom. The three degrees of freedom are based on the number of possible models. In this analysis, three models are being predicted, reward, focus, and priority schools. The category with no designation is the reference group and is not counted as a model. Eight of the 22 independent variables entered the stepwise multinomial logistic regression. Although the percentage of English language learners (ELL) initially entered the analysis as a statistically significant predictor of school designation, by the final step it was no longer statistically significant. The remaining seven independent variables were statistically significant predictors of the school designation.

The parameter estimates were examined for each of the three school designations to determine which of the independent variables were predictive. The results of this analysis are presented in Table 15.

Table 15

*Parameter Estimates*

| Independent Variables | *B* | *SE* | Wald | *DF* | Sig | Exp(*B*) |
|---|---|---|---|---|---|---|
| | | | Reward | | | |
| Intercept | 7.24 | 31.96 | .05 | 1 | .821 | |
| % of Asian | .07 | .03 | 6.63 | 1 | .010 | 1.07 |
| % of Multiracial | -.27 | .14 | 3.61 | 1 | .057 | .77 |
| % of economically disadvantaged | -.04 | .02 | 8.18 | 1 | .004 | .96 |
| % of special needs students | -.16 | .07 | 5.39 | 1 | .020 | .85 |
| % of English language learners | .02 | .02 | 1.2 | 1 | .271 | 1.02 |
| Revenue per pupil | <.01 | <.01 | 5.53 | 1 | .019 | 1.00 |
| Attendance rate | -.08 | .33 | .06 | 1 | .810 | .92 |
| Mobility rate | -.41 | .15 | 7.33 | 1 | .007 | .67 |
| | | | Focus | | | |
| Intercept | -64.68 | 23.62 | 7.50 | 1 | .006 | |
| % of Asian | .06 | .03 | 5.37 | 1 | .020 | 1.06 |
| % of Multiracial | .09 | .08 | 1.13 | 1 | .287 | 1.09 |
| % of economically disadvantaged | .01 | .01 | .66 | 1 | .417 | 1.01 |
| % of special needs students | .07 | .05 | 2.02 | 1 | .156 | 1.07 |
| % of English language learners | <.01 | .02 | .03 | 1 | .869 | 1.00 |
| Revenue per pupil | <.01 | <.01 | 4.75 | 1 | .029 | 1.00 |
| Attendance rate | .60 | .24 | 6.30 | 1 | .012 | 1.82 |
| Mobility rate | .09 | .08 | 1.46 | 1 | .226 | 1.10 |
| | | | Priority | | | |
| Intercept | 12.67 | 10.94 | 1.34 | 1 | .247 | |
| % of Asian | .12 | .05 | 5.71 | 1 | .017 | 1.13 |
| % of Multiracial | .17 | .11 | 2.45 | 1 | .118 | 1.19 |
| % of economically disadvantaged | .06 | .02 | 6.91 | 1 | .009 | 1.06 |
| % of special needs students | .04 | .06 | .52 | 1 | .473 | 1.05 |
| % of English language learners | .01 | .02 | .11 | 1 | .755 | 1.01 |
| Revenue per pupil | <.01 | <.01 | .07 | 1 | .790 | 1.00 |
| Attendance rate | -.23 | .11 | 4.46 | 1 | .035 | .80 |
| Mobility rate | -.07 | .08 | .73 | 1 | .394 | .93 |

The values of the parameters were estimated using maximum-likelihood estimation, which selects the coefficients that make the values most likely to have occurred (Field, 2009). The parameter estimates table quantifies the effect of each predictor variable on the probability that a school falls in the specified category. The Wald statistic is analogous to a t statistic for determining the statistical significance for each of the predictor variables. The logistic coefficient, Exp (B), is an odds ratio of membership in the alternative category due to a one-unit increase in the independent variable. The alternative category denotes the reference/omitted category. The p-value represents the probability that the null hypothesis is true. The conventional p-value in social sciences is .05. The outcome of the analysis is presented for each school designation.

- Reward Schools
    - The intercept is the multinomial logit estimate for reward schools relative to a non-designated school when the predictor variables are omitted from the analysis and estimated at 0. (Intercept = 7.24, Wald = .05, p = .821)
    - A one percentage point increase of Asian students made a school 1.07 times, or 7%, more likely of becoming a reward school in comparison to schools in the reference category. (b = .07, $se_b$ = .03, Wald = 6.63, p = .010). This finding indicates that schools with greater percentages of Asian students are more likely to be considered reward schools.
    - A one percentage point increase of economically disadvantaged students decreases the odds of becoming a reward school by a factor of .96, or 4%, in comparison to the schools in the reference category, (b = -.27, $se_b$ = .14, Wald = 8.18, p = .004). Thus, schools with a lower percentage of

economically disadvantaged students are more likely to be considered reward schools when compared to non-designated schools.

- A one percentage point increase of students with special needs decreases the odds of becoming a reward school by .85, or 15%, in comparison to the schools in the reference category (b = -.16, $se_b$ = .07, Wald = 5.39, p = .020). This finding indicates that schools with a higher percentage of students with special education needs are less likely of becoming a reward school.
- An increase of one dollar of revenue per pupil results in an odds ratio of 1, which indicates no change in the odds. The significance of the Wald statistic indicates that revenue is a statistically significant predictor of becoming a reward school, although, a mere one dollar increase in revenue per pupil does not affect these odds (b = <.01, $se_b$ = <.01, Wald = 5.53, p = .019). A more substantial increase in revenue would increase the odds of a school entering the reward category.
- A one percentage point increase in the mobility rate within the school environment decreases the odds of becoming a reward school by .67, or 33%, in comparison to schools in the reference category (b = -.41, $se_b$ = .15, Wald = 7.33, p = .007). Schools with a higher percentage of students who are mobile or transient are less likely to become a reward school.
- The remaining independent variables were not statistically significant predictors of being a reward school.

- The statistically significant odds ratios for schools to become Focus schools include:
    - A one percentage point increase in the Asian student population increases the odds of being a focus school by 1.06, or 6%, in comparison to the schools in the reference category (b = .06, $se_b$ = .03, Wald = 5.37, p = .020). Thus, an increase in the percentage of Asian students makes a school more likely to be a focus school in comparison to schools that have no designated label.
    - An increase of one dollar of revenue per pupil results in an odds ratio of 1, which indicates no change in the odds from the reference category. The significance of the Wald indicates that revenue is a statistically significant predictor of becoming a focus school, although, a mere one dollar increase in revenue per pupil does not affect these odds (b = <.01, $se_b$ = <.01, Wald = 4.75, p = .029). A more substantial increase in revenue would increase the odds of a school entering the focus category.
    - A one percentage point increase in the attendance rate, increases the odds of becoming a focus school by 1.82, or 82%, in comparison to schools in the reference category (b = .60, $se_b$ = .24, Wald = 6.30, p = .012). This finding indicates that an increase in the attendance rate makes a school more likely to become a focus school in comparison to non-designated schools. According to the research literature, higher attendance rates are associated with higher achievement (Balfanz & Byrnes, 2013). Since focus schools are schools with the largest achievement gaps, this finding may

indicate that schools with a strong attendance rates may have larger discrepancies between their high achieving group and their lower achieving group.

- The remaining independent variables were not statistically significant predictors of being a focus school.

- The statistically significant odds ratios for schools to become Priority schools include:
  - A one percentage point increase of Asian students increases the odds of a school becoming a priority school by 1.13, or 13%, in comparison to the schools in the reference category (b = .60, $se_b$ = .24 (Wald = 5.71, p = 017). Thus, an increase in the percentage of Asian students makes a school more likely to be a priority school in comparison to schools that have no designated label. This result is counterintuitive, contrary to previous research, and discussed further in this section.
  - A one percentage point increase of economically disadvantaged students increases the odds of becoming a priority school by 1.06, or 6%, in comparison to schools in the reference category (b = .12, $se_b$ = .05, Wald = 6.91, p = .009). Schools with a higher economically disadvantaged population increases the odds that the school will be a priority school.
  - A one percentage point increase in the attendance rate decreases the odds of a school becoming a priority school by a factor of .80, or 20%, in comparison with schools in the reference category (b = -..23, $se_b$ = .11, Wald

= 4.46, p = .035). This finding indicates that schools with students that have higher attendance rates are less likely to be designated as a priority school.

- The remaining independent variables were not statistically significant predictors of being a priority school.

**The "Asian students" conundrum.** Students who are part of the Asian population are listed in all three school designation models: reward, focus, and priority. It should be noted that the Michigan Department of Education (2008) defines Asian as: a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent, including Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam. When examining specific schools within each category, the populations designated as Asian look different from district to district. The type of Asian populations found in high achieving reward and focus schools may not be the same Asian student populations found in priority schools. Considering the large umbrella used to classify the Asian community, Hmong students have very different language and culture than students who are Indian, yet, both are considered Asian. One can question the usefulness of the ethnic classification of Asian, when different populations yield different academic results and lack commonalities in regards to culture and/or language.

**Accuracy of the predictors.** To determine the accuracy of the predictors, the classification table for the multinomial logistic regression was examined. The classification table demonstrates how well the model predicts cases by classification and includes an overall percentage measure of the model's accuracy. A perfect model would

show predicted and observed classification perfectly matched (100% correct). Table 16 presents results of this analysis.

Table 16
*Multinomial Logistic Regression – Classification Table*

| Observed Classification | Predicted Classification | | | | |
|---|---|---|---|---|---|
| | None | Reward | Focus | Priority | Percent Correct |
| None | 204 | 12 | 0 | 3 | 93.2% |
| Reward | 27 | 22 | 0 | 0 | 44.9% |
| Focus | 37 | 1 | 1 | 0 | 2.6% |
| Priority | 14 | 0 | 0 | 3 | 17.6% |
| Overall Percent | 87.0% | 10.8% | 0.3% | 1.9% | 71.0% |

Missing None 8
Priority 1

As noted above, nine of the 333 schools had missing values and were eliminated from the analysis. Eight schools that had no designation and one school with a priority designation had missing values in some of the independent variables and were not included in this analysis. Of the 324 schools that were included in the study, 230 (71%) were correctly classified by the logit model. Among the schools that had no specific designation, 204 were correctly classified with 12 predicted to be reward schools and 3 schools predicted to be in the priority schools category. Twenty-seven of the 49 schools that had reward status were predicted to have no designation and 22 were correctly classified. Thirty-seven of the focus schools were predicted to have no designation, one school was predicted to be a reward school, and one school was predicted to be a focus school. Among the 17 schools that had a priority designation, 14 were predicted to have no designation and 3 correctly classified as priority schools.

While the model accurately predicted the classification of 71% of school designations, the accuracy of the alternative categories: reward, focus, and priority

yielded lower results. Accuracy of reward school classifications was approximately 45%, while focus and priority classifications were approximately 3% and 18%, respectively. A school's achievement gap or improvement slope are examples of factors used to determine reward, focus, or priority status. The complexity of how student, teacher, school, and district characteristics affect a school's achievement gap or improvement slope is beyond the scope of this study, and the absence of these factors from the model likely contributed to the inability of the model to predict these school classifications accurately. This is especially true focus schools which are, by definition, schools with large achievement gaps. Furthermore, schools that are lower performing may be excluded from the priority category dependent upon a positive improvement rate for achievement.

**Ancillary Findings**

In addition to receiving a designation label of reward, focus, priority or none, schools are ranked from the 99$^{th}$ percentile to 0. This section includes ancillary findings related to each school's ranking.

Stepwise multiple linear regression was used to model the relationship between the independent variables named earlier in this chapter and the dependent variable of school ranking. The purpose is to predict the dependent variable on the basis of the independent variables. In this model, student, teacher, school, and district characteristics were used as the independent variables. Table 17 presents results of this analysis**.**

Table 17

*Stepwise Multiple Linear Regression Analysis – School Ranking*

| Independent Variable | Constant | b-weight | β-weight | Δ $R^2$ | t | Sig |
|---|---|---|---|---|---|---|
| Included Variables | | | | | | |
| Percentage of economically disadvantaged students | 198.06 | -.96 | -.88 | .71 | -24.16 | <.001 |
| Percentage of English language learners | | .24 | .14 | .03 | 4.14 | <.001 |
| Teacher salary | | .00 | -.13 | .01 | -2.83 | .005 |
| Percentage of special education | | -.72 | -.09 | <.01 | -3.09 | .002 |
| Percentage of teachers with 5 yrs. or less experience | | -.32 | -.15 | <.01 | -3.49 | .001 |
| Pupil-teacher Ratio | | -1.36 | -.13 | <.01 | -3.59 | <.001 |
| Foundation allowance | | <-.01 | -.09 | <.01 | -2.42 | .016 |

| | |
|---|---|
| Multiple R | .88 |
| Adjusted $R^2$ | .77 |
| F Ratio | 150.92 |
| DF | 7, 316 |
| Sig | <.001 |

Seven independent variables entered the stepwise multiple linear regression equation, accounting for 77% of the variance in school ranking, F (7, 316) = 150.92, p = <.001. The percentage of economically disadvantaged students entered the stepwise multiple linear regression equation first, explaining 71% of the variance in the dependent variable, (β = -.88, t = -24.16, p =<.001). The negative relationship between the percentage of economically disadvantaged students and school ranking indicates that schools with a higher percentage of economically disadvantaged students are more likely to have a lower school ranking. Again, this finding is in alignment with a vast body of previous research indicating that socioeconomic status is one of the strongest predictors of academic achievement (Berliner, 2009; Lubienski & Crane, 2010; Reardon, 2011).

The percentage of English language learners entered the regression equation accounting for 3% of the variance in school ranking, (β = .14, t = 4.14, p =<.001). Schools with a greater percentage of students who were English language learners have a higher

school ranking. This conflicts with published research that indicates that schools with a large percentage of students who are English language learners perform relatively poorly on state assessments (Darling-Hammond, 2007). The English language learner (ELL) population is comprised of a plethora of ethnic and racial groups. Students within the ELL population may perform differently depending on their ethnicity (e.g., Hispanic and Asian). Hispanic students, for example, are positively correlated in the research literature with economically disadvantaged populations ("State of America's Children 2014," 2014). Students of Hispanic origins may not perform as well as their Asian peers. Further research should identify the differences in ELL populations within schools of various rankings.

Furthermore, this study used the Michigan Department of Education reported combined percentage of students at the proficient or advanced levels as a single measure for both subject areas tested. This may have skewed the results of how ELL students performed on the MEAP assessments. For example, some ELL populations are able to perform very well in mathematics. Since this study used one combined score for reading and mathematics, a student performing extremely high in mathematics may have compensated for a lower reading assessment score. Using separate reading and mathematics scores may have yielded differing results in relation to the effect of the ELL population on ranking, and proficiency.

An additional 1% of the variance in school ranking was explained by teacher salary, ($\beta$ = -.13, t = -2.83, p = .005). This result provided evidence that schools with higher teacher salaries were more likely to have a lower school ranking, which is contrary to the research. The literature on teacher salaries and student achievement is mixed, with

several studies showing that teacher salaries have little or no effect on student achievement (Fryer Jr., 2011; Jones, Alexander, Rudo, Pan, Vaden-Kiernan, 2006). However, increased teacher salaries are found to affect student achievement positively when such salaries are used to attract and retain more effective teachers (Hanushek, 2010, Loeb & Page, 2000).

Moreover, in this study, teacher salaries were negatively correlated with inexperienced teachers ($r = -.73$, $p = <.001$; Table 11) which means that schools with higher teacher salaries had more experienced teachers, and teachers with more experience work in schools with higher rankings. This finding is contrary to the above finding that higher teacher salaries are associated with lower performance. However, the reporting of teacher salary must be considered. Teacher salary is reported at the state level by district. All schools within a district have the same reported average teacher salary. However, within the same district, there could be two schools that have markedly different teacher populations. One school could have the majority of their teachers new and inexperienced, while the other school, within the same district, may have a majority of veteran teachers. Understanding the effect of teacher salary at the school level is difficult when state administrative data report salaries at the district level only.

The percentage of teachers with fewer than 5 years of experience accounted for less than 1% of the variance in the dependent variable ($\beta = -.15$, $t = -3.49$, $p = .001$), indicating that schools with a higher percentage of inexperienced teachers had lower TTB rankings. Again, this finding is consistent with a large body of research literature (see, for example, Rice 2010).

Percentage of students with special needs accounted for less than 1% of the variance in the dependent variable (β = -.09, t = -3.09, p =.002). The remaining two independent variables, pupil-teacher ratio (β = -.13, t = -3.59, p =<.001) and foundation allowance (β = -.09, t = -2.42, p =.016), were statistically significant, but accounted for less than 1% of the variance in the dependent variable.

These findings are similar to the results in the first research question that probed whether student, teacher, school and/or district factors can be used to predict the percent of students scoring at proficient or advanced levels on the reading and mathematics MEAP tests. In both findings, most of the variance can be explained by the percentage of economically disadvantaged students. Economically disadvantaged students often face challenges in many areas including: inadequate medical, dental, and/or vision support; food insecurity; family stress; and academic readiness. The statistically significant positive relationship between an increase in English language learners and higher student achievement was found in both the ancillary findings and research question one. The statistically significant correlation between higher pupil-teacher ratio and lower student achievement was found in both research question one and the ancillary findings.

Several variables significant in the analysis of the percent of students at proficient or advanced levels in reading and writing were not significant determinants of school ranking. Per pupil instructional expenditures and revenue per pupil were significant for academic proficiency, but not for school ranking. Foundation allowance was significant for school ranking, but was not a significant factor in relation to academic proficiency.

However, as shown in the intercorrelational matrix (Table 11), foundation allowance is highly correlated with revenue per pupil (r=.66, p<.001) and instructional

expenditure per pupil (r=.66, p < .001). Revenue per pupil is also highly correlated with instructional expenditure per pupil (r=.68, p < .001). One can infer that schools with higher foundation allowances and higher revenue per pupil are spending more money on instruction.

Teacher salary and percentage of teachers with 5 or fewer years of experience were significant in the ancillary findings only. The percentage of students with special needs was significant for school rankings only, and students who are multiracial were significant only for the proficiency rates of reading and mathematics.

While the core of both sets of findings showed percentage of economically disadvantaged students as the strongest factor of school ranking and academic proficiency, obvious differences exist between the proficiency and school ranking models. Academic proficiency for the purpose of this study is defined as the proportion of students who receive a proficient or advanced score in reading and mathematics. School ranking, on the other hand, is not based solely on reading and mathematics proficiency. On the Michigan's District and School Accountability website, the TTB ranking evaluates schools by their students' achievement in all core subject areas: reading, mathematics, science, and social studies using the Michigan Education Assessment Program tests. Moreover, TTB ranking holds schools accountable for three areas of performance: achievement, improvement, and achievement gap. These differences highlight the complexity of the TTB rankings and speak to the challenges of predicting classifications of school designation labels accurately.

# CHAPTER 5: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Politicians and educators have long debated that the solution to curing societal ills and securing America's place as an economic superpower is through education reform. Several historical events created a perception that American schools were not preparing students adequately or creating an environment in which our students could be academically competitive with their global peers. The 1957 Soviet launch of artificial satellite Sputnik, the Coleman Study, and a "Nation at Risk" report were all catalysts to legislative actions aimed at improving student achievement (Coleman, 1966; Gardner, 1983; USDOE, 2012a). The public concern with the perceived erosion of the American educational system gave rise to key initiatives that launched the subsequent standards and accountability movement (Hamilton, Stecher, & Yuan, 2012).

In the context of standards-based reform, accountability is part of a broader integrated policy package that provides incentives and consequences for students, teachers, schools, or districts to perform at the highest academic level (Hamilton et al., 2012; Figlio & Loeb, 2011). Much of the recent activity in the accountability movement can be directly attributed to the restructuring of the Elementary and Secondary Act ([ESEA] Skinner & Lomax, 2010).

Originally passed in 2001, No Child Left Behind legislation (NCLB) revised the Elementary and Secondary Education Act (ESEA) and dramatically broadened the scope of the federal government's involvement in K-12 education (Dee & Jacob, 2011; New America Foundation, 2014). Under NCLB, states were required to establish accountability systems that held all public schools and school districts accountable through high-stakes

testing (Dee & Jacobs, 2011). In the state of Michigan, legislators enacted several accountability systems over the past decade in fulfillment of the NCLB mandate.

Currently, Michigan's accountability system focuses on ranking schools from top-to-bottom (TTB; USDOE, 2013a). According to Michigan's District and School Accountability website, the TTB ranking evaluates schools by their students' achievement in all core subject areas: reading, mathematics, science, and social studies using the Michigan Education Assessment Program (MEAP) test scores.

Since the 2010-11 school year, Michigan has used data and the TTB ranking to assign a specific color and designation to elementary, middle, and high schools. Currently, schools are assigned a color from green to purple, and may be designated as reward, focus, priority or no designation. In the spring of 2015, Michigan instituted the Michigan Student Test of Educational Progress (M-STEP). This assessment replaces the MEAP and will be used for future TTB rankings. Current TTB rankings are still based on the MEAP.

Reward schools are schools that occupy the top 5% of the Top-to-Bottom ranking. Beyond the ranking of the top 5% academically, there are three additional criteria in which the Michigan Department of Education (MDE) adds schools to this reward category. These criteria include: schools that outperform schools with similar risk factors and demographic makeup; schools in the top 5% of schools on the improvement metric in the Top-to-Bottom ranking; and schools that show continuous improvement beyond the 2022 proficiency targets (beginning in 2013). Focus Schools are schools with the largest achievement gaps, defined as the difference between the average scale score for the top 30% of their students and the bottom 30% of their students. These schools are

determined from the achievement gap component within the Top-to-Bottom ranking. Priority Schools are schools in the bottom 5% of the Top-to-Bottom list. These schools may also be ranked in the bottom 5% of Title I schools or schools formerly considered as Persistently Low-Achieving (PLA; MDE, 2010).

School designation labels are based on three areas of performance: achievement, improvement, and achievement gap; additionally, high schools must include their graduation rate as a designation factor. This information is made publicly available for parents and the community-at-large (Michigan Department of Education [MDE], 2013a). Schools are either rewarded or sanctioned by the state based on their designations (USDOE, 2013a). According to the most recent accountability system results, many Michigan schools continue to struggle to educate students effectively.

This research explored and defined student, teacher, school, and district characteristics and their effects on academic proficiency, school designation labels, and school rankings. This study was limited to K-5 elementary schools that had TTB rankings (n = 333) in three counties: Macomb (23.4%), Oakland (37.8%), and Wayne (38.7%). A total of 333 elementary schools in 56 public school districts and 18 charter schools included in this study had a total combined student population of 142,619 (Michigan Department of Education, 2014). Two relevant research questions were developed for this study.

The first research question examined which factors predicted the percentage of students scoring at proficient or advanced levels on the reading and mathematics MEAP tests. Stepwise multiple linear regression analysis was used to model the relationship between the independent variables and the dependent variable, academic proficiency in

reading and mathematics. All decisions on the statistical significance of the findings were made using a criterion alpha level of .05.

The second research question examined factors that predict whether an elementary school would be classified as a reward, focus, or priority school. A stepwise multinomial logistic regression was used to predict the category membership or the probability of category placement based on multiple independent variables (Starkweather & Moske, 2011).

In addition to receiving a designation label of reward, focus, priority, or none, schools are ranked from the 99$^{th}$ percentile to 0. Stepwise multiple linear regression was used to model the relationship between independent variables and the dependent variable of school ranking.

The independent variables included in the study are: student demographics (percentage economically disadvantaged, percentage English language learners, percentage students with special needs, and student ethnic/racial composition), teacher characteristics (average salary, percentage of teachers with graduate degrees, percentage of teachers with fewer than 5 years of experience), and school or district characteristics (charter/public school, total enrollment, foundation allowance, revenue per pupil, instructional expenditures per pupil, general fund balance per pupil, total enrollment, mobility rate/change in school enrollment during the school year). Stepwise multiple linear regression analysis was used to examine the relationship between the independent variables named above and the dependent variable of school ranking (*ancillary findings*).

Michigan's accountability system focuses on utilizing student achievement data to categorize and rank schools and does not consider the effects of student, teacher, school, and district characteristics. The research literature discussed how these factors impact student achievement.

**Findings**

Six variables were found to be statistically significant predictors of the percentage of students scoring at proficient or advanced levels on the reading and mathematics MEAP assessments, which addressed research question one. The percentage of economically disadvantaged students accounted for 75% of the variance in this regression analysis. Percentage of students who were English language learners (ELL), per pupil instructional expenditures, pupil-teacher ratio, percentage of students who were multiracial, and revenue per pupil accounted for an additional 4% of the variance.

These findings indicated that schools with a higher percentage of economically disadvantaged students had a lower percentage of students scoring proficiently in reading and mathematics as corroborated by the MEAP scores. This analysis was supported by the ancillary findings, in which economically disadvantaged students accounted for 71% of the variance in school ranking, and was substantiated by an extensive amount of research literature that indicated socioeconomic status was one of the strongest predictors of academic achievement (Berliner, 2009; Lubienski & Crane, 2010; Reardon, 2011). As well, this study found that economically disadvantaged students were more likely to be African-American, and less likely to be Caucasian. Schools with higher percentages of economically disadvantaged students systemically had lower attendance rates.

Due to the above profile, servicing economically disadvantaged students in a way that promotes high academic achievement has proved challenging for schools. In Macomb, Oakland, and Wayne counties, some schools have a greater challenge with 100% of their students qualifying as economically disadvantaged, while other schools had only 2% of students in this population. One could question the fairness and/or the validity of using a Top-to-Bottom (TTB) ranking system that compares schools with disparate needs and challenges.

Percentage of students who were English Language Learners (ELL) accounted for 2% of the variance in reading and mathematics proficiency scores, and 3% of the variance in the ancillary findings of school ranking. In this study, schools with a greater percentage of students who were ELL were more likely to have a higher student proficiency rate and a higher school ranking. At first glance, these results appear counterintuitive and are contrary to past research that ELL may have more difficulty passing state assessments (Darling-Hammond, 2007). However, the English language learner (ELL) population in the three counties included in the study is comprised of multiple diverse ethnic groups. Students within the ELL population may perform differently depending on their ethnicity (e.g., Hispanic versus Asian). Future research should identify the differences in ELL populations as it relates to the various school rankings and academic proficiency.

Furthermore, this study used a combined score for both reading and mathematics proficiency levels. This score, reported by the state of Michigan, may not provide the necessary information to analyze ELL performance results appropriately. Thus, a student performing extremely high in mathematics may have compensated for a lower reading

assessment score. Mathematics and reading measured separately may have produced different results and should be the focus of future research.

Per pupil expenditures accounted for 1% of the variance in academic proficiency. This finding was aligned with research by Greenwald, Hedges, and Laine (1996), who stated expenditures on specific factors, such as smaller schools, small class size, teacher quality, etc., could lead to increases in academic achievement.

While foundation allowance did not register as a significant variable for academic proficiency, it was a significant variable in the ancillary findings, accounting for less than 1% of the variance. Foundation allowance is positively correlated with instructional expenditures per pupil, and revenue per pupil was positively associated with instructional expenditures per pupil. Revenue per pupil accounted for less than 1% of the variance in reading and mathematics proficiency. Schools with greater foundation allowances and/or more revenue per pupil may allocate more instructional expenditures per pupil which, as stated above, may lead to increased academic achievement.

Pupil-teacher ratio accounted for 1% of the variance as it relates to academic proficiency and less than 1% of the variance in school TTB rankings. This finding is aligned with studies that indicated smaller class-size produced positive effects for students at the elementary level (Whitehurst & Chingos, 2011).

The final statistically significant variable for academic proficiency, resulting in less than 1% of variance in outcomes, was the percentage of students who were multiracial. No research was found in the literature that supported this finding. Without specific knowledge of the students identified in this category, the finding is difficult to interpret.

The analysis of research question one and the ancillary findings revealed similarities in statistically significant variables: percentage economically disadvantaged students, percentage English language learners, and pupil-teacher ratio. Since school ranking is not based solely on reading and mathematics proficiency, it is understandable that differences are reflected in the findings. The TTB ranking holds schools accountable for three areas of their students' performance: achievement, improvement, and achievement gap.

Average teacher salary accounted for 1% of the predictive value for the ancillary findings of school ranking. This result provided evidence that schools with higher teacher salaries were more likely to have a lower school ranking, which is contrary to the research. Most studies show that teacher salaries have little or no effect on increased student achievement (Fryer Jr., 2011; Jones, Alexander, Rudo, Pan, Vaden-Kiernan., 2006), however, the reporting of teacher salary must be considered. Teacher salary is reported at the state level by district. All schools within a district have the same reported average teacher salary. However, within the same district, there could be two schools that have markedly different teacher populations. One school could have the majority of their teachers new and inexperienced, while the other school, within the same district, may have a majority of veteran teachers. Understanding the effect of teacher salary on each individual school is difficult when relying on teacher salary as a district average.

The percentage of students with special needs accounted for less than 1% of the variance in school ranking. Higher percentages of students with special needs were weakly correlated with lower student achievement. According to Feng and Sass (2010), students with special needs require teachers with higher levels of expertise.

The second research question examined factors that predicted whether an elementary school is classified a reward, focus, or priority school. Specifically, multinomial logistic regression analysis was used to determine commonalities and/or patterns that were present in elementary schools with the above designations in the tri-county area of Macomb, Oakland, and Wayne counties.

Reward schools is a category comprised of schools in the top 5% of the Top-to-Bottom ranking or rated as either “Beating the Odds” or “High Progress,” or schools that are deemed to have shown continuous improvement. The following factors increase the odds of becoming a reward school: a higher percentage of Asian students, lower percentage of economically disadvantaged students, lower percentage of students with special needs, low mobility rates, and high revenue per pupil.

The mobility rate or change in school enrollment during the school year can result in a myriad of problems for school districts. Since funding is based on the number of pupils within a school, declining enrollment creates a loss of school funding and is an indicator of fiscal stress. Higher mobility rates are associated with challenges in instructional delivery, classroom management, and the school environment, resulting in lower student achievement. Inconsistent classroom and school composition contribute to the challenges within the educational environment. Students who are economically disadvantaged, minorities and immigrants are disproportionately represented in the transient population. However, these educational outcomes affect transient students and their stable classroom peers (Hartman & Leff, 2002). Conversely, lower mobility rates are a sign of fiscal stability, higher student achievement, and contributes to a school being designated as a reward school. The adverse effects of lower revenue per pupil, high

percentages of economically disadvantaged students and students with special needs were discussed earlier in this chapter.

Focus schools are those categorized with the largest achievement gaps. Factors that increase the odds of a focus school designation include: a higher percentage of Asian students, an increase in revenue per pupil, and an increase in the attendance rate. Students with better attendance records have higher student achievement (Balfanz & Byrnes, 2013). Higher student achievement contributes to the achievement gap observed in focus schools, when the achievement gains are distributed unevenly across students in the school.

The priority schools category include schools that are in the bottom 5% of the Top-to-Bottom list. Factors that increase the odds of becoming a priority school include: a higher percentage of Asian students, an increase in the percentage of economically disadvantaged students, and decrease in the attendance rate.

Asian student population are represented in schools designated reward, focus, and priority. When examining specific schools within each category, the observed populations designated as Asian differ from district to district. The type of Asian populations found in high-achieving reward and focus schools may not be the same as those found in priority schools. As noted earlier, future research should distinguish among the different student groups designated Asian by the MDE.

**Conclusions**

Legislators have implemented an accountability system in an effort to increase school quality for all students. Policymakers assume that rewards and sanctions, based on results from high-stakes testing, can improve student achievement. The accountability

system does not consider student, teacher, school, and district factors that impact student outcomes.

Michigan's accountability system lacks validity due to the measurement of student, teacher, school, and district demographics as opposed to measuring school quality. In alignment with the vast amount of research literature, this study finds that socioeconomic status is the greatest predictor of student achievement. Schools with a higher percentage of economically disadvantaged students have lower proficiency scores in reading and mathematics, lower school rankings, and are less likely to achieve reward school status, and more likely to be classified a priority school. Thus, the measurement of school quality is confounded by the proportion of lower socioeconomic students attending the school.

While socioeconomic status explained most of the variance in all outcome measures, this study revealed that increases in the attendance rate and instructional expenditures positively impact school rankings, academic proficiency, and/or the ability to be designated a reward school. Moreover, increases in pupil-teacher ratio, percentage of students with special needs, percentage of inexperienced teachers, and the mobility rate negatively impact school ranking, academic proficiency, and/or the ability to be designated a reward school. These factors align with a substantial segment of the research literature.

Since the aforementioned student, teacher, school, and district factors negatively impact students, it is important that legislators create policies that address the access to resources necessary for educating economically disadvantaged students effectively. Resources that mitigate the effects of poverty on students should be provided. Policymakers should ensure that schools are adequately funded. In turn, this funding will

allow schools the benefit of having sufficient funds for instructional expenditures to reduce class size as well as attract, hire, and retain teachers with more experience and expertise. State accountability policies should address resource adequacy to promote parity among student, teacher, school, and district characteristics. Using an accountability system to create change in education reform is not reasonable when the system does not consider the necessary school resources.

Schools with different demographics should not be compared or ranked against each other. A school that has lower instructional expenditures per pupil, and large populations of economically disadvantaged and special needs students, should not be compared to schools with higher socioeconomic status populations and no subgroups of economically disadvantaged or special needs students. Comparing these schools does not indicate that one school has better instructional practices, and may not take into consideration that a school is dealing with environmental factors with limited resources. Under the current law, schools are expected to produce the same outcomes regardless of the diverse challenges they face.

Furthermore, the delineation between a reward school designation and a priority school designation is strict. A school with very few economically disadvantaged students, small percentages of students with special needs, a low mobility rate, and a substantial amount of revenue per pupil, indicates that the school is more likely to be a reward school. Conversely, a school with high percentages of economically disadvantaged students and lower attendance rates is more likely to be a priority school. Therefore, the accountability system is classifying schools by factors beyond the school or school district's control.

Despite differences in schools, all students are expected to meet proficiency targets for the overall population and each subgroup. While this noble target sets high expectations for every student, it does not appear attainable under current circumstances. Schools with multiple subgroups (e.g., economically disadvantaged, students with special needs, English language learners, etc.) confront what the literature calls the “diversity penalty” (Darling-Hammond, 2009). For each subgroup, schools are expected to reach their achievement target, giving schools more opportunities to miss a target and be penalized. In the tri-county area, schools with a more homogenous population have only to ensure the achievement of the overall population and students in the bottom 30%. Thus, some schools have an unfair advantage in creating an environment that allows for success under the Michigan accountability system.

English language learners are associated with a higher school ranking in the current study, which is counterintuitive and contrary to much research as discussed earlier in the chapter. The ELL population encompasses a multitude of different ethnicities. If the state of Michigan wants to research and pursue possible strategies that can help ELL students be successful, there needs to be a clear delineation of the students classified within this group. This would require further analysis of the ethnicities comprising the ELL population, and an investigation into the success rate of certain ELL populations as evidenced by higher academic proficiency.

The accountability system developed for student measurement continues to change, sometimes on an annual basis. This timing does not give the system an opportunity to evaluate its feasibility. The state of Michigan continuously makes small, but relevant adjustments on how students and schools will be measured. Revising the actual

assessment, administration of the assessment, and standards on which the assessment is based are but a few of the ways the state has changed the accountability system over the past several years. These changes may create different outcomes in achievement and do not allow schools to create an environment of success due to an inability to assess the previous year's test administration results.

Instead of focusing on rewarding and sanctioning schools and school districts, legislators should focus on change across all facets of the educational system. These changes need to address the effects of poverty on the educational system, fairly measure school quality, provide adequate resources, and reject comparing schools that have dissimilar demographics.

**Limitations of the Study**

The following limitations may affect the ability to generalize the findings:

- The study is limited to three proximate counties, Macomb, Oakland, and Wayne, in Michigan. The findings may not be generalizable to schools in other counties in Michigan or to other states.
- The study is limited to elementary schools with K through 5$^{th}$ grade configurations. The findings may not be generalizable to middle or high schools as the accountability standards are different at the secondary level.
- The study is limited to public K-5 elementary schools in Macomb, Oakland, and Wayne counties. This configuration included a small sample (5.4%) of charter schools, and thus, may not adequately measure the impact of student, teacher, school, and district characteristics on charter schools.

- The study is limited to a cross-sectional analysis of one year of data. This raises issues of reliability. An analysis of a panel of three or more years of data could yield more reliable findings.
- Pupil-teacher ratios are an imprecise indicator of class size. Pupil-teacher ratios do not account for frequently intense teaching resources targeted toward Title I, special education, or bilingual services in schools (Hanushek, 1998). The better indicator of class size is the average number of students in a regular classroom (Mayer, Moore, Mullens, & Ralph, 2001).
- Average teacher salary, percentage of teachers with graduate degrees, and percentage of teachers with fewer than 5 years of experience are reported to the state at the district level. However, within a district, these characteristics can vary widely across schools, depending on the demographic make-up of each particular building. Due to this limitation, this study may not be able to fully gauge the effect of each of these characteristics on the academic proficiency, school classification, or school ranking.

**Recommendations to Policy Makers**

The effects of poverty on the educational system are substantial. Policy makers should create a system that provides schools with resources to mitigate factors plaguing students who are economically disadvantaged. Fair allocation of resources means that schools with higher percentages of economically disadvantaged students need support to address social, economic, and educational challenges within their community. Without addressing the issue of poverty, as mentioned in the Coleman study of 1966 and

countless other studies, education reform will continue to be inadequate in addressing our most at-risk students.

Furthermore, the accountability system needs to measure school quality fairly. The predictability of academic proficiency, school ranking, or designation label should not be based solely on the demographics of a particular school. Currently, Michigan's system measures school quality based on factors that are often outside of the school's control. School quality should measure instructional practices, school culture, and curriculum resources, with the assumption that schools are given adequate resources to effectively and efficiently address the needs of students.

If governmental entities are going to hold schools accountable for achievement, improvement, and achievement gaps, policy makers should provide adequate resources and strategies to address the aforementioned out-of-school factors that impact student achievement. Schools need adequate support and financial resources to address economic and social needs, to hire teachers with experience and expertise, and to purchase adequate curriculum materials (e.g., books, technology, etc.).

Policymakers should reject the practice of comparing schools that do not share similar demographics. Ranking schools in this way for the benefit of community stakeholders does not give them an accurate picture of school culture. Schools that work hard to mitigate numerous educational challenges are unfairly compared with schools possessing fewer educational challenges. Educators could learn more from schools that have similar demographics instead of being presented with reward schools as the model of high academic achievement. Reward schools commonly do not have the same demographics as priority schools. As well, schools that are more diverse and have several

subgroup proficiency targets should not be expected to emulate schools with very few or no subgroup proficiency targets.

Finally, policymakers should endeavor to keep the accountability system consistent for several years so that schools and districts can analyze the trend data and create improvement plans that are effective and can be implemented and monitored for student success.

**Recommendations for Further Research**

Further research on the ethnic and racial classification is needed. The classification of Asian as an ethnicity does not appear to be useful in data collection, since it encompasses too many cultures that are non-related. The Asian population may not be the same ethnic composition of Asian students from school to school.

Multiracial is defined as comprised of two or more races. Multiracial was a category of students identified as a significant variable in the prediction of reading and mathematics proficiency. This classification can include a myriad of cultures and compositions of ethnic groups. Without specific knowledge of the students within this category, one cannot glean valuable information on how to improve student achievement for that particular ethnic category.

Information on students considered ELL presented a similar dilemma. This population includes a multitude of ethnicities. To understand which instructional strategies and practices help this population of students, one would need to understand the results of academic proficiency disaggregated by different ethnicities, cultures, and languages. In this study, ELL had a positive effect on student achievement that was contrary to the research. More information is needed on the specifics of students within this category.

As the study was limited to three proximate counties, further research is needed to examine a population greater than the tri-county area. Research should focus on the relevance to schools in other Michigan counties, and other states.

Elementary schools with a K-5 grade configuration were used in the current study. High schools, middle schools, and elementary schools with different configurations, such as grades K-6, have different student achievement score compositions included in the accountability data. Research is needed on whether the effects are similar for schools with different the grade level configurations.

Traditional public schools and charter schools, both profit and nonprofit, were included in this study, however, many charter schools in the tri-county area do not have a K-5 grade-level configuration. Thus, charter schools comprised only 5.4% of the sample population used in this study. The impact of charter schools as it relates to student, teacher, school, and district factors may not have been measured accurately.

Conducting an analysis of multiple years of cross-sectional data may address the concerns of reliability and may generate results that are more accurate and consistent. The current study is limited to one year of cross-sectional data, raising issues of reliability.

Due to the imprecise nature of pupil-teacher ratios as a proxy for class size, future research should measure average number of students in a regular classroom. At the present time, pupil-teacher ratios are calculated by dividing the number of students in a school by the number of classroom teachers and additional teaching resources such as Title I support, special education staff, and bilingual support. The better indicator of class size is the average number of students in a regular classroom (Mayer, Moore, Mullens & Ralph, 2001).

Average teacher salary, percentage of teachers with graduate degrees, and percentage of teachers with fewer than 5 years of experience are reported to the state based on the district average. To truly understand the effects of these factors on academic achievement, future research must measure these averages at the school, rather than at the district level.

**Closing Statement**

Michigan's school accountability system lacks validity because of the predictability of a school's academic proficiency, ranking, or designation label, based solely on socioeconomic status of the students in a particular school. Until policymakers address environmental factors, specifically poverty and lack of adequate resources, students in poverty-stricken schools will continue to fail. Socioeconomic status is the most powerful predictor of school outcomes and should be addressed through social policy and education reform. Legislators must create policies that measure school quality and not student socioeconomic status or other demographic determinants. In the absence of such reform, sanctioning and rewarding schools are not effective strategies for improving student achievement.

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# ABSTRACT

## STUDENT, TEACHER, SCHOOL, AND DISTRICT DETERMINANTS OF ELEMENTARY SCHOOL ACCOUNTABILITY CLASSIFICATION IN THE DETROIT METROPOLITAN REGION

by

**EMBEKKA FOREHAND-THOMPSON**

**August 2016**

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**Major:** Educational Leadership and Policy Studies

**Degree:** Doctor of Education

Legislators have implemented an accountability system in an effort to increase school quality for all students. Policymakers assume that rewards and sanctions, based on results from high-stakes testing, can improve student achievement. The accountability system does not consider environmental factors that impact student outcomes.

This study examines student, teacher, school and district determinants and their impact on student achievement, school designation, and school ranking. Data was collected from 333 elementary (K-5) schools in 56 public school districts and 18 charter schools in three counties: Macomb, Oakland, and Wayne. Two research questions were developed for this study.

The first research question examined which factors predict the percentage of students scoring at proficient or advanced levels on the reading and mathematics MEAP tests. Multiple linear regression analysis was used to model the relationship between the independent variables and the dependent variable, test proficiency.

The second research question examined factors that predict whether an elementary school will be classified as a reward, focus, or priority school. Multinomial logistic regression was used to determine which of the independent variables could predict the dependent variable, school classification.

In alignment with the research, This study demonstrated that schools with a higher percentage of economically disadvantaged students are less likely to produce students scoring proficient in reading and mathematics, less likely to have a higher school ranking, less likely to be a reward school, and more likely to be a priority school. As confirmed by the research, this study documented that an increase in percentage of special needs students, inexperienced teachers, and pupil-teacher ratio negatively impacted student achievement. Conversely, an increase in instructional expenditures, revenue per pupil, and foundation allowance increased student achievement.

Michigan's school accountability system lacks validity because of the predictability of a school's academic proficiency, ranking, or designation label. Until policymakers address environmental factors, specifically poverty and lack of adequate resources, students will continue to fail. Socioeconomic status is the most powerful predictor of school outcomes and should be addressed through social policy and education reform. In the absence of such reform, sanctioning and rewarding schools are not effective strategies for improving student achievement.

# AUTOBIOGRAPHICAL STATEMENT

# EMBEKKA FOREHAND-THOMPSON

## Education: Wayne State University

Doctorate of Education
Educational Leadership and Policy Studies — 2016

Education Specialist Certificate — 2005
General Administration & Supervision

Master of Arts in Teaching — 1999
Elementary Education

Bachelor of Arts — 1996
Speech Communication

## Certification: State of Michigan

School Administrator Certification — 2015
*Central Office (AC); Elementary & Secondary Admin (ES)*
Professional Education Certification — 2005
Provisional Education Certification — 2000
*K-5 All Subjects; K-8 self-contained; BX Language Arts 6-8*

## Professional Experience

**Principal** — **2006-Present**
*Harlan Elementary School*
Birmingham Public Schools, Bloomfield Hills, Michigan

*Vandenberg Elementary School*
Wayne-Westland Community Schools, Wayne, Michigan

**Title I Coordinator/Teacher** — **1998-2006**
*Francis Scott Key Elementary School*
Oak Park School District-Oak Park, Michigan

*Highland Park Junior High School*
Highland Park School District, Highland Park, Michigan

*Carstens Elementary School*
Detroit Public Schools, Detroit, Michigan

## Professional Organizations

Association for Supervision and Curriculum Development
Michigan Elementary and Middle School Principals Association
National Association of Elementary School Principals